



Rail Transport

Volume I: Report

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INDUSTRY
COMMISSION

21 August 1991

The Honourable John Kerin, MP
Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with Section 7 of the *Industry Commission Act 1989*, we submit to you the report on Rail Transport.

Yours sincerely

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ABBREVIATIONS USED IN VOLUME 1

..	negligible
-	not applicable
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACAC	Australian Conciliation and Arbitration Commission
ACM	Australian Chamber of Manufactures
ACT	Australian Capital Territory
ACTU	Australian Council of Trade Unions
AFCC	Australian Federation of Construction Contractors
AFCO	Australian Federation of Consumer Organisations
AFULE	Australian Federated Union of Locomotive Enginem
AGPS	Australian Government Publishing Service
AIRC	Australian Industrial Relations Commission
ALGA	Australian Local Government Association
AMIC	Australian Mining Industry Council
AMWU	Amalgamated Metal Workers Union
Amtrak	trading name of the National Railroad Passenger Corporation (US)
AN	Australian National Railways Commission
ANI	Australian National Industries Limited
ARRDO	Australian Railway Research and Development Organisation
ARTF	Australian Road Transport Federation
ARU	Australian Railways Union
ASE	Australasian Society of Engineers
ATAC	Australian Transport Advisory Council
ATOF	Australian Transport Officers Federation
AWB	Australian Wheat Board
AWU	Australian Workers Union
BCA	Business Council of Australia
BGQ	Bulk Grains Queensland
BHP	Broken Hill Proprietary Company Limited
BHPT	BHP Transport Limited, subsidiary of BHP
BTCE	Bureau of Transport and Communication Economics
BTE	Bureau of Transport Economics
BTR	Bureau of Tourism Research
CAPM	Capital Asset Pricing Model
CBD	Central Business District
CGC	Commonwealth Grants Commission
COPS	Centre of Policy Studies (Monash University)
CPI	consumer price index
DEET	Commonwealth Department of Employment, Education and Training
DIR	Commonwealth Department of Industrial Relations
DoTC	Commonwealth Department of Transport and Communications
DSS	Commonwealth Department of Social Security
ECMAL	Exxon Coal and Minerals
EPAC	Economic Planning Advisory Council
ETU	Electrical Trades Union
FCL	full-car-load
fob	free-on-board
FORS	Federal Office of Road Safety
GBE	Government Business Enterprise

GDP	gross domestic product
GMA	Grocery Manufacturers of Australia Ltd
GNP	gross national product
IAC	Industries Assistance Commission
IC	Industry Commission
ISC	Inter-State Commission
hp	horsepower
km	kilometres
LCL	less-than-car-load
Met	trading name for the urban activities of the PTC
mt	million-tonnes
MTCL	Mount Thorley Coal Loader
na	not available
NFF	National Farmers' Federation
NFG	National Freight Group, part of ROA
NFI	National Freight Initiative
NRC	National Rail Corporation
NRFC	National Rail Freight Corporation
NRMA	National Roads and Motorists' Association
NSW	New South Wales
NSWCA	New South Wales Coal Association
NT	Northern Territory
NTB	National Training Board
ntk	net tonne-kilometres
NZRC	New Zealand Railways Corporation
PTC	Public Transport Corporation (Victoria)
PUD	pickup and delivery
QLD	Queensland
QR	Queensland Railways
RIC	Railway Industry Council
ROA	Railways of Australia Committee
SA	South Australia
SEC	State Electricity Commission
SEP	Structural Efficiency Principle
SPC	special Premiers' Conference
SRA	State Rail Authority of New South Wales
STA	State Transit Authority of New South Wales
STAP	State Transport Authority Plan (Victoria)
Tasrail	Tasmanian operations of AN
TFP	total factor productivity
TNT	TNT Limited
TPC	Trade Practices Commission
Transperth	trading name of the Metropolitan (Perth) Passenger Transport Trust
UK	United Kingdom
US	United States
USA	United States of America
VIA	VIA Rail Canada Inc.
V/Line	trading name for the non-urban activities of the PTC
VFT	Very Fast Train
WA	Western Australia
Westrail	Western Australian Government Railways Commission
XPT	Express Passenger Train (NSW)

OVERVIEW AND RECOMMENDATIONS

Railways are essential to Australia's transport system. They play major roles in moving coal, iron ore and grain to ports, and in carrying commuters, particularly to and from central business districts. They account for about half of freight tonne-kilometres moved by land transport, 9 per cent of urban trips to and from work, and almost 1 per cent of GDP. There are approximately 75 000 railway employees.

- Yet there is ample evidence that many railway services are inefficiently operated and inefficiently priced, as is reflected in their large financial losses. Those inefficiencies give rise to substantial costs elsewhere in the economy, so that reform of the railways is an essential element of microeconomic reform.

Most countries have nation-wide railway systems running on tracks of uniform gauge and owned by the national government.

- Australia does not. Each colony established its own railway system last century, and ninety years after federation the nation still has separate incompatible systems owned individually by governments.

World-wide, railways are servicing a declining share of the transport market. Their function is quite different from 100 years ago; now cars, buses, trucks and aeroplanes offer a greater range of choices in speed, price and service. The general decline of rail has continued over the past 20 years, but overseas there has been a revival of high-speed long-distance passenger trains, and there is a growing need for efficient urban rail systems. Rail freight is increasingly concentrated on long-distance unit trains and heavy hauls, where currently rail has a comparative advantage.

- But railways in Australia have been slow to adapt to this changing environment. There is a culture within the railways which has resisted reform, and society has been slow to accept the need for change. Even where rail patronage has declined sharply, many have argued for the continuation of services on the grounds that they may need them in the future. Railway services are considered by many to be a 'public right', in part because the very large net costs of the services are not adequately known by the community, and in part because those advocating the continuation of this 'right' are not required to bear the full costs.

Major problems with railways

Participants in this inquiry have identified problems in railways in pricing, productivity and quality of service. Users' criticisms are based on what could be achieved in a more competitive market, and a comparison of Australian rail services with other modes of transport and with railway performances overseas.

The ability of railways to meet the expectations of their customers is hampered by mistakes made in the past, and a continued reluctance of State governments to implement reforms which, although difficult, are essential to ensure the future viability of railways. In particular:

- the operating methods of railways have been changed only slowly, even though technological advances should have allowed large reductions in operating costs;
- many lines and services which are no longer viable have not been closed or discontinued, thereby reducing the ability of the remainder of the rail system to operate efficiently;
- fares and freight rates have not been flexible enough to obtain optimal use of the railway rollingstock and infrastructure;
- capital has been mis-invested; and
- governments have presented rail administrators with conflicting social and financial objectives, making it difficult for them to set and achieve efficiency goals.

These problems are manifest in the poor financial performance of railways which imposes costs on both taxpayers and the railways. Government railways draw on public sector savings by \$4 billion or more each year. Railways are responsible for a substantial share of accumulated State government debt and thus place a significant burden on taxpayers. In part because their operations are consistently in deficit, railways tend to have limited access to funds for profitable new investment and maintenance of infrastructure and rollingstock. Funds are often diverted to non-commercial but politically desirable investment with adverse consequences for profitability and safety.

The size of Australia and its dispersed population means that an effective transport system is essential to the performance of the Australian economy. Rail is a significant part of that transport system. So long as railways devote resources to those services where they do not have a comparative advantage, Australia as a whole will not be able to get the best use out of its transport resources and will not achieve its potential for economic growth.

Essential reform

Governments and railways are aware of many of these shortcomings and are attempting to address them through commercialisation, better management, improved work practices, reduced staff levels, and the replacement and upgrading of obsolete equipment.

However, the Commission is of the view that such changes on their own will not be sufficient to achieve the substantial and sustained reform needed to ensure a viable railway system for the next century. In addition, the vigour with which such changes are being implemented varies considerably between different Australian rail systems.

In the past railways have been used frequently as instruments of government social policy. To achieve reform there must be fundamental changes for each system in the relationships between the government and the rail authority, the government and the rail unions, and the government and rail customers. Rail authorities, unions and customers all have to be convinced that the rail system will be run as a commercial business and that the government will not override the actions of railway managers, even if changes in services do not suit its political agenda. Fundamental changes will be necessary.

This report does not attempt to recommend technical changes to the running of railways, or which services should be continued or discontinued. Rather, the Commission's recommendations are designed to create the environment necessary to encourage and facilitate reform. The recommendations are based on the following principles.

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- Railways should be allowed to operate as commercial businesses with full control over their revenues and expenditures:
 - they need to be able to alter their prices to get the optimal use out of their rollingstock and infrastructure;
 - they need to be able to reduce costs by changing their use of labour and other inputs without political interference;
 - they should not be used by State governments to collect taxes or mineral royalties; and
 - there should be no automatic deficit funding of rail losses.
 - Railways should be free to concentrate on what they do best and to discontinue those services which are not financially viable.
 - If a government wishes to achieve social objectives (such as providing welfare concessional fares or particular services) by means of the railway, it should enter into contractual agreements with the railway, with the contracts explicitly specifying the services required and the payments to be made.
 - There needs to be equitable competition between road and rail transport. Regulations which restrict traffic to any particular mode should be eliminated as policies are implemented which ensure each mode meets all of its costs.
 - There should be open access to the use of rail track and infrastructure, for an appropriate fee. Any organisation, public or private, should be allowed to operate trains on any railway track, subject to reasonable terms.

Benefits and effects of reform

Substantial benefits are available from undertaking rail reform. Delays in reform will impose significant costs on the Australian economy.

- Requiring railways to perform activities where they have a comparative disadvantage will reduce the overall efficiency with which Australia uses its scarce resources.

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- By failing to reform rail, Australia will forgo a potential gain every year of more than \$5 billion in GDP.
 - Rail transport makes up a significant proportion of the costs of some of Australia's largest exporting industries. If rail services are not provided efficiently, Australia's international competitiveness will be reduced.
 - Allowing rail deficits to continue to add to State government debt will increase further the burden on taxpayers of servicing such debt.
 - The savings available to governments from improved productivity and from price changes to achieve full cost recovery are equivalent to about 7 per cent of Australia's income tax collections.
 - Continuing deficits reduce the ability of States to fund new investment with a high rate of return, whether in railways or elsewhere. Failing to undertake necessary and profitable investment in railways will result in a deterioration in the level of service and further falls in rail's share of the passenger and freight markets.

The longer genuine rail reform is delayed the more difficult it will be for railways later to regain the confidence of potential customers and to become an efficient part of Australia's transport network. Immediate reform is essential. The benefits of such reform will flow to rail customers (particularly exporting industries), State taxpayers and Australians generally.

There is no easy solution to railways' problems. The recommendations put forward in this report do not offer a painless way of overcoming the substantial problems that Australian railways face today and which have been allowed to accumulate over many decades. The Commission's recommendations imply hard decisions and difficult change for governments, railway management, rail employees and rail passengers. The recommendations involve major rationalisation of Australian railways. But as noted above, substantial benefits are available to the community by implementing them.

If all of the Commission's recommendations were adopted, railways in Australia will likely evolve as follows.

- Governments will find it much more difficult to use the railways for political advantage, a practice which misallocates and wastes resources.
- The community will become more aware of the costs of providing some rail services and will likely opt for redirecting some of those resources to other community uses (education, health, etc).

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- The pricing of both road and rail transport will better reflect their costs. Rail transport will focus on those services where it has a comparative advantage over road: bulk hauls from mines and grain storage facilities to ports, long-distance hauls with unit trains, and urban peak-period commuting.
 - The rationalisation of rail services will lead to withdrawal from those services where road and other transport modes have the comparative advantage: less than container load (LCL) freight, some intrastate freight, and many country and interstate passenger services.
 - Branch lines in country areas, where the volume of rail traffic is so low that even train operating costs are not met, will be closed (unless local communities contribute sufficiently to retain the services). In contrast, other lines will be upgraded, particularly those between capital cities.
 - The closure of some rail services, together with increased private sector contracting for specialist work, will result in a much smaller railway workforce.
 - The provision of reliable and timely interstate freight services by a national body, such as the intended National Rail Corporation, will increase rail's share of the interstate freight transport market.
 - There will be a few trains, owned and controlled by the private sector, running on the public rail network. Open access to the network will be unlikely to attract many private services because there is insufficient traffic density on most lines to warrant extensive competition. However, the very fact that access will be available should provide incentive for the government railway corporations to offer competitive services.
 - Private sector railway lines from new mines will become more common. Some will be self-contained lines from mine to port (or processing facility), while others may be connected to the public rail network.
 - Urban rail services will be characterised by higher peak-period fares resulting in more travel in off-peak periods. 'Flatter' morning and evening peaks will increase utilisation of carriages and rail infrastructure. There may be reductions in lowly patronised services at night and on weekends for which special buses can provide a safer, more flexible and cost-effective service.

The Australian economy as a whole will benefit from more efficient railways, by more than \$5 billion per annum in the long term. In particular, there will be an expansion of the mining sector which will enhance Australia's export performance. But the manufacturing sector will also directly benefit. Employment losses in railways will be offset by the generation of a similar number of jobs elsewhere in the economy.

The Commission's recommendations follow. The number attached to each recommendation indicates in which of Chapters 3 to 12 that particular recommendation is discussed.

Recommendations

- 3.1 The Commission recommends that railways be fully commercialised through their being corporatised, including incorporation under the corporations law. These processes of corporatisation and incorporation should be completed within three years.
- 3.2 The Commission recommends that if governments require railways to provide community services, the conditions of provision should be set out in contracts, the details of which are made public, and which should include the pre-determined fees to be paid to the railways. All such community service contracts should be in effect within three years.
- 4.1 The Commission recommends that community service contracts between governments and railways should be as specific as possible, identifying exactly what particular market segments or lines are to be explicitly funded as community services. These contracts should also include criteria for evaluation of the performance of the rail authority in meeting each particular community service.
- 4.2 The Commission recommends that payments made to the railways under any community service contracts should be charged against the appropriate government expenditure category - education, social welfare, industry assistance, etc - and be subject to budgetary review.

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- 5.1 The Commission recommends the introduction of road user charges which reflect more accurately the amount of road use and pavement damage caused by all classes of vehicles. A national vehicle registration scheme is a key element in achieving these changes.
- 5.2 The Commission recommends that State and Territory laws be amended to provide local governments, for all roads under their control, with effective capacity to impose specific pavement damage and externality charges on heavy vehicles. Such changes should be levied on the principals for whom the road haulage is provided. A process of appeal should be set up to settle disputes between the local authority and the principals responsible for the pavement damage or externalities.
- 6.1 The Commission recommends that, in the consideration of new railway lines and services, negotiations be undertaken with the relevant local government authorities with the aim of obtaining contributions towards capital and operating costs. Similar negotiations should be undertaken if the withdrawal of services is under consideration.
- 6.2 The Commission recommends that railways should receive a rebate of diesel fuel excise for diesel used in rail freight services.
- 6.3 The Commission recommends that the Commonwealth Grants Commission be asked to report on the case for excluding all public transport activities from its assessments.
- 7.1 The Commission recommends the removal of all restrictions on the contracting of tasks so that railways can take every opportunity to attain maximum efficiency. Contracts could be competed for by other rail systems, between elements of the same system, or by the private sector.
- 7.2 The Commission recommends that all rail authorities strive for more efficient use of their most costly input, labour. There remains considerable scope for increased labour productivity from more flexible use of their workforce. Such changes might include:
- more employment of permanent part-time staff (particularly for peak periods);
 - more extensive use of casual and temporary employment;
 - wider shift spans and split shifts; and

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- continued multi-skilling in order to reduce fragmentation of the workforce and demarcation disputes.
- 7.3 The Commission recommends that a national accreditation scheme be established, perhaps under the auspices of the National Training Board, for the recognition of rail skills.
- 7.4 The Commission recommends that rail authorities establish incentives for productive performance including:
- the abolition of seniority based promotion and the introduction of merit based promotion for all employees; and
 - the introduction of salary structures that allow some scope for recruitment or promotion of employees to different levels within a salary range, depending on an individual's skills, qualifications and experience.
- 7.5 The Commission recommends that, with respect to their management of labour resources, railways not be subject to government policy constraints that are more restrictive than those applying to private sector enterprises.
- 8.1 The Commission recommends that rail authorities immediately implement policies to reduce the cost of operating their urban rail services, with the objective of achieving international best practice within five years.
- 8.2 The Commission recommends that urban rail welfare concessions should generally be available only in off-peak periods.
- 8.3 The Commission recommends that over the next five years rail authorities increase urban fares so that fare revenue plus government payments for community services (including contributions from non-user beneficiaries) cover the operating and new capital costs of urban rail services.
- 9.1 The Commission recommends that the revenue earned on non-urban passenger services, including reimbursement for non-commercial fares, should at least cover the operating costs of those services, with a return sufficient to finance the replacement of rollingstock. If this is not achieved the service should be phased out.

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- 9.2 The Commission recommends that governments should significantly reduce the number of welfare concessions available for non-urban passengers. If, however, governments choose to subsidise concessional travel, vouchers for any mode of non-urban travel should be provided to a limited value per annum per entitled person.
- 10.1 The Commission recommends that State governments eliminate all regulation of traffics to rail, with the possible exception of dangerous goods, at the same time as appropriate road user charging mechanisms for pavement damage and externalities are introduced.
- 10.2 The Commission recommends that super-normal profits, whether described as ‘royalties’ or otherwise, should not be obtained via rail freight rates. In the case of Queensland, this could initially be achieved by identifying, and separating, the royalty component from the freight charge, and requiring that the royalty be paid directly to the Queensland Treasury.
- 10.3 The Commission recommends that governments eliminate all their subsidies to bulk rail freight, in the first instance by not restraining their rail authorities from reducing costs to international best practice. This reduction should be achieved within three years. During the transition period, authorities should refrain from increasing average bulk freight rates (in dollar terms).
- 11.1 The Commission recommends that individual freight services, in particular LCL, should be retained only if they at least cover short-run marginal costs (including all applicable taxes and financial imposts) and in the longer term will make a contribution to fixed costs.
- 11.2 The Commission recommends that there should be no restrictions on private ownership and operation of freight terminals, including common-user loading/unloading facilities.
- 12.1 The Commission recommends that owners of railway tracks (whether they be governments, rail authorities or private owners) be required to allow access by other organisations (whether public or private) to operate on their tracks, subject only to capacity being available and negotiation of a commercial agreement which sets the prices and conditions for access. The Commonwealth Government should require open access on lines controlled by AN and the NRC and, if necessary, should contemplate using its powers (over interstate trade and international trade) to achieve open access elsewhere.

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- 12.2 The Commission recommends that each rail authority be required to operate its infrastructure network as a separate business centre, and to publish separate accounts concerning it.
- 12.3 The Commission recommends that Commonwealth and State legislation be changed so that the coverage of the Trade Practices Act extends to railway authorities, whether incorporated under the corporations law or not. The Act should also provide the power to facilitate the settlement of disputes concerning monopoly pricing and anti-competitive behaviour (including access to track).

Implementation of reforms

Implementation of the reforms embodied in these recommendations is largely in the hands of governments as owners of the rail systems. The principal motivation for State governments to take appropriate action may lie with the considerable burden that the railways continue to place on State finances, and thus on the community generally. Some States also see merit in pursuing economic efficiency for all of their government business enterprises, as part of a general microeconomic reform program.

Fundamental and sustainable reform of the railways will not be achieved without changes to the relationships between governments and their railways. Accordingly, the Commission places highest priority on those recommendations in Chapters 3 and 4 which aim to make railways more commercial. Incorporation of government railways could proceed quite rapidly once the appropriate decisions were made. The Commission recommends that incorporation be in effect within a period of three years.

The Commission also is of the view that the introduction of contractual arrangements between governments and railways should occur within three years. Work is already under way in some States to implement such contracts. The Commission recognises that this contractual exercise is difficult - especially in situations where there are insufficient financial and physical data - and, even when the program commences, it is expected that several years will be required to get it working properly.

In terms of large potential gains in economic activity, a high priority is the setting of rail freight rates appropriate to the cost of providing services. In particular, the provision of open access and the removal of monopoly charges are likely to expand mining exports.

It is important that some reforms be coordinated with others. In particular, removal of regulations restricting carriage of certain goods to rail should be coordinated with changes in road user charges. Closures of branch lines and services should commence without delay except where changes in road funding arrangements are relevant.

Reforms in urban passenger systems should be undertaken simultaneously as a package, comprising reductions in costs, improvement in service, increases in fares and changes to the fare structure. The full changes should be phased in over about five years.

Finally, there are interdependencies between many of these recommendations and the reforms they would initiate. For example, incorporation of railways and their operation as commercial enterprises without any monopoly profits is likely to be dependent upon enhanced dispute settlement powers of the Trade Practices Commission.

1 INTRODUCTION

1.1 Origin and scope of the inquiry

In its inquiry into government (non-tax) charges, the Commission undertook case studies of two groups of government business enterprises, railways and electricity authorities (IAC 1989). The Commission concluded that there were substantial potential gains to the economy from the more efficient provision of services from such enterprises. Subsequently, as part of its program of microeconomic reform, the Commonwealth Government announced in May 1990 terms of reference for separate inquiries, into rail transport, and energy generation and distribution. A final report for the latter was released in May 1991.

The terms of reference for the rail transport inquiry, which were prepared in consultation with State and Territory governments, are provided at the beginning of this report. In brief, the Commission was asked to inquire into and report on factors leading to inefficient resource use in Australian railways, and to recommend action to reduce or remove such inefficiencies. Freight, urban and non-urban passenger rail services were to be covered. Specific issues set down in the terms of reference included management and work practices, pricing policies, structural impediments to efficient operations, the funding of capital expenditure, regulations requiring some commodities to be transported by rail, and the effect that rail charges and regulations have on competing modes of transport.

In order to keep the scope of this inquiry within manageable bounds, the Commission has not examined in any detail:

- private railways, such as the dedicated iron ore lines in Western Australia which are recognised as being relatively efficient;
- various proposals for expansion of government rail systems, because the paramount requirement is reform of the existing systems;
- technical aspects of running trains efficiently; or
- the Very Fast Train (VFT) proposal which has been analysed in detail elsewhere.

The inquiry has been focused on an examination of how the institutional and regulatory environments in which railways operate affect their efficiency, and how these problems might be overcome. Of necessity, the inquiry has examined some aspects of road freight and passenger transport because they are the rail industry's chief competitors.

1.2 Conduct of the inquiry

In May 1990 an issues paper was distributed to all potential participants and written submissions were invited. The Commission held informal discussions with relevant Commonwealth and State government departments, rail authorities, representatives of the trade union movement, major industry users of rail services and with road transport associations. In September 1990 an initial round of public hearings in Sydney, Melbourne and Canberra provided participants with the opportunity to discuss written submissions. The draft report was released on 17 April 1991 and a further round of public hearings enabled participants to respond to the Commission's analysis and draft recommendations prior to finalisation of this report.

In preparation of this report the Commission has drawn upon some 170 written submissions received (see Appendix A), additional information tendered at public hearings, results from its own research and analysis, and a consultants' report prepared for the inquiry by Travers Morgan Pty Ltd on the effects of adopting international best practices in Australian railways. The Industry Commission's recent reports on mining and minerals processing in Australia (IC 1991a) and on energy generation and distribution (IC 1991b) contain elements relevant to the rail transport inquiry.

In the conduct of this inquiry due recognition has been given to general policy guidelines which require the Commission to: have regard to the desire of the Commonwealth Government to encourage the development of efficient industries; facilitate structural adjustment; reduce unnecessary industry regulation; and recognise the interests of other industries and consumers generally. The Commission is also required to take account of the social and environmental consequences of any recommendations it makes.

1.3 Structure of this report

The role of rail transport, inquiry participants' views of railway problems and the potential nationwide benefits from rail reform are discussed in Chapter 2. Then follow five chapters, 3 to 7, each covering a major issue for this inquiry. The first, Chapter 3, examines relationships between governments and railways. The case for government intervention in railways is assessed in Chapter 4 as are the competitive, environmental and social costs of rail and road services in Chapter 5. The financing of railway operations, including capital expenditure, is addressed in Chapter 6. Management and labour productivity are covered in Chapter 7. The next four chapters, 8 to 11, focus on the major rail service segments: urban passengers, country and interstate passengers, bulk commodity freight, and non-bulk freight. While some aspects of structural reform are touched on in many places throughout the report, Chapter 12 brings together and extends the discussion of such issues. The Commission's recommendations are set out in each chapter.

2 THE SCOPE FOR AND BENEFITS OF RAIL REFORM

The trend in land freight transport is for high volume, long-distance, unitised and bulk hauls to be performed increasingly by rail; other freight tasks are performed increasingly by road transport. For passengers, the trend suggests a move away from long-distance rail travel to other modes. Rail users and others identify major problems in the railways in pricing, productive efficiency and quality of service. Some of these can be traced to methods of government intervention in the form of regulations, restrictions on access to rail, political involvement, and ensuing conflicts between commercial and social objectives. Reform to date, while substantial, will not overcome railways' persistent losses. It is estimated that the potential net benefits to the whole economy of rail reform could be of the order of \$5 billion annually.

2.1 Role of transport in the economy

Transport is a large and essential part of any community or economy. In Australia rail transport represents about one per cent of GDP and is responsible for about one and a half per cent of annual capital investment. It is therefore important to ensure efficient allocation of resources to and within the transport sector. Additionally, the location and development of industries and towns interacts with the availability of transport, and its price and service characteristics.

Frequently the same transport task can be performed by two or more modes. Modal preference depends on service characteristics (such as transit time, reliability, flexibility, frequency of service and security) and price. Preferences may be constrained by regulation and can vary greatly over time as these characteristics change in relative terms.

Freight transport tasks in Australia are summarised in Table 2.1 in terms of tonnes carried and net tonne-kilometres (ntk). Table 2.2 contains details of passenger-kilometres for urban and non-urban passenger travel separately.

Transport tasks can be measured in various ways and different measures are appropriate for different purposes. Tonnes and numbers of passengers are conventional measures but provide no information on distances travelled. On the other hand, tonne-kilometres take no account of loading or unloading activity, while passenger-kilometres give no indication of the total number of passengers in the system during the peak period.

While there are difficulties in obtaining exact data, and problems in creating clear definitions for bulk and non-bulk and urban and non-urban, Tables 2.1 and 2.2 give some general indication of the relative shares of the transport task performed by different modes.

Table 2.1: Freight transport tasks in Australia, 1988-89

<i>Task</i>	<i>Tonnes (millions)</i>	<i>Net tonne- Kilometres (billion)</i>	<i>Average distance^a (km)</i>
Rail	148	32	220
Government bulk ^{b,c}			
Government non-bulk ^{b,c}			
Intrasystem	10	3	300
Intersystem	9	15	1 600
Private bulk ^b	137	31	230
Total	304	81	270
Road			
Capital city and provincial urban)	31)
) 975) 70
Other areas of state)	37)
Interstate	15 ^d	17	1 200
Total	990	85	86
Sea^b			
Bulk			
Intrastate	14	24 ^d	1 700 ^d
Interstate	26	64 ^d	2 500 ^d
Non-bulk	3.6	3	800
Total	43	91	2 100
Air	0.15	0.14	900
Total (all tasks)	1 337	257	192

a Derived by dividing net tonne-kilometres by tonnes carried.

b Includes coal and other minerals, ores, grains, concentrates, coke, limestone, gypsum, sand, gravel, stone, clinker, quarry products, most fertilisers, most petroleum products, most cement and most sugar.

c Tonnes are counted only once for each trip. In particular, there is no multiple counting for intersystem rail tasks.

d Commission estimates based on limited information.

Sources: Rail authority Annual Reports 1988-89; ABS (1989, 1990a); DoTC (1990); NFI (1990a); Commission estimates.

Road, rail and sea account for 32, 33 and 36 per cent of net tonne-kilometres respectively. Thus tonnage shares of 73 per cent for road and 3 per cent for sea highlight road's comparative advantage for short hauls, and sea's advantage for long hauls.

Sea transport dominates the interstate freight task with long hauls of iron ore and appreciable tonnages of crude oil and petroleum products. Restricting attention to the land transport interstate freight task of 24 million tonnes and 32 billion net tonne-kilometres, rail is responsible for 38 per cent of tonnage and 47 per cent of net tonne-kilometres.

Table 2.2: Passenger transport tasks in Australia, passenger-kilometres (billion), 1988-89

<i>Task</i>	<i>Urban^a</i>	<i>Non-urban</i>
Rail	5.8 ^b	1.6 ^c
Road		
Cars d	127 ^e	49
Trams	0.6 ^c	-
Buses	25 ^e	18
Air	-	14
Total	158	82.6

a Includes long-distance commuters.

b Based on ticket sales making allowances for periodical tickets.

c Commission estimates based on limited information.

d Cars include station wagons, utilities and panel vans.

e Estimated assuming 1.3 passengers per car and 30 passengers per bus.

Sources: Rail authority Annual Reports, 1988-89; ABS (1990a); DoTC (1990); Commission estimates.

Rail transport accounts for less than 4 per cent of urban passenger-kilometres, but a smaller proportion of passenger journeys. This result can be explained in terms of the large number of very short car trips for purposes such as shopping.

There are considerable difficulties in obtaining passenger data for different modes, especially for car journeys. While reasonable estimates can be made of car-kilometres, there is little information on numbers of journeys, car occupancy or the split between urban and non-urban car travel. For the purpose of comparing road and rail it is probably more appropriate to focus on particular transport tasks such as travelling to work and school, and long-distance trips for business and pleasure.

Table C.4 in Appendix C contains 1986 census data for travel to work in urban areas. The proportion of persons living in capital cities who travel to work by train is 9 per cent, ranging from 2 per cent in Perth to 14 per cent in Sydney. These proportions suggest that travel to and from work accounts for over 40 per cent of urban rail patronage.

A survey by the Bureau of Tourism Research (BTR 1989) of long-distance journeys (more than 40 km and at least one night away) showed that, in 1987-88, 4 per cent were by rail, 6 per cent by coach, 8 per cent by plane, 77 per cent by private vehicle and 5 per cent by other means (see Figure 9.2).

Table 2.3 indicates that in 1986-87 rail accounted for 0.7 per cent of GDP and 1.5 per cent of total wages. Due to price distortions, especially artificially low fares, the GDP contribution (in dollars) is less than wages. In the absence of distortions, the GDP contribution would be higher. Rail employment in June 1987 was 97 000 (see Appendix H, Table H.1), corresponding to 1.4 per cent

of aggregate employment. It has now fallen to about 75y000 or 1.0 per cent of aggregate employment.

Table 2.3: Rail transport in relation to other transport modes and the Australian economy, 1986-87a

<i>Sector</i>	<i>Contribution to GDP</i>		<i>Wages</i>	
	<i>\$m</i>	<i>%</i>	<i>\$m</i>	<i>%</i>
Rail transport	1 856	0.7	1 937	1.5
Road transport	7 498	2.9	3 092	2.4
Sea transport	581	0.2	381	0.3
Air transport	2 501	1.0	1 036	0.8
Total transport	12 436	4.8	6 446	5.1
Transport services (including storage)	3 311	1.3	2 211	1.7
Australia	259 304	100	127 176	100

a Excluding most transport infrastructure, although maintenance and operation of rail infrastructure, at least, are included.

Source: ABS (1990b).

Table 2.4 presents information on transport costs incurred by selected industries and the major sectors of production. Many transport costs relate to transfers from one industry to another and thus there is some ambiguity about the sector to which the costs are attributable.

Table 2.4: Rail costs as a proportion of total costs for selected industries, 1986-87

<i>Industry^a</i>	<i>Value of output \$m</i>	<i>Rail costs^a \$m</i>	<i>Transport services as percentage of value of output</i>				
			<i>Rail</i>	<i>Road</i>	<i>Sea</i>	<i>Air</i>	<i>Total</i>
Cereal grains	3 346	368	11.0	7.6	0.2	0.0	18.7
Ferrous metal ores	1 919	326	17.0	0.3	13.8	0.0	31.1
Non-ferrous metal ores	4 567	83	1.8	1.0	2.6	0.0	5.4
Coal, oil and gas	9 867	1 149	11.6	2.1	1.1	0.0	14.8
Other minerals	1 579	38	2.4	55.9	1.1	0.1	59.4
Chemical fertilisers	887	17	2.0	14.5	0.1	0.0	16.5
Petroleum and coal products	10 273	55	0.5	4.6	0.2	0.0	5.3
Cement	692	26	3.7	6.0	0.4	0.0	10.1
Basic iron and steel	6 360	57	0.9	2.3	0.5	0.0	3.7
Construction machinery	513	9	1.7	15.0	0.7	2.6	19.9
Agriculture	18 618	463	2.5	6.8	0.1	0.2	9.5
Mining	18 981	1 596	8.4	6.0	2.7	0.0	17.1
Manufacturing	124 199	286	0.2	3.2	0.2	0.2	3.8

a Industries are included if rail costs exceed either \$50 million or 1.2 per cent of total costs.

Source: ABS (1990b).

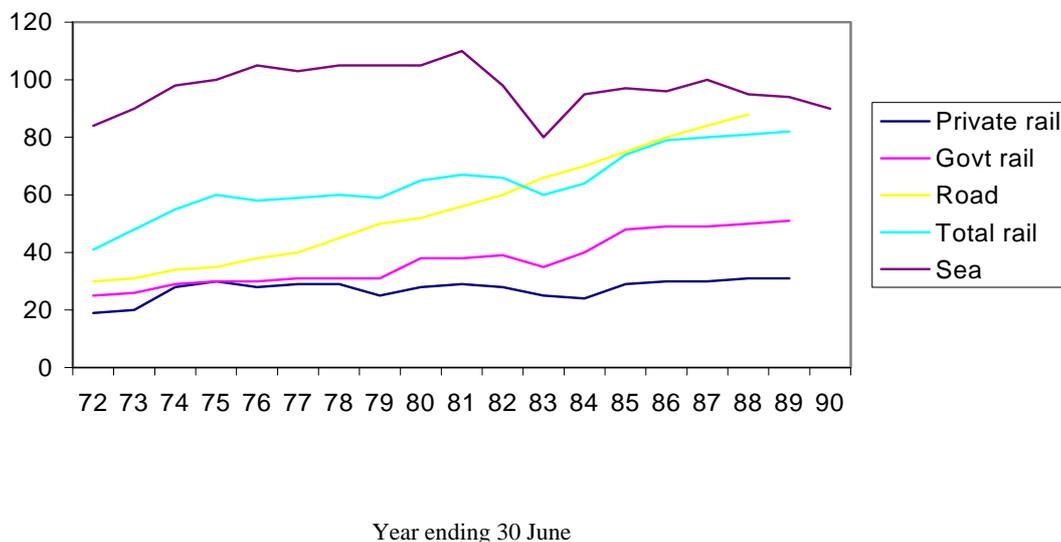
Table 2.4 is compiled according to usual business practice whereby goods are supplied free-into-store or free-on-board (that is, freight services are associated with the supplying sector). The tabulated data show that total transport accounts for as much as 60 per cent of total costs in the case of 'other minerals' (being principally minerals from local quarries). Rail accounts for more than 10 per cent of costs in some industries with the mining sector being the major user of rail freight services. Rail accounts for only 0.2 per cent of costs in the manufacturing sector.

2.2 Trends in rail transport

Changes in the domestic freight tasks for road, rail and sea, measured in net tonne-kilometres are illustrated in Figure 2.1 for the period 1972 to 1990. The main features are the rapid growth of road transport (at an average growth rate of 7 per cent per year), the growth of government rail transport (4 per cent per year), essentially constant output for private rail after an initial period of growth, and the rise and fall of sea transport. Total rail transport has grown by 4 per cent per year.

Figure 2.1: Trends in domestic freight tasks, by mode, 1971-72 to 1989-90a

Tonne-kilometres (billion)



a 1987-88 for road, 1988-89 for rail.
Source: ABS (1990a; various), BTCE (personal communication), DoTC (1990).

The growth in government rail transport is due mostly to export coal, and to a lesser extent other minerals. Although grain harvests fluctuate from year to year, there is little change over time in the long term average.

Technological improvements in large articulated vehicles and the building of high quality roads have enabled road transport to capture a large proportion of the general freight market, not only for relatively short distances but also for interstate movements. Road transport has acquired the share of interstate non-bulk traffic lost by sea transport (more details in RIC 1990a, p.3). Non-bulk rail freight, including interstate, has grown steadily (see BTCE 1989b for further details), although its share of the total traffic is essentially unchanged. Individual corridors show variations from this pattern. For example, rail's share of transport tonnages including shipping increased from 26 per cent in 1964-65 to 65 per cent in 1985-86 for services to and from Perth, but decreased between Sydney and Melbourne from 51 to 22 per cent in the same time (BTCE 1989b). Over the same period, rail's share of land transport fell from 95 to 74 per cent for services to and from Perth and from 57 to 25 per cent between Sydney and Melbourne (BTCE 1989b).

Total rail passenger journeys fell from 426 million in 1971-72 to 354 million in 1980-81 and then recovered slightly to 378 million in 1985-86 (RIC 1990a, p.3). By 1988-89 they had increased to 418 million.

The Railway Industry Council (RIC) reports that 'in urban areas, rail's share of the passenger task in most cases declined. Rail trips per head of population did not keep pace with capital city population growth' (RIC 1990a, p.3). One third to one half of urban rail journeys to work are for travel to and from the central business district (see Appendix C, Table C.4).

RIC, using data up to 1985-86, reported that:

Patronage on interstate and country rail services fell from the 1971-72 level by over 50% and decreased on all systems except V/Line...

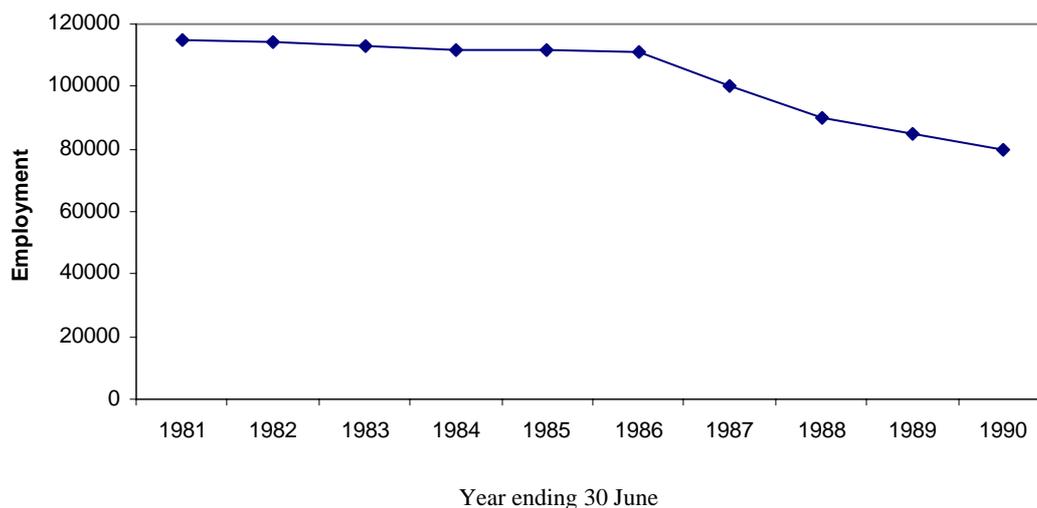
Rail's share of the long-distance travel market remained static in the period from 1979 at around 4% to 5%. During the same period the share of the market held by private motor vehicles fell from 82% to 74% while that captured by road coaches doubled to 7%. On the major long-distance interstate routes (and Townsville-Brisbane), air held over 70% of the market in 1985, with rail about 11% and the remainder road/coach. (RIC 1990a, pp. 3,4)

Patronage of non-urban rail services, including both interstate services and country services, has declined because improvements in buses and roads have brought about faster and more frequent services. Indeed, rail authorities in NSW, Victoria and Western Australia now operate coach services for some routes where they used to operate rail services.

The trend in land transport has been for high volume bulk hauls to be performed by rail, while low traffic density tasks involving both freight and passenger have been delivered increasingly by road transport.

Figure 2.2 shows that railway employment fell to about 79,000 in June 1990. It is now about 75,000, compared to 117,300 in 1971-72 (RIC 1990a, p.4). The rate of decrease in railway employment has been greater since the mid-1980s.

Figure 2.2: **Aggregate railway employment, 1980-81 to 1989-90**



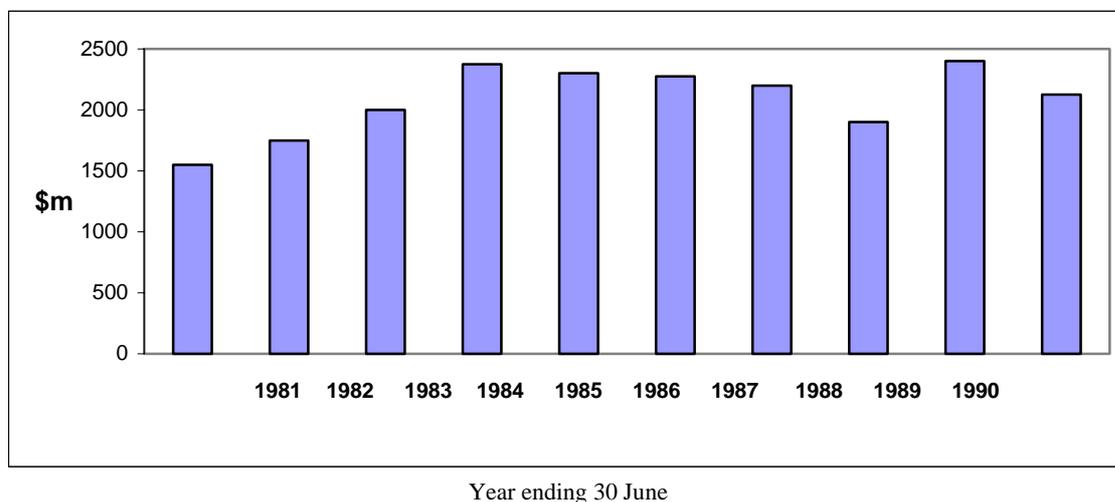
Source: Appendix H, Table H.1

The aggregate declared operating deficit for railways ¹, expressed in 1989-90 prices, peaked in 1983-84 at \$2338 million (see Figure 2.3, based on Table 6.1). This compares with a deficit in 1971-72 (expressed in 1989-90 prices) of \$810 million (based on RIC 1990a, p.4). In spite of the increased attention given to financial results, there has been little improvement in recent years.

Details of the rail transport task by sector are presented in Chapters 8 to 11. Appendix B contains maps of the current railway systems, and Appendix C tabulates various rail statistics.

¹ The Commission is of the view that the true deficit may be more than \$4 billion per year; see Section 6.1.

Figure 2.3: Aggregate declared railway operating deficits, 1980-81 to 1989-90a



a Constant 1989-90 prices.
Source: Table 6.1.

2.3 Rail tasks and opportunities for substitution with other modes

The current division of transport tasks between rail and other modes is in many cases distorted by regulations which restrict traffic to certain modes, and by price distortions such as government directions to limit fares and freight rates and to provide services at concessional fares. The possible removal of these distortions should be recognised when considering the possibilities for substitution between transport modes. It is usually necessary to consider substitution within individual tasks (such as coal traffic, or freight between Adelaide and Perth), rather than within broad categories (such as freight, urban passenger and non-urban passenger).

The choice of transport mode depends to a large extent on prices and hence costs which in turn depend on distance, traffic density, locations of source and destination, type of traffic and capacity utilisation of track and vehicles. Prices, and hence choice, can be distorted by subsidies and undercharging. However the choice of mode does not depend on price alone - in some cases it depends strongly on the quality of service. In the case of freight, on-time reliability is particularly influential in modal choice. For multi-modal tasks and journeys, the costs of transfers and transport by the other modes need to be added. The external costs of air pollution, noise, greenhouse gases, accidents and congestion should also be taken into account.

Freight

Trucks clearly have an advantage over railways for many tasks because it is not practical to build railway tracks to all locations, while the road system enables goods to be delivered almost anywhere. Within urban areas trucks are clearly the preferred means of transporting goods including delivery to and from railway freight yards.

There is ample evidence that rail is the most efficient mode for high tonnage long-distance overland bulk hauls directly from producer to user or port. For example, the four Pilbara iron ore mines, which each move millions of tonnes annually over distances ranging from 185 to 423 km, have all chosen to use rail. It should be noted that one 6300 tonne train (that is, a large NSW coal train consisting of 84 wagons each carrying 75 tonnes) corresponds to 252 semitrailer loads (at 25 tonnes each) or 158 B-Double loads (at 40 tonnes each). There are thus logistic advantages in organising movements by train. However, when total costs including transfers are considered, even bulk movements by truck are cheaper than train for short distances.

Other factors such as congestion, safety and charges for road use play an important part in both the choice of mode by users and in decisions by authorities not to allow trucks to be used for certain traffics.

In comparing road and rail for non-bulk tasks it is necessary to consider costs and times from door to door. Overnight service from door to door is an important factor on the Sydney-Melbourne route, for example. While trucks can achieve this result, it currently is not possible for trains to achieve it when times for pickup and delivery are added. Rail accounts for between 22 and 40 per cent of traffic on intercapital routes of about 1000 km, but 60 to 65 per cent of traffic between Adelaide and Perth (2700 km) (see Table 11.3).

Intercapital non-bulk freight is one task where rail might replace an appreciable proportion of road traffic, if there are adequate improvements in service such as increased reliability and reductions in transit times and times for loading and unloading.

Urban passenger services

Cars, taxis, buses, trains, trams, ferries, bicycles and walking are used for transport in cities. However, most urban travellers do not have this wide choice. In particular, urban railways usually radiate from the central business district (CBD), and are thus mostly unsuitable for non-radial movements. Many parts of Australian cities are not serviced by rail at all. As for freight movements in the urban area, rail cannot go everywhere and most distribution is by road. Low population densities in the outer areas of cities are insufficient to support the development of new lines, although long-distance commuter services can be provided along lines which already exist for other

purposes. Buses and cars are better suited to the low density traffic in the outer suburbs and provide more flexibility.

Rail already accounts for about 50 per cent of commuter travel to Sydney's CBD and railway lines to the CBD are congested in peak hours. There are thus difficulties in substituting rail travel for existing road travel, at least for passenger movements to the Sydney CBD. There are similar capacity problems in parts of some other systems.

Long-distance passenger services

Road travel is usually preferred to rail travel for long-distance journeys because it is mostly faster and cheaper. Also there is much greater flexibility if using a car, or a more frequent and more flexible service in the case of coach travel.

The major customers of long-distance rail services are pensioners and railway employees, both of which groups travel at concessional fares. Other users include those who prefer the comfort and facilities of train travel for a long trip (for example, sleeping cars, bar, meals, opportunity to walk around) and who might be prepared to pay more than they pay at present for this service. Others consider rail to be safer than coach or plane travel, and some are physiologically inconvenienced by road travel (by, for example, motion sickness, and sitting in the same position for long periods of time).

While recent improvements in long-distance rail services (for example, on the Ghan and the Spirit of Capricorn) have increased patronage, none of these services is yet covering operating costs, and some are not even covering fuel costs. There is thus a question mark over the continued existence of such services.

An additional factor in long-distance travel is the recent reduction in air fares as a consequence of deregulation of the domestic airlines.

2.4 Problems in railways

Many of the problems in Australia's railways are addressed in the written submissions made in this inquiry (see list in Appendix A). The submissions cover a wide range of interests; the bulk of the submissions come from one of the following groups:

- State governments and rail authorities;
- coal and other mineral producers;
- other industry customers of rail; and
- community interest groups and rail passengers.

The common themes raised by the non-government participants can be summarised as follows.

Coal mines and other bulk minerals producers expressed concerns about the monopoly of the State railways and the related excess railway charges imposed. In some cases the approval to expand an existing mine or to open a new mine has been dependent on substantial capital contributions from the miner to fund the rail infrastructure; producers claim that freight rates have not properly reflected these capital contributions. As a result of excess charges, employment and exports are said to be lower than they otherwise would be. Despite recent real reductions in some coal freight rates, the mining companies remain critical of the inflated basis of the charges and of the inequitable automatic escalation factors set by the railways.

Other industry customers include freight forwarders, BHP and grain producers. These customers generally have some scope for switching from rail to other competitive modes of transport. For some customers, service quality is considered appropriate whereas price is not. For some customers, their rail freight rates are not in dispute; their concerns focus on the quality of service provided by railways which is regarded as inadequate, particularly for interstate movement of goods where the lack of system coordination and responsibility are legend.

Among the participants there were many individuals and **community interest groups**, including users of both urban and country passenger services. They favour rail services compared to road transport for a range of reasons, including their perception of reduced air pollution and greenhouse gas emissions, lower energy consumption, fewer accidents and less noise. Those in support of improved urban rail services focussed on environmental advantages, energy savings, and implications for urban planning. Those in support of country and interstate passenger services underlined convenience and comfort, especially for aged and sick persons, of sleeping, dining and motor vehicle carrying services.

Participants in the inquiry have identified problems in railways including large financial deficits, and major problems in productive efficiency, pricing and quality of service. Many of these problems are related to governments' political involvement in the form of restrictions on private user access to rail, regulations which require that rail be used for certain tasks, and governments requiring railways to satisfy conflicting commercial and social objectives.

2.4.1 Financial performance

The financial performance of railways, whether considered in terms of financial deficit, level of cost recovery or rate of return, is poor and is of increasing interest to governments. According to the National Farmers' Federation:

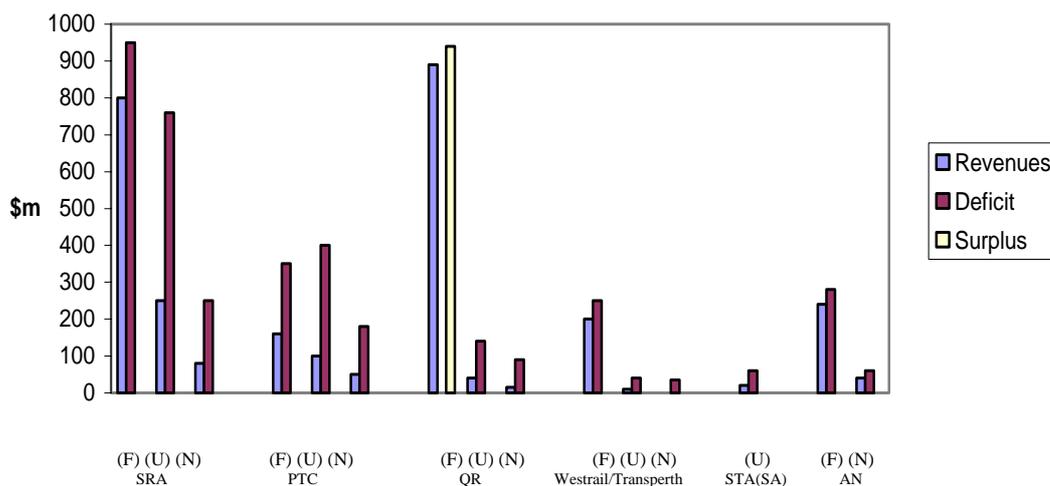
The interest of politicians in rail reform, however, goes beyond mere matters of national well being. The political imperative for reform derives as much, if not more, from the drain rail represents on the public purse. Rail deficits, in aggregate, amount to some \$2-\$3 billion annually.

That rail deficits cannot be calculated more accurately than this is a revelation in itself. Without much difficulty one could believe that a deliberate policy of obfuscation had been followed. For example, depreciation treatment between railways is inconsistent, some capital charges are met by State treasuries, government revenue supplements are sometimes treated as income, and so on. (Submission 77, p.3)

It is difficult to assess overall cost recovery, and it is particularly difficult to estimate levels of cost recovery for individual systems and tasks because railways will not or cannot disclose costs. Admittedly there are some problems in separating costs when tracks, locomotives and facilities are used for multiple purposes, but the railways have procedures which they use for this cost allocation task.

Revenues and costs for freight, urban passenger and non-urban passenger are shown separately for each system in Figure 2.4 (derived from RIC 1990a). Revenues include government reimbursements for concessional travel and costs include some costs of capital. The results are for 1986-87 but the general features of the figure are unlikely to have changed since. In particular, most of the deficit relates to the NSW and Victorian systems. Over all systems, more than half of the deficit relates to urban operations, while a quarter arises from non-urban passenger services. The same RIC analysis found nation-wide cost recovery levels of 140 per cent for coal and minerals, 84 per cent for grains, 24 per cent for less-than-car-load (LCL) freight and levels around 50 per cent for other freight.

Figure 2.4: Rail costs and revenues by system and traffic type, 1986-87



(F) Freight (U) Urban passenger (N) Non-urban passenger

Source: RIC (1990a pp.10, 13).

2.4.2 Productive efficiency

Travers Morgan undertook work for the Commission, reported as Appendix K, which indicates the possibility of large reductions in operating costs if Australian rail systems were operating with international best-practice costs. The potential gains vary by traffic type and system but, overall, operating costs would reduce by 30 per cent for freight, 35 per cent for non-urban passenger and 36 per cent for urban passenger services. The savings in operating costs from changing to international best practice were estimated to be \$1.2 billion per year. Travers Morgan also indicated that additional savings could be obtained from improved capital productivity. Using Travers Morgan (1990) the Commission has estimated that total savings of about \$2.2 billion would be achievable, based on current tasks. Such estimates are typically conservative (see, for example, Section I.1 of Appendix I).

Users also have views on the efficiency of railways, reached either by observations of component functions or by comparisons with overseas operations. Participants' views on the efficiency of railways varied to some extent according to the type of service provided. They are thus discussed separately for different traffics.

Coal traffic

The coal and minerals industries were particularly critical of high rail freight charges, and their relationship to railways' monopoly power. But they also saw scope for improvements in operating efficiency, even for the heavy hauls from the NSW and Queensland coalfields.

The NSW Coal Association made use of a recent report by Gutteridge, Haskins and Davey (1989) on the scope for improving the efficiency of NSW rail operations for coal, and hence reducing costs and freight rates (Submission 31, p.14). The main areas of potential savings are:

- better wagon fleet utilisation, through better maintenance and scheduling to reduce peak demands;
- new locomotives with increased reliability and availability;
- single crewing on selected routes;
- reduced energy costs through electrification;
- improved planning and scheduling through closer co-operation between the SRA and the industry;
- larger unit trains; and
- improved communications and signalling systems.

Interstate

The Australian Railways Union (ARU) pointed to incompatibility and lack of uniformity as a source of inefficiency in intersystem operations. It looked to the Commonwealth Government for oversight and provision of financial support.

The lack of Federal oversighting and financial support for the investment needed to systematically modernise the Australian rail industry has helped to breed inefficiency in Australian inter-system operations. In many instances, parochialism wins out in rail system investment decisions (eg communication systems, vehicle design etc.) so that lack of uniformity and incompatibility are often distinguishing characteristics of rail systems collectively. This lack of uniformity and lack of compatibility in investment decisions between systems has residual problems for safe working which compound the efficiency problems, and in many instances it is rail unions which are taking the initiative to force the industry to address such problems. (Submission 63, p.12)

The ARU described difficulties it is having in achieving standardisation of freight wagon design and shunting methods.

BHP Transport (BHPT) reported that:

Rail efficiency has been of a low standard when compared to its main competitor, road. From a user's viewpoint, the problem seems to be traced to several institutionalised factors in the structure of railroads in Australia.

1. Five Government systems operating facilities to a large extent independently of each other.
2. Government ownership introducing a mix of commercial and social demands.
3. Traditionally structured and highly unionised workforces with a large number of unions often with individual agendas.
4. Organisation structures which have not provided adequate linkages to market requirements.
5. The relatively low priority traditionally afforded research and development in the industry, a trend which is fortunately changing.

The management structure has allowed inefficiencies to manifest themselves in:

- Inadequate and poorly maintained infrastructure causing capacity and speed restrictions.
- Lower running priorities on interstate freight behind intrastate freight or passenger trains.
- Inefficient and inadequate rolling stock.
- The inability to monitor wagon movements effectively across state borders.
- Little apparent management accountability for performance.
- Poor management information systems and responsiveness. (Submission 32, pp.10, 11)

Further inefficiencies are caused by changes of gauge which necessitate transshipment or bogie exchange. BHPT was critical of the management of freight services on interstate corridors, and submits that a single management structure for freight services be progressed as a matter of urgency in the national interest (Submission 32, p.15).

Branch lines

The National Farmers' Federation (NFF) stated that 'many branch lines in Australian rail systems carry traffic of densities far lower than levels necessary for economic efficiency' (Submission 77, p.12), using as an example carriage of 47 000 tonnes on the Gwabegar line in 1990-91. 'The SRA complain that "any method employed to clear such a small tonnage from a branch line will result in uneconomic work practices": but the SRA's grain tendering practices have directly led to this situation continuing' (Submission 77, p.13). Referring to the United States' response to deregulation in 1980, in which traffic density was increased by abandoning 10 per cent of the network, the NFF suggested that a significant rationalisation of the Australian network has yet to occur. AN stated that it 'has greatly reduced the network of branch lines in response to changing demands' (Submission 115, p.2).

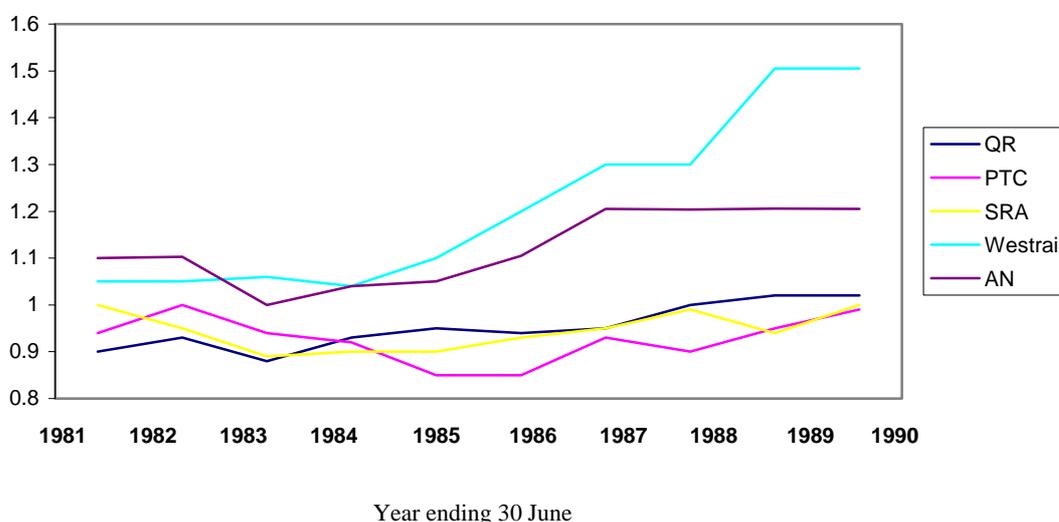
Total factor productivity

The Commission has extended its measurements of the performance of government business enterprises to include railways (see Appendix E). Total factor productivity (TFP) is an index of the ratio of total output quantity to total input quantity and is an important indicator of economic efficiency. Rail outputs are calculated as composite measures of freight and passenger services which are combined using information on output quantities and revenue shares. Rail inputs are calculated as composite measures of labour, capital and other costs combined using information on input quantities and cost shares. TFP indices for the five rail systems were presented in the Draft Report, since which time the Commission has carried out additional work. Among other things, this has involved examining the influence of scale of operations and composition of output on TFP. The effects of these characteristics are netted out to form adjusted TFP indices which are presented in Figure 2.5, with indices normalised relative to the SRA figure for 1980-81.

The adjusted TFP indices presented in Figure 2.5 produce a very different picture of the relative efficiency of the five systems compared with the unadjusted indexes reported in the draft report and revised and updated in Appendix E (Table E.1). No longer are the TFP rankings unchanged over the past decade. QR, the PTC and the SRA now all have similar multilateral TFP levels and have achieved very little, if anything, in terms of TFP growth over the last decade other than that arising from increased scale and changes in the ratio of freight to passenger tasks. Most of QR's impressive unadjusted TFP performance has consequently arisen from its rapidly increasing scale and growth in freight tasks as a result of increased black coal exports. Conversely, much of the PTC's poor unadjusted performance is accounted for by its small scale and increasing concentration on passenger services. Westrail and AN perform significantly better than the other systems on the basis of the adjusted TFP series.

They started off in 1980-81 at TFP levels marginally above those of the other systems but their higher adjusted TFP growth rates have considerably widened the gap since. AN's adjusted TFP level was around 25 per cent higher than that of QR, PTC and the SRA in 1989-90 while Westrail's was around 50 per cent higher. Westrail and AN retain relatively high adjusted TFP growth rates of 4.8 and 3.3 per cent per annum, respectively.

Figure 2.5: **Output-adjusted multilateral TFP, 1980-81 to 1989-90**



Source: Appendix E, Figure E.5.

The adjusted TFP series highlight the urgency of moves for railway reform and increases in efficiency. With the exception of Westrail and, to a lesser extent, AN, Australian railways have made very little progress over the last decade in improving their performance other than through changing the scale and output focus of their operations. If all Australian railways were as efficient as Westrail (which has implemented some structural reform) total Australian railway deficits would be reduced by about \$2 billion.

2.4.3 Pricing of rail services

As noted earlier, the Commission received many complaints from coal and mining companies about excessive rail freight rates. Because they are monopoly providers of transport (through restrictions on road transport, restrictions on operating private railway lines, restrictions on user access to government tracks, or natural monopoly), railways are able to charge prices well in excess of costs.

The excess charges are perceived as being used to subsidise losses elsewhere in the railways.

The coal industry in NSW has genuinely been concerned for some time regarding the lack of a commercial approach to the setting of coal rail freight rates. The SRA has generally used an ad-hoc approach, often imposing "across-the-board" increases on the industry to meet revenue targets, rather than formulating freight rates in accordance with the cost of providing services. The industry is firmly of the view that this has resulted in freight rates being set well above the level of costs incurred and allowed the SRA, in previous years, to offset or subsidise the loss of other sectors. (NSW Coal Association, Submission 31, p.4)

Users have considerable difficulty in establishing the existence and extent of overcharging because they do not have access to railway costs. Their claims are based on consultants' estimates of costs, the perceived scope for reductions in costs through improvements in efficiency, and comparisons with freight rates for overseas hauls. These matters are considered in Chapter 10.

Users argued that freight rates should be set so as to cover operating costs of an efficiently run operation, plus a reasonable rate of return on capital.

The coal industry firmly maintains that the setting of rail freight rates by the SRA should be strictly on the basis that services are provided on an efficient and competitive basis to cover costs and earn an appropriate return on capital to enable ongoing investment in the rail system. However, there is considerable concern within the industry that the new charter given to the SRA to operate commercially has been taken to allow the setting of freight rates on the basis of "what the market will bear". (NSW Coal Association, Submission 31, p. 5)

The SRA has declared its position on pricing in its 'Coal Pricing Policies in State Rail' (Submission 98), although the numerical results presented in that document should be treated as preliminary. It aims to achieve a target rate of return on assets for its coal operations overall. However, rather than using the same proportional mark-up on costs for each mine, the SRA strongly defended its position of negotiating a rate with each mine separately, with the provision that each user pays at least operating costs and none pays more than 'stand alone' costs. There are differences between the SRA and NSW coal companies in three major areas - the calculation of capital costs (including asset values, depreciation and the costs of debt and equity), the distribution of charges across different mines and the use of efficient costs. The NSW Coal Association argued that the SRA recovers amounts in excess of 'normal depreciation' on the historical costs of assets, that its use of replacement cost for rollingstock makes no allowance for potential improvements in technology or productivity, and that its real discount rate of 15 per cent is well above rates generally set by government/statutory authorities (Submission 31, pp.12, 13).

The situation in Queensland is different. In most cases QR has required coal companies to pay for the infrastructure and sometimes rollingstock, and charges were adjusted for this. However, as for NSW, the charges are excessive - indeed the Queensland Government admitted that it uses the coal freight charges as an indirect means of collecting coal royalties (Submission 50, p.27). However, these 'royalties' are budgeted as part of QR revenue - not as general or royalty revenue - and hence directly support loss-making rail services.

Claims of excess charging are not restricted to coal companies.

BHPT places a higher priority on price and reliability than on short transit times for its interstate movements of steel. It pointed out that rail rates from NSW to Perth are less than road rates. However they are higher than for comparable rail haulage overseas:

As an indication of international comparison, privately owned rail companies in the USA, operating at a profit, are able to offer corridor rates (on comparable tonnage and distance) some 30-80 per cent lower than our Australian rail rates on a cost per tonne kilometre basis. (Submission 32, p.10)

The Commission has received little comment on under-pricing, although such is endemic in those markets in which rail has no monopoly, for example LCL freight.

The New South Wales Road Transport Association made the following comments regarding the SRA's Trackfast LCL service.

Will Trackfast pay company tax, payroll tax, stamp duties and the other full range of commercial charges road transport companies pay?

Will Trackfast repay its losses to the taxpayer?

Bruce Baird must ensure that SRA's commercial activities run on proper commercial lines especially since Trackfast is sending much of its freight by road and destabilising existing freight rates.

With the current downturn of freight volumes Trackfast is actively forcing down freight rates below cost.

It's a sick joke when taxpayers' money is used to force private sector transport companies to lose work and lay off staff.

Thanks to Trackfast everybody in the industry is losing, and the safety standards are being jeopardised.

If the New South Wales Government really wants to stay in the small freight business let it do so on a proper commercial basis. (Media release, 19 June 1990)

Freight customers have observed that the existence of passenger subsidies means that taxes are higher than they would otherwise be. The NFF has emphasised the magnitude of the subsidies to passenger services.

The extent of urban rail subsidies means that the community is providing the average rail commuter with a gift of more than \$500.

On some rural services per passenger subsidies are astronomical. In NSW country rail passenger services are subsidised to the extent of \$125 per trip. On the Indian Pacific the per passenger subsidy (on a fully distributed cost basis) is \$850 - more than the cost of a first class air fare between Sydney and Perth. (National Farmers' Federation, Submission 77, p. 4)

In urban rail systems the major reform needed is abundantly clear. Fares should be increased far above their current levels - by at least 300 per cent. These fare increases should be targeted at peak hour CBD commuters. (NFF, Submission 77, p.18)

2.4.4 Service quality

BHPT described service quality as including, 'in the context of transport: reliability against an agreed target; transit time; product care; responsiveness to needs and queries; and information' (Submission 32, p.8). As the major private customer of the interstate rail system, its criticism of service quality is directed particularly at interstate services.

Rail freight service is generally perceived by users to be of low quality. Our experience as customers has been that individual rail systems can provide a high quality service...

Given the far more extensive road network Australia wide, rail is not equally placed to compete on service with road. Rail however should be in a position to provide a good service on the major interstate routes. It is the relatively poor level of interstate rail service which is of concern and results in a general preference for the direct, reliable and efficient services provided by road transport. (Submission 32, p.8)

The key issue from our perspective is reliability, and this would be achieved by improved wagon design, standardized infrastructure and operations, through system wagon monitoring and more focussed management. (Submission 32, p.10)

BHPT explained that the rail systems have confirmed that four days is a reasonable time to move steel from Newcastle and Port Kembla to Perth. 'Recent monitoring of wagons in our East-West corridor indicate no times of four days are achieved at all, and actual transit times ranging from five to ten days are the norm' (Submission 32, p.12).

Rail passenger services were frequently criticised in submissions. For example, Dr C Taylor commented as follows:

Successful commercial operations back up their advertising with quality products; they sometimes even admit that the customer may be right! How different from the current attitude of NSW State Rail in trying to convince the public that a sit-up-all-night XPT with no showers and no dining car is an improvement in service quality!

... The notion that buses are an "adequate" substitute for rail is one perpetrated by cost-pruning managements and is not supported by published research or by those whose trains are taken away. In many thousands of kilometres of participant research in the field I have yet to meet a passenger who praised road-rail substitution. If management went out more and talked to the bleary-eyed passengers transferring to rail from buses at Grafton or Dubbo, or those forced onto buses at Port Pirie when the Crystal Brook-Adelaide line was being standardised they would not continue uttering such platitudes. (Submission 26, pp.3-4)

2.4.5 Government intervention

Many of the deficiencies in productive efficiency, pricing and service quality have their origins in government intervention. In particular, government ownership of railways, together with restrictions on the use of road transport for particular tasks, confers monopoly power on the railways, while the lack of competition encourages inefficiency.

Government ownership

AMIC emphasised the inter-related issues of allowing competition and the need to implement changes in ownership.

The rail transport sector in Australia is characterised by the dominance of government intervention in the sector which has retained a strangle-hold over the supply of services through vertically integrated monopoly authorities protected by legislation and the shield of the Crown. This covers all elements ... from the control of the land corridors and permanent way through track maintenance, train programming, provision of services, both passenger and freight, and maintenance of rolling stock.

With the total control vested in existing government railway authorities, their involvement in all sectors of the industry combined with regulatory and other mechanisms to reduce competition, provision of services on a commercial basis has not occurred. (Submission 88, p.7)

These matters are pursued further in Section 2.4.7.

Regulation of traffic to rail

The coal industry is opposed to regulations which restrict coal movements to rail.

The NSW coal industry firmly contends that government regulations requiring transport of coal by rail has been a fundamental cause of the SRA setting of freight rates well above the costs of providing services...

The NSWCA supports removal of regulations requiring coal to be transported by rail. Restrictions placed on the industry regarding mode of land transport to be used eliminates effective competition, placing the SRA in a position of monopoly control. The SRA maintains the ability to set freight rates which do not truly reflect the cost of providing services because competition is not available to the rail user. (NSW Coal Association, Submission 31, p.15)

On the other hand, the ARU cautioned the Commission about pursuing deregulation:

The concern of unions about deregulation of the grain network applies just as much to the coal network. The intended effect of coal network deregulation and actual or potential modal competition would be to force freight rates to more closely reflect marginal costs of the rail task from specific mines, and thus remove intra-traffic cross subsidisation. While such an intention is straight out of the "contestable market" textbook, the Industry Commission will miss the point in pursuing the contestable market line [if] it does not thoroughly examine the structural change, social consequences and social costs of such an argument. (Submission 63, p.15)

AMIC extended the concept of deregulation to include private provision of rail services.

In a deregulated rail market with the option for mining companies to employ the least cost transport mode, including private provision of rail services, state governments would be unable to exploit their monopoly position to impose excess rail charges. (Submission 88, p15)

AMIC went on to say that, in these circumstances, State governments would probably attempt to recover lost revenues by increasing explicit royalties, but that explicit royalties would have advantages over the present system.

Conflicting objectives

Governments are increasingly expecting railways to act commercially, but at the same time are requiring them to satisfy certain social objectives.

The lack of clearly defined commercial and business objectives caused by the inclusion of CSOs and other ad hoc ministerial interventions, combined with constraints on competition, have stimulated an ethos built-up over generations of this behaviour within the railways that costs, efficiency and productivity are not of paramount concern to the organisation or its employees. (AMIC, Submission 88, p.6)

Politicisation of railways

The NFF was critical of the use of railways for political purposes.

At the global level the refusal of most State politicians not to sell their railways to the Federal Government in the late 1970s has led to a decade of lost opportunity. Whatever possessed the State politicians to block the purchase of rail systems, it was certainly not the welfare of their constituents. Even then the NSW and Victorian systems, especially, were making large losses, and the purchase terms were very generous. Evidently State politicians refused the Federal Government's purchase offer because inability to manipulate transport systems entails a loss of political convenience and power.

Manipulation of rail systems for political convenience is the explanation for chronic urban rail deficits. For political convenience urban rail fares have been kept artificially low. Urban rail fares in Sydney, for instance, are about one-third of fare levels in London for equivalently distanced trips. Such subsidization of fares enhances neither economic efficiency nor social equity. (Submission 77, p.8)

Who can forget the election promise that propelled Wran into power in NSW; the promise of a 25% reduction in urban public transport fares? (Submission 77, p.9)

Nor are the NFF's comments restricted to political manipulation of transport in urban electorates. It even criticised cases of political interference to keep rural freight rates artificially low. The NFF also targeted the role of unions in the political process.

Pressure groups need not only comprise consumers. Competitors or labour within public organisations are also in a position to place pressure on governments. Indeed the most insidious influence of meddling politicians on rail authorities has been to increase union power.

The powerful position occupied by rail unions is most conspicuous in the event of strike activity. A recent example was the Melbourne train dispute. The potency of rail unions, however, extends well beyond mere use of the strike weapon.

In Labor governed States, especially, rail unions are able to exert enormous influence over decision making in their industry. In some States the distinction between labour and management has become very blurred. (Submission 77, p.10)

Professor Kolsen, a past member of the Inter-State Commission, drew attention to the politicisation of the transport system when addressing a Chartered Institute of Transport seminar on road and rail competition in early 1990.

Whitlam when Prime Minister in the 1970s ... tried to persuade the various State governments to sell their railways to the Federal government on very generous terms indeed. All the States with significant railway systems refused. In the case of NSW and Victoria, this was a puzzle to those who do not understand the mechanics of transport politics. Each made then and makes now a very large loss which would have been transferred to the Federal government. Why did they not get rid of those railways when that had the chance, together with the deficit, and give them to the Federal government? It was certainly not the welfare of the citizens of NSW and Victoria which was uppermost in the minds of their respective governments. Nor does transport politics have a party label - it does not matter whether it is Liberal or Labour. There is a political convenience in manipulating the transport system, especially a railway system, which no government wishes to give up - even if it costs its constituents a Parliament House every year. (Reported in Daily Commercial News, 17 April 1990, p.12ff)

J W Laird contended:

The plain facts are that transport is too basic a need of modern society for it to be a political football. Transport is a national responsibility. Thousands of kilometres of our roads have been widened and strengthened with passing lanes built, plus hundreds of bridges and culverts have also been strengthened and other massive costs incurred in upgrading our roads to carry heavy duty traffic. Yet, for thousands of kilometres, these roads run parallel to older rail lines capable of carrying the whole load without any of the associated problems and their continuing costs. (Submission 106, p.3)

2.4.6 Structural problems

Structural problems were summarised by the ARU in its submission, as follows:

Railways in Australia have many well documented structural problems, many of which date back to their origin in the nineteenth century.

These problems include:

- a) five separate operating systems for freight and long distance passenger rail services;
- b) different track gauges, communication systems, operating standards, vehicle design standards, training requirements, policy priorities and marketing objectives between some (and in most cases, all) systems;
- c) a multiplicity of unions;
- d) an absence of Federal Government involvement and leadership in national railway development.

It was to address these structural problems that rail unions proposed the formation of a tripartite Rail Industry Council in the early 1980s...

Furthermore, the last twelve years of unprecedented change in the railways has had little impact on the financial problems of railways because in many instances basic structural problems have not been addressed...

State and Federal Transport Ministers and the ACTU are about to consider the conclusions and recommendations of the Rail Industry Council. Those recommendations squarely address the underlying structural problems of railways and are anticipated to be pursued through processes which reflect an ongoing negotiated approach to change. (Submission 63, p.1)

After receiving comments on its discussion paper (RIC 1990a), the RIC produced a set of recommendations (RIC 1990b) which addressed these issues within the existing framework of government rail authorities but with greater Commonwealth Government involvement (see Appendix D.7).

The Australian Mining Industry Council (AMIC) has a concept of structural reform quite different from RIC:

Of particular concern to AMIC was that the discussion paper by RIC did not recognise the need for significant structural reform within the rail industry. This result appeared to AMIC to be the direct outcome of the industry's (and its participants) own perceptions and desire, explicit or implicit, to retain the existing structure of the organisation or industry. (AMIC, Submission 88, p.11)

AMIC advocated the removal of State railway monopolies, and allowing commercial access to railway infrastructure (including track/permanent way). It stated, furthermore, that:

In the freight area, the long-term outcome could be for governments/rail authorities to completely withdraw from providing freight services and undertake solely the provision of the infrastructure such as track signals, the maintenance of the permanent way and the oversight of programming of trains, both public and private, on the system. (Submission 88, p.12)

AMIC also advocated ownership rights for dominant users (including consortium or joint venture arrangements), establishment of common user sections of the permanent way, and the splitting of railways into a number of separate operations (Submission 88, pp.8, 9).

2.4.7 Lack of competition within railways

Participants have drawn attention to the lack of competition within the railway sector as a result of government ownership and intervention, and the consequences in terms of inefficiencies and price distortions. AMIC's views have already been described in Sections 2.4.5 and 2.4.6. The opinion of the NFF was:

... there is a need to increase competition in the provision of rail services. It is simply untenable for rail authorities to be unreasonably taking advantage of their strong market position with transport of some commodities. It is obscene that with carriage of certain bulk commodities rail, for all its inefficiencies, is receiving a return on costs of 140 per cent. Simply, this is abuse of monopoly power.

Use of the permanent way should be open to any operator. This would place rail on a similar footing to road transport. (NFF, Submission 77, pp. 17, 18)

The NFF also advocated competitive tendering of support services for the purpose of increasing efficiency (pp. 15-17).

The Business Council of Australia gave a high priority to increased competition in its proposals for land transport reform.

Fundamentally, reform must aim to achieve, in as short a time as possible, a world-class land transport system. Competition within and between land transport modes should be increased, with road and rail freight transport operating on a commercial, competitive basis. The user pays principle should be adopted, with charges based on an accurate assessment of underlying costs. Funding of transport infrastructure must be transparent and adequate, and there should be no cross-subsidy between transport modes. Discriminatory regulations favouring particular transport modes or reserving particular traffics to a transport mode must be abolished. (Submission 57, p.1)

2.5 Ongoing rail reform

While participants' comments on problems with the railways show how serious those problems are, due recognition must be given to the substantial reform already under way, or planned, for all of Australia's government rail systems. More details of recent developments are provided in Appendix D.

Governments and railways are responding to some of the criticisms outlined in the previous section, particularly those relating to productive efficiency. For example, the NSW Government is implementing most of the recommendations made by Booz.Allen and Hamilton (1989a and 1989b) relating to the SRA.

In their written submissions, **State governments and railways** typically emphasised reforms already implemented or under consideration. There was general recognition of efficiency gains from allowing railways to operate on a commercial basis with minimal government intervention, and the allied need for more formal means of meeting and funding community services. Most railways recognise the need further to reduce staffing and other costs; workforce reductions were said to be heavily dependent on the extent of capital investment. Some further, but limited, deregulation of the transport of bulk commodities was regarded as an inevitable extension of developments in recent years. Pricing of services better to reflect the cost of supply was generally recognised as a desirable objective. On urban services, the railways typically are striving to improve the quality of service; they generally admit to the desirability of increased and/or restructured urban fares.

In **New South Wales** the Transport Administration Act 1988 specifies that the Minister is responsible for transport policy and that an independent board of directors of the State Rail Authority is responsible for pursuing commercial objectives. The Act delineates the SRA's managerial responsibility for commercial decisions and ministerial responsibility for social policy

decisions. To facilitate this commercial orientation, the SRA was reorganised during 1988-89 into three separate businesses - CityRail, Countrylink and Freight Rail. Reform is proceeding on a broad front including improved management and work practices, staff reductions of 45 per cent in the five years to 1994, and a \$2.6 billion investment program for essential infrastructure. In the second year of a seven year 'turnaround program', the SRA reports increased freight tonnage (growth of 2.2 million tonnes), increased commuter travel (passenger trips up by 5 million or two per cent), reduced cash operating costs (down by \$80 million or 5 per cent), reduced government cash contribution (down by \$14 million or 3 per cent), reduced employee numbers (down by 1800 or 6 per cent) and increased employee productivity.

The principal recent change in **Victoria** that is pertinent to rail reform was the amalgamation in July 1989 of the State Transport Authority (which operated as V/Line and provided country freight and passenger services) with the Metropolitan Transit Authority to form the Public Transport Corporation. The main purpose of the amalgamation is to provide integrated transport services. In the latter half of the 1980s there was substantial rationalisation of the country network which carries mainly grain; some lines were closed. On the other hand Victoria, until recently, has prohibited all but minor use of B-Double trucks. Such regulation - even now only cautiously being reduced - is perceived by some to be for the protection of rail freight from competition. Evidence available to the Commission suggests that, overall, the railways in Victoria appear to have implemented less reform than the other major rail systems. This is particularly so for urban rail.

The rail system in **Queensland** until 1990 was organised on a functional basis (engineering, traffic operations, etc) rather than one which focused on achieving commercial objectives in specific sectors. Following an extensive review, QR's organisational structure was altered with the formation of three core business units and three head office service groups, each responsible and accountable for a specific business area. Monopoly rents hidden in coal freight rates continue to disguise the fact that Queensland Rail operations other than coal transport generate a large deficit; monopoly coal freight revenue is used to cross-subsidise heavy losses on other freight and passenger services. An attempt is now being made to reduce the large losses on intrastate freight - services are being rationalised, with the number of freight terminals being reduced from 312 to about 20. Coal rail freight policies, which have been widely criticised by the coal industry, are currently being reviewed. Since 1 July 1990 a separate QR Trust Fund has operated to cover all receipts and expenditures; it will provide improved accountability and increased control of funds by QR. The Transport Infrastructure (Railways) Act established, as an interim measure, Queensland Railways as a statutory authority under control of a commercial board. The longer term objective is for corporatisation and/or incorporation.

In **Western Australia** a commercial approach has been pursued by Westrail since the mid-1980s; there is a specific corporate objective to 'provide quality freight transport and related services profitably'. The favourable impact of this approach is evident from the Commission's total factor productivity measures (see Figure 2.5). The regulation of bulk commodities to rail is under review. The workforce has been reduced by more than 40 per cent over the past ten years, with substantial related productivity gains. Urban rail services, provided under contract to Transperth, will be expanded with the construction of a new northern suburbs line; the remainder of the urban system has been converted to electric power and the aged diesel rollingstock are to be replaced by new electric equipment. Without changed pricing policies, however, there is likely to be a substantial increase in government's urban railway deficit, with increased finance costs outweighing reduced maintenance costs.

Australian National is owned by the Commonwealth Government. It is responsible for non-urban rail services in South Australia and all services in Tasmania. The Australian National Railway Commission Act 1983 requires AN to conduct its operations in accord with sound commercial practice; amendments in 1989, as part of the Commonwealth's reform package for government business enterprises, removed from AN virtually all government-imposed constraints on management and required improved accountability from AN. Line closures, the use of unit trains, improved terminal facilities, development of technologically advanced rollingstock and substantial workforce reductions have all enhanced AN's productivity. Its financial performance has improved steadily. AN reports a small profit on its total mainland freight operations even though it has very little of the bulk commodity long-haul business so suited to rail; most of its business consists of general interstate freight.

The potentially most important intersystem reform is the establishment of the **National Rail Corporation**, agreed to at the special Premiers' Conference on 30 July 1991. It is to incorporate all of the railways' interstate freight business, operate on a strictly commercial basis and aim to earn a rate of return sufficient to fund all investment from non-government sources. Whilst ownership will remain with Commonwealth and State governments, the corporation aims to overcome the strong parochial approach of the past which has impeded the efficiency of interstate services. The initial equity will be used to upgrade track, terminals and other freight handling facilities. The corporation is expected to break even within three years, compared to the current deficits incurred by interstate rail freight of around \$375 million a year. It is expected that productivity gains averaging at least 35 per cent can be achieved through revised work practices and new investment. The demonstration effect of a properly established corporation is likely to point to very large benefits which could be gained from other segments of rail operations.

In summary, railways consider that they have put in considerable administrative reform effort and pursued increased efficiency on a wide front. The notable successes have been in the freight business, and there is a promising, significant development in the interstate freight segment. Reforms in urban, country and interstate passenger services have been modest. In terms of financial

performance, there has not been a significant overall improvement in the past seven years, although reforms to date suggest modest improvements in the years ahead. The gains achieved seem too small in scope and too slow in coming relative to the substantial prospects for gains from structural rail reform.

A fundamental concern is how the reforms implemented and planned can be preserved so that hard-won gains are not dissipated or reversed. A further concern is how to give the recent momentum for reform necessary added impetus.

2.6 Potential economy-wide effects of reform: ORANI analysis

On the evidence presented in the preceding sections, there are opportunities for railway reform to bring about large improvements in both productive efficiency and allocative efficiency. Changes in productive efficiency include increased labour productivity (and hence a smaller workforce to satisfy the current transport task), better utilisation of existing resources (including closure of a large range of services) and, as existing capital stocks wear out, replacement with more efficient equipment. Improvements in allocative efficiency would be achieved by more efficient pricing practices for both rail and road, including appropriate road user charges for heavy vehicles as agreed upon in principle at the July 1991 special Premiers' Conference. Activity in some rail sectors would increase while in others it would decrease.

ORANI-RAIL model

Railway transport impinges on many sectors and hence any improvement in its performance would have important flow-on and multiplier effects throughout the economy. The Commission has attempted to gauge the economy-wide effects of reform using a specially constructed version of the ORANI model of the Australian economy to quantify the gains from the introduction of international best practice and more efficient pricing in Australian railways. This model, ORANI-RAIL, builds on work previously used in the Government (Non-Tax) Charges report (IAC 1989).

The special features of the model include the disaggregation of the rail sector into five separate industries: bulk mineral freight, non-bulk freight, grain freight, private iron ore rail freight and passenger transport. This disaggregation highlights special aspects of the rail sector. Studies show that some bulk mineral freight charges are excessive, while for non-bulk freight and grain, rail freight charges do not cover current costs. Furthermore, it is generally accepted that private haulage of iron ore is already at or near international best practice. Therefore, to avoid over-estimating the gains from productivity improvements it is necessary to separate out this section of the industry.

The model also incorporates substitution by users between road and rail services in transporting goods for final demand to householders, government or for export. When setting the parameters which determine the level of substitution, it was assumed that there is relatively little scope to switch from rail to road in the transportation of agricultural and mining products, whereas more choice is available for transporting manufactured or service-related goods.

The analysis, however, does not account for the possible removal of restrictions on the road freight transport industry of certain goods. Nor do the pricing reform simulations allow for the removal of cross-subsidies in excise and registration fees from passenger to road freight services. However, a link is made between the damage caused by road freight haulage and the level of activity in the industry.

The model was used to estimate possible gains in implementing productivity and pricing reforms in the rail transport industry. Two sets of results are presented. In scenario 1, railway costs are reduced so as to bring Australian railway productivity levels into line with international best practice. The cost savings from these productivity improvements are used to reduce rail deficits. In scenario 2, charges for freight and passenger services are appropriately adjusted to achieve full cost recovery assuming that the productivity improvements in scenario 1 are already in place. In the case of bulk minerals and grain freight, charges are reduced, while they are increased for non-bulk freight and passenger services.

Assumed productivity improvements

The model is not suitable for simulating the macroeconomic effects of many of the reforms which are recommended in this report, but it is suitable for simulating the effects of achieving feasible reductions in railways' costs. The magnitude of such reductions has been determined on the basis of Australian railways adopting international best practice. That involves both technical and work-related initiatives. Examples include the acquisition of more fuel-efficient locomotives, the lengthening of passing loops to permit longer trains, and more efficient work practices such as single-staffing of selected train and shunting services.

The various productivity improvements possible for Australian railways are outlined in the report prepared by Travers Morgan (reproduced in this report as Appendix K). This study provided estimates of operating cost reductions possible if all Australian rail networks were to move to international best practice in work practices and costs in all areas of operation. In an earlier exercise, Travers Morgan (1990) provided estimates of the potential savings in total costs after comparing Australian railways with US best practice, taking into account differences such as in the prices of labour and material inputs. These potential savings in total costs, are presented in Table 2.5 for the four rail sectors considered.

Labour makes up approximately 45 per cent of total rail costs, while materials and capital each account for about 30 per cent.

That such savings are feasible, without major reductions in rail services provided, can be illustrated by the labour projections discussed in Chapter 7. Railway employment is currently around 75000, down from 110000 ten years ago. Some rail systems, such as the SRA, have publicly declared employment targets. Others have no formal workforce reduction program but in the course of this inquiry the Commission has obtained well-informed estimates of the size of the workforce required for the current level of services. The summation of these targets and estimates suggests that current rail tasks could be performed by approximately 50000 employees. The implied 33 per cent reduction is consistent with the labour savings estimate provided by Travers Morgan.

Table 2.5: Cost reductions required to achieve international best practice

<i>Rail sector</i>	<i>Cost savings (percentage) in:</i>			
	<i>Labour</i>	<i>Material</i>	<i>Capital</i>	<i>Total</i>
Freight				
Grains	40	40	19	35
Other bulk	40	36	17	31
Non-bulk	38	37	18	34
Passenger	37	36	14	31

Source: Commission estimates derived from Travers Morgan (1990).

Pricing reforms

As noted in Section 2.4.1, all Australian railway systems have operated at a deficit in recent years. The degree of deficit has varied between activities with urban passenger services consistently having the largest deficits. Some freight operations have operated with a surplus. In fact, some rail freight charges have been used as a means of collecting royalties on minerals (for example, 'excess' coal rail freights - see Chapter 10).

The size of deficits will be reduced by achieving the productivity improvements outlined in scenario 1 as prices to users are assumed to be held fixed allowing the cost savings to be used to reduce deficits. The Commission's estimates of the additional price changes required to achieve full cost recovery are presented in Table 2.6.

The cost reductions associated with improved production practices are deducted from the base cost presented as an index equal to 100 to arrive at international best practice cost estimates (Table 2.6, column 3). These are then used as target levels for full cost recovery. Column 4 expresses current revenue (fares plus an additional 25 per cent for reimbursements for concessions) as a proportion of the base cost. The required price changes (column 5) in Table 2.6 reflect the differences between

base revenues and the corresponding revenue targets. It should be noted that these estimated price changes represent only the initial or first round price changes required to achieve full cost recovery. Further price adjustments would be required to achieve full cost recovery following changes in demand in response to the initial price changes. The first round price changes are also based on the assumption that rail tasks remain unchanged. Additional cost savings could be made by further rationalisation of the transport system.

Charges for passenger and general freight would have to increase by 130 and 32 per cent, respectively, to achieve full cost recovery following adoption of international best practice. In practice, passenger fare increases might be less to the extent that some revenue could be obtained from non-user beneficiaries of those services. Substantial reductions in minerals and grain freight rates would be required to achieve full cost recovery. While rail freight rates for minerals could be reduced to achieve full cost recovery, it needs to be recognised that in the case of Queensland black coal these ‘excess’ rail freights have been used as a means of collecting royalty payments for access to coal deposits. There is also considerable evidence that ‘excess’ rail freights have applied in the past in NSW (see Chapter 10). Consequently, in these simulations a non-distortionary tax equal in value to the current ‘excess’ rail freights on black coal has been introduced to represent the replacement of ‘excess’ coal rail freights by a resource rent tax.

Table 2.6: Price changes required to achieve full cost recovery

<i>Rail sector</i>	<i>Base cost</i> (1)	<i>Cost reduction (%)</i> (2)	<i>Best practice cost</i> (3)=(1)-(2)	<i>Base revenue index</i> (4)	<i>Price change (%)</i> (5) ^a
Freight					
Grains	100	35	65	77	-16
Other bulk	100	31	69	121	-43
Non-bulk	100	34	66	50	+32
Passenger	100	31	69	30	+130

^a (5)=100*[(4)-(3)]/(4)

Source: Commission estimates derived from Travers Morgan (1990).

Effects of productivity improvements and pricing reforms

The effects of these reforms over the long run (a period of about 10 years) were simulated using ORANI-RAIL based on the following assumptions regarding the Australian economic environment: sufficient flexibility in industry capital stocks is assumed so that after-tax rates of return are restored in the long run to their initial values (that is, the shocks applied do not affect the relative riskiness of the industry); real wages and occupational wage relativities are sufficiently flexible to keep occupational employment rates constant; the public sector borrowing requirement is kept fixed in real terms via equi proportional adjustments to personal and corporate tax rates; and government consumption spending is adjusted in line with household consumption spending.

The economy-wide effects of introducing productivity and pricing reforms for all rail services are provided in Table 2.7.

Table 2.7: Estimated long-run effects of productivity and pricing reforms in the rail transport industry: percentage changes^{a,b}

	<i>Scenario 1</i> <i>Productivity reforms</i> <i>Cost savings used</i> <i>to reduce rail deficits</i> <i>(1):</i>	<i>Scenario 2</i> <i>Prices changed to achieve full cost</i> <i>recovery; assumes scenario 1 is in place:</i>			<i>TOTAL</i> <i>(5)</i> <i>=(1)+(4)</i>
		<i>Rail</i> <i>freight</i> <i>(2)</i>	<i>Passenger</i> <i>rail</i> <i>(3)</i>	<i>Total</i> <i>Pricing</i> <i>(4)=(2)+(3)</i>	
Macroeconomic variables					
Real GDP	1.0	0.2	0.2	0.4	1.5
Real GNP	0.2	-0.1	0.1	0.0	0.2
Real consumption	0.6	0.0	0.0	0.0	0.6
Real investment	1.1	0.5	0.4	0.9	2.0
Real government spending	0.6	0.0	0.0	0.0	0.6
Export volume	2.4	1.2	0.9	2.1	4.5
Import volume	0.4	0.6	0.1	0.7	1.1
Balance of trade	0.3	0.1	0.1	0.2	0.5
CPI	-0.4	0.7	0.3	0.9	0.5
Real pre-tax wage rate	0.1	0.3	-0.4	-0.2	-0.1
Aggregate employment (persons)	0.1	-0.2	0.0	-0.2	-0.1
Aggregate capital stock	1.1	0.5	0.4	0.9	2.0
General shift in taxes	-4.1	-1.1	-2.1	-3.2	-7.3
Sectoral outputs					
Agriculture	0.9	-2.3	0.4	-2.0	-1.0
Mining	3.1	7.5	1.2	8.7	11.8
Manufacturing	0.9	-0.7	0.3	-0.4	0.5
Rail	1.2	0.3	-6.3	-6.0	-4.8
Mining rail	3.6	16.0	1.5	17.5	21.1
Non-bulk rail	0.8	-12.4	0.3	-12.1	-11.3
Grain rail	0.7	-0.6	0.3	-0.3	0.5
Passenger rail	0.1	-0.1	-23.9	-24.0	-23.8
Road freight	1.0	1.9	0.3	2.2	3.2
Buses and coaches	-	0.1	0.1	0.2	0.2
Services	0.7	0.1	0.1	0.2	0.9

a All results are expressed as percentage changes, except for the balance of trade which is expressed as a percentage of base-period GDP.

b Differences in row totals are due to rounding errors.

Source: Commission estimates.

The results in Table 2.7 indicate relatively large gains for the economy as a whole as a result of implementing these reforms. Implementing both productivity and pricing reforms would lead to long-run annual GDP gains of around 1.5 per cent or \$5.4 billion in 1989-90 prices. This consists of a \$3.8 billion annual increase in GDP from implementing international best practice and using the cost savings to reduce rail deficits, and a \$1.6 billion annual GDP increase from implementing additional pricing reforms to achieve full cost recovery.

In **scenario 1**, productivity improvements that have been simulated are equivalent to an initial cost reduction in the rail industry of \$2.2 billion in 1989-90 prices. Since rail charges remain unchanged there is little direct gain to users of rail transport. However, these cost savings are passed on throughout the economy through significant reductions in general income taxes by around 4.1 per cent. Lower taxes imply lower costs to all industries and consumers resulting in a fall in the CPI of 0.4 per cent. Lower prices improve the competitiveness of both export-oriented and import-competing industries. As a consequence, demand for and production of Australian produced goods rises.

Export volumes increase by 2.4 per cent in response to increased export demand. Import-competing industries also benefit with imports rising by only 0.4 per cent. Overall the balance of trade improves by 0.3 per cent of GDP. This small rise reflects a net inflow of capital from abroad as the increase in domestic savings is insufficient to fund the 1.1 per cent increase in real investment and the aggregate capital stock.

Greater activity in the economy increases the demand for inputs and factors of production such as labour and capital. Most of the redundancies in the rail industry are absorbed by other industries so that overall employment increases by 0.1 per cent or 7 500 persons. Competition for labour inputs leads to a small rise in the real pre-tax wage rate of 0.1 per cent. This small rise in labour costs has minimal impact on the overall reduction in costs brought about by the fall in direct tax rates.

Output increases in all of the major sectors. The mining sector is more able to respond to cost reductions than is the agricultural sector. Mining export demand is more responsive to price changes and mining production faces fewer constraints. Thus, mining sector output expands by 3.1 per cent as it takes advantage of lower capital and material costs while agricultural output expands by 0.9 per cent.

The manufacturing sector also increases its output by 0.9 per cent due to the fall in prices of material and capital inputs constrained by the slight increase in wages. Export-oriented metal producing industries share in some of the gains to the mining sector.

Services sector growth of 0.7 per cent is partly the result of increased demand for services from expansion in the other sectors. The remaining service sector growth is accounted for by the increased output of the rail sector (1.2 per cent).

The price changes simulated in scenario 2 adjust rail charges to achieve full cost recovery assuming international best practice has been implemented as in scenario 1. Adoption of prices which recover costs will lead to an improvement in the efficiency of resource allocation as users are forced to make decisions based on the full cost of providing the service. In this study the additional price changes generate real GDP gains of 0.4 per cent or \$1.6 billion.

The rail freight component of scenario 2 consists of price changes for minerals, grain and non-bulk freight assuming international best practice has been implemented as in scenario 1. Substantial reductions in mining rail freight rates lead to a significant expansion of the mining sector as it is able to respond more readily than other sectors to cost reductions. The agricultural sector benefits from reduced grain rail freight rates but these are more than offset by increased costs for labour and other inputs brought about by competition for resources from the expanding mining sector. As a result the agricultural sector contracts by 2.3 per cent. The manufacturing sector is also disadvantaged by the increased competition for resources and directly by increased charges for non-bulk rail freight. The demand for road freight increases substantially as non-bulk freight is diverted away from the now more expensive rail mode and, more importantly, as a result of the increased activity associated with lower mining rail freight charges. The services sector expands slightly. Overall the rail industry's output is unchanged as expansions in mining rail are offset by contractions in non-bulk rail, grain rail and passenger rail.

Export volume increases by 1.2 per cent as a result of increased mining sector output. Import volume increases by 0.6 per cent leading to a slight increase in the balance of trade (around 0.1 per cent of GDP). Mining sector expansion leads to an increase in the demand for primary inputs. This leads to an increase in wage rates and in the prices of domestic commodities as reflected by an increase of 0.7 per cent in the CPI. Overall real consumption remains largely unchanged while real investment increases by 0.5 per cent.

In the second part of scenario 2 fares for rail passenger services are more than doubled to achieve first round full cost recovery. Rail passenger services are currently heavily subsidised by government. The result of the price increase is a 24 per cent reduction in rail passenger activity. Thus, to achieve full cost recovery after allowing for changes in demand, fare increases would need to be greater than the initial 130 per cent increase modelled. No increase in the quantity used of other modes of transport is shown in Table 2.7 because the usage of private cars cannot be separately identified. There is minimal change in the quantity of bus and coach transport because the database used relates to 1980-81 when this industry was relatively small and highly regulated. Labour, capital and material resources are released from the rail passenger industry reducing the prices of primary inputs and domestic price levels generally. This leads to increased activity in almost all sectors. Export volumes increase following cost reductions and there is a slight increase in the balance of trade (0.1 per cent of GDP).

Investment and the accumulation of capital stocks increase by 0.4 per cent as a result of increased activity in all sectors. Real consumption increases slightly. The increase in economic activity leads to a 0.2 per cent rise in GDP.

Net effects

The overall effects of implementing international best practice and price changes required to achieve full cost recovery would, in 1989-90 values:

- result in initial cost savings in the rail industry of \$2.2 billion;
- expand national output by \$5.4 billion (\$3.8 billion from productivity reforms and \$1.6 billion from pricing reforms); and,
- lower income taxes by 7.3 per cent.



3 RELATIONSHIPS BETWEEN GOVERNMENTS AND RAILWAYS

Railways have long been used by governments as instruments of policy. Governments continue to support rail services for intended economic and social benefits despite financial losses. The role of governments as both proprietor and client when the railway is used as an instrument of policy has given rise to significant impediments to industry reform. That dual role makes it difficult to apply the commercial incentives essential to the reform of government business enterprises. The potential conflicts of interest that arise when incompatible goals are being addressed discourage private participation, to the detriment of achieving efficiency improvements through increased competition.

Commonwealth and State governments have recognised rail industry reform to be a key component of microeconomic reform. Governments have commenced the reform of their railways and intersystem operations, but the sense of urgency and approach varies from State to State. The principles of commercialisation and increased competition should be the guiding elements of reform and they require changed relationships between governments and railways. Incorporation of adequately capitalised railways under the corporations law should provide an effective way to achieve 'arm's length' operation of the railways and minimise the extent of government intervention to enable efficient operation. A feature of the 'arm's length' relationship would be negotiated contracts for any community services delivered by railways.

3.1 Historical overview

3.1.1 Government involvement and policy

The introduction of railways in Australia in the 1850s, as in most other parts of the world, was a private initiative. The entrepreneurs were either local businessmen, overseas railway speculators or railway construction companies.

Initial government involvement in Australian railways arose because of investors' demands that governments guarantee the dividends of private investors and the need to provide additional capital to complete lines. When the entrepreneurs experienced difficulties, such as underestimating construction costs and times, governments took over ownership to protect themselves from financial exposure. Thus there is no significant early history of private participation in railways in Australia, either in competition as in the USA and the UK or as private monopolies as in India and France.

The early railways generally proved to be marginally viable, though their financial performance was dependent on the economic prosperity of the regions they served. The seeds of later more serious financial problems, however, had already been sown. Capital constraints had dictated construction at grades far steeper and with smaller radius curves than tried elsewhere in the world.

These factors have adversely affected railway operations and their ability to compete with other modes of modern transport.

The early financial viability of the railways encouraged governments to expand their systems because they were regarded as important to the development of the colonies. In South Australia the railways were also regarded as having the potential to add to the Colony's revenue. In NSW the railways were extended to the Riverina and to Bourke on the Darling River in order to compete with inland water transport which was taking trade away from Sydney to Melbourne and Adelaide.

The expansion led to political pressure for the construction of lines to every settlement and railways were forced to build lines cheaply in order to maximise network coverage. Most of the lines were a financial burden from the outset because of low levels of traffic and, because of cheap construction, very high maintenance costs.

The poor financial performance that ensued raised a major public policy issue: should rail services operate on a commercial basis or should they be considered primarily as a 'public good' provided to all at subsidised rates?

Ever since that day [in 1850 when construction of railways began] the railways have been the centre of a stormy debate. It has been a political debate and its main theme has been this: should the railways operate like every honest commercial concern and earn some return on the capital invested in them, or should the State treat them as public works necessary for the proper workings of industry and commerce, essential to the provision of ordered and acceptable daily life for the State's inhabitants. (Gunn 1989, p.xiii)

Governments have not explicitly resolved this debate but generally have treated railways as essential public services. They have been reluctant on perceived equity grounds to close lines that proved to be uneconomic. Furthermore, for those regions affected by natural disasters such as droughts, governments often gave further relief by reducing freight rates even though this invariably increased railway losses.

Railways were seriously run down during the Second World War. An inquiry into railways by the Curtin Government found that substantial renewal was required to rectify the deferral of maintenance during the war. As a consequence, railways were not in a strong position to withstand competition from other modes of transport which were growing rapidly at that time.

The Privy Council's ruling on the Hughes and Vale case in 1954 increased price competition for interstate traffic. State governments up until that time had protected their railways and earned revenues from licensing long-distance road transport. The Privy Council found that these licence charges were inconsistent with s.92 of the Constitution which guarantees that trade and commerce between the States shall be absolutely free. Railways were particularly vulnerable to this form of competition and lost market share because they were required by their governments to continue as common carriers, that is to accept the carriage of all freight and passengers at scheduled rates

without pricing flexibility to respond to the road transport competition.

Despite the changes in the technology of transport and in the demand for rail services, railways continued to operate according to non-commercial objectives with charges set by the government. Gunn assessed the plight of the NSW Railway Commissioner in the 1960s as follows:

The Commissioner's three core constituencies were the public, his employees and his political masters. He had to provide ... unprofitable and occasionally cost free services and to pay interest on a capital debt that included assets that had long passed their economic life. He operated in world where railways everywhere were suffering, despite technical improvements, from the inherent inflexibility of moving along fixed lines. (Gunn 1989, p.445)

In 1968 the NSW Minister for Transport informed Parliament that 'the Government recognises that public transport is a public utility and that in these days the services must be subsidised to a certain extent'. He mentioned significant losses on urban and country passenger services and concessions for pensioners, school children, freight concessions to decentralised industries, and concessions on carriage of coal and wheat. Concessions were also available for some agricultural products. All rail passenger services had become unprofitable.

The transport systems were forced to face up to mounting revenue shortfalls and strong pressures were placed on State budgets in the 1970s. In 1972 Neal McCusker, the NSW Commissioner for Railways, indicated the magnitude of the problem in his last annual report:

... it must be said that whilst the Department is bound to maintain passenger train services equated neither to traffic needs nor a realistic fare structure, while it provides services on uneconomic country lines and accepts a common carrier obligation to carry all classifications of freight offered for transportation, and whilst uncontrollable costs continue to rise without strong measures being taken to contain, if not nullify, the effect, heavier deficits are inevitable. (Gunn 1989, p.474)

Prime Minister Whitlam considered that the administration of the railways by State governments had led to diseconomies such as duplication of facilities and administration, inefficient operating procedures, poor use of available resources, limited standardisation of equipment and a lack of a uniform approach to railway policy. He offered to take over the State railways, something that had been previously raised by the States and rejected by the Gorton Government. This offer was accepted only by the South Australian and Tasmanian Governments.

In the 1970s there was some rationalisation of services and some of the most uneconomical branch lines were closed. However, the bulk of unprofitable traffic was carried into the 1980s and in the face of mounting deficits, the trend of government policy was to maintain, if not increase, government control over railways.

In the last decade there have been administrative reforms, especially elimination of some legislative barriers to non-rail freight haulage of certain commodities. There has been some further rationalisation of services. Common carrier requirements were dispensed with. The earlier trend of greater government control has been modified. Most railways now have mission statements and corporate plans that emphasise commercial objectives. The 1980s brought a new, more commercial approach to the management of public transport, but government intervention persists.

The cumulative effect upon railways of many decades of government control and direction of management has led to mounting debt, the running down of assets and the perceived need to subsidise many services. This poor financial position militates against reform as it will be difficult to generate sufficient funds to finance labour redundancy payments, retraining and capital improvements.

3.1.2 Railway management

Public railways were managed initially by government-appointed boards. Although under ministerial control, they managed the railways with a large degree of independence.

The appropriate relationship between the government and the railway commissioners was first raised in NSW during 1855 over the issue of passenger fare levels. The then Commissioner, Martindale, advocated that direct government ownership and control of railways, free of detailed political interference and operating precisely as if in the hands of a private company, was superior to both free competition and closely controlled official monopolies.

As the railways experienced increasing financial difficulties, ministers tended to take over direct managerial responsibility, and new construction had to be sanctioned by parliament. Government ownership and direct ministerial control encouraged political resolution of complaints about railway policy and management. Community lobbying on the routing of new lines became a significant problem.

The first proposals for reform arose in the Victorian Parliament in 1876. The Victorian Government proposed to change the existing system of railway management by substituting a board of commissioners responsible to parliament but independent of the ministry. The criticisms of the then current arrangements made during the parliamentary debates included:

... our Railway department (is managed) not upon any ordinary principle of business whatever....(but) has become simply a political machine, used for political purposes, and as a means of providing employment for political friends and hangers-on. (Wettenhall 1961, p.13)

The 1883 Railway Bill represented a pioneering form of today's public corporations. The railway which had been suffering losses was returned to a profitable situation under the management of

independent commissioners. This apparent success encouraged the other colonies to adopt the Victorian model.

Governments gave commissioners greater security to resist blatant interference by increasing their tenures to seven-year terms and by defining the reasons for dismissal from office (which could be effected only by both houses of parliament). The construction of new railways remained the prerogative of parliament, so that there was a separation of the building and operational functions.

The continued existence of a political office concerned with railway affairs and an overlapping of responsibility led to an encroachment on the commissioners' powers. Problems arose because of a failure to give financial credit for work undertaken on behalf of other departments, directions to employ lightweight construction as an economy measure, government refusal to establish reserve funds for the replacement of locomotives and rollingstock and directions to provide rate concessions during droughts. The success of the reforms was therefore short-lived and the fortunes of the railways began to decline again. Parliaments tended to blame railway management for the reversal of fortune, not recognising that government policy also was to blame.

In response to these problems, parliamentary standing committees were established in some jurisdictions to evaluate new construction proposals and operating efficiency. For example, in South Australia the Parliamentary Standing Committee on Railway Works was introduced in 1912 in an endeavour to halt the wasteful expenditure that had characterised the development of railways in the State. This Committee was critical of the construction of poor quality railways, unsatisfactory developmental land settlement policy and high construction costs.

In relation to government directions to reduce railway charges, the Victorian Commissioner in 1896 gave notice that he had no objection to alterations being made providing that a 'recoup' provision was made to ensure that the railway revenue did not suffer. This sparked a major debate over the issue. Over a number of years the Victorian Parliament agreed to a Treasury reimbursement but many members criticised it as a meaningless book entry in the public accounts and made claims that the commissioner had not proven the amount of the actual loss. Under attack by parliamentary members and the Victorian Treasury, the railway commissioners eventually abandoned claims for reimbursement.

The early Victorian reforms were adopted in principle by all of the State governments. Administrative arrangements were not changed substantively from those set at the turn of the century, until transport commissions comprising representatives of each transport authority, including the railways, were established in the 1970s. These commissions, which were formed because of State government concerns about the problems of urban transport coordination, had a strong transport planning emphasis. In general they were not successful in resolving the urban transport problems and were abandoned after they recommended investment programs which governments could not fund.

By the late 1980s some substantial reforms were underway. The Commonwealth Government gave increased commercial autonomy to AN. The New South Wales State Government has recently introduced administrative arrangements more consistent with commercialisation. Some governments have also formed advisory boards in order to increase user and, in the case of Victoria, worker participation in the formulation of policy. In Queensland in 1991, the Transport Infrastructure (Railways) Act established Queensland Railways as a statutory authority under the control of a commercial board. This was stated to be an interim measure with the longer term objective being that the organisation be corporatised and/or incorporated (Queensland Government, Submission 135, p.6).

3.2 Railway legislation

3.2.1 Constitutional background

Railways were the dominant mode of transport at the time when the Constitution was drafted. They were seen as vital for establishing national communications and as a possible instrument of State protectionist policies (which could reduce the full benefits of federation). Special provisions were thus included in the constitution to prevent the States from using railways to restrict interstate trade as they, as colonies, had done in the past. Consequently, the Commonwealth has significant powers in relation to railways.

Details of the Commonwealth's Constitutional powers are presented in Appendix F.

3.2.2 Industry regulation

The ownership of railways is not reserved to governments in any legislation. But railways could not be built without government cooperation. Government approval, possibly supported by legislation, would be essential to the establishment of a new railway because of land acquisition problems in most areas. Governments as railway owners and regulators may be reluctant to provide this cooperation to potential competitors.

Some governments may be amenable to private involvement and control over part of their railways. They have made provision in their railway legislation for approval of the construction and maintenance of sidings and branch lines by the private sector. The Western Australian Government Railways Commission also has the power, with the approval of the Governor, to lease by public tender any portion of the railway and its rollingstock.

There are also provisions allowing private operations. Under most legislation, owners of branch lines can undertake their own operations. For example, the Queensland Commissioner has the power to allow privately-owned trains to run on government-owned track; that Commissioner, however, also has the power to control and regulate the working of private branch lines, including prohibition of working either over the whole or part of the line.

State governments have regulated to prevent the carriage of certain commodities by road. This effectively reserves the traffic to rail because they are bulk goods that could not sensibly be air freighted. A list of the regulated traffics applying in each State is presented in Chapter 10.

3.2.3 Current government railway administrative arrangements

Ministerial intervention has been a major issue in establishing administrative arrangements for railways over their long history. Government intervention for political reasons represents a potentially serious impediment to achieving reform through commercialisation because it can give rise to conflicting objectives. The State Rail Authority recognised that:

... in the past its general level of efficiency, particularly in passenger and [general] freight areas, has been constrained by government intervention and constraints on its employment and investment policies. (Submission 98, p.21)

Particularly towards the end of the last decade, government railway administrative arrangements have been reformed in most jurisdictions to provide a more commercial orientation to their management. In the case of New South Wales, Victoria and the Australian National Railways Commission, the basis of Ministerial control is defined in legislation. Boards are charged with the responsibility of formulating policy and business strategies. Ministers are required to issue instructions in writing before the chief executive/general manager is obliged to execute the order, although managers are still free to execute ministerial suggestions. Under the NSW legislation, the Board can request a review of any instruction if it is regarded detrimental to the commercial and financial interests of the Authority. The Minister must then estimate the financial loss, consult with the Treasurer and only confirm the decision if the Treasurer has approved reimbursement of the financial loss from the public purse.

Western Australia has a separate authority responsible for arranging urban transport which contracts with Westrail to undertake the rail transport task. The Commission considers that this arrangement is likely to lessen, but not overcome, the opportunity for ministerial intervention in management issues.

Despite the recent reforms, scope remains for ministerial intervention in both day-to-day operations and strategic policy decisions. The main reason for this is that, unlike most large business enterprises, all of the equity control of a railway is vested in a single person, the Minister. Another

reason is that the effective tenure of the most senior executive, who is usually a key member of the managing board, is typically a matter for the Minister.

In the case of AN the chief executive officer of the Commission, the Managing Director, is appointed by the Commission and is a member of the Commission. In New South Wales, the Chief Executive of the SRA is appointed by the Government (after receiving advice from the Board) and currently is also Board Chairman (appointed by the Minister). The Public Transport Corporation of Victoria consists of one member (appointed as Chief Executive by the Minister) who chairs and is advised by a board appointed by the Minister. In Western Australia the Commission consists of a sole Commissioner who is the Chief Executive Officer. In Queensland there is a chief executive appointed by the Board (which is appointed by the Minister).

The Industry Commission is of the view that railway boards should comprise more than one member and, whereas members of any such managing board should be appointed by the Minister, the chief executive should be appointed by the board [and be an ex officio member].

Major administrative efficiency problems arise from the conflict between commercial and non-commercial objectives of governments. Some governments have introduced reforms aimed at resolving the conflict. For example, where the Australian National Railways Commission can satisfy the Commonwealth Minister that complying with a direction has been to AN's financial detriment, whether by increasing cost or forgoing revenue, it is entitled to reimbursement. A preferable solution is the separation of the responsibility for policy decisions on railway services from the responsibility for the actual provision of railway services. The provision of these services could then be a contractual arrangement between two areas of government, represented by independent ministers.

3.2.4 Powers and responsibilities of government railways

State and Commonwealth government railway legislation in practice does not ensure a proper relationship between governments and their railways although, prima facie, it allows railways to operate with almost total commercial freedom. The only exception to this freedom is the power to close and dispose of railway lines; this power resides in most States with the parliament. The legislated powers available to management include establishing new services, constructing new railways, operating any other additional or alternative transport service (including bus and road freight services), entering into complementary business activities such as land development, entering into arrangements to allow others to operate part of the railway, conducting joint services with other railways, making provision for the safe operation of their railway, making necessary regulations, and the determination of employment conditions, classification of positions, superannuation, appeals procedures and dispute settlement procedures.

However, the same legislation gives the minister executive power over the railways and also provides for ministerial controls in many areas which, in practice, may prevent management from exercising the above powers. The extent to which the powers are exercised depends on the preparedness of governments to give railway management a commercial mission and to allow management to use their powers to meet that mission.

Explicit controls by government over matters such as charges suggest, however, that governments have not been prepared to allow management full commercial freedom. For example, although the Western Australian Government Railway Commission (like all other authorities) has the power to determine charges within the context of their corporate mission, it is required to obtain the approval of the Minister before fixing charges. Under Victorian legislation, charges for passenger services may not be increased without the approval of the Minister. The State Rail Authority of NSW has the power to fix charges and to enter into contracts, but is bound by the pricing policy approved by the Minister and must notify the Minister of the proposed adjustment and details of the factors leading to the decision. This is a matter for concern because, for example, in the past ‘government constraints and interventions to meet particular circumstances have meant that coal pricing has lacked commercial consistency’ (State Rail Authority of NSW, Submission 98, p.23). The Australian National Railways Commission may fix charges without reference to the Minister, if ministerial guidelines are followed.

Indeed, knowing the views of the government, authorities usually would be reluctant to propose price increases if they know or expect that they will be refused. This gives the incorrect impression that railways are satisfied with present prices.

The responsibilities of railways include financial reporting. All the government railways are financially accountable to the responsible Minister. Typically they are required to supply all requested information and to keep the Minister informed. For example, the Victorian Minister can request details relating to the budget, finances, cash flow and staffing at any time and can override budgets, if circumstances warrant action. These responsibilities are no more onerous than those applying in private enterprise or those applying to private railways in the US and are not likely to impede efficient operations or the reform process.

On the other hand, financial responsibility of the railways is diminished by government involvement because governments are not usually prepared to withdraw support for services which experience financial difficulties and often do not satisfactorily recompense railways for requirements imposed on them.

The Commission concludes that under current legislation government railway powers can allow operations to be conducted on a commercial basis, including setting charges at levels to recover all costs. However, such legislation is not adequate in ensuring reforms do actually occur. History suggests that even if governments of the day permit railways to operate on a fully commercial

basis, subsequent governments may be tempted to influence operations if the commercial commitment is not more firmly legislated. History reveals that government interests often have been too entrenched to relinquish control over important areas such as charges and urban passenger service levels. Even given the new legislation in New South Wales, for instance, there are still examples of government intervention overriding railway management's commercial decisions in that State.

The Commission notes that legislative changes are necessary to ensure that governments are compelled by parliament to set consistent objectives, to establish appropriate administrative arrangements, to ensure that the correct management incentives are in place and to refrain from political influence.

3.3 Reform of the relationship between governments and their railways

The reform of government railways has begun. It is important, however, to question at this stage whether processes underway will lead to sustained improvement in railway productivity and resource allocation in the transport sector. To date, most reform effort has been in the same administrative framework that has existed for decades - and in which reform has not generally been successful. The focus has been very much on incremental improvement, of a kind which can be easily reversed. What is needed is reform of a more fundamental nature. Governments are examining such reform as a key component of microeconomic reform, by looking at how to improve the performance of Government Business Enterprises (GBEs), especially those in the transport sector.

Instruments of GBE reform may be based on varying degrees of administrative change, regulatory change, commercialisation, corporatisation and privatisation. The Commonwealth, State and Territory governments are increasingly focusing their attention on the relationship between government and GBE management. Governments appear to have recognised that productive efficiency is best achieved by requiring railway management to behave commercially. As in the case of a number of GBEs examined in its previous reports, the Commission considers that the best means of achieving commercialisation of railway businesses is by their corporatisation.

Corporatisation encompasses initiatives aimed at replicating many of the commercial incentives which apply to private firms, but excludes changes in ownership. Within the constraints imposed by ongoing government ownership, corporatisation seeks to establish a structure of incentives that approximates those that exist for private sector managers and, by removing factors which have both advantaged and disadvantaged public authorities compared with their private sector counterparts, to provide public enterprises with a more commercial focus.

The remainder of this chapter concentrates on what the Commission believes to be the most fundamental reform elements, those of commercialisation and promoting increased competition, by corporatisation. Other instruments of reform, particularly those relating to regulatory change and privatisation, are considered in subsequent chapters, and Chapter 12 extends the scope of reform to full-scale structural reform.

3.3.1 Reform principles

Reform objectives for enterprises that continue to be owned by governments have been enunciated for some time. The Commonwealth Government stated its objectives as:

- to enable the GBEs to perform more efficiently and effectively, on a commercial basis, in an increasingly competitive environment;
- to make the GBEs more financially viable, so that their demands on the budget are reduced and they have a secure financial base from which to expand and diversify their operations;
- to focus the Government's involvement in the operations of GBEs on their strategic direction and financial accountability; put simply, to shift the emphasis from inputs to outputs; and
- to ensure GBEs provide substantial and growing benefits to the community, including through a strong emphasis on quality and service, fulfilling community service obligations (where appropriate) and prices that have been constrained in various ways. (Willis 1989)

These objectives are being pursued at the State level as well. Various States have identified the means to obtain the above ends. For instance, the NSW Government's Steering Committee on Government Trading Enterprises reported that the improvement of the performance of public enterprises depended on five conditions being met (NSW Government 1988, pp.ii-iv). These conditions are as follows.

- Clarity of management objectives that provide an unambiguous focus for management and no excuse for unsatisfactory performance.
- Managerial authority free of externally-imposed controls that stifle innovation and diffuse responsibility exercised by individuals with strong incentives to maximise the value of the organisation.
- Rewards and sanctions on managers for good and poor performance.

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- Competitive neutrality to ensure that goods and services are supplied by the most efficient competitor and that advantages do not undermine reliability of normal criteria used to assess performance.
 - Performance monitoring to ensure that efficiency gains flow from the reforms.

The NSW Steering Committee also found that efficiency is likely to be improved by implementing explicit regulatory provisions on pricing and industry structure in the output markets of those enterprises with a significant degree of market power.

The Queensland Government (1990) proposed similar principles to the above list in its Green Paper on Government Owned Enterprises, and the Western Australian Government outlined similar elements of GBE reform (Submission 131). Reform of government trading enterprises was discussed at the special Premiers' Conference in October 1990 and task forces were established to report to the special Premiers' Conference in July 1991. The report (SPC 1991e) and a discussion paper (SPC 1991b) of the Task Force on Other Issues in the Reform of Government Trading Enterprises, made available as background papers at the July 1991 special Premiers' Conference, discussed seven principles which summarise those of the abovementioned and other reports.

Seven reform principles are:

- clear and non-conflicting objectives.
- managerial responsibility, authority and autonomy.
- effective performance monitoring by the owner-government.
- effective rewards and sanctions related to performance.
- attaining competitive neutrality in input markets.
- attaining competitive neutrality in output markets.
- effective natural monopoly regulation.

These seven principles essentially define the characteristics of a fully corporatised GBE. The first four, which are seen to be critical in achieving productive efficiency, involve administrative changes to the operation and management of enterprises. The last three, which are seen to be necessary for ensuring allocative efficiency, aim at promoting increased competition.

How these principles are translated into practice for railway reform has been open to interpretation, and the degree of reform being implemented and/or contemplated varies amongst the States. The application of the seven principles may be expected to vary across GBEs because principles cannot be arbitrarily applied in practice. This is evident in the following discussion of those elements which the Commission believes are critical to reform of government railways. The discussion draws heavily on background papers to the special Premiers' Conference of July 1991 (SPC 1991b, 1991e).

Clear and non-conflicting objectives

There should be a clear understanding by governments and their railways of the objectives which the owning government wishes pursued. Where there are conflicts between commercial, social and regulatory objectives, there needs to be clear guidance on trade-offs, and criteria and procedures for resolving any inconsistencies. Otherwise, management may use poorly specified or contradictory objectives to excuse unsatisfactory performance. As railways engage principally in tradeable activities, they should have commercial performance as the prime objective.

A commercial approach does not limit the ability of governments to use railways as instruments of transport or social policy. Governments should, however, approach their dealings with railways on such matters not as the principal but as a client, and come to a contractual arrangement with the railway to supply the service at an agreed price within a commercial framework. So-called 'non-commercial' or community services thus can be provided by a railway which is operating commercially. In these circumstances, all rail services can be corporatised. This approach also has the advantage that it would encourage the consideration of other, possibly more efficient, options for implementing particular policies, such as using alternative transport modes or increased income support.

Any policy or regulatory function traditionally undertaken by railways should be removed to separate specialist advisory bodies with direct ministerial accountability. This removal ensures that there is no conflict of interest and that railway management is not distracted from the commercial management of their operations. To avoid subjecting one minister to conflicting objectives, responsibility for the commercial success of railways, for the definition and monitoring of associated regulatory functions, and for defining, negotiating and monitoring the provision of community services should be with separate ministries.

Particular objectives should be agreed and clearly set out in a statement of corporate intent (published as part of a railway's corporate plan). Such a statement would form a contract between the railway's board and the government as owner/shareholder. All government railways now produce corporate plans. Indeed, parliaments have legislated a requirement for corporate plans. For example, the NSW Transport Administration Act 1988 formalises the requirement for the State Rail Authority to submit corporate plans. The Australian National Railways Commission Act 1983 requires the Commission to develop objectives, strategies and policies aimed at fulfilling on a long-term basis the duties under the Act, that is, to conduct its operations safely and efficiently.

The corporate plans cover matters such as:

- policies on cost recovery, pricing, training, redundancy, retraining, redeployment, investment and consultation;
- the reform process and productivity improvement initiatives; and

-
- business development strategies.

Most government railways have the objective of operating freight services on a commercial basis. The aim is to improve both the quality and price competitiveness of existing services. Most governments plan also to improve the quality of passenger services while at the same time increasing their efficiency. Greater emphasis is being given to marketing than in the past because of the perceived need to improve service. There is also a significant emphasis on staff management because of its central importance to achieving productive efficiency via more flexible and efficient use of labour.

All the railway managements are constrained by government financial controls in the development of their business strategies. For example, the Victorian legislation requires the authorities to meet ministerial targets and prepare budgets within Treasury guidelines. These constraints may prevent railways from implementing plans that are fully commercial when governments are exercising fiscal constraint or are setting targets that are inconsistent with efficient outcomes.

The current financial problems of railways also influence their business strategies. Consequently, the pace of reform may be slower than that which maximises the net present value of the savings generated by the reforms. However, AN contended that incremental change on a year-to-year basis is the only way to achieve fundamental change.

In an industry environment containing 19 unions, limited investment funds and the need to maintain workforce commitment to the change process, rapid change is neither possible nor desirable. In order to implant change permanently it is necessary to change the organisation's culture and this cannot be achieved rapidly. (Submission 115, p.3)

The corporate role established by governments for their railways should be clear and consistent, with assumptions clearly stated, responsibilities properly delineated and processes for resolving conflicts defined.

Managerial responsibility, authority and autonomy

Management responsibility should be vested in a board accountable to parliament through the relevant minister. Board members should be appointed on the basis of experience, knowledge and skills relevant to achieving commercial objectives. It is important that boards are sufficiently competent to create correct management incentives and strong enough to resist commercially unwanted shareholder/owner interference motivated by political rather than commercial considerations. Social or regulatory objectives should not be set by the board, but by the appropriate ministers.

Management authority is a particularly important issue in the case of government railways. Many of the current problems have arisen because governments have interfered and imposed short-term expediencies, frequently for electoral purposes, that have been contrary to good long-term financial management of the railways (and to the interests of the wider community). In some railways this

has clouded the objectives and left managers without a clear corporate mission. In order to manage effectively, goals and strategies have to be established. Strategies must be applied consistently for a number of years because railway investment is lumpy, involving long-term planning and construction lead-times. It follows then that there is no place for day-to-day and ad hoc government intervention if railways are to be managed efficiently. Railway boards and managements need the authority to make key decisions required to achieve efficient commercial outcomes and, as noted in Section 3.2.3, boards should have the authority to appoint their chief executives.

Governments are seeking to create an environment which fosters management efficiency. The Queensland Government, for instance, stated that in enabling Queensland Railways to pursue its commercial charter:

Government policy is to provide appropriate management autonomy so that commercial objectives can be pursued. This autonomy will be accompanied by a commensurate degree of responsibility and accountability. (Submission 135, p.9)

Managerial autonomy should enable commercial decisions to be made by railway boards which are clearly responsible for bottom line results. If the government intervenes, it must carry its share of responsibility for any financial shortfalls. However, this does not involve complete freedom from government-imposed constraints. It is appropriate for governments as owners of railways to impose constraints on management. These should include the overall dividend policy to be pursued, the target rate of return expected on the government's investment, and the broad limits of the enterprise's new capital expenditure and associated borrowing programs. In other respects the government as owner should operate at arm's length from the board and management to ensure full accountability of management for its performance.

Having been given responsibility, authority and autonomy, managers will be in a better position to invest in the capital items required to achieve productive efficiency, set charges that provide sufficient revenue to cover attributable costs (including charges which governments should meet if railways are required by them to provide non-commercial services), curtail services that are uneconomic, clear markets by matching supply to demand at appropriate prices, determine the corporate structure and make decisions on such matters as the terms and conditions of employment. Rail management needs to have the authority to make decisions, to manage rather than administrate as observed by one inquiry participant (Ewen Michael, Submission 122, p.2).

Clearly, commercialisation must be supported by public commitment and government dealings that are consistent with the objective. For example, it would be appropriate for the responsible minister to engage only as a final resort in an irreconcilable dispute between management and railway customers or employee representative groups. Similarly, there should be no prescription of the railway's strategic plan. This is the case for AN whose autonomy is protected by the Australian National Railways Commission Act 1983. In addition, there should be no limitations, such as non-commercial financial restrictions that limit the scope for innovation.

Effective performance monitoring by the owner-government

Because railways are subject to less performance assessment by the equity and debt markets than private sector corporations, governments need to establish independent and objective performance monitoring arrangements sufficient to ensure that the board and management are held accountable for an enterprise's performance. Such monitoring should focus primarily on commercial performance. Performance should be assessed against agreed corporate and business plans. A background working paper for the July 1991 special Premiers' Conference (SPC 1991e) proposed that the performance indicators should be negotiated and monitored by a central monitoring unit - a unit which should itself be subject to periodic assessment (see also SPC 1991a,d).

In circumstances where railways are directed by governments to provide community services, the requirement to meet financial performance criteria will not necessarily be sufficient to ensure the desired productive efficiency. To avoid providing opportunities for railway management and governments to conceal the cost of inefficiency, there is a need for governments to put in place a system of performance monitoring of various non-financial efficiency and effectiveness indicators. This ought to ensure that managers continue to improve the performance of their railways.

At the July 1991 special Premiers' Conference it was agreed that a framework for national performance monitoring of government trading enterprises be established. The system will initially concentrate on a core of larger and more significant enterprises. A range of performance indicators, including accounting, economic and non-financial indicators, are to be used with the focus initially being on providing accounting and non-financial measures (SPC 1991c).

Effective rewards and sanctions related to performance

Performance monitoring is not adequate unless it acts as a basis for incentive systems to improve performance by the boards and their managements. Ministerial rewards and sanctions should be applied to railway boards which, in turn, should reward and discipline chief executives and management. Appropriate rewards and sanctions ought to be pre-defined against agreed performance targets, understood and consistently applied if they are to motivate railways to maximise their performance. In this environment innovation ought to be encouraged in order to achieve increased productive and allocative efficiency.

Directors/board members of government-owned railways should bear the same legal personal liabilities for their railways' performance as do directors of private corporations.

Attaining competitive neutrality in input markets

Competitive neutrality means that railways should not face any special competitive advantages or disadvantages by virtue of their government ownership. In input markets this means that any advantages or disadvantages in the cost of the resources which it uses, which arise because a railway is owned by government, should be identified and removed.

Capital inputs need to be properly priced, for example, by rate of return targeting. The existence or perception of a government guarantee of debt funding can be overcome by the application of an explicit fee for any interest cost advantage associated with continuing government ownership of railways (with such fees reflecting the credit risk of the enterprise if not so guaranteed). Railways should be freed from any award pay and conditions or other restrictions on labour resources that do not apply to private sector enterprises.

The Loan Council meeting of 31 May 1991 agreed that GBEs which satisfy strict commerciality criteria are to be exempted from global borrowing limits. The proposed criteria mean that enterprises without substantial private equity - such as railways - will need to demonstrate an established record of meeting strict commerciality criteria (see Section 6.5.4).

Governments have the power to bestow advantages on their business enterprises by relieving them of the requirement to pay duties and taxation. This contradicts competitive neutrality. It should also be recognised that duties and taxes as transfer payments have welfare distribution and efficiency consequences. If railways are not required to pay the same government charges as competing private enterprises the market for transport services will be distorted. Competitive neutrality is required if the commercialisation is to succeed in producing efficient resource usage in the transport sector and the economy generally. Thus, railways should face the same input (and output) taxation (or taxation equivalent) arrangements as apply in the private sector. This requirement applies equally to commercial and non-commercial services because the government should be prepared to pay for the economic benefits it wishes to gain and the transfers it wishes to make.

In support of this the Australian Road Transport Federation insisted that railways be required to:

- pay all taxes, charges and duties that are applicable to competitors,
- pay all dividends or rates of returns applicable to competitors,
- not be shielded from the true cost of funds,
- not be given favourable status by the use of grants or injection of equity,
- not have hidden royalty collections artificially inflating revenue collections. (Submission 124, p.3)

Government railways should bear all relevant taxes and charges applicable to the private sector. It is inappropriate for governments to use their involvement in railways to bestow input cost or taxation advantages on railways relative to the private sector.

Attaining competitive neutrality in output markets

Government-imposed restrictions on direct competition for railways are based on the belief that competition may not lead to a socially desirable outcome. Competitive neutrality in output markets means that any protective barriers in the transport market be removed, otherwise railway costs and service quality will not be subject to competitive disciplines. Protective barriers may involve direct or indirect regulation, ranging from outright prohibition (for example, of B-Double trucks) to price controls.

The removal of price controls will concern those who then pay the very highest price for a railway service. They will regard such a price as inequitable, particularly if the railway's market position continues to be protected by restrictions on carriage by substitute modes. Any new policy should be transparent so that judgements can be made about its equity and the prices set can be tested against the policy. Where there is evidence of non-trivial market failure, any regulatory regime should be targeted on the relevant failure (see Chapter 4).

The State Rail Authority of NSW drew the Commission's attention to the acceptance by the United States Interstate Commerce Commission of demand-based or market-based pricing as the appropriate pricing policy; proposals to set maximum rates on a fully distributed cost basis had been demonstrated to be neither commercially nor economically appropriate to the industry or the public interest (Submission 98, p.20). Market-based pricing is often confused with cross-subsidisation. Cross-subsidisation arises only when some buyers are not meeting the cost of the resources that can be directly attributed to their consumption. If the prices they pay exceed this cost, however, they are making a contribution to overheads and the other consumers are better off overall.

Concerns about pricing which arise out of such a move to competitive neutrality can be removed simply by requiring that all users meet their direct costs. In order to avoid disputes about the precise value of the costs, the Commission considers that an appropriate minimum price is the marginal, or, if not available, average variable cost of each traffic.

Revenue from charges together with any payments by government should exceed marginal costs for every traffic.

Effective natural monopoly regulation

The adoption of a strong commercialisation approach will give rise to some concerns given the natural monopoly characteristics of some railway functions. For example, concern is expressed in

submissions about bulk haulage for which railways have adopted a commercial approach to setting rates. The Commission considers that these will have to be addressed if there is to be widespread public and business community support for greater independence for railways and if efficient outcomes are to be attained.

Abuse of natural monopoly powers can be minimised by government reducing both the capacity and the incentive for abusing such powers. Governments should minimise the opportunity to build up such power by restructuring railway functions (see Chapter 12). Increased transparency will minimise the ability to exercise such power and the incentive should be reduced by establishing a proper performance monitoring structure. A last resort should be formal regulation.

Concerns about railways abusing their monopoly power may be assuaged by placing them on the same footing in respect of trade practice and corporations law as private enterprises. Governments should open railways to the scrutiny of the Trade Practices Commission or other regulatory agencies which place limits on the extent to which railways can use their monopoly position to engage in anti-competitive behaviour or to monopoly price.

Government railways should be subject to at least the same corporations and trade practices laws and proprietorial controls as private enterprises.

Another measure that governments can take to allay concerns about abuses of monopoly power is to require authorities to account separately for their commercial and non-commercial activities. Commercial operations are defined here to be those that governments and railway managements agree to be operated solely on their commercial merit. The test of a commercial operation is that the railway management is at liberty to terminate it if it does not cover its short-run marginal cost and cover its share of fixed costs. If railway management is not free to terminate or modify the level of service of an operation, and government desires to continue the service, the government should make a contribution to the railway sufficient for the operation in question to remain financially self-sufficient. There is a potential conflict of interest (as discussed previously) when the government is both the proprietor and one of the major clients where the railway is used as an instrument of government policy that is not compatible with full commercialisation. Maintenance of separate accounts will overcome concerns about this potential conflict of interest by removing any basis for claims that governments are not meeting the full cost of their decisions to financially support services. AN stated that it ‘maintains segmented accounts of its businesses and its segmented annual financial statement is audited’ (Submission 115, p.3).

Governments should require their railways to account separately for commercial and non-commercial operations.

3.3.2 Corporatisation

The Commission believes that governments should corporatise their railways, as soon as possible, in order to achieve the above seven principles of commercialisation and promotion of increased competition. The Commission recognises that the timing of the recommended changes to administrative arrangements will depend on how quickly the railway can be placed in a sound financial position at a level of productive (technical) efficiency that will not significantly distort allocative efficiency or jeopardise the long-term viability of the railway. In other words, the correct arrangements should be in place and the organisation should be on a sound financial basis before corporatisation. Some go so far as to suggest also that the correct personnel should be appointed before corporatisation.

Corporatisation is achieved by the establishment of a public authority as a public corporation by means of an Act of parliament.

Governments have had difficulty in meeting the public's expectations about the level of services provided and charges imposed by their railways. Historically this has been a particular problem in circumstances which required the rationalisation of services or an increase in charges. In many respects the reforms currently required are a consequence of a natural reluctance on the part of government to convince the public that certain railway tasks are in decline and that their role in transport has changed significantly.

The Commission considers that governments face a major challenge in promoting the need for reform and a change in public expectations. If governments fail to change community expectations they will tend to compromise on reforms because of electoral pressures. This is likely to prevent the elimination of many inefficiencies and therefore impose costs which could have been avoided. Governments and railway management should, as part of the reform process, increase public awareness of the current problems in railways and develop mechanisms for greater public participation in decisions on rationalisation and investment.

This all suggests that adoption of the above seven principles is not enough to guarantee effective reform. There needs to be a more open and transparent relationship between governments and their railways. This leads the Commission to consider incorporation of railways under the corporations law which bestows on directors broader responsibilities to both creditors and shareholders.

3.3.3 Incorporation

The Commission considers there to be merit in incorporating railways under the corporations law, consistent with its recommendations for public electricity and gas utilities (IC 1991b, vol. 2, p.73). Incorporation would place on company directors a burden of responsibility to shareholders, creditors and others which does not exist under usual statutory authority legislation. As

incorporated bodies, railways would face the same environment as private companies being subject to a national, uniform discipline, including that imposed by the Trade Practices Act.

A GBE operating in accordance with the corporations law would generally not be liable for payment of Commonwealth income tax. State governments, accordingly, would need to establish arrangements to collect equivalent taxes.

The Western Australian Government (Submission 131, pp.3-4) quoted from a background discussion paper prepared for the July 1991 special Premiers' Conference:

Corporatisation does not necessarily involve 'incorporation', which only involves establishing a government enterprise as a public company under the companies code [now the corporations law]. In fact, the requirements of the companies code of themselves do not impose any of the conditions essential to reform, and so do not guarantee any improvement in an enterprise's performance. While incorporation is sometimes used as a symbolic gesture to deem that a government enterprise has been fully corporatised (ie complies with each of the seven principles), by itself it does little to achieve the objectives of corporatisation. (SPC 1991b, p.8)

Unless the same obligations for directors as exist under the corporations law can be replicated by State legislation, the Commission believes that incorporation is more than a symbolic gesture.

Several inquiry participants view incorporation with major reservations. The Western Australian Government noted that it almost certainly will not incorporate its agencies under (Commonwealth) corporations law, but rather will constitute its agencies under only State law, drawing as necessary on those parts of corporations law considered relevant (Submission 131, p.3). It indicates that parliamentary accountability and public scrutiny cannot be satisfactorily achieved under the corporations law. The Commission notes, however, that a strength of the corporations law is that shareholders appoint the company's auditor. Thus, State, Territory or Commonwealth Auditors-General could be appointed as auditors. Furthermore, company boards would not be able to resist a request to appear before parliamentary committees assessing the company's performance.

The suggestion that incorporation is not an effective action was also made by the Australian Railways Union (ARU):

Although the Industry Commission favours private sector corporate structure for rail systems so as to remove 'political interference' and make railway commercial transactions transparent, it is respectfully suggested that private sector standards of transparency are no model given the well reported accounts of private sector financial mismanagement coinciding with the appropriation of shareholders funds. (Submission 141, p.5)

On the other hand, the public sector - even where not incorporated - is not immune from problems identified by the ARU.

There is also a view that where a government agency is heavily dependent on government funds there is little benefit in incorporation. However, the Commission suggests that this view might give

too little weight to the need for (and benefits of) community service contracts negotiated at ‘arm’s length’.

The Commission remains of the opinion that there is great benefit from corporatisation of railways by incorporation. Incorporation enhances the prospects of successful reform suggested in Section 3.3.1. It may be noted that incorporation of railways:

- will give consistency with private corporations;
- will subject railways to a national, uniform discipline;
- will give railway boards additional responsibilities, not just to shareholders but to creditors also; and
- is not without successful precedent, for example QANTAS.

Several inquiry participants support incorporation. The NSW Coal Association (Submission 133) argued that incorporation should be undertaken within one year in at least the case of the State Rail Authority. The Commuter Council (Submission 144) was supportive of corporatisation provided that the incorporated body is independently audited for technical performance (on-time running, track, rollingstock and so on) - consistent with the performance monitoring principle earlier noted.

Corporatisation is a practical step to greater commercialisation of government railways; it should involve incorporation under the corporations law. The aim should be to create an environment in which railways can pursue commercial objectives in a competitive environment.

RECOMMENDATION 3.1

The Commission recommends that railways be fully commercialised through their being corporatised, including incorporation under the corporations law. These processes of corporatisation and incorporation should be completed within three years.

Many inquiry participants strongly support full commercialisation. However, the Australian Federated Union of Locomotive Enginemen expressed concern at the strictly commercial position and perspective, arguing that it takes no account of social concerns (Submission 125). The Commission, though, believes that Recommendation 3.1 allows non-commercial activities by means of negotiated contractual arrangements between governments and their incorporated railways (as noted in Section 3.3.1). This is the best way to deliver any necessary social policy in an efficient manner.

The Commonwealth Department of Transport and Communications (Submission 128) stated that commercialisation is consistent with its own principles. The Queensland Government was supportive, stating that 'It will endeavour to implement similar reforms to those suggested within the nominated three year timeframe' (Submission 135, p.2), although the question of incorporation has not yet been fully considered.

The NSW Treasury (Submission 130, p.2) agreed, noting that under the Transport Administration Act the State Rail Authority has been exposed to considerable commercial initiatives. It stated that options for corporatisation of Freight Rail and workshops are currently being considered. However, it suggested that passenger businesses may not be appropriate for corporatisation. The Commission has difficulty with this distinction; corporatisation of the whole railway (and all its businesses) is considered crucial to the commercial operation - even of 'non-commercial' passenger services.

The Western Australian Government supported corporatisation and commercialisation (Submission 131, p.4) but, as noted already, had major reservations about the use of the corporations law. The Victorian Government had no concerns with the general thrust of the recommendation, but was not convinced that corporatisation as described by the Commission is necessary. It stated:

It should be recognised however that similar benefits can also be achieved by the structure currently in operation in Victoria where the Public Transport Corporation is set up as a Government Corporation operating under objectives which are clearly set out in the Transport Act.

These objectives are fully transparent to all, and can be drafted so as to give the same responsibilities and incentives to the Corporation as the Industry Commission's model provides. (Submission 134, p.3)

The Commission is of the opinion that the excessively wide range of objectives spelt out in the Victorian Transport Act inevitably involves conflicts. The Public Transport Corporation's operations therefore are particularly open to ministerial influence, which may not be always as transparent as desirable. Corporatisation, meaning the adoption of the principles outlined in Section 3.3.1, is essential to ensure the arm's length commercial operation of railways without fear of political influence.

3.3.4 Community services and other government intervention

Governments for many years have used railways as an instrument of transport policy, particularly in urban transport. Intervention can only be justified by a belief in the need to correct for substantial market failures. The rationale is discussed in detail in Chapter 4 and the extent of the market failure problem is examined in Chapter 5. Government ownership of railways also provides a mechanism for putting into effect social objectives. Governments have been reluctant or unable, however, to specify their social objectives for transport in other than material assistance terms, such as the number of services. They tend to take as given the need for a service and state objectives

relating to the nature or level of the service. The cost of pursuing these objectives in the case of railways can be substantial and of unquantifiable benefit.

Intervention in the absence of normal market signals can lead, and has led, to inappropriate policies in relation to the level of railway services and to greater inefficiency. Providing support in the absence of competitive disciplines or strict adherence to commercial principles can exacerbate low productivity because the support provides opportunities to camouflage problems such as poor labour productivity and undercapitalisation.

The Commission's position is that intervention should only occur if it can be clearly justified because the attendant problems usually impose costs exceeding those of the problems the government is attempting to rectify. In order to be consistent with the principles of commercialisation, governments should enter into contracts with railways when they intervene in markets to use their railways as instruments of government policy. This will serve several purposes. First, it will normalise, as far as possible, the business-client relationship. Second, it will allow the railway to conduct its business on a normal financial basis and allow financial performance to be monitored. Third, it will serve to improve the transparency of governments' decisions and encourage more thorough assessment of the policies as taxpayers see the cost of selective social policies. Fourth, there will be incentives for both the supplier (the railway) and the customer (government) to arrive at an efficient level of service. Finally, it will ensure that accountability for policy remains with the contracting government department and that the railway is accountable only for operations.

The establishment of such contracts will involve considerable effort by both railways and governments. The process, already considered in Section 3.3.1 as critical to reform, ought to be inseparable from that of incorporation, and should be completed within three years.

If governments require railways to provide non-commercial services, the provision should be set out in contracts and the railways should be paid predetermined fees.

This is consistent with overseas developments. A directive of the Transport Council of the European Community in June 1991 included a ruling providing for the lifting of obligations inherent in the notion of public (community) services in rail and other transport modes. Obligations are to be replaced by an optional system of public (community) service contracts. The ruling stated that public obligations would remain for certain social categories of travellers (if imposed by a member State) and for urban, suburban and regional services.

Government will only become accountable when government objectives and the cost of achieving the objectives are open to public scrutiny. This requires clearer statements of the rationale and objective of decisions to intervene.

Governments should clearly state their rationale and objectives for market intervention.

The extent of the subsidy involved to off-set market failures being addressed by intervention is rarely identified. Governments cannot as a consequence be held accountable for their decisions to intervene.

Public scrutiny of the decisions requires that:

- all price and service options and their expected revenues and costs requested by government and provided by the railway are made publicly available;
- the basis of allocating costs to traffics is the subject of a publicly available agreement between the government and its authority;
- the size of any subsidy to individual communities or businesses should be announced in any decision in respect of service levels and prices; and
- all underlying assumptions and railway management responsibilities should be announced with contractual decisions that embody performance requirements.

For instance, the Canberra/Queanbeyan Regional Transport Action Group contended that:

... rail organisations need to develop accurate costing systems that can be open to public scrutiny, so that when queries arise, it can be demonstrated that the public interest is being served. (Submission 116, p.4)

The uncertainties of market response and the potentially undesirable consequences of intervention make it essential that the effectiveness of the action is monitored closely. There is also the need to monitor the productive efficiency of supported railway operations because of the absence of competitive disciplines. In order to facilitate the review of effectiveness and safeguard against productive inefficiency, arrangements for effectiveness and performance monitoring should be established.

Government contracts should provide a basis for monitoring the achievement of the government's objectives properly explained and the performance of the railway.

The dual role of governments as proprietor and client when they intervene on the quality of service and price gives rise for the need to safeguard against conflicting requirements. These conflicts could jeopardise efficient management if they are not consistent with a commercial approach.

Some parliaments have required Ministers to make instruction in writing and have established review procedures. A more commercially oriented approach to railway management where managers are rewarded by performance requires the extension of these provisions to the negotiation of contracts for the provision of government supported services. Without legal recourse to challenge inconsistent decisions, managers will be placed in an invidious position as their ability to negotiate what should be a contractual arrangement would be compromised by their relationship with the client.

There should be legislation to give railway managements the recourse to challenge government decisions on service and price when they are in conflict with other requirements placed on them. Furthermore, railway managements should be indemnified in their contracts against the legal consequences of executing government decisions where the authority has raised safety and other concerns and these have been overruled.

RECOMMENDATION 3.2

The Commission recommends that if governments require railways to provide community services, the conditions of provision should be set out in contracts, the details of which are made public, and which should include the pre-determined fees to be paid to the railways. All such community service contracts should be in effect within three years.

The Transport Action Council of NSW supported this recommendation stating that ‘Contractual arrangements should be designed to force rail authorities to act more resolutely to minimise costs and maximise patronage before eliminating services’ (Submission 127, p.1). Some inquiry participants gave conditional support, such as the Commuter Council which requested that there be mandatory input to decision making by the community (Submission 144, p.3).

The Queensland Government agreed with the recommendation (Submission 135, p.2), the Victorian Government supported it in principle, although raised some concerns regarding implementation (Submission 134, p.4). The NSW Treasury was supportive, mentioning commercial-style contracts between the Director-General of Transport and the SRA to commence on 1 July 1991, under which predetermined fees will be paid to the SRA for provision of specified services (Submission 130, p.3).

4 THE CASE FOR GOVERNMENT INTERVENTION IN RAILWAYS

The case for government intervention in railways to improve efficiency in resource use depends largely on the existence and extent of natural monopoly in railways services and the extent to which road users pay for external costs such as congestion, pollution and road accidents.

While it appears to be accepted that the railways exhibit features of a natural monopoly, the case for intervention must address whether there is sufficient potential competition from other modes of transport or from within the rail industry to obviate the need for government intervention. In the event that efficiency losses associated with the monopoly are intolerable, government options include regulation of market conduct and structural reform. Government intervention in railways to reduce the social costs of road use depends on whether it is more cost effective than measures which affect directly the extent of these social costs.

Historically, governments have intervened in railways to pursue income distribution objectives by instructing railways to provide community services. At issue is whether provision of these services is justified and, if so, what is the most efficient method of implementation.

4.1 Introduction

The effects of government intervention in railways can be assessed in terms of their impact on efficiency in resource use, both from a community-wide perspective (allocative efficiency) and within railway enterprises (productive efficiency), and on equity. The rationale for government intervention depends on it advancing the efficiency and equity objectives of the community. Government intervention may offer improvements in efficiency if it can implement cost-effective means of overcoming forms of market failure which otherwise would detract from the most efficient use of public resources.

Two common justifications for government intervention in railways are the existence of natural monopoly and the facility for railways to reduce the costs of congestion and pollution associated with road transport. Intervention is advocated also on the basis of providing access to transport, especially for disadvantaged groups in the community. These justifications for government intervention are outlined in this chapter and are assessed in more specific terms in later chapters.

Government intervention in the provision of railway services is manifested often in the provision of certain community services at the behest of governments. The nature of such community services supplied by railways and their funding is considered also in this chapter.

4.2 Economies of scale and natural monopoly

A central economic argument for government intervention in railways, particularly subsidisation of the losses of railways, is based on the existence of natural monopoly. Railways have long been considered to exhibit to some degree the characteristics of natural monopoly.

An industry is considered to be a natural monopoly if total costs of production are lower when a single firm produces the entire industry output than when two or more firms divide the total among themselves. Railway networks have been regarded as natural monopolies because it is said customers can be served at least cost only by a single firm. Traditionally, natural monopoly has been considered to be present if there are economies of scale throughout the relevant range of production for the market. However, a natural monopoly need not exhibit economies of scale throughout the range of production in the market. Even in the presence of rising costs after some point in production, the cost and demand conditions may be such that a single supplier could serve the whole market at a lower unit cost than any industry configuration with two or more firms.

In a multiproduct setting, economies of scale are neither necessary nor sufficient for natural monopoly (Panzar 1989). Here, natural monopoly is associated with economies of scope. Economies of scope occur when a single firm can produce a given level of output of each product line more cheaply than a combination of separate firms, each producing a single product at the given level of output. They arise, for example, from the sharing or joint utilisation of inputs which create various forms of cost complementarities and economies of joint production. In the case of a multiproduct firm, the presence of economies of scope is a necessary requirement for natural monopoly although it is not the only requirement (Panzar 1989, Berg and Tschirhart 1988). For example, a combination of economies of scale for each product of the firm and economies of scope is one among several sets of conditions which indicate the existence of natural monopoly combines (Panzar 1989).

The case for government intervention in a multiproduct natural monopoly is similar to that for single-product natural monopoly. Economic efficiency will be maximised at the output level at which consumers are willing to pay at least as much as the marginal cost of producing that output. However, under conditions of natural monopoly the firm has the opportunity to extract monopoly profits while having regard to potential entry to the market by rival firms. This commercial practice results in prices and output levels which are inefficient and it provides a prima facie case for government intervention to promote more efficient outcomes.

One option is for government to direct the firm to produce and price at levels to maximise economic efficiency. Marginal cost pricing will lead to deficits. In order for the firm to remain

economically viable, the government must subsidise it or, alternatively, the railway can adopt other pricing practices which will permit it to break even while remaining under a government imposed profit constraint. As a consequence, prices may deviate in some fashion from uniform marginal cost prices. This deviation will result in some loss of allocative efficiency which may not be as large as that associated with monopoly pricing by the firm in the absence of government intervention.

Several matters need to be considered in evaluating this case for intervention in railways.

4.2.1 Existence of natural monopoly

The first consideration concerns whether a natural monopoly exists in railways and whether the extent of the associated resource misallocation is such as to justify the costs of government intervention.

The answer to these questions is by no means straightforward. It is a difficult exercise to establish empirically the existence of a natural monopoly in its modern sense. Such studies are in their infancy and those that have been carried out are subject to some criticism on methodological grounds.

The nature and extent of scale economies in rail operations have provided grounds for ongoing debate. Recent attempts to define and quantify scale economies have distinguished returns to traffic density from returns to scale. Returns to density reflect the degree of utilisation of a given route or network so that costs may decline, increase or remain constant as the volume of traffic changes. Returns to scale reflect the relationship between inputs and the overall scale of operations of the rail authority, including the size of the rail network. The dominant view of available overseas studies, undertaken from a single-product perspective, is that the rail industry is characterised by increasing returns to density but constant returns to scale (Keeler 1983). This view has been confirmed by more recent work which takes into account the cost effects of different route structures, that is, network effects (Braeutigum et al. 1984; Caves et al. 1985).

It is apparent also that there are economies of scope in railways in the presence of uncongested track which permits joint production of passenger and freight services. Separate production of passenger and freight services would require duplication of track. Moreover, within each category of traffic there are journeys of different lengths, between different combinations of stations and for different purposes. The rail network offers considerable economies of scope (Bailey and Friedlander 1982).

While the presence of either density economies and economies of scope separately is not sufficient to provide complete proof of a natural monopoly, together they do provide necessary conditions for natural monopoly. There appears to be some evidence to suggest a basis for accepting the traditional judgment of railways as being natural monopolies.

For example, Braeutigum (1990) concludes that railways appear to be natural monopolies. One study (Jara-Diaz and Winston 1981; cited in Keeler 1983) has tested for the existence of multiproduct natural monopoly in railways using a sample of small U.S. railways. The tentative conclusion was that there are sufficient economies of scale and scope to guarantee natural monopoly at low densities.

These judgments need to be evaluated in relation to the Australian railway system. However, such empirical studies of natural monopoly are virtually non-existent. Nonetheless, it is apparent that traffic densities on Australian railways are much lower than those of United States railways in general. There is disagreement about the traffic density at which economies of density are exhausted, but in freight it appears to be at least 8 million ntk/route-km, averaged over an entire system. This implies much higher densities in parts of the system. In comparison, the highest system-wide densities in Australia are about 2 million ntk/route-km for QR and the SRA, although traffic densities would exceed 8 million ntk/route-km on many of the coal lines. Intercapital freight densities are less than 3 million ntk/route-km.

These comparisons suggest that the tentative conclusions of Jara-Diaz and Winston may have some relevance to Australian railway cost structures. Even the findings from a single-product perspective may not be inappropriate for some aspects of Australian railway systems. While linked to the network, some lines are dedicated, almost wholly, to the delivery of one product over a standard journey length. This is most apparent in the case of some coal lines where the returns to density may be sufficient to engender natural monopoly conditions.

One particularly relevant and more definite conclusion from the Jara-Diaz and Winston study was that if fixed maintenance and capital costs for the railway track and its associated structures are ignored, there are insufficient economies of scale and scope to cause natural monopoly in the industry. It suggests that the natural monopoly in the rail industry is associated primarily with the network. If similar results are accepted for Australian railways it could provide a basis for considering separation of track and rollingstock functions as a means of increasing competition in rail services. This option is discussed below and in Chapter 12.

4.2.2 Potential for competition

The presence of natural monopoly does not establish the case for government intervention. It may be possible for sufficient competition, either from within the industry or from competing modes of transport, to minimise the loss of economic efficiency while avoiding the potential costs of government intervention to subsidise losses or to impose some form of price regulation.

The potential entry of new competitors to the industry may ensure that a monopolist produces and prices at levels which approach those which maximise economic efficiency.

Legislative barriers to entry, sunk costs in various forms and strategic entry deterrence behaviour by the incumbent may all preclude potential competition. In the case of railways the existence of substantial sunk costs provide a major barrier to entry. There are substantial costs associated with the permanent way and structure which might typically be regarded as sunk. A railway cannot be moved easily from a particular route and, at low cost, be placed in service elsewhere. Explicit legislative barriers to entry do not appear to exist in Australia. However, a new entrant would require government, and community, cooperation to resume land and guarantee right of way, for example, as in the case of the Very Fast Train proposal. New technological advances may be sufficient also to undermine a natural monopoly based on older technology, for example, the decline of rail travel associated with the development of airlines.

Competition may be encouraged by vertical separation of the natural monopoly from the potentially competitive sections of the industry. For example, it may be possible to separate the functions associated with maintaining the track, stations and terminals, as well as signalling and scheduling on the one hand, from operation of the rollingstock on the other. Access could be provided to private firms to run rollingstock on the publicly owned and maintained track system. The potential benefits of increased competition need to be assessed against the potential costs associated with loss of benefits from vertical integration, setting the conditions for access to the track, and administration of scheduling and dispute settling procedures. Moreover, vertical separation may not induce the desired level of competition. In the presence of economies of density on the major routes, whereby extra wagons can be readily added to satisfy demand, there may be some limitation of the potential for competition between rail companies operating rollingstock on the same track. Sunk costs, strategic entry deterrence behaviour and/or collusion may lead to a market structure in rollingstock operations which inhibits the emergence of competition, thereby creating a case for further intervention to regulate prices and access to the industry in order to promote competition. This option is discussed in detail in Chapter 12.

If competition from within the existing industry is not a feasible option, competition may be possible in other ways to reduce the economic costs associated with monopoly pricing and production. Competition for the market may be possible even if competition in the market is not.

One option to build on vertical separation would be to allow bidding among potential entrants for the franchise rights to operate rollingstock on different routes. Franchising has been a successful means of introducing competition in a number of government controlled activities. However, it does incur costs which have to be assessed against the potential benefits.

Bidding for the franchise might fail to be competitive because there may be few competitors due to scarcity of requisite skills, collusion between bidders, or strategic advantages possessed by the incumbent which deter challengers.

The gains in internal efficiency made over time may not be passed on to users until franchise renewal falls due. In addition, problems associated with asset handover in the event of an incumbent being displaced may reduce the incentives to invest and maintain capital. Valuation of sunk assets is both difficult and costly. Finally, the specification of the contract may be a complex task in the case of railway services, particularly, in regard to regularity and quality of services. The need to monitor and administer the contract could become indistinguishable from direct regulation.

A further means by which the economic costs of monopoly pricing may be reduced by competition without resorting to other forms of government intervention is intermodal competition, for example, between road and rail. The market conditions determining natural monopoly in the rail industry are not removed but the ability of the monopolist to take advantage of them is reduced by the existence of competitive services provided by other transport modes. Competition from road carrier services may restrict the ability of rail authorities to maximise returns by monopoly pricing. It is likely to be seen to best effect where there is sufficient competition within the road transport industry to minimise collusion between rail and road carriers. In these cases, the costs to the community, in terms of losses in allocative efficiency from not producing at the most efficient output levels, may be tolerable compared with the efficiency costs of government funding of the railway enterprise's deficit or of an administered pricing scheme.

Many parts of the transport task in Australia are characterised by competition between road and rail. Road freight and road passenger services appear to constitute a competitive market structure with relatively large numbers of carriers. However, the freight forwarding industry, for example, is heavily concentrated. Nevertheless, intermodal competition in these circumstances may still be sufficient to reject the case for government intervention in regulation of rail services because of the ease of potential entry into the road transport industry. For example, companies using road freight services may, and do, substitute their own freight service if it becomes cost effective compared to contracting out this task.

Intermodal competition may not be adequate in other circumstances. Some commodities are reserved solely for rail transport and for others, particularly bulk commodities, rail transport has such cost advantages that road transport is not a viable competitor. In these circumstances, rail authorities are in a position to monopoly price for their services and some form of government intervention may be required to ensure more economically efficient price and output levels. These issues are discussed further below and in Chapter 10.

4.2.3 Intervention options

Where the losses to the community from not producing at the most efficient output are intolerably large several mechanisms are available to governments to improve allocative efficiency. These include direct funding of deficits and regulation of prices in the form of average cost pricing or various regulated pricing schemes which involve a departure from a single price for all units of output sold in the market. The latter group include differential pricing practices, such as peak-load pricing and Ramsey pricing, and nonlinear pricing schedules such as two-part tariffs, one part of which is a variable component relating to consumption. In the cases of price regulation, the objective of the government intervention is to achieve a target profit which is less than the profit that could be obtained in an unregulated monopoly.

Each mechanism has its costs and benefits and these need to be compared and evaluated in terms of the objective of achieving more efficient use of public resources by rail authorities. There is a tension between the objective of economic efficiency and the need to ensure the revenue adequacy of the railway authority. This tension provides the focus for a complex range of regulatory issues to be considered by policy makers.

Government funding of railway deficits provides the prospect of obtaining a 'first-best' outcome in that it could enable services to be provided at their marginal cost. However, these subsidies have to be funded by government, either by increased borrowing and/or increased taxation. Whatever the method of raising revenue that government adopts, there are implications for efficiency. A further loss of efficiency is incurred as the subsidy is extended to fund services which are not covering their marginal costs, a common practice in Australian railway systems. Government funding of railway deficits also encourages cost padding and other inefficient practices in the provision of the services which reduce productivity and quality.

Consequently, there is a case for considering some form of price regulation to achieve improved economic efficiency. The pricing mechanisms noted above eliminate the subsidy requirement but decrease allocative efficiency because they all involve a departure from marginal cost pricing. The decrease in allocative efficiency has to be assessed against the potential costs of the subsidy route. These include reduced productivity of the enterprise and the costs of government monitoring and regulation.

Another option is to require the enterprise to price at average cost. Pricing according to average cost offers the prospect of the rail authority breaking even and not requiring a subsidy while eliminating the incentive to monopoly price. However, in the presence of scale economies average cost pricing induces losses in allocative efficiency because prices are above marginal costs. Further, in multiproduct firms such as railways there is no unambiguous way in

which to allocate common costs. There is no clear way to determine an economically meaningful measure of the average cost associated with each service and the authority must adopt arbitrary allocations of fixed costs between the different types of service. Average cost pricing can even undermine the financial viability of the railway. If unattributable costs are substantial and if the value of rail services vary substantially, users shipping below average value goods may find it cheaper to avoid the arbitrary mark-up and turn to other modes of transport. Ironically, pricing to recover costs in this way can preclude enterprises from earning enough to maintain financial viability (Baumol and Willig 1983).

Discriminatory pricing schemes such as Ramsey pricing offer both the prospect of avoiding losses by the enterprise and minimising the loss of allocative efficiency arising from the necessary deviation from marginal cost pricing. ‘Ramsey prices are defined as those prices which induce the most efficient allocation of resources among all the sets of prices that are compatible with financial viability of the suppliers’ (Baumol and Willig 1983, p.16). They are designed to ensure efficiency while maintaining a normal rate of return to the enterprise.

Two-part or multi-part tariffs are a further option for government intervention. Such options have two components. The first part or access charge is a fixed charge, independent of the amount consumed, intended to cover fixed costs. The second part is a marginal cost based charge per item consumed.

Peak-load pricing is another regulatory pricing method which may be employed by governments in regulating natural monopoly. The potential for greater use of peak-load pricing in railway operations is explored in Chapters 8 and 10.

4.2.4 Ramsey pricing

Under Ramsey pricing, all prices are set to exceed marginal costs in a pattern which satisfies the need to break even (in economic terms) and to minimise the influence on the pattern of consumption decisions. Consumers whose demand for the service varies relatively little as prices change are charged a price which includes a large mark-up and consumers whose demand is more elastic as prices vary are subject to a lower mark-up. No administrative allocation of common costs is required by this mechanism. Compared to average cost pricing, such a scheme is likely to generate smaller losses in efficiency while ensuring revenue adequacy.

However, Ramsey pricing is very demanding in terms of the information required for its implementation. It is necessary to have estimates of the demand elasticity’s for relevant commodities. This information will not generally be available to a regulatory authority charged with setting Ramsey prices. Moreover, the administrative costs of setting Ramsey prices may outweigh the feasible efficiency gains. For this and other reasons, the applicability of Ramsey pricing is often questioned. For example, Kamerschen and Keenan (1983, p.200) describe the formulation as ‘more of a theoretical curiosity than a workable regulatory rule’. Exxon Coal

and Minerals Australia (ECMAL, Submission 138) stated that Ramsey pricing is unworkable because of the information required by a regulator to set such prices.

Nevertheless, regulation may be used in this area, if only to require the enterprise to adopt Ramsey pricing. This approach has the advantage of minimal information requirements on the part of the regulatory authority while retaining the efficiency benefits of Ramsey pricing. The regulator's informational requirements are reduced to that information which is necessary for the ex post control of the enterprise. This approach is discussed further below in relation to the provision of railway services.

Opposition has been expressed to Ramsey pricing on the grounds that it results in monopoly pricing of services for which there are no alternative suppliers. However, it is apposite to recall that since it is only the enterprise's necessary costs, including the cost of capital, that are covered by Ramsey prices, Ramsey pricing is not equivalent to 'charging what the traffic will bear', that is, monopoly pricing. Rather, Ramsey prices are said to be lower overall than those that the traffic would bear, provided the railway could otherwise earn a rate of return on its capital in excess of its cost of capital (Baumol and Willig 1983, p.33).

There is also an issue as to whether Ramsey pricing would be in breach of the Trade Practices Act. In its submission, the Trade Practices Commission stated that, while the Trade Practices Act prohibits discriminatory pricing such as Ramsey pricing, there is a case for considering amendment of the Act to permit Ramsey pricing by natural monopolies.

Ramsey prices are non-discriminatory in the sense that services with similar economic characteristics will have similar Ramsey prices, whatever the commodities transported, whatever the route and whatever the identity of the user. Two different services with the same elasticity's of demand will be priced at the same percentage mark-ups above marginal costs. In any case, the practicalities of pricing railway services will ensure uniformity of rates for services that are indistinguishable from one another. In addition, Ramsey pricing is intended to approximate the results of a competitive market, thus avoiding monopoly pricing, while providing for the financial viability of the enterprise.

4.2.5 Pricing of railway services

Railways subject to intermodal competition

Most railways in Australia operate in a variety of transport service markets involving varying degrees of competition from other modes, particularly road transport. Ramsey pricing rules can be adapted to the more complex situations which characterise rail operations. For example, some modifications to Ramsey rules could be used for regulation of a firm with economies of scale, such as a rail authority, to avoid losses despite competition from another mode which comprises a number of firms competing with each other, such as road transport (Braeutigum 1979). Other modifications to Ramsey pricing rules have applications to more specific

examples of intermodal competition with railways. These include situations in which the firms in both modes operate under economies of scale (Baumol, Panzar and Willig 1988, Braeutigum 1984), for example, where a railway providing a number of different services faces competition in the transport of coal by a pipeline (Braeutigum 1985).

Application of regulated Ramsey pricing to the road-rail rivalry case implies entry restrictions and the extension of price regulation to the competing transport mode as well as railways, a formidable and perhaps costly administrative task.

Specifically, the presence of intermodal competition such as road transport, which provides partially substitutable services, influences the determination of efficient prices for the natural monopoly because of interdependencies in demand between the two types of transport service. In these circumstances, regulated Ramsey price increases for the rail service could result in reduced demand for that service and an expansion of demand for the substitute service, thus threatening the financial viability of the railway enterprise. In order to retain customers, the railway may be forced to reduce its mark-ups to levels below that required by Ramsey pricing. The regulated Ramsey pricing solution is efficient here only if it can be applied to the services of the competitive industry as well. This implies regulation of rival firms so that prices are set above marginal cost despite the process of competition in the industry which may drive price down to marginal cost. Some loss of efficiency will occur in the competitive industry but the higher prices in that industry are likely to lead to increased demand for the services provided by the natural monopoly.

However, such a solution may not be sustainable. The realisation of efficient prices may involve restrictions on entry in all industries that affect the demand elasticity's of the services of the natural monopoly and/or taxes on consumers to ensure that prices paid for the competing services diverge from marginal cost. In transport services, limitations on entry in order to hold prices above marginal cost are not likely to be feasible. Those who would otherwise use the services of trucking operators, for example, will have incentives to buy or lease their own trucks to provide a cheaper means of meeting their transport requirements.

Furthermore, the application of regulated Ramsey prices in circumstances of intermodal competition has substantial information requirements pertaining to cost and demand conditions for all competing modes of transport. Such information may be difficult to obtain and costly to collect, particularly given the importance of cross-elasticity's of demand, that is, the extent to which demand for railway services responds to changes in the price of services of competing modes. For example, interdependence between rail demands and those for other modes for a range of different services (freight, passenger, long-haul, short-haul, peak or off-peak, etc) necessitate information about the demand elasticity's and costs of these other modes and information about the cross-elasticity's with the outputs of other firms in order to determine Ramsey pricing rules. Indeed, 'the information required on numerous cross elasticity's of demand alone is enough to make the outlined program quite unwieldy' (Braeutigum 1979, p.42).

Given the potential costs of such complex pricing rules, it is likely to be more efficient to rely on the application of Ramsey rules to the natural monopoly alone and take as given the pricing and other market behaviours of any other suppliers of competing transportation services. The efficiency gains from the more complex regulatory approach may not be sufficient to outweigh the associated information-gathering and administrative costs (Braeutigum 1979, p.47).

However, even this partially regulated Ramsey solution has demanding information requirements as noted above. The cost of the partially regulated solution has to be assessed against alternative approaches. If there is sufficient intermodal competition to prevent abuse of monopoly power while permitting a reasonable rate of return for the natural monopolist, there may be little case for government intervention. This is the essence of a proposal for railway reform by Baumol and Willig (1983).

Baumol and Willig have suggested that Ramsey pricing for rail services will achieve the goals of both financial viability (defined as the achievement of a rate of return equal to the cost of capital) and economic efficiency. On the basis of their earlier demonstration that an enterprise in a contestable market unprotected by entry barriers can best protect itself from its competitors by setting prices at their Ramsey levels (see Baumol, Bailey and Willig 1977), Baumol and Willig state that railways can earn an adequate rate of return in the presence of direct or intermodal competition for rail services by adopting Ramsey prices without the need for regulatory guidance: ‘... regulatory intervention is unjustified because that competition will produce efficient prices without regulatory guidance’ (Baumol and Willig 1983, p.13).

Baumol and Willig concede, however, that the incentive may not be sufficiently strong for a railway to choose Ramsey prices from among the range of possible sets of prices to achieve adequate revenues. The circumstances in which it is in the self-interest of a monopolist to adopt Ramsey prices are quite restrictive. Other pricing structures are available to the monopolist which do not maximise efficiency but ensure an adequate rate of return while deterring potential competition (see Weiss and Lee 1986). Consequently, it may be appropriate for some form of regulatory oversight which requires railways to demonstrate that their rates are consistent with the principles of Ramsey pricing and the rate-of-return constraint in order to ensure the most efficient allocation of resources.

However, the simplest and most cost-effective approach may well be to rely on the intermodal competition to approximate efficient use of resources. There may be few additional gains from requiring railways to adopt Ramsey prices and they may not be sufficient to outweigh the costs of general regulatory oversight. For example, the results of a study by McFarland (1987) of railway deregulation in the United States suggest that the competition railways face is sufficient to protect users and that stricter regulation is unnecessary. Competition could be further enhanced by the separation of functions associated with the provision of track facilities from the operation of rollingstock.

This separation of functions creates the potential for intramodal competition by providing access to other operators, government or private. In addition, the presence of intermodal and intramodal competition will maintain incentives for cost minimisation by railway authorities in meeting the rate of return target. In these circumstances, regulatory oversight could be confined to the terms and conditions of open access to the way while the owners make periodic assessment of performance to determine whether adequate revenues have been achieved.

Monopoly railway services

For those rail services where there is no competition, directly or from other modes of transport, there is a stronger case for regulation. Once again, external imposition of Ramsey prices may not be feasible in the light of information requirements and administrative costs. The more appropriate regulatory response would be to require railways operating monopoly services to demonstrate that they have adopted Ramsey principles in pricing those services on the grounds that it ensures the most efficient set of prices consistent with a normal rate of return to the enterprise. Such ex post verification of Ramsey prices implies that the regulator's informational requirements are low.

In the absence of competition, the incentives for the enterprise to minimise costs are also likely to be low. The mark-ups above marginal cost set by the enterprise may not be based on efficient or best-practice costs. Various measures may be employed to help minimise costs. These range from administrative reforms to improve enterprise performance which have been the focus of much of public enterprise reform efforts in Australia to the implementation of incentive structures to minimise costs (for a survey of the variety of such incentive mechanisms, see Caillaud et al. 1988 and Baron 1989). The need to ensure cost minimisation behaviour by the monopoly railway remains whatever pricing scheme is adopted.

Another approach is to place upper bounds on the rates which railways set while maintaining the financial viability constraint. Its effect is to place a maximum and minimum bound on the prices which can be charged by a railway, the minimum bound being marginal costs. This approach has been adopted by the Interstate Commerce Commission in the United States. Under regulations adopted in 1985, the Commission noted Ramsey pricing to be desirable as a general guide but not as a day-to-day regulatory device, given its heavy data requirements (Willig and Baumol 1987). Instead, it adopted rate ceilings designed to ensure that users pay no more for the service than if the service were supplied competitively. Its rate setting arrangement, called 'constrained market pricing', incorporates rate ceilings determined by the stand-alone test and rate floors reflecting economic incremental costs. Between these floors and ceilings, railroads are free to select their own rates based on their assessment of market demand.

The stand-alone cost test as the rate ceiling for railways supplying monopoly services has been advocated by Baumol and Willig (1983; see also Willig and Baumol 1987).

The stand-alone test requires that revenues from any service or group of services fall below the total cost (including the cost of capital facilities evaluated at the current cost of capital) which would be incurred by supplying that service or group of services in isolation (see also Faulhaber 1975). Economies of scope available to railway enterprises provide the basis for supply of particular services at a cost less than if they were supplied separately from other services. By requiring each service or group of services supplied by a railway dominant in the market to be sold at less than stand-alone costs, users can be assured of sharing in the benefits derived from the economies of scope. According to Baumol and Willig (1983, p.41), ‘... the stand-alone cost test affords shippers the same protection that competition would provide’.

Direct application of the stand-alone cost test to a single service requires that its rate be compared with the unit cost that would have to be incurred in the long run if the railway supplied no other service. However, monopoly railway services in Australia are usually connected with other parts of a rail network. Lines completely dedicated to one particular service are an exception. Where the service utilises common facilities that are also employed to supply other services, Baumol and Willig state that the stand-alone cost test does not impose the strictest ceiling on railway prices. In these, more general, circumstances, they suggest that the appropriate ceiling is obtained by a comparison of the revenues and stand-alone cost of the group of services that utilises the common facilities. Here, the relevant ceiling on the revenue from a monopoly service is its variable cost, plus the costs of the common facilities utilised, less the contribution to those costs from the other services that use them.

The evaluation of stand-alone costs becomes more difficult in those circumstances where a monopoly service utilises a main network line for much of its journey. There is a serious practical problem in determining an appropriate portion of the capital costs of the main network and other shared facilities for attribution to the monopoly service. Such problems have been raised by ECMAL (Submission 138). Consequently, the stand-alone cost test may be feasible only for those services that are confined to separate or largely separate parts of a railway network. Where this is not the case, indirect tests for stand-alone costs can be utilised which are less stringent and less satisfactory (see Baumol and Willig 1983).

Freebairn and Trace (see Freebairn, Submission 1) suggest multi-part tariffs for multiple use lines as a means of allocating unattributable costs. The difficulty remains, however, as to how best to allocate the fixed costs between users. One option is to rely on arbitrary rules such as estimated share of total traffic carried, estimated share of total attributable costs, or estimated share of total number of train trips. As Freebairn and Trace acknowledge, such options have the disadvantage that they may exclude some users not able to pay the arbitrarily determined access fee to cover fixed costs. Another approach is to allocate the unattributable costs to reflect the nature of the demands of the various users. An efficient set of prices can be derived in this manner whereby the fixed access fee varies according to the elasticity of demand of the

users. In other words, this approach reduces to a form similar to Ramsey pricing (see Brown and Sibley 1986; Berg and Tschirhart 1988; Braeutigum 1989).

While some railway services, such as coal transport over long distances, are not likely to be subject to significant intermodal competition, intramodal competition could be facilitated by structural reform of railway operations. Separation of functions relating to rollingstock and track provision could be considered as a means of increasing competition and obviating the need for much of the regulation described above. Nevertheless, other regulatory functions could be required to minimise collusive behaviour between operators and to govern the terms and conditions of access to the track.

Summing up

Ramsey pricing rules and its various modifications provide useful guidelines for government intervention in a natural monopoly and in the presence of economies of scale. Ramsey pricing offers the most efficient set of prices consistent with the requirement of a normal rate of return from the operations of the enterprise. It is most useful when the demand for a natural monopolist's products is independent of the demand for other products. Even here information requirements on the demand elasticity's and costs for all services supplied by the natural monopolist are extensive. Demand interdependence due to another competitive mode or sector requires more complex Ramsey rules which imply additional regulatory measure and which are even more demanding in terms of information required by regulators involved in setting prices.

The proposals of Baumol and Willig, outlined above, avoid the necessity to meet the demanding information requirements associated with regulatory imposition of Ramsey pricing. Where there is intermodal or intramodal competition for services supplied by railways there is little case for government intervention, taking into account the costs of administration and compliance, to closely regulate railway pricing. Potential competition should be sufficient to assure efficient Ramsey prices, minimisation of costs and a rate of return commensurate with the cost of capital of an enterprise. The role of regulation should be confined to a rate-of-return constraint and, possibly, a requirement for railways to demonstrate their rates are consistent with Ramsey pricing principles. However, the potential gains from this latter requirement may not be sufficient to justify the costs to railways and governments.

A greater regulatory role is appropriate in the case of monopoly services supplied by railways. This could include the requirement for the monopoly railway to demonstrate it has adopted Ramsey pricing principles. Stand-alone costs of relevant groups of services, estimated directly or indirectly, can serve as a ceiling on the rates set by railways. Consideration should be given to mechanisms to ensure cost minimisation by the monopolist. Separation of functions relating to rollingstock and track provision may create the potential for intramodal competition.

Pricing policy is further explored in relation to the major networks of urban passenger services, non-urban passenger services and freight services in Chapters 8 to 11.

4.2.6 Ownership of railways

Another form of intervention is government ownership. In the presence of natural monopoly conditions, the case for government ownership of railways depends on the judgment that it is less costly to regulate a government-owned enterprise than one which is privately owned in terms of gaining access to relevant information held by an enterprise. Whatever the accuracy of such a judgment, the extensive government ownership of railways in Australia determines that the question of ownership is discussed on the basis of the merits of a transfer of ownership to the private sector.

The weight of empirical evidence in the relative performance of public and private firms generally supports the view that, where there are a number of competitors, a private firm will be more efficient than a public firm (see IAC 1989, Appendix H). Where firms face little product market competition and are extensively regulated, often because of the presence of natural monopoly, the evidence in comparative performance is not decisive in favour of one or the other form of ownership. This implies that the case for the transfer of ownership as a means of improving efficiency is weakest in these circumstances.

The findings of empirical studies of the comparative performance of public and private railways appears consistent with these general conclusions. For example, a study by Caves and Christensen (1980) of productivity growth in Canadian railroads, where public and private lines compete with each other, found there was little difference in the performance of the public and private railways.

Moreover, in the presence of a strong natural monopoly, a transfer of ownership will do little to change the nature of other aspects of the case for government intervention in railways. While a private railway monopoly would have some incentive to minimise costs, it would also have an incentive to restrict output and to maximise profits by setting higher prices although intermodal competition may be sufficient to limit this incentive in some parts of the market. The policy choice then becomes largely one of a regulated private monopoly or a regulated public monopoly.

Ownership issues relating to railways are further discussed in Chapter 12.

4.3 External costs and benefits

A number of participants have argued that private motor vehicle transport in urban areas imposes significant social costs that do not arise in the case of urban rail transport.

This pattern of urban development has created growing automobile dependence and increasingly high per capital energy consumption in Australian cities, and a corresponding increase in serious urban air pollution and Greenhouse gas emissions. (Australian Conservation Foundation, Submission 34, p.ii)

The Transport Action Council strongly supports an expanded role of urban railways integrated with town planning policies aimed at encouraging a shift towards public transport. This has obvious environmental benefits including conservation of exhaustible petroleum reserves and reduction of congestion, pollution, noise, stress and the Greenhouse effect. (NSW Transport Action Council, Submission 23, p.4)

Some of these external factors relate to costs to society that are not considered in the pricing of road services. To the extent that road users do not pay for the full economic cost of the resources they consume, rail transport would face a competitive disadvantage. These external costs affect the welfare of people who do not participate in the transport consumption decision. The three most notable external costs are congestion, pollution and road accidents; they are discussed in detail in Chapter 5.

These external costs provide a possible a priori justification for government intervention in the transport market and in particular modes. The goal of such intervention should be to apply a mechanism by which those who consume unpriced resources pay as close as possible to the full economic cost of those resources. Alternatively, it may be preferable to compensate those persons whose welfare is detrimentally affected. Government policies should therefore be designed to alleviate any failure in the transport market and ensure that all costs and benefits arising from a decision to consume a good or service are taken into account in a decision by transport providers or users. The goal is to internalise the external cost into the market process.

In practice it is difficult for governments to levy charges that approximate external costs or to pay appropriate compensation. It is difficult to compensate persons for reductions in their welfare caused by external costs. Many of these costs are not easily quantified and mechanisms for compensation may themselves create distortions or inefficiencies. Consequently, there is a case to be considered for government to simply subsidise rail services rather than attempt to internalise the external costs of road use. Assessment of this case, nevertheless, should consider advances in technology which make it feasible to implement charges for such costs.

However, subsidisation of rail costs has a number of disadvantages which need to be considered in deciding the most appropriate response to the external costs of road use. The rail

subsidies will only have an impact on the road externalities if there is sufficient substitution between road and rail services. It is difficult, for example, to determine accurately the level of subsidy to rail services necessary to offset the additional social costs of road transport. Rarely, is there sufficient information available on the extent of these unrecovered costs in order to determine to what degree rail services should be priced below marginal cost. Moreover, as noted above, subsidies to rail services can create a further set of inefficiencies associated with the particular method of funding these subsidies and with incentives for cost padding within the subsidised enterprises.

The appropriate response of government depends on the relative costs and benefits of various options available in responding to the problem of the social costs of road transport. These matters are further discussed in Chapter 5.

4.4 Equity objectives

A further justification for government intervention in the transport market may be to pursue certain social objectives. The most notable of these objectives is provide universal access to public transport.

Most governments recognise the need to provide for persons who are genuinely in need of assistance, due to low levels of income, or physical or mental incapacity. It can be argued that such assistance must include provision of transport services. There may be a certain level of consumption of transport services that is required in order to provide a basic minimum standard of living and the opportunity to participate in society. Governments may accept responsibility for the provision of public transport at less than marginal cost in order to meet this social objective. Such intervention could take various forms: cash transfers to compensate individuals for transport costs, in-kind vouchers for public transport, free or concessional travel for certain classes of persons (in-kind subsidies) or general subsidies for urban or non-urban passengers.

Passenger (urban and non-urban) rail fares generally appear to be significantly lower than marginal costs; the loss eventually being funded by taxpayers. Such general subsidies are an ineffective means of income support for those genuinely in need and for ensuring they have access to transport because the general subsidy does not distinguish between different users of railways. Those who can afford to pay for transport services also receive the subsidy. For example, the ABS 1988 Household Expenditure Survey demonstrates that higher income households consume more rail services than the those on lower income (see Chapter 8).

Welfare concessional fares for rail travel appear to be the most popular mechanism for providing basic transport services to those in need. These in-kind subsidies have significant efficiency costs associated with restrictions on consumption choice (see Chapter 8; and IAC 1989, Appendix I). Furthermore, such concessions are not very effective as a mechanism of

income support for the disadvantaged since they target assistance according to certain social characteristics that are not necessarily co-incident with social disadvantage. They are generally available to pensioners, the unemployed and school children. School children may come from wealthy families. The Social Security Review found that in June 1988 only 13 per cent of age pensioners rely solely on the income of their pension (DSS 1988, p.89). Pensioners with significant assets may not warrant public assistance. In some cases the criterion for a concessional pension fare is not that the customer is a beneficiary of a Commonwealth pension but simply that they are over the age of 60. In such cases there is even less assurance that the welfare concession is going to those clearly in need.

The provision of welfare concessions results in an expansion of demand, as indicated in Chapter 8. Not all of the increase in demand is associated with travel to meet social needs. For example, the concessions also apply to holiday travel.

Cash payments are often suggested as the most efficient form of income support. They maximise the choice of beneficiaries and therefore should be the most economically efficient (IAC 1989, Appendix I). It is likely to be more efficient for governments to adopt a commercial pricing structure for railway services and provide for access to these services among the less well-off by increases in pensions or other cash transfers. One of the main difficulties associated with this option arises from the nature of the division of powers between the Commonwealth and State governments. State governments have differing social objectives which may also differ from those of the Commonwealth and, yet, it is the latter which has prime responsibility for social welfare payments. Nevertheless, it would seem possible for State governments to establish a separate fund to replace a range of in-kind welfare benefits including subsidised rail services. Furthermore, by agreement with the States, it may be possible to transfer responsibility for meeting these equity objectives to the Commonwealth Government and the Commonwealth Department of Social Security. This may imply an increase in social security benefits if rail travel concessions were removed. The advantage of this approach is that the administrative costs associated with meeting government requirements to provide transport community services might be minimised by using the existing social security system.

Some studies suggest that in certain conditions the cost of cash-based transfer programs can be reduced by providing a welfare program package that includes both cash payments and payments in-kind (see Nicholls and Zeckhauser 1982, Dye and Antle 1986, Blackorby and Donaldson 1988, Ross 1991). In adopting in-kind packages, some loss of welfare is accepted by restricting recipients' choices to improve the targeting of the redistribution process and deterring potential fraud.

Although it may be desirable to include some in-kind payments as part of the welfare system it is difficult to discern a particular case for subsidised rail services. If access to transport is considered important enough to make specific provision for it in the welfare system, it may be best delivered through transport vouchers. These may include specific vouchers entitling the

bearer to a concessional fare or ‘pseudo’ vouchers such as a pensioner's health benefit card which can be used to obtain concessional fares.

The advantage of voucher systems is that they can be used to implement in-kind transfers while incorporating some of the desirable features of cash transfers such as retaining an element of consumption choice, transparency and non-interference in the commercial activities of enterprises. Replacement of subsidised rail services with transport vouchers for the disadvantaged maintains their access to needed transport but leaves them a choice as to the mode of transport. Consequently, an element of competition can be introduced between transport providers for this particular market.

Governments have historically required railways to meet equity and other social objectives in the provision of railway services. These requirements imposed on railways by governments are often referred to as community service obligations (a term which seemingly reflects the view of GBEs that government directives on the provision of non-commercial services constitute ‘obligations’ for the authorities). The Commission (consistent with its views in Chapter 3 on the need for an arm's length relation between governments and authorities) uses the terms ‘community services’ and ‘community service contracts’ in this report. The Queensland Government submitted that key issues addressed through community services include externalities such as congestion and environmental costs associated with private motor transport and social objectives such as providing access to transport at concessional rates for specific groups. The rest of this chapter examines the nature of community services required by governments of railways, types of community services performed by railway authorities, funding arrangements for these community services and some reform options.

4.5 Community services

4.5.1 The nature of community services

As the IAC (1989) noted in its report on Government (Non-Tax) Charges, there is a range of definitions of the services which are collected under the term community services. Consequently, there is some ambiguity as to what features or characteristics should be considered as a community service. While acknowledging the plurality of definitions such as those of ARRDO, the Commonwealth Treasury and the Department of Transport and Communications, the Industry Commission has maintained for the most part the same interpretation as that adopted by the IAC in its consideration, namely:

A Community Service Obligation arises when a government requires a public enterprise to carry out activities which it would not elect to provide on a commercial basis, or which could only be provided commercially at higher prices. (IAC 1989, Volume 3, p.41)

This definition is similar to that used by the Queensland Department of Transport. The IAC definition incorporates several characteristics of community services. (A similar listing has been provided by ARRDO 1982, and Michael 1984).

These characteristics are:

- a government requirement or directive to provide a specific service or function and in some cases including specification of output and price levels;
- the requirement usually pertains to a public enterprise;
- the service or function provides an identifiable community or social benefit; and
- the service or function would not otherwise be supplied, under the same conditions, as a commercial decision.

The first characteristic covers a range of circumstances - explicit public directions from government, bureaucratic directions, ministerial directions. In many cases, community services may be based on tradition or established practice rather than explicit direction. In some instances, the pattern of constraints and impositions developed by governments on railways over time has created public expectations that railways will continue to provide certain community services despite their changing transport role, for example, the continued operation of uneconomic branch lines. There may be a dilemma for railway managers as to which historical obligations can be assumed to be current government objectives. While fare and freight concessions in railway operations may be explicit, political directions may have been given governing other aspects of railway operations. The requirements may include government directions not to do certain things, for example, government refusals to grant fare increases as proposed by railway management.

Government requirements to provide community services are interpreted usually as requirements made on public enterprises despite the fact that in other industries private firms may be required to meet similar obligations. For example, licence conditions for broadcasters may regulate the content of programming, non-commercial activities may be forced on private enterprise by health and safety regulations, private enterprise may be induced to supply certain services by tax benefits or direct subsidies.

Community services have been widely seen as referring to requirements governing supply of services rather than requirements impinging directly on inputs to these services such as labour. Nevertheless government requirements also affect the inputs used by GBEs, for example, implementation of government policies such as equal opportunity and purchasing preferences. It is somewhat arbitrary to exclude such input requirements from the definition of community services and there seems little reason not to include them in the discussion of community service provision.

The characteristic that the service or function provide an identifiable community or social benefit covers a wide range of possibilities. This is taken generally to include distributional objectives of governments.

Two types can be considered:

- the objective of providing service uniformly throughout a State or the nation (horizontal equity objective); and
- the objective of making service affordable to the greatest number of households (vertical equity objective).

Apart from the distributional aspects, however, community or social benefits may arise in the pursuit of efficiency objectives. Government may require a GBE to take account of social costs and benefits in their pricing and production decisions, for example, environmental requirements of electricity authorities, in order to achieve a more efficient allocation of resources. Nevertheless, the term community service can be used generally to cover requirements to meet the distributional objectives of governments.

The final characteristic is that the service would not otherwise be supplied, or would not be supplied under the same terms, as a commercial decision. A non-commercial service is usually interpreted as one which cannot generate sufficient revenue to cover the costs of supplying the service.

This aspect of a community service can include a range of market circumstances. The existence of losses is not always indicative of an inefficient activity. For example, both public and private firms may choose for good commercial reasons to accept losses on particular activities or use particular inputs despite their higher cost. Moreover, efficient outcomes in public utility pricing may involve losses: in the presence of scale economies, pricing to recover marginal costs will result in public enterprise deficits. This is of some significance since much GBE activity takes place under scale economies.

Alternatively, in the case of public utilities a commercial decision may be inefficient. In the absence of government regulation a natural monopoly will have some incentive to price its services such as to maximise monopoly profits. In such a case, a commercial decision is not necessarily the most efficient outcome and there is a case for the government to require the monopolist to price competitively, a decision that the monopolist would not necessarily make on commercial grounds.

In summary, the definition of a community service is a vague and somewhat arbitrary one and covers a variety of circumstances, although income redistribution is perhaps the primary objective of such requirements. As in the case of other forms of government intervention in economic activity, the rationale should be analysed, the costs and benefits incurred should be evaluated, and the most efficient way of carrying out the intervention be examined. Community service requirements imposed by governments are a broad, but loosely defined,

range of government measures which should be analysed on their merits - some may be justified, others not, still others may be better implemented with alternative measures.

4.5.2 Railway Community Services

ARRDO (1980, 1982) and Michael (1984), have previously identified five major railway services as community services. These are: urban passenger railway services, non-urban railway passenger services, uneconomic branch lines, less-than-car-load (LCL) freight, and concessional rates and fares. These are discussed in more detail in Chapters 8, 9 and 11. Government policies to maintain employment levels in railways and the defence role of railway have been considered also to constitute community services.

Using data presented in submissions and annual reports of rail authorities, the Commission can identify at least \$554 million spent on railway community services in 1989-90. This is approximately 25 per cent of the total declared Australia railway deficit of \$2.1 billion (see Chapter 6). However, community services make a much larger contribution to total deficits than the published figures indicate.

Many urban rail passenger systems fail to recover operating costs and this is a feature of urban systems world-wide. Perhaps the strongest argument in support of urban rail passenger services rests in the benefits of reducing external costs of other transport systems. While the prima facie case for community services in rail services appears strongest in relation to urban services, further issues arise in terms of the operating efficiency of these services and the methods of funding the services.

The community benefits derived by providing non-urban rail passenger services are not as readily apparent as for urban services. Some participants have suggested that non-urban rail services may provide some benefits to disadvantaged social groups and the rural communities. In many of these cases, however, some other mode of transport might perform the task more efficiently.

LCL rail freight services are generally unprofitable. There seems little case for this task to continue to be run at a loss. In large part these losses are incurred as a result of high labour costs in handling.

Uneconomic branch lines have been considered as those which carry less than 500 000 gross tonnes per annum and which are unlikely to generate significant traffic in the foreseeable future (ARRDO 1982, p.72). Where alternative transport modes are available, the costs of the rail service are likely to be too high to warrant continuation of the service in many cases.

All railways are directed to offer a wide range of 'welfare' concessions to passenger and freight customers. Commercial concession rates and fares may be adopted as part of differential pricing practices based on the nature of the demand from different groups of consumers. Cheaper fares may be considered to encourage traffic from the more elastic

components of market demand. They may also reflect an attempt to spread demand more evenly between peak and off-peak periods, thus utilising capacity more efficiently. There appears to be evidence that the pricing policies of railways do not ensure efficient use of capacity. Considerations of industry assistance and social welfare have usually been more relevant. Similarly, there seems little case for existing fare concessions for categories such as naval reserve cadets, parliamentarians, members of lifesaving associations, etc.

4.5.3 Funding arrangements for rail community services

There are three funding scenarios for community services presently in use by rail authorities and their supporting governments:

- cross-subsidisation arrangements;
- general government contributions towards operating deficits; and
- explicit compensation for the loss a rail authority incurs in providing community services.

Cross-subsidisation

Cross-subsidisation involves financing the losses incurred by community services through income earned on other activities. Historically, cross-subsidisation has been the most common form of funding for the non-commercial operations of GBEs. It is not as prevalent among railway authorities compared with other public enterprises perhaps because there are less opportunities for monopoly profits on other services. Instead, governments have generally chosen to fund the operating deficits of railways.

Cross-subsidisation in railway operations is most apparent with regard to some freight services. Some rail authorities operate cross-subsidies between profitable freight and unprofitable services. The Western Australian Government submitted that:

... the lack of commercial viability of a significant number of services provides a reliance on cross-subsidisation from performing routes to maintain uneconomic services. (Submission 43, p.57)

In Queensland, coal freight appears to be the major breadwinner for the whole rail system. The Queensland Government stated:

Welfare and social objectives are being met by way of hidden cross-subsidisation within the accounts of QR.

a major disadvantage of the present coal freight arrangements is that they allow the system of cross-subsidisation to continue. (Submission 50, p.39)

Cross-subsidy arrangements can have important efficiency costs. The cross-subsidisation mechanism involves levying a consumption tax on certain profitable traffic and providing a consumption subsidy for passenger or freight community services that can not cover their economic costs. Those industries, most notably coal, which use the higher priced service more

intensively are disadvantaged in the competition for resources with other industries. They face reduced cost competitiveness relative to other suppliers not using the higher priced rail services. Conversely, those who receive the subsidies will expand their use of rail services so that the value they place on consuming additional rail services becomes less than the cost of operating the service. Industries using these subsidised services gain an advantage over other suppliers.

An additional effect on efficiency in resource use and consumption arises from the regulatory barriers in place which enable railway authorities to practice cross-subsidisation. In Queensland and NSW, coal rail freight is protected from competition from other transport modes by mining licensing requirements or regulation. The absence of competition may encourage cost-padding practices such as overstaffing and restrictive work practices. Restrictions on competition from potential new entrants may also discourage the introduction of new techniques of production and management.

Cross-subsidisation arrangements also reduce transparency and inhibit accurate monitoring of the performance of railway enterprises. The mixture of commercial and non-commercial services makes it difficult to identify the cost of operating any particular market segment. This makes it difficult to assess performance on a commercial basis. According to the Queensland Government:

The existing system hides the real costs of providing CSOs and does not allow reasoned decision making by Government, based on measured costs or assistance to the community or to particular industries, to take place. (Submission 50, p.39)

Government contributions towards operating deficits

The most common form of funding arrangements for community services provided by railways are by government contributions to cover the global operating deficits of the relevant rail systems. Community services in the SRA and the PTC, and to lesser extent Westrail, are largely funded by this mechanism. Government simply appropriates a lump sum contribution to the rail network to cover its annual deficit.

Funding of railway deficits incurs some (but not all) of the costs to efficiency that are caused by cross-subsidisation. While there is no direct consumption tax to railway users associated with deficit funding there is a consumption subsidy, a reduction in production efficiency and an associated welfare loss. Financing the consumption subsidy also leads to inefficient resource use, a lower than commercial rate of return and poor factor productivity. The assurance of government appropriations to fund deficits tends to discourage cost minimisation and may positively encourage cost padding.

There are problems of transparency and accountability under this form of funding. Decisions are based on a mixture of commercial and non-commercial factors and there is consequently no basis to assess performance. Contributions towards a deficit obscure how much the

community services really cost and to what extent a government is subsidising these services directly from taxation revenue.

Explicit funding

A further funding scenario is explicit compensation of a rail authority for the costs of providing a community service. Westrail's urban deficit is funded in this way and the SRA is currently negotiating with the NSW Government on more specific community service funding.

Explicit funding still incurs the same loss in production efficiency that occurs in the funding of global railway deficits. However, this form of funding may not be inconsistent with incentives for cost-minimisation. If, as proposed by the NSW Government, penalty and performance incentives could be inserted into the contract, cost minimisation incentives could be maintained.

The Department of Transport will specify service requirements [for the community services]; the SRA will prepare quotes for delivery based on efficient costs or revenue forgone as appropriate. A formal contract will be agreed and monitored with costs and performance-based rewards and sanctions. (New South Wales Government Submission 75, p.4)

Explicit funding of community services can lead to transparency and accountability of decision making. If the community services are provided under a contract the conflict between commercial and non-commercial obligations could potentially be eliminated. Decision making and overall performance can then be compared to other commercial ventures.

Explicit funding was recommended by all governments who fund major rail networks (except the Victorian Government which was silent on this issue). AN was unequivocal in its view:

Non-commercial activities which will not cover costs with customer derived revenues should be brought to account as separate business segments. They should be explicitly funded by Governments or rigorously abandoned. (Submission 64, p.10)

4.5.4 General reform options

The uncertainty of what constitutes a community service and inadequate specification of them by governments has implications for the performance of GBEs. Some of these have been outlined by the Treasury (1990b) as follows:

- Conflicts may arise between objectives. There may arise a conflict between a GBE being asked to operate commercially and being directed to provide community services that are only loosely specified. Uncertainty about their scope may lead to over-provision or under-provision depending on the emphasis the enterprise gives to competing objectives.
- If the community service direction is not clear, it is difficult for the cost of the associated services to be estimated accurately and for the overall commercial

performance of the enterprise to be evaluated. This makes it difficult to make the GBE accountable for its performance.

- Vague directions or uncertainty about the extent of provision of a community service can make it difficult for government to determine whether its social objectives are being met.

Whatever the merits of various community services and alternative methods of implementing them, the precise specification of government objectives and requirements for community services is an important feature of any reform proposals for the delivery of rail services. In addition, a requirement to account separately for and publish estimates of the cost of supplying community services would make the costs and benefits of these policies more transparent and assist appraisals of an enterprise's performance in respect of its commercial activities.

Several alternative mechanisms can be utilised to implement community services. They include voucher systems, direct funding and contracting out services to be provided. None of these mechanisms provides a complete solution to the problems encountered with provision of community services. They all involve trade-offs between efficiency and other objectives.

Nevertheless, all these options for funding community services could be considered as potentially part of a complementary set of measures to implement government objectives more efficiently. Explicit funding of community services provides an avenue for ensuring that the objectives of government policy are made more transparent; it provides greater scope for public scrutiny of the costs incurred in implementing community services. It is also a means of overcoming some of the more serious efficiency effects of cross-subsidies. Non-financial indicators of performance could be built into the community service contracts. It is very important that community service contracts are as specific as possible. This was emphasised in several submissions, for example, Transport Action Council of NSW and the Commonwealth Department of Transport and Communications. The government should identify exactly which particular services are to be explicitly funded under the contract, the quality of services to be provided and indicators to be used in measuring performance. It would be preferable if the descriptions of community services were localised. For example, some branch lines leading to a city may be community services, but others may not. Certain routes may also be considered as community services at different times of the day (for example, off-peak periods). It is important to separate clearly which operations are commercial and which relate to community services.

Transparency would be further enhanced if the payments for community services were charged against the relevant government expenditure category. For example, concessions for pensioners should be included in the welfare budget and those for school children should be included in the education budget. This means that government departments must monitor the effectiveness of rail authorities in providing community services, and the relative priorities of community services compared to other budgetary priorities. In some cases this approach to

monitoring of costs will be dependent on improvements in ticketing systems in order to record accurately the costs of community services.

The NSW Treasury pointed out that one disadvantage of this procedure is the overall costs of community services, for example, in transport, could be diffused through several departments thereby masking a global perspective on these costs. However, payment by using departments initially to the Transport Department for onforwarding to the railways would allow an aggregation of the support payments in Transport's appropriations (the net effect of which would be offset by revenues it receives from other Departments).

Selected use of voucher systems and contracting out services to be provided to meet government objectives could be used to improve consumption choice. A voucher system could be used to provide a set amount of concessions for use of any transport service, public or private, and the concession be funded directly by the government. The Combined Pensioners Association of NSW for example, pointed out that concession passes in Sydney are valid for trains, buses and ferries. More detailed discussion of these options in relation to specific railway community services is contained in following chapters of this report.

RECOMMENDATION 4.1

The Commission recommends that community service contracts between governments and railways should be as specific as possible, identifying exactly what particular market segments or lines are to be explicitly funded as community services. These contracts should also include criteria for evaluation of the performance of the rail authority in meeting each particular community service.

RECOMMENDATION 4.2

The Commission recommends that payments made to the railways under any community service contracts should be charged against the appropriate government expenditure category - education, social welfare, industry assistance, etc - and be subject to budgetary review.

The Commonwealth Department of Transport and Communications in commenting on these recommendations in the Draft Report stated that detailed contracts for community services would improve rail accountability and service levels. The Department also indicated that charging community service expenditures to particular government programs would facilitate government scrutiny and accountability. The Queensland and Victorian Governments supported these recommendations in principle. The Victorian Government suggested that additional work would need to be undertaken to implement these recommendations, for example, in determining the basis on which community services are costed and ensuring adequate systems are in place to record community service costs. The NSW Treasury indicated that it had no objection to charging payments for community services against specific government expenditure categories but it would be a matter of government policy. In relation to the specification of community service contracts, the Treasury cautioned that too much disaggregation of costs can be counterproductive.

5 COMPETITIVE, ENVIRONMENTAL AND SOCIAL ASPECTS OF RAIL AND ROAD TRANSPORT

Some users of rail and road transport do not cover the track costs they impose. The extent of the shortfall varies between different types of traffic. Both the subsidisation of rail services and inadequate charges for heavy road vehicles must be eliminated to allow more equitable competition between modes.

Many participants emphasised the greater external cost of meeting transport needs by road compared to rail. They argued that rail transport is more energy efficient, involves fewer accidents, relieves road congestion and noise pollution and contributes less to atmospheric pollution and greenhouse gas emissions. They claimed that rail's advantages justify increasing the subsidisation of rail services to promote a shift in the transport task from road to rail. The Commission has concluded that the external costs of road compared with rail are not as large as claimed, and that subsidising rail services, especially in isolation, is an ineffective means of reducing these costs.

The principal social benefits of urban rail services lie in their role as part of an integrated urban transport policy. A set of complementary policies needs to be implemented to achieve sustained reductions in the social costs of urban transport.

Outside urban areas, reducing rail services can have a detrimental effect on regional roads and local environments. It may be necessary for local government to be given more effective power to levy specific user charges on heavy vehicles using local roads.

The Commission's issues paper noted that 'Rail services cannot be considered in isolation from other elements of transport...' Many participants agreed with this proposition. Their major concern was whether road transport meets its costs, including construction, maintenance and external costs¹ and the effect this has on the use of rail services. Community groups considered that the use of rail services should be expanded in order to reduce such transport costs.

In this chapter the relevance of road social costs to rail policy decisions is discussed. Section 5.1 covers some aspects of equitable competition between rail and road transport; external costs of the two modes are analysed in Section 5.2, followed by a brief discussion of some relevant urban land use issues in Section 5.3. Regional implications of changes in rail and road services are addressed in Section 5.4. Appendix G provides data and background information on the major costs participants raised as important for competition between road and rail.

¹ External costs are costs which are caused by one activity and have effects outside that activity which are not reflected in its price. For example, noise pollution caused by either road or rail transport which affects city residents.

5.1 Equitable competition between modes

The provision of a subsidy affects resource allocation in a number of ways (see Chapter 4). In particular, it has implications for the resources used by the subsidised service (attracting more resources away from other industries than it otherwise would) and for the output of competing services (reducing the output of the industries which are not subsidised).

A number of submissions to the Commission contended that road users are not paying their way and are subsidised by the general community with adverse economic implications. For instance, the Fast Train-Polis Action Group argued:

Some of the more significant costs that have not been assigned to the use of motor vehicle for passenger or freight transfer: provision of the road system; the new construction that is required; the accident cost ... of \$6 billion per annum; administering the road system; congestion; pollution and the effects on the health of the community. (Submission 56, p.2)

To remove any uneven treatment between road and rail services, some participants have suggested subsidising the competing service.

AFCO does not believe railways should be required to achieve full cost recovery, especially given the fact there is no such requirement on the road freight industry. (Australian Federation of Consumer Organizations, Submission 87, p.3)

Others have suggested abolishing the subsidy on the subsidised service.

It is essential for the success of the NFI that the road freight industry pays its full share of road costs and 'external' costs arising from road accidents, air and noise pollution, greenhouse gas emissions and oil depletion. (Australian Railways Union, Submission 63, NFI Proposal for a National Rail Freight Corporation: Rail Union Comments, p.5)

Providing a compensatory subsidy on the competing service does remove the distortion between the two activities but it has a number of disadvantages. It results in transport as a whole being subsidised relative to other activities, leading to an overuse of transport services. It is difficult also to determine the appropriate size of the compensatory subsidy which depends on the size of the existing subsidy and the relationship between the two services. For example, existing subsidies on the road transport of bulk minerals over long distances would have very little effect on the rail sector which is much better at this task than road. Therefore, any compensatory subsidy to rail (for long-distance haulage of bulk minerals) in order to counteract the existing road subsidy for heavy vehicles, should be very small. In contrast, for containerised traffic, road and rail are more competitive. Therefore, if there is a significant subsidy on road transport the equitable subsidy to rail transport (for containerised traffic) may also be large.

In certain markets rail transport also competes with modes other than road, for example, sea in the case of long-distance bulk minerals. An increase in subsidies to rail would reduce the competitiveness of these other modes.

Removing all subsidies is a far simpler policy option which increases economic efficiency compared to providing subsidies to both road and rail transport. Governments are currently negotiating a national pricing scheme for heavy vehicles. Similarly, this report outlines ways to improve the pricing of rail services. If it is technically possible, and not too administratively costly, policies should be directed at removing subsidies and pricing both road and rail services correctly.

5.1.1 Overall recovery of operating and infrastructure costs

Many participants discussed the under-recovery of the cost of investment in, and maintenance of, road and rail infrastructure. Different submissions reached different conclusions on which mode is subsidised. Some argued that both road and rail are subsidised. Some concentrated on the subsidies to road and others on the subsidies to rail.

The implications of such a major increase in heavy road freight vehicles (paralleled by an even larger percentage increase in long-distance road coaches) has been a soaring road maintenance bill (largely paid for by car owners and rate payers)... (Australian Conservation Foundation, Submission 34, p.12)

Cost recovery on rail transport for industrial products is 59 per cent, on rural products other than grain is 45 per cent, and LCL cargo is 24 per cent. The competitive playing field is uneven; it slopes steeply in rail's favour. (National Farmers' Federation, Submission 77, p.8)

The extent of the subsidy available to road users has been examined by the Inter-State Commission (ISC). The ISC compared the cost of building and maintaining roads with the revenue collected from road users through registration charges and fuel excise². It suggests that, overall, road users are meeting road maintenance and construction costs. Expenditures annually incurred on roads are matched by revenues (mainly consisting of registration and excise on fuel products). Road users generally meet the capital and operating costs of the vehicles which use the roads and pay taxes such as sales tax and income tax. In contrast, Chapter 6 suggests that, overall, the users of government railways do not even cover the operating costs of the services provided, although performance differs greatly between traffics (Section 5.1.2). The cost recovery of rail relative to road would be improved somewhat if the inefficiencies in rail operations were eliminated. Travers Morgan estimated that if rail authorities achieved international best practice they could reduce operating costs by 30 per cent for freight and 36 per cent for urban and non-urban passenger services (Appendix K). Even allowing for these inefficiencies, rail users overall would not contribute to rail infrastructure costs.

Neither the users of rail services nor the users of government provided roads fully meet the opportunity cost³ of the land on which the railway or road has been constructed, and

² The ISC concluded that some of the fuel excise should be treated as a road user charge rather than a tax.

³ Opportunity cost is the return from the alternative use the land could be put to if the road or rail line is closed. The opportunity cost of land will vary greatly depending on its location.

overall they do not meet the opportunity cost of the capital embedded in the rail and road networks. The failure of either mode to meet these opportunity costs discourages the private sector from providing road and rail infrastructure; that function is left to the government sector. The failure to meet opportunity costs also encourages investment in and use of road and rail at the expense of other modes of transport where all users meet all of the relevant costs, and at the expense of other investment opportunities.

The Commission has received little evidence on this opportunity cost issue and it has been unable to obtain data which would enable the distortion to be quantified. The ISC (1990) examined the question but tentatively concluded not to include land costs because of measurement difficulties, problems of revenue collection and because roads have historically been considered to be public rights of way. The Industry Commission believes that this general issue is worthy of separate, further research.

5.1.2 Incidence of subsidies

Overall rail does not even cover its operating costs, although performance differs greatly between traffics. Bulk minerals generally cover their operating costs and generate a return on capital. Other bulk commodities such as grain cover their operating and capital costs on heavily trafficked lines, but not when averaged over all lines (see Chapter 10). Interstate freight covers operating and capital costs in AN and Westrail (ISC 1990, Volume 2, p.272). Other systems have difficulty meeting even operating costs. LCL freight and non-urban and urban passenger services do not cover their operating costs and thus make no contribution to capital costs.

Setting aside the issue of opportunity cost discussed above, whether road or rail transport is receiving the greater subsidy varies between different types of freight. For bulk traffic, rail is disadvantaged because road user charges are most deficient for heavy trucks, while cost recovery on bulk rail is high. However, the competition between road and rail for bulk freight is limited (see Chapter 10) so that the impact of this distortion is fairly small.

Heavy long-distance trucks are also used to transport interstate freight. In South Australia and Western Australia where interstate rail freight covers its capital costs, road is subsidised relative to rail. However, in other States this is reversed. Similarly for small freight (LCL) rail does not cover its operating costs whereas road does, and so rail is more heavily subsidised.

Non-urban rail passenger services do not cover operating costs. Long-distance coaches cover operating and capital costs, while cars cover more than their share of all costs. Therefore rail is subsidised relative to road.

Finally, in urban areas rail cost recovery is insufficient to cover operating costs while car drivers collectively meet all of their operating costs and most of the costs of new capital. Again rail is subsidised relative to road.

To eliminate these subsidies, policies should be directed at improving the pricing of heavy road transport and rail passenger services. The Inter-State Commission report on road user charges (ISC 1990) recommended a mechanism to improve the distribution of charges across road transport for building and maintaining roads. Chapters 8 and 9 of this report look at the pricing of rail passenger services.

While the Industry Commission finds it important that road and rail are priced correctly, detailed recommendations on road user charges are beyond the scope of this reference. The ISC recommendations offer a significant improvement on present charges. The Industry Commission does not agree with all of the details of the ISC recommendations. There is substantial merit, however, in the introduction of a national registration scheme and the principle of making road users meet the costs for which their vehicles are responsible. Efficient road user charges need to reflect as closely as possible the costs imposed by individual vehicles. Fuel taxes only partially differentiate between vehicles. Fuel taxes cannot differentiate sufficiently between the types of roads that a vehicle is travelling on, the surface of those roads or the weight of the load the vehicle is carrying.

In the context of the July 1991 special Premiers' Conference all State and Territory governments, except the Northern Territory, signed an agreement to establish a national heavy vehicle registration, regulation and charging scheme. The structure of charges is to include a nominal administration charge, a road user charge component of Commonwealth diesel excise and a registration charge for the few classes of vehicles which would not cover their road costs through the fuel payments (SPC 1991c, p.15).

The changes outlined at the special Premiers' Conference, particularly those to establish consistent national regulations and a national registration system, are a substantial improvement on the current State-based arrangements. However, the proposed charging scheme falls well short of introducing efficient road user charges. Because the scheme excludes cars and light trucks, overcharging of these vehicles will remain. Increased registration fees, not mass-distance charges, will be levied on heavy vehicles. Registration charges cannot differentiate sufficiently between the distance travelled by different vehicles. Those which travel the longest distances will still receive large subsidies and those travelling shorter distances will be penalised.

RECOMMENDATION 5.1

The Commission recommends the introduction of road user charges which reflect more accurately the amount of road use and pavement damage caused by all classes of vehicles. A national vehicle registration scheme is a key element in achieving these changes.

5.1.3 Fringe benefits tax

Some participants, including environmental groups, community groups and urban transport authorities, argued that the tax treatment of company cars and company car parking spaces encourages the provision of cars as part of an employee's salary package; this was said to exacerbate pollution and congestion problems, particularly in the peak period in cities.

The fringe benefits tax on company car use needs a major overhaul to ensure that the epidemic of the company car perk does not remain the dominant factor in peak period road demand in Australian cities. (Australian Conservation Foundation, Submission 34, p.22)

The current fringe benefits tax regulations do not specifically include car parking facilities provided by employers. This encourages road use. In order to encourage rail use, rail tickets provided by employers could be exempt from fringe benefits tax. (New South Wales Government, Submission 75, Volume 2, Annexure 5, p.18)

The fringe benefits tax was introduced from 1 July 1986. Because the company tax rate is less than the top marginal personal income tax rate there is an incentive for high income earners to take more of their income package as fringe benefits. Also, the approach used to assess the tax liability on company cars does encourage employees to take a company car in preference to other forms of fringe benefits, such as rail passes. Under one method, the value of the car benefit (operating and capital costs) each year is deemed to be a statutory fraction of the initial cost of the car. The fraction falls as distance travelled by the car increases; this is so because the business component of travel and the rate of depreciation of the car both increase with distance travelled by the car. It is recognized that these statutory fractions err on the side on undervaluing the likely benefit of private usage (Keating 1986). But there is no such bias in the treatment of other travel benefits which are valued at cost for fringe benefits tax purposes.

The exemption of car parking spaces from fringe benefits tax is a valuable benefit, particularly in the central business district (CBD). The Fielding Report (1988) estimated that the annual cost of a new parking space in a multistorey garage in Adelaide was \$1810 to \$2520 depending on the discount rate used. The BTCE (1990b) estimated that the total cost of a CBD parking space in an Australian city was \$15 000; amortised over 30 years with a 10 per cent rate of interest this implies a benefit equivalent to \$1600 per annum. The BTCE estimated that the cost of a non-CBD carpark is one third of the cost of a CBD carpark.

The exemption was introduced because of the practical difficulties in determining what is legitimate business use in the case of parking spaces. But it also encourages the use of cars to travel to work, because some employees receive, tax free, a parking space which is solely for private use. Although not a perfect solution, a statutory formula could be used to improve the taxation of car parking spaces.

5.2 Externalities

Some participants argued that road based transport generates large social and environmental costs, and that these costs are not taken into account when people decide what type of transport to use. Such costs are often referred to as external costs. The areas discussed in the following sections include energy costs and fuel efficiency, atmospheric pollution, greenhouse gas emissions, accident costs, noise pollution and congestion. Not all of these issues involve external costs. Evidence available on the magnitude of the social costs of transport is presented in Appendix G, which draws heavily on the work done by the ISC (1990).

In Section 5.1 it was noted that when one mode is not paying all of its costs the most efficient solution is to remove the subsidy on that activity, that is, to ensure it pays its full costs. When dealing with external costs it is even more important to charge directly the activity responsible for the externality. With atmospheric pollution, for example, subsidising rail may reduce the number of cars on the road and hence the level of pollution. However, if an accurate charge could be levied on pollution it would not only reduce the number of cars on the road, but also would encourage the remaining drivers to drive vehicles which emit less pollution.

To change people's behaviour the externality charge needs to be targeted as closely as possible to the source of the externality. Hence a fuel tax may be a good method of charging for greenhouse gas emissions, which are directly related to the amount of fuel used, but would be a poor method of charging for noise pollution, the costs of which depend on the mechanics of the vehicle and where it is driven.

The proposed [by the ISC] externality charges of 8.5 cents per litre for diesel and 5.1 cents per litre for petrol are an extremely crude and inefficient means of addressing the [air and noise pollution] externalities. Externalities of this nature are invariably location specific. For example, problems of air quality in Sydney and Melbourne arising from vehicle emissions are quite different in magnitude from those in the outback. Hence any approach to such problems must be location specific. (AMIC, Submission 140, Attachment 1, p.3)

Some participants were critical of singling out road transport for externality charges and, indeed, the ISC (1990) recommended research be undertaken on the externality costs generated by rail transport.

The Commission considers that there are substantial efficiency gains in moving away from regulation to charging for externalities. Companies and individuals would be encouraged to reduce the amount of tax they have to pay by cutting back on the taxed activity. They would also choose to adopt existing technology and use new technology in order to generate fewer externalities.

Road transport, particularly cars in cities and trucks using country roads, has been identified as imposing sizeable external costs. For OECD countries as a whole motor vehicles are responsible for 47 per cent of the nitrous oxides and 66 per cent of the carbon monoxide produced (Leggett 1990, p.262). Because of the benefits of charging for externalities and the size of the externality problem in road transport, it may be appropriate for road transport to be one of the first industries in Australia where pricing for externalities is adopted.

It can be very difficult to levy charges properly so as to approximate external costs, but mechanisms do exist to charge for some externalities. In Hong Kong in 1986 a trial was undertaken to charge for congestion using an 'electronic number plate' which enables the vehicle location to be registered in a central computer. Such a system potentially has significant efficiency gains because variations in the levy, according to location and time of day, can be used to reflect the cost of congestion. The scheme may, however, introduce its own social costs. In Hong Kong there were concerns regarding civil liberties, and strong opposition to perceived higher government charges. The system also had a high implementation cost and was administratively expensive (Glaister et al. 1990, p.31). Research and testing is being undertaken in Europe to perfect urban road pricing. Practicable road pricing systems are expected to be fully operational within the next 6 years (Petit 1990).

To combat its congestion problems Singapore has adopted a mechanism of selling rights to travel into restricted zones (Steadman and Bryan 1988). This system is less efficient than the Hong Kong approach, since it does not tax the actual contribution an individual vehicle makes to congestion. The Singapore congestion charge relates to the average cost of congestion across all vehicles.

For accidents it is possible to adapt third party personal insurance charges to recover some of the external costs of road accidents. Instead of levying a flat fee the premium should be based upon the probability of an individual or type of vehicle being involved in an accident which generates external costs. Dangerous drivers and those in charge of vehicles which are more prone to such accidents would pay more under such arrangements. In NSW, private insurance companies are able to sell compulsory third-party personal insurance. The National Roads and Motorists' Association (NRMA) in NSW has said that it will offer a significant rate reduction to those drivers with an accident free record. This scheme will not take account of all of the external costs of death and injury due to road accidents, but it is a large improvement on the current system of charging all drivers an equal premium.

Several community groups and individuals argued that road transport is subsidised because it does not pay for the environmental problems it causes, and that the use of rail transport should be encouraged in order to overcome these social and environmental problems. Apart from the efficiency costs of subsidising any activity, subsidising rail alone will not overcome the environmental costs of road transport. In addition, rail transport is not environmentally neutral. Subsidising rail would encourage the overuse of transport in general, to the detriment of some aspects of the environment. Therefore, where possible, it is better to deal with the social costs of road transport through road policies.

It is not practicable to provide a complete discussion of road external costs within this report. Therefore, the discussion is restricted to the relevance of road related issues which affect rail policy decisions.

5.2.1 Energy costs and fuel efficiency

The Commission's terms of reference include examination of the efficiencies in the use of energy in rail compared to road. This section draws on the discussion in Appendix G on the relative energy efficiency of road and rail transport.

The energy efficiency of different modes of transport will affect the amount of pollution and greenhouse gases which they each emit. Accordingly, the amount of energy each mode needs to perform any particular task is important to the issue of the external costs generated by transport.

Some participants argued that improving energy efficiency is desirable in itself, and that government policies should be directed at reducing the use of energy.

Also to be considered is the squandering of fossil fuels on the Transport task. The soon to occur sharp decline in local oil supplies - mainly from Bass Strait - will impact sharply on local prices just as the increased import bill will adversely affect the balance of payments. (Save the Upfield Line Campaign, Submission 78, p.2)

To a large extent the cost of fuel is already taken into account as a cost of providing all transport services. Those modes which are the more energy efficient receive an advantage because their fuel costs are lower. However, rail transport may be unable to exploit fully its energy efficiency advantages. Government policies lead to railways pursuing non-commercial objectives and, as a result, running at a loss so that they cannot raise funds internally to finance investment. They then rely on the government to provide money for new projects and often the government directs them to invest in projects with a high social-political profile. This could leave insufficient funds for commercial projects which might improve their energy efficiency. Adopting the Commission's recommendations, to give railways a more commercial orientation and more control over where funds are invested, would go some way to allowing rail to exploit its energy efficiency advantages.

While fuel efficiency is not strictly an external cost, it was raised by community groups and individuals as an important issue for both freight and passenger transport. Most comments were concerned with the relative fuel efficiency of different modes. Typical of these was:

There is an obvious need to save liquid fuels in the whole transport system by switching more freight to rail and carrying more passengers on rail. Straight cost comparisons between road and rail passenger and freight systems do not consider the effect of imported oil blowing out the Australian deficit by a minimum of \$5 billion by 2000. Nor do they consider the economic impacts from oil flow disruptions if we are too dependent on the volatile Middle East. (Newman and Kenworthy, Submission 54, p.2)

Comparing fuel efficiency between modes

As illustrated in Appendix G there are differing views on the relative fuel efficiency of road and rail freight transport. Comparing the total freight task with total energy consumption shows that rail is more energy efficient than road. However, as pointed out by the Australian Road Transport Federation (ARTF) energy efficiency should be compared on a task by task basis. It estimates that for certain tasks, such as bulk freight for rail and urban freight for road, one mode clearly uses less fuel than the other. It also concludes that in the transport of general freight from capital city to capital city and from capital cities to country areas, road is up to twice as fuel efficient as rail. Many participants were critical of the ARTF's approach. In particular, they criticised the distance used to represent intercity freight and the ARTF's estimate of the fuel efficiency of trucks.

The Commission calculated the relative fuel efficiency of road and rail for freight transported between Sydney and Melbourne. The estimates were based on the ARTF's methodology, the ISC's road and rail distances between Sydney and Melbourne and Dr Philip Laird's estimate of the fuel consumption of an energy efficient truck travelling between Sydney and Melbourne. The results indicate that trains use less fuel than trucks to transport the same volume of freight between Sydney and Melbourne (see Appendix G for details).

Trucks still have a sizeable fuel advantage in transporting freight which is low volume or carried over a short distance, particularly if the alternative rail service would be using low quality branch lines.

Work undertaken by the BTCE (1991) indicates that for non-urban passenger transport, averages over all operations show that bus services perform best, then rail, then cars in terms of megajoules/passenger-kilometre. These results are based on existing services and passenger occupancy rates.

For urban areas all sources indicate that, at current occupancy rates (1.3 persons per vehicle for journeys to work and 2.3 persons per vehicle when used for other private purposes) (BTCE 1991), the fuel efficiency for car transport is considerably less than that of public transport. However, the performance of rail relative to buses is not clear.

The Society for Social Responsibility in Engineering (Submission 5) estimated fuel efficiency per passenger-kilometre for Melbourne and concluded that buses are slightly more fuel efficient than rail transport. The results reported by the BTCE, however, indicate that rail performs slightly better.

Participants have suggested that rail transport could substantially improve its energy efficiency by increasing freight wagon load factors and passenger occupancy rates, and improving rail infrastructure.

The low number of passengers on some non-urban services results in poor energy efficiency per passenger kilometre. In some cases promoting the service and improving its operation would increase the number of passengers and dramatically improve energy efficiency. In other cases less energy would be used if the passengers travelled by coach.

Upgrading the infrastructure would also reduce the amount of fuel used by rail transport. Dr Philip Laird has estimated that upgrading the track alignment and increasing clearances between Sydney and Melbourne would increase the energy efficiency of rail from 1.6ntk/MJ to 3.0ntk/MJ (Submission 114, p.5). A similar point was argued by Action for Public Transport:

... poor energy consumption, transit times and operating costs in NSW are intimately connected with the steeply graded and curvy infrastructure. Thus road performance on reasonably modern infrastructure is being compared with rail on old infrastructure to show that rail has no significant advantages for non-bulk freight and country passengers What if rail speeds were doubled through straighter and less graded tracks in line with the Jacana study for Sydney-Melbourne? Energy would be saved through less cycling through the speed range... (Submission 139, p.5)

In this report the Commission discusses commercialising rail authorities and improving their efficiency. Chapter 12 discusses increasing private investment in rail infrastructure, for example through joint ventures. Such reforms would allow rail authorities to make efficient decisions on where investment in infrastructure is needed and improve their ability to raise money to fund these projects. When assessing proposals to improve rail infrastructure, fuel saving would be one of the factors taken into account.

The Commission strongly supports the creation of the National Rail Corporation (see Chapter 11). Such an organisation, with a strong commercial orientation, would be in a good position to review where investment in infrastructure is needed and to raise funds for that investment.

Effectiveness of rail subsidies in improving energy efficiency

Subsidising rail in order to reduce fuel use would be costly and unlikely to achieve the desired objectives.

A large proportion of road freight services cannot be replaced by rail. Thirty six per cent of road freight traffic movement, measured in tonne-kilometres, is within urban centres (see Table 2.1). Rail is not capable of replacing this traffic. Of the remaining road freight, some is transported insufficient distance, some is too small in volume and some is coming from or going to areas not serviced by rail, making rail impractical as an alternative. Rail is currently competitive with road for some long-distance intrastate movements. However, the traffic where rail could make the greatest inroads is interstate freight which accounts for only 20 per cent of road's total tonne-kilometres (Table 2.1). If 50 per cent of all interstate road freight was dedicated to rail there would be only a 2.5 per cent fall in the total volume of fuel used in non-urban freight transport, and a 1 per cent fall in the fuel used to transport all freight. Therefore, the potential for rail substantially to affect fuel consumption in freight transport is limited.

In addition, if fuel does become more scarce its price will rise. Higher fuel prices will encourage increased exploration for new oil deposits. Higher prices will also make it more expensive to operate fuel intensive modes of transport. This will stimulate changes in driving practices to reduce the amount of fuel used, and increases in the use of more fuel efficient modes of transport. Higher fuel prices will also stimulate research into alternative fuel sources and improved fuel efficiency. The reduction in the amount of fuel used in response to increases in the fuel price is a more efficient reallocative mechanism than government intervention.

Taking all of these factors into account, there is little justification for government to encourage or force traffic to transfer from road to rail. The information on fuel efficiency indicates that the gains may not be as large as some claim. Forcing traffic on to rail when it is not suited to the task imposes large costs on users and/or taxpayers. But improving the efficiency of rail, particularly freight services, will result in increased use of rail for those tasks where it is most suited. This would have the favourable consequence of improving the efficiency of fuel usage overall.

5.2.2 Atmospheric pollution

Atmospheric pollutants are airborne chemical emissions which cause damage to the environment and property or discomfort and illness in people. Appendix G notes that atmospheric pollution in Australia is primarily an urban issue, as it is only in this environment that it significantly affects the health and comfort of people. The ISC estimated that the total cost of road based atmospheric pollution in country areas was \$4 million, compared to \$783 million in urban areas. Cars were estimated to be responsible for urban pollution costs of \$671 million (ISC 1990). The ISC also estimated that the cost of atmospheric pollution in cents per kilometre for cars was 0.006 for interstate and rural journeys, and 0.677 for urban journeys. The cost of atmospheric pollution for diesel powered vehicles was 0.014 for interstate and rural journeys and 1.625 for urban journeys (see Table G.3). The problem of pollution from car emissions was raised by the Town and Country Planning Association.

Motor cars generate more low level air pollution than any other activity with profound implications for human health. (Submission 45, p.12)

Because most urban rail transport is electric powered it causes few if any atmospheric pollution problems. In general, power is generated away from the cities and therefore the emissions of the power stations are not concentrated enough to cause atmospheric pollution problems ⁴.

Reducing road use

It is necessary to consider whether subsidising rail transport is a cost-effective means of reducing atmospheric pollution. For this policy to be effective, increasing rail usage would have to result in a significant fall in car travel.

Studies have indicated that car drivers are relatively unresponsive to changes in rail fares. Therefore, it would be difficult to attract them off the road. For example, Dodgson (1985) estimated for Sydney that a 10 per cent decrease in rail fares would lead to only a 0.08 per cent to 0.16 per cent decrease in road use. These low values arise because:

- many trips cannot be undertaken by rail;
- rail's service is perceived to be poor so that even at very low prices people are not inclined to use it;
- once a person has bought, insured and registered a car the cost of each additional journey is low, making it difficult for rail to compete; and
- the flexibility of car travel is highly valued, so that people are reluctant to change to rail.

Over extended periods of time a larger transfer of existing motorists from road to rail may be possible. However, there is no guarantee that moving these existing motorists off road and on to rail will result in a sustained reduction in road traffic. The initial reduction in road traffic will reduce congestion, particularly into the CBD. This will encourage an increase in car trips and the total number of vehicles on the road may not fall. This is discussed in more detail in Section 5.2.6 on congestion.

Finally, rail transport currently accounts for a relatively small proportion of urban travel to work, from 14 per cent in Sydney to 2 per cent in Perth (see Appendix C, Table C.4). On average it would take a 103 per cent increase in the number of rail trips to facilitate a 10 per cent fall in the number of non-rail journeys, while in Perth it would take a 573 per cent increase in the number of rail trips to facilitate a 10 per cent fall in the number of non-rail journeys. In the short term the rail system could not accommodate the increases in traffic necessary to provide any significant reductions in

⁴ Power stations do emit greenhouse gases which are another form of pollution; see Section 5.2.3.

car journeys and consequently in atmospheric pollution. In the long term an expansion in rail infrastructure would be needed. The costs, both financial and environmental, of such an expansion in a developed city are very high and large guaranteed benefits would have to result. Because such benefits can not be guaranteed, subsidising rail travel alone is not an effective way of reducing atmospheric pollution.

5.2.3 Greenhouse gas emissions

The impact of atmospheric pollution tends to be concentrated in a localised area; a similar problem, but on a global scale is the emission of greenhouse gases. Many participants were concerned about transport's contribution to the greenhouse effect.

Generally it can be said that, from a long term global warming perspective, the transport sector needs to change direction away from an individual-car based society dependent on fossil fuels to a public transport based society utilising renewable sources of energy. (Greenpeace, Submission 36)

The Commission is conducting an inquiry on greenhouse emissions; the draft report was released in August 1991 and the final report is to be completed in November 1991. Policy approaches to the greenhouse effect are discussed in that report.

The important issue for this report is the relative greenhouse emissions of road and rail transport. The amount of greenhouse gases emitted by a mode will depend on how efficiently it uses fuel and what type of fuel it uses. For example,

... Perth's electric trains would only produce about half of the CO₂ emissions per pass-km as Melbourne's, even if the vehicles and occupancy rates were identical. This is simply because, in Western Australia, more of the premium fuel, natural gas is used than in Victoria. (Society for Social Responsibility in Engineering, Submission 5, Appendix 1, p.6)

The BTCE (1991) has estimated the rate of CO₂ emissions for freight and passenger transport (these results are presented in Appendix G). In the transport of freight, rail produces significantly less CO₂ per tonne-kilometre than road transport, however sea performs better than either road or rail. Rail also produces significantly less CO₂ than cars for both urban and non-urban passenger transport. However, the relative performance of rail and buses is not so clear. In the urban case rail produces, on average, slightly less CO₂ than buses. It would be expected that the CO₂ emissions per passenger-kilometre for rail would be much less in peak periods when the rail system is used more intensively, and the relative performance of buses would improve in the off-peak period. On average, non-urban road coaches produce less than half the CO₂ per passenger-kilometre of non-urban rail. These results refer to existing services. If some of the rail services with very low occupancy rates were terminated the average energy efficiency of rail would improve dramatically.

5.2.4 Noise pollution

Many groups believe that noise pollution is extensive,

350,000 people in Sydney are seriously affected and a further one and a quarter million are moderately affected by road traffic noise. You are looking at something like a quarter of Sydney's population are affected by traffic noise. (Peter Mills, Action for Public Transport, Initial hearings, p.242)

Although,

It should also be recognised that rail transport also poses environmental concerns in relation to noise and vibration of freight train movements through urban areas. (New South Wales Coal Association, Submission 31, p.16)

More noise is generated in urban areas than in rural areas, because there is more traffic. Also, because cities are densely populated more people are located close to the source of the noise. Therefore, noise levels are a greater problem in urban areas than in rural areas.

The effects of noise not only vary with the volume of noise but also its pitch and consistency. For example, road noise is more intrusive at traffic lights where vehicles are frequently stopping and starting.

The cost of noise pollution depends on people's exposure to that noise. A study by the OECD has concluded that in most European countries more people are exposed to road noise than to rail noise. Action for Public Transport argued that this is also the case in Australia:

... rails ... probably have fewer route kilometres than main roads. Railways are quite often fronted by roads, factories, etcetera, rather than houses... (Draft report hearings, p.129)

Hence, if it is possible to transfer people from cars to the existing rail system the amount of noise to which residents are exposed would fall. The effect of transferring people to rail may be different if the additional passengers result in new rail lines being built. Building new lines would substantially increase the number of people exposed to rail noise. For instance, during the debate about the Very Fast Train project there was considerable criticism of the increase in noise which would result if the rail line was built through new areas.

5.2.5 Accident costs

Participants were also concerned about the number and cost of road accidents. Many believed that shifting freight and passengers to rail would alleviate the problem.

The cost to the community from road accidents has been conservatively estimated at \$6 billion by the BTCE. No such estimate is available for rail accidents, but rail's record is enviable... (Australian Railways Union, Submission 63, p.5)

The BTCE estimated the cost of road accidents in 1988 to be \$6.2 billion ⁵. This estimate is discussed in more detail in Appendix G. It can be divided into two types of costs: those borne by road users; and those which affect others. This distinction is important for the relationship between these costs and rail services.

Injuries and property damage borne directly by road users involved in road accidents influence their decisions on whether to use road or other transport modes. Insurance premiums also are an obvious means by which drivers face some of the costs of road accidents.

However, as noted in Appendix G, there are other costs (external costs) which go beyond those directly involved in the accident. One of these was identified at the public hearings by Peter Mills from Action for Public Transport,

... you are losing a productive member of society. (Initial hearings, p.241)

The existence of unrecouped external costs distorts peoples' decisions on whether to use road or other transport modes. The size of these external costs is substantially less than the BTCE's estimate of total accident costs of \$6.2 billion, but it is difficult to quantify accurately the external component. In 1987-88 insurance premiums amounted to \$4.4 billion (ISC 1990, Volume 1, p.91). Premium payments can give an indication of that part of accident costs which is internalised to road users. The remaining \$1.8 billion approximates the unrecouped external costs which will encourage people to overuse road services, possibly at the expense of rail.

The comments by Action for Public Transport (Draft report hearings, p.130) were typical of the criticisms of using insurance premiums as a measure of the internalised portion of accident costs. It was said that often the insurance premium facing the individual does not rise with the risk of being involved in an accident. Therefore, it does not change the behaviour of people or force them to consider the costs of accidents. Insurance is paid periodically, only once or twice a year. Once it is paid many drivers do not take it into account when they drive their car. In addition third party personal insurance in most States is a uniform rate across each class of vehicle. It does not vary with the risk of the individual. This is changing in NSW where some private insurance companies are now able to sell compulsory third party personal insurance (see Section 5.2).

Participants expressed particular concern about accidents involving coaches and trucks.

... the community also subsidises road accident costs, and this subsidy is also proportionally greatest in the case of heavy vehicles. (NSW Transport Action Council, Submission 23, p.14)

⁵ The BTCE is currently updating its estimates of road accident costs. This new study 'The Social Costs of Transport Accidents' also will include estimates of the costs of rail and aviation accidents.

In total there are fewer fatalities on rail compared to road (see Appendix G). The Federal Office of Road Safety (FORS) noted that,

... Victorian data ... have shown that rail freight is safer than road freight. (FORS 1990, p.192)

However, not all road accidents can be avoided. Because of the practical difficulties in transferring freight from road to rail the cost of eliminating truck accidents would be prohibitively high. FORS estimated that on the Hume and Pacific highways

... the greater use of rail is irrelevant in at least 49 per cent of crashes, since these were assessed as involving trucks on trips for which rail was not a competitor. This is a valuable conclusion because it indicates that greater use of rail, while relevant to certain traffics, is not a panacea for road crashes (and rail of course is not without its own safety concerns). (FORS 1990, pp.101-2)

However, the Hume and Pacific highways carry unusually high proportions of freight which could potentially be moved to rail. Australia-wide there is much less scope (even less than the FORS estimate of 49 per cent) to reduce crashes by shifting freight from road to rail. The discussion in Section 5.2.1 notes the constraints on rail making appreciable inroads into road freight, particularly under current conditions. However, improving the efficiency of rail transport would increase the scope for rail to compete with road services and reduce the number of road accidents.

Coaches are involved in relatively few accidents for the number of kilometres they travel. FORS estimated that for 1984-85 the fatality rate (fatalities per 100 million passenger km) was 1.3 for cars and 0.06 for coaches. The average fatality rate for rail in 1982-83 was 0.2. Even in 1989, the year of the Kempzie and Grafton bus crashes, the coach fatality rate was 0.2.

... although the two multi-fatality crashes involving coaches in NSW in October and December 1989 will no doubt have changed the picture, the long term history is that coach operations are comparable in safety to rail operations, and may be the safest form of land transport... (FORS 1990, p.193)

The rail fatality data include all passenger services, both urban and non-urban. The fatality rate is likely to be higher on urban trains. Therefore, this average overstates the accident costs of non-urban rail passenger services.

Private motorists are responsible for the largest number of road fatalities and have by far the highest fatality rate. They also account for 77 per cent of non-urban travel. Rail currently accounts for only 4 per cent of non-urban travel. It would be very difficult for country passenger rail services to make any appreciable impact on the number of cars on the road.

5.2.6 Road congestion

The two policies most often advocated to deal with road congestion are to increase the capacity of the system and to raise the price of using the road system in order to ration its use.

Increasing the capacity of the system might be achieved by providing more roads and/or by encouraging the use of public transport so as to reduce the number of vehicles on the roads.

Many authors, including Dr Peter Newman, have written on the self defeating nature of efforts to ease road congestion by building more roads. This is because the time savings freely given to individual vehicles are offset by new traffic which is induced (Action for Public Transport, Submission 40, A Review of the RIC Discussion Paper, Rail into the 21st Century, p.5)

Encouraging the use of public transport will have the same result. Increased public transport use initially reduces road congestion but this lower congestion will lead to more people opting to travel by road and the road situation will not improve. The NSW Roads and Traffic Authority notes that:

... unless efficient and effective road pricing is also introduced, increasing capacity will not manage congestion. (New South Wales Government, Submission 75, Annexure 9, Roads and Traffic Authority)

Appropriate pricing for road use (with higher prices for more congested periods or routes) would result in the greatest use by those people who most value travelling by road. The NSW Roads and Traffic Authority indicated that congestion pricing is technically feasible.

There are various technical ways of implementing road pricing. These range from the imposition of specific tolls for use of certain roads, to fuel levies for recovering the cost of pollution. A Singapore style traffic management scheme could also be used. The use of electronic road user pricing offers new possibilities where specific road users could be charged on the basis of use of the road resource in terms of time of day, vehicle type and characteristics of the drivers. (New South Wales Government, Submission 75, Annexure 9, Roads and Traffic Authority)

The use of rail to carry a greater proportion of urban commuters is not, by itself, a long-term solution to the congestion problems in cities. Less congestion on roads (caused, for example, by subsidising rail passengers) lowers the costs of road use to the user and a consequent increase in travel can be expected. The fundamental cause of road congestion in cities is that road use is not properly priced. The solution to the congestion problem lies more in changing this arrangement than relying on rail to alleviate current congestion levels.

5.2.7 Conclusions on externalities

Some participants argued that rail transport should be subsidised to reduce the use and therefore the environmental and social impact of road transport. The provision of subsidies to rail imposes costs on State taxpayers. Thus the reduction in external costs arising from less road use would need to be sufficient to outweigh these costs.

The scope for rail transport to make substantial inroads into road freight is limited, even with significantly lower rail freight rates. Improving the efficiency of rail freight services may be more effective in decreasing the number of trucks on the highways, reducing accidents and increasing fuel efficiency.

Non-urban rail passenger transport is not unambiguously better than road-based transport from an environmental viewpoint. Coaches can be more fuel efficient than trains, and contribute less to greenhouse gas emissions. This is because of the low passenger occupancy rates on some rail services. Raising occupancy rates would increase the environmental advantages of rail; although raising passenger numbers by increasing the subsidy to rail services is not an appropriate option. Those services with the lowest occupancy rates have the least environmental advantages but would need the greatest subsidies to keep them operating. Non-urban rail passenger services are already heavily subsidised. These subsidies cannot be justified on environmental grounds (see Chapter 9).

The size of the urban transport task means that fuel use, greenhouse gas emissions and accident costs are all important considerations. In addition, atmospheric pollution, noise pollution and congestion are principally urban problems. However, subsidising rail transport alone is an ineffective means of reducing road use: those travelling by car are relatively unresponsive to changes in rail fares; any fall in road use is unlikely to be sustained in the long-term; and rail infrastructure would have difficulty accommodating the increase in rail traffic necessary to reduce road use by any substantial margin.

5.3 Urban infrastructure and land use

The previous sections on external costs concluded that subsidising public transport alone is an ineffective means of reducing the environmental costs of urban road use. However, the environmental and infrastructure costs of sprawling cities are substantial. Successfully tackling these problems requires a coordinated strategy which consists of many arms, one of which is rail transport. If transferring passengers to rail can be combined with policies which promote a desirable urban structure and reduce the number of cars on the road, this would increase the effectiveness of rail transport in reducing environmental problems. This is discussed in Chapter 8.

Achieving a coordinated urban land use strategy is not easy. Often policies contradict each other.

... responsibility for urban planning is spread between state and local government, while the relevant investment and land use decisions are spread between three levels of government in a way which bears little relationship to the distribution of planning responsibility. (Neutze 1988, p.5)

Some policies, designed to assist urban planning, have side effects which work against this objective. Governments subsidise rail fares to try to encourage the use of rail transport and reduce

the environmental costs of road based travel. However, subsidising rail can also worsen the problem of urban sprawl. For example, in Sydney and Melbourne long-distance fares are more heavily subsidised than fares for travel over shorter distances. This encourages people to live away from centralised areas and to commute longer distances to work, shop and socialise.

Participants identified a number of policy options which could be included in an urban land use strategy. Some of these are noted briefly.

5.3.1 Traffic calming

It has been suggested that physical restrictions on the use of cars in the form of traffic calming would make a significant contribution to improving the urban environment.

This [traffic calming] is a multitude of techniques designed to ease the impact of traffic on both residential streets and main roads. (Newman and Kenworthy, Submission 54, Cities, Transport and Greenhouse - Expectations and Practical Solutions, p.8)

Traffic calming involves techniques such as reducing speed limits, redesigning roads to force motorists to travel at a slower and more even pace, discouraging the use of cars and increasing the use of public transport.

It is beyond the scope of this reference to consider the application of traffic calming, although as part of a total package it appears to offer many benefits.

5.3.2 Pricing externalities

One approach advocated to reduce environmental problems in urban areas, such as pollution and congestion, is to introduce charges on road users. Some have advocated taxing emissions through registration charges or fuel taxes. The ISC (1990) for example recommended using a fuel levy to charge for the external costs of road use. The NSW Roads and Traffic Authority supported the view that road users should be charged for the costs they impose on others.

The RTA generally subscribes to a "user pays" philosophy. In so doing it also believes in charging for not only use of the road resources but also for congestion and air pollution. The Authority fully endorses the environmental levy proposed by the ISC report... (New South Wales Government, Submission 75, Annex 9, Roads and Traffic Authority)

However, it also believed that it is currently not politically possible to introduce direct charges for external costs.

At present, the [road using] community is not prepared to pay for the externalities of road travel. While there is an increasing focus in the public on environmental matters, a substantial increase in road use charges to decrease congestion and emissions is unlikely to win many votes. (New South Wales Government, Submission 75, Annex 9, Roads and Traffic Authority)

If charges are to be used to reduce activities which generate external costs, information is needed on where the cost is a problem and who are the people responsible. With pollution for example, it is difficult to identify the vehicles responsible for pollution because the amount of pollution varies with the vehicle type, the method of driving, driving conditions and weather patterns. Depending on atmospheric conditions, vehicles travelling in the outer suburbs do not have as much of an impact on the level of pollution as those travelling into the city.

However, as noted in Section 5.2.6 the technology and information is available to make pricing a more feasible option. Where the technology is available and the administrative costs are not too high charges should be used. Currently it is not possible to charge for all urban externalities, but as technology improves the scope to introduce direct charges will increase.

5.3.3 Parking

Australian capital city CBDs contain between 168 parking spaces per thousand CBD workers (Sydney) and 252 per thousand (Brisbane). Some councils subsidise city parking spaces. This provides a clear incentive for people to drive their cars into town rather than taking public transport. Such a policy is inconsistent with existing rail subsidies designed to increase the proportion of city travellers using public transport.

The provision of free parking at rail stations may attract more rail users, but it ties up land which could be used for more productive purposes. Sensibly, parking is usually not provided at the more centralised stations, only in the outer areas where the opportunity cost of the land is lower.

The Town and Country Planning Association criticised the rail authorities for not taking a more flexible approach to access to railway stations. They argued that secure storage for bicycles should be provided, at an appropriate price. Car parking at stations is free in most cases, while permission to construct secure bicycle storage has been refused.

... I get the general feeling that the overall philosophy in the railways is, well, the railways exist to serve the needs of motorists. (Draft report hearings, p.116)

5.3.4 Rail-based urban villages

Some participants suggested that Australia should work towards the long-term objective of redesigning its cities along the lines of urban villages:

The Australian Government must begin to recognise the key role which rail has to play in developing more energy-efficient and land-conserving cities. As a matter of urgency the Federal government should introduce a programme which encourages and facilitates in every State the development of rail-based urban villages and sub-centres which demonstrate not only the efficiencies in land and energy, but also the superior liveability of such environments for all sections of the community. (Newman and Kenworthy, Submission 54, p.6)

Urban villages would be situated along rail corridors to facilitate travel by rail and contain most of the facilities people need to reduce travel overall.

It was suggested also that cities should develop several business districts to reduce the need to travel to one central area.

Both the current and previous state government have adopted a policy to develop Parramatta as a second CBD along with other regional commercial centres... The extent to which this is achieved will largely depend on adequate transport links... With the present traffic problems in Parramatta and associated bus operation difficulties, it is highly unlikely that this target will be achieved without major improvements to the rail network. (Jacana 1990, pp.8-5)

It is beyond the scope of this reference to consider these options in detail. However, the current practice of providing some of the largest subsidies to those commuters travelling to the central CBD appears to discourage the development of alternative business centres, and encourage the sprawl of cities.

It is also clear (see Chapter 8) that rail transport requires a degree of density of use (and thus density of population) if intraurban rail transport is to be efficient. Without adequate density, the lower cost and higher flexibility of buses compared to trains, mean that using buses would be more resource efficient.

5.3.5 Conclusions on urban infrastructure and land use

In most large cities there is a role for both road and rail networks to service the transport needs of the population.

The basic difference between road and rail transport in urban settings is that roads tend to disperse development while rail tends to concentrate it. This is why urban rail offers potentially large economies in the use of land and energy. (Newman and Kenworthy, Submission 54, p.3)

Rail transport is most important in cities the size of Sydney, Melbourne and perhaps Brisbane. In smaller cities it is much harder to achieve passenger densities sufficient to make the railway financially viable. Also, the environmental costs of road based transport are less in smaller cities; so there is less justification for subsidising rail to try and transfer traffic from road to rail.

As noted in Section 5.2.7, subsidising rail services alone is not an effective means of reducing the social costs of urban road transport. Subsidies to rail transport would be more effective in reducing the social costs of road use, if they were part of a coordinated policy. In Australian cities the current policy approach to rail and road use does not appear to be part of such a strategy. In fact, policies such as subsidising parking and not charging directly for external costs encourage the use of road transport, and therefore exacerbate environmental problems.

A coordinated strategy should include policies directed at reducing the use of roads by restricting traffic to the levels for which the roads were designed, better road pricing, reducing subsidised parking and developing an urban structure which decreases the need to travel. An efficiently provided rail service, offering an alternative to road travel, would be a major part of such a package in the larger cities.

5.4 Regional implications of changed rail services

From Federation until the Second World War, rail was the vital link between Australia's primary producers and their export markets. The fate of rural communities became inextricably tied to the railways. However, changes in technology (including improved road infrastructure) and deregulation of road transport have meant that rail freight now faces more competition from road freight. Consequently, some branch lines and certain services have become uneconomical and risk closure. Most systems have closed low volume lines in the last few years. This may have serious implications for some rural communities, although no definite conclusions can be drawn for any particular region without having detailed information on its socioeconomic characteristics and its interrelationship with other regions. The Bathurst City Council is concerned about the impact on their region if the National Rail Corporation chooses to send freight from Sydney to Adelaide and Perth south via Melbourne instead of west.

Should the National Rail Freight Line bypass this region then in all probability it may only be a matter of time before all rail services to the abovementioned cities could cease... As a result the economic viability of this region would be put at great risk. (Submission 118)

The possible effects can be classified as: employment; regional income; rail transport services; and local government road expenditure. The employment issues are discussed in Chapter 7; the others are treated here.

5.4.1 Regional income

In large regions with a low reliance on rail services the real effect on the local economy of closing these services will be small. This is also true if the local economy is highly integrated with other regions so that the impact of local changes is dissipated.

However, where the railway generates a substantial proportion of local employment, the income of the regional economy will fall noticeably - at least in the short-term - if rail jobs are lost. This impact would be alleviated by redundancy payments, the level of personal wealth, unemployment benefits and other social security payments. However, it may still adversely affect economic activity in the area. It may also reduce the ability of the local economy to resist economic downturns in the future. Public sector employment has tended in the past to be relatively stable and therefore places a floor under local employment and income.

Despite these problems, stability in public sector employment is not desirable for its own sake. It may impede the movement of resources to more productive uses elsewhere in the economy. Such movements will increase national output, despite the decline in the local economy.

5.4.2 Rail transport services

It is argued that regional rail services have a value to a local community which is not reflected in their use of the line.

They are a link with history, they are a tangible link with the rest of the country, they are an existing asset in which the community has already invested time and money, they provide employment directly and indirectly and they are used one way or another by most of the community. (Taylor, Submission 26, p.10)

The community's demand for rail has two parts: a market demand reflected in patronage; and an option demand which cannot be captured through fares. Decisions to remove rail services based on their direct revenue alone can result in the closure of some services which would be viable if all of their benefits were taken into account.

Recognition that the community values rail services more than is reflected by actual use should be considered when closing branch lines. However, it does not justify maintaining services through general subsidies from the State's taxpayers. A community facing the prospect of a line closure should be given the option of maintaining the rail service itself (see Recommendation 6.1). The Australian Local Government Association (ALGA) argues that,

... where closure of a branch line is being contemplated, Local Government and the community should have a right to look at and to negotiate on options. (Submission 81)

The Commission understands that when Bourke (NSW) Shire Council attempted in 1989 to retain a rail service on the Nyngan-Bourke line (which had been losing \$1.5 million per annum and required capital expenditure), both the Premier and the SRA were supportive of proposals from the Council or private enterprise to take over the line. In the event, no proposal was put into effect.

The principles for local councils funding rail services, which are discussed in Section 6.3.4, can be applied to this example were the local community places a value on the rail service which is not reflected in the use of that service.

5.4.3 Local government road expenditure and road externalities

Branch line closures (or service reductions) can result in more heavy vehicles on local roads; the consequent pavement damage can add significantly to local government road expenditure. Heavy vehicles travelling through country towns can also impose large noise and pollution costs on the local residents. The ALGA, taking a national perspective, commented as follows:

In looking at the economies of closing the branch line, the cost of upgrading the road alternative to a standard where it can do the same job efficiently needs to be taken into account. From the perspective of developing a rational transport system, the economics of saving public expenditure by closing a branch line might be illusionary if the net result is a requirement to increase public expenditure on roads. (Submission 81)

The issue is well illustrated by AN's closure of the Gladstone to Wilmington line in South Australia. AN operates as a commercial business and is unable to take into account increased damage to local roads when deciding upon rationalisation of its network. When AN lost the contract to transport grain there was a large increase in the number of trucks travelling on local roads such that the District Council of Mount Remarkable estimated a doubling of the maintenance cost of a 21 km length of local road. The estimated additional costs were \$140 000 (in 1990 prices) every four to five years (ALGA, Submission 81). If the cost of such road damage had been included in the cost of road transport, sufficient traffic may have been retained on the rail line to warrant keeping it open. The Commission has been informed by that council that local government legislation in South Australia does not provide local councils with sufficient power to impose specific charges on the principals ultimately responsible for heavy trucks causing road damage. In this case the council resolved its problem by obtaining the cooperation of the grain handling authorities who instructed their road haulage contractors to keep off that particular local road. The additional grain truck traffic is now limited to arterial and State roads which are deteriorating more rapidly than before. Thus, costs borne initially by AN were effectively transferred to a local government body, and then transferred to the State government.

The Commission recommends the modification of road user charges (see Recommendation 5.1) in order to overcome, in part, such problems. However, implementation of that recommendation would result in road charges only approximating the average damage caused by heavy vehicles on arterial roads; it is not designed to compensate for concentrated damage to local roads, nor any external costs. In addition, the distribution of road funds to State and local governments does not yet appear to be flexible enough to account for relatively localised or short-lived abnormal use, by heavy trucks, of local roads. Many rural communities are also very concerned about the environmental impact of heavy vehicles, particularly those carrying bulk freight.

The Commission sought the advice of the Australian Local Government Association as to whether or not local governments are able to impose specific charges for local road damage. In Victoria, Queensland, South Australia and Tasmania the local government laws include provisions for permits and associated charges, but typically they have not been used because of legal opinions that it would be necessary to attribute particular road damage to individual trucks. The principals for whom haulage is provided are not liable under the current arrangements. There are no provisions in Western Australia or the Northern Territory for local governments to impose specific charges on heavy trucks.

In the case of NSW, the power to levy charges for road damage was removed with the introduction of a State-wide excess load permit system. More recently a policy has been developed to address the problem of general road user charges not adequately taking into account the damage to roads caused by new coal mining projects. The Roads and Traffic Authority has recommended that a levy of 3 cents per net tonne-kilometre be applied to those new coal projects which will result in significant damage to local roads. This policy goes some way to redressing the problem but it is not an ideal solution: it does not take into account the different levels of costs imposed by different projects; it only applies to road damage costs and not environmental costs; and it only applies to coal mines and not to other forms of bulk road transport which can generate similar costs.

Participants disagreed on how the problem of local pavement damage and external costs should be tackled. Some supported the Commission's draft recommendation that direct charges should be imposed on heavy vehicles causing excessive damage to local roads.

The Council agrees as we feel that in outlying areas of NSW and other States the cost of providing roads for 40-50 tonne trucks would place an unfair cost on the community and should be borne by the user. (Commuter Council, Submission 144)

Others strongly disagreed arguing that:

- some local governments would abuse the system and impose excessive charges to raise revenue;
- the policy would be administratively difficult to implement and police; and
- projects, which impose large costs on the local community but would benefit Australia as a whole, may be stopped by high local road charges.

Not all State governments commented on the recommendation. Those which did supported it in principle but noted that it could be difficult to implement.

The risk of local governments overcharging is greatest when charging for externalities because externality costs are harder to quantify directly and recover equitably than pavement damage costs.

Problems may also arise if the project imposes substantial costs on the local community but also has large benefits for Australia as a whole. High local charges may make such projects unprofitable when it would be in the national interest for them to proceed.

If Recommendation 5.2 is accepted, a process of appeal may need to be provided to settle disputes between the local government and the principals for whom the road haulage is provided. This process could allow for an arbitrator to intervene where there is a dispute over the size of externality charges or whether a project should proceed in the interest of the wider community.

As an alternative to direct charging, some participants suggested that the method of hypothecating funds should be improved so that local governments are fully reimbursed for the damage heavy vehicles do to their roads.

The real issue regarding local roads and road freight transport are their classification and efficient flow of funds to local government. There may be local roads that should be classified as arterial roads removing burden of maintenance and construction from local councils. (ARTF, Submission 124, p.9)

Reimbursing councils for the cost of repairing road damage will solve their financial problem, but it is not an ideal solution. When transport companies decide which route to take they should be faced with the full cost of travelling along local roads. A transport company may have two options, one on a local road and another, longer route, primarily on arterial roads. The company may wrongly choose to take the shorter route unless it faces the full cost of damage to the local road.

RECOMMENDATION 5.2

The Commission recommends that State and Territory laws be amended to provide local governments, for all roads under their control, with effective capacity to impose specific pavement damage and externality charges on heavy vehicles. Such charges should be levied on the principals for whom the road haulage is provided. A process of appeal should be set up to settle disputes between the local authority and the principals responsible for the pavement damage or externalities.

6 RAILWAY FINANCING AND CAPITAL INVESTMENT

Government railways are characterised by large, declared financial losses which amounted to \$2.1 billion in 1989-90 and have exceeded \$20 billion in aggregate over the past ten years. Railway losses account for about one third of State sector debt. these figures considerably understate railways' full losses which the Commission estimates exceed \$4 billion each year. While these losses are borne by taxpayers and the community, only a portion of the net costs can be justified by the social benefits of railways. Reforms already implemented and planned are not expected to reduce the financial losses to a level commensurate with the non-financial benefits of rail services.

The continuing deficits of railways stem mainly from government intervention in railway operations for non-economic reasons. Such intervention is apparent in excessive operating expenditures and a misallocation of capital expenditure. Railways must be given a more commercial orientation. Essential elements are more appropriate payments from the beneficiaries of rail services, increased private sector participation in the provision of rail infrastructure and other capital investments, their exclusion from Commonwealth Grants Commission assessments and, when railways adopt a more commercial orientation, their exemption from Loan Council borrowing restrictions.

6.1 Railway deficits

In 1989-90, the aggregate deficit for Australian government rail systems was around \$2.1 billion (see Table 6.1). A little over half of the deficit is attributable to urban rail systems, mainly in Sydney and Melbourne. About one quarter of the total rail deficit is attributable to passenger services outside urban areas, and the remaining quarter to freight services.¹ The only profitable activity of most railways, indeed, is bulk freight.

This estimate, which is based on an ABS compilation of the accounts of the various rail systems, understates the true extent to which railways draw on public finances. For the reasons set out in this section, the Commission has concluded that the overall deficit is likely to exceed \$4 billion per annum.

Rail systems in aggregate had managed to break even during the 1950s and 1960s but substantial deficits emerged in the following decade. In real terms, the total deficit increased five-fold between 1968-69 and 1979-80, principally because of substantial real declines in freight rates over that period combined with a failure to adjust adequately for large rises in real wages (ARRDO 1981, pp.25-26).

¹ Based on shares provided in Railway Industry Council (RIC 1990a, pp.10, 13) for the year 1986-87; there is no evidence of substantial change in the shares since then.

In the early 1980s the total deficit rose further: in real terms (constant 1989-90 prices) it increased by 50 per cent between 1980-81 and 1983-84 (see Table 6.1); some decline from the historically high deficits of the mid-1980s is evident in recent years. But large deficits persist despite substantial reductions in rail workforces with allied increases in productivity and, in some systems, a wide range of other reform measures; rising interest costs worked against any improvement in financial performance. The failure in recent years by railways to reduce more substantially their demands on public funds raises doubts about the adequacy of those reforms.

Table 6.1: Railway deficits a, 1980-81 to 1989-90

<i>Year</i>	<i>Current prices \$ million</i>	<i>Constant (1989-90) prices^b \$ million</i>
1980-81	768	1 533
1981-82	955	1 711
1982-83	1 213	1 960
1983-84	1 548	2 338
1984-85	1 618	2 311
1985-86	1 708	2 277
1986-87	1 742	2 164
1987-88	1 655	1 916
1988-89	2 223	2 357
1989-90	2 100	2 100

a Deficits are estimated as operating expenditure including interest payments and depreciation, less operating revenue excluding subsidies. State components of these ABS-based estimates are provided in Appendix C, Table C.10.

b Conversion of current price estimates to constant prices was based on national accounts implicit price deflators for non-farm GDP.

Sources: ABS unpublished statistics; Commission estimate for 1989-90.

- The \$2.1 billion deficit in 1989-90 is the net of \$6.1 billion in disclosed total costs and \$4.0 billion in revenue (excluding subsidies).
- Cost recovery overall is thus around 65 per cent.
- Accumulated railway losses account for about one third of State sector net indebtedness which amounted to \$65 billion as at June 1987 (later estimates not available)

The Railway Industry Council (RIC 1990a) has made some projections including a ‘base case’ which assumes the implementation of reforms set out in corporate and strategic plans for all systems. That projection suggests a total rail deficit in the year 2001-2 only some 25 per cent less than the actual real deficit in 1986-87. Even if such a reduction were achieved, railways over the next ten years would add to public debt an amount not significantly less than that added during the 1980s.

Travers Morgan has provided estimates (Appendix K) indicating \$1.2 billion per annum in potential savings in operating costs if Australian railways were to adopt international best practices. Total savings would be greater because of the more efficient use of capital (and thus reduced capital cost) from adopting best practices, but would be reduced to the extent that new capital is required to achieve best practices. Travers Morgan also reported that much larger savings would be achieved, if structural reforms were implemented (for example, closing unprofitable lines and removing some country passenger services). Nevertheless, the conclusion is that a substantial part of the unprofitability of rail services is 'simply because they are performed inefficiently' (Ewen Michael, Submission 122, p.2).

It is emphasised that the Commission is not here arguing for the complete elimination of these deficits. The measures in Table 6.1 exclude from revenue any subsidy payments from governments because the purpose here is to gauge the impact on State finances of railway operations. Of course, there will be some services that governments will chose to subsidise, under contracts with the railways, for perceived equity reasons. While it is not possible to quantify the net social benefit obtained by the community from railway services, the Commission judges them to be considerably smaller than the financial deficits of the railways. While the facts presented above indicate how large are those measured financial deficits, there is substantial evidence that the true costs that railways impose on the community are considerably greater.

Modifications to the estimated railway deficit

There are four principal reasons why the estimate for 1989-90 of \$2.1 billion understates the extent to which railways add to public debt:

- it does not properly account for losses incurred by rail services in Queensland, Western Australia and in metropolitan Adelaide;
- part of railways' recorded revenue is attributable to their monopoly powers rather than the efficient provision of rail services;
- much railway capital is provided without charge by governments; and
- governments occasionally free railways of accumulated debts.

The **State breakdown** of the overall estimate as provided by the ABS (see Appendix C, Table C.10) indicates the rail system in Queensland operated with a small surplus in 1989-90, that in Adelaide just covered its costs, and that in Western Australia recorded only a small deficit. There is ample evidence to the contrary. Examination of the accounts of these rail systems and analysis of 1989-90 deficits of State government business undertakings published by the Commonwealth Grants Commission (see CGC 1991, p.130) suggest that together these three rail systems generated deficits amounting \$300 million in 1989-90.

Secondly, all the rail systems exercise some degree of **monopoly power** to boost their revenues. The effect is most obvious in Queensland (and to a much lesser extent in NSW) where the rail deficits are reduced by coal freight rates that are well above the cost of providing rail services plus some reasonable profit. These ‘excess charges’ cannot fairly be regarded as rail revenue, as is recognised by the Queensland Government.

Coal and mineral rail freight rates are more than simply a charge for carrying out a transport service, they are also a means of deriving an additional royalty from the development of the State's coal and mineral resources. (Submission 50, p.27)

Using conservative assumptions, the Commission estimates that about \$400 million of rail revenue in Queensland and NSW could be regarded as mining taxes rather than rail revenue.

Thirdly, in NSW, Victoria and Queensland, the true costs to the taxpayers of providing rail services are disguised by the practice of funding some capital expenditures free of any charges. While the governments may regard such transactions as purchasing additional equity in the rail systems, such funding does not have the typical characteristics of equity, for example no dividend is required to be paid by the railways on these funds. In NSW capital expenditures for the urban rail system and for the country and interstate passenger services, which are treated basically as community services, are met by government grants which are free of any interest, dividend or repayment obligation. Similar arrangements apply in Victoria. In NSW and Victoria, only those rail capital expenditures applied to commercial services - as defined by government - are funded by borrowings on which interest must be paid by the railways. In Queensland the situation is less clear; QR's accounts include a substantial provision for debt charges, but some \$600 million worth of projects have been funded by non-repayable grants (Queensland Department of Transport 1990, p.56). Westrail and AN appear to operate on a much more commercial basis with only a relatively small share of capital expenditure funded by grants or interest-free loans.

Had the NSW, Victorian and Queensland rail systems accounted properly on a commercial basis for all capital expenditure, the aggregate financial performance would have been considerably worse than estimated in Table 6.1 (and in Appendix C). An indication of the magnitude of this effect is given in Table 6.2.

Thus, the aggregate deficit as recorded by railways should be increased by another \$600 million to make an allowance for capital servicing costs which are not included in railway accounts.

Table 6.2: Debt servicing of railway capital expenditure not included in railway accounts

	<i>NSW</i>	<i>Victoria</i>	<i>Queensland</i>
		(\$ million)	
Estimated capital expenditure (historical cost basis) 1980-81 to 1989-90 ^a	3 800	2 300	2 500
Estimated capital expenditure not funded by borrowings	2 700	1 700	600
Notional annual debt servicing cost assuming a nominal 12 per cent annual interest rate	320	200	70

a See Appendix C, Table C.11.
Source: Commission estimates.

Fourthly, it is not uncommon that when the accumulated debt servicing costs of commercial rail projects become relatively large, State governments extinguish the debt, possibly in exchange for railway surrender of ownership of surplus assets sold subsequently.

This happened most recently in July 1989 when financial restructuring of the SRA involved the assumption by the NSW Treasury of \$2.5 billion in outstanding loan liabilities (SRA 1990b, p.43). As a result of this debt/equity swap, interest paid by the SRA fell from \$498 million in 1988-89 to \$3 million in 1989-90. This suggests that a very high rate of return was being earned by those assets, or that the assets swapped were not valued at market prices, or that there previously was no real link between the nominated assets and the interest paid by the SRA. An additional complexity is that the assets remain in the care of (if not the control of) the SRA which is not paying the owners any rent for their use. To take this into account, an amount of \$550 million has been included in the SRA's component of the \$2.1 billion deficit for 1989-90 shown in Table 6.1.

No such adjustment has been made in respect of the indebtedness of the former State Transport Authority and the Metropolitan Transport Authority which was extinguished when the Victorian Transport (Amendment) Act 1986 came into effect. Based on the capital expenditure and interest payment data provided in Tables C.11 and C.12 of Appendix C, it is possible to estimate the additional total interest cost had not those debts been written off on that occasion. The additional cost in 1989-90 would have been around \$400 million which is a railways' cost borne by, but effectively hidden from, the taxpayers of Victoria.

Taking into account the four principal modifications discussed above suggests an aggregate rail deficit of almost \$4 billion each year. More than 80 per cent of this deficit is attributable to the NSW and Victorian rail systems.

Perspectives on a rail deficit of \$4 billion per year

- Aggregate deficits of \$4 billion per year are of the same magnitude as total railway revenue.
- \$4 billion annual deficit is equivalent to a levy on Australian taxpayers of \$12 million per day, or \$15 per household per week. There is a substantial subsidy from households that don't use rail services to the small proportion of households that do.
- \$4 billion annual rail deficit compares with all State and local government sector deficits combined which in recent years averaged around \$4 billion per year.
- If such railway deficits could be eliminated, the States could redirect the funds by (for example) doubling total new capital expenditure on education, health facilities, and public housing.
- If the railway deficits could be eliminated, payroll taxes (for example) could be reduced by two-thirds and still leave State finances in aggregate unchanged.

The Commission has not attempted to estimate the extent of the addition to railways' deficits which would be evident if more realistic accounting practices were used by railways, for example, for unfunded superannuation schemes.

Furthermore, as discussed in Section 6.2.4, the community should expect some return on the substantial assets it has in railways. Using a relatively low estimate of rail capital stock of \$10 billion (EPAC 1991), suggests that a cash flow of up to \$1 billion per annum should be generated. The Commission's estimate of capital stock, the derivation of which is described in Appendix E, is around \$15 billion for all Australian government-owned railways. Thus, while the Commission is not arguing for elimination of rail deficits, it also points out that the current financial performance of rail services may be more than \$5 billion per annum worse than if they were provided by viable commercial ventures.

Although governments continually pressure rail systems to minimise their call on public funds (and yet often restrict their ability to do so), deficits for most systems ultimately are simply funded from the community's taxes. This practice dampens the incentives for cost minimisation and efficient supply of services that typify a commercial environment in which entrenched financial losses must be eliminated. **Such deficit funding by governments is one of the most unsatisfactory aspects of rail operations.**

The fact that most capital funds for commercial rail services typically are borrowed and must be serviced provides an element of commercial discipline. The practice of funding investment for passenger services by 'equity' injections (from which the government has no expectations of any dividend) or interest-free grants removes much of that discipline and does not provide the necessary rationing to ensure efficient use of the funds. Financial assessment of projects before they are undertaken is a necessary discipline, but may not provide adequate accountability years after the project is operating.

Of all the rail systems, AN and Westrail seem most heavily dependent on borrowings to fund capital expenditure. AN obtains only minor equity injections from the Commonwealth Government; in recent years Westrail has borrowed two-thirds of funds needed for capital expenditure (WA Government, Submission 43, p.33). In this respect, these two railways are more commercially oriented than the other systems. In presenting their submissions to this inquiry, both emphasised that a shortage of capital expenditure does impair their efficiency, and that their limited ability to service the capital was the major constraint. However, these two rail systems have achieved substantial deficit reduction - in real terms to levels approximately one-fifth those in 1983-84 (AN 1990, p.77 and WA Government, Submission 43, p.14). This is in stark contrast to the overall situation illustrated in Table 6.1. Related to such improvements are the relatively favourable results for these two rail systems in terms of total factor productivity after adjustments for scale and output composition - see Appendix E, Figure E.5. The Commission suggests that the relatively favourable performance of these two rail systems over the past decade is attributable in part to their commercial orientation, including their funding and accountability of capital expenditure. Indeed, AN commented that

tight control of the capital program, and hence interest charges, has been a major factor in our reduction of the deficit. (Submission 64, Appendix, p.21)

The Commission concludes that steps must be taken, first to acknowledge the extent to which railways are adding to public debt, and then to alleviate that burden. The first steps in this process involve railways and governments properly accounting for rail services, with particular attention to capital costs. The recommendations in Chapter 3 on incorporation of railways and the formal contracting of rail services to provide community services would facilitate these changes. The magnitude of the task requires a more commercial approach both to costs of provision of services and to prices charged.

Reflecting the importance of capital investment to such a commercial approach, the remainder of this chapter addresses investment criteria and constraints, sources of capital funds and the role of the Commonwealth in railway financing.

6.2 Investment decisions and asset management

6.2.1 Investment priorities and constraints

The Commission is aware of tangible evidence of inadequate capital expenditure in parts of railway systems such as signalling equipment so old as to be unreliable and railway track in need of realignment consistent with modern operating capacities. However, given that total capital expenditure in railways appears to have been at a tenable level (see Table 6.4), the suggestion is that railways may have suffered from a misallocation of capital expenditure between different segments such as passengers and freight, rollingstock and infrastructure.

For the State-owned rail systems, political considerations seem to play the dominant role in determining the magnitude and nature of railway capital expenditure. Nevertheless, each rail system has a formal procedure for assessing and ranking investment projects. The relevant transport department plays an important role and rail projects have to compete for limited funds with a wide range of other government investments.

QR, Westrail and AN spelled out the consequences for efficiency if capital investment cannot be financed.

QR noted rail's inferior competitive position because modern weight-saving wagon technology cannot be implemented rapidly enough to match similar road transport innovations. QR said that its efficiency and competitiveness is also reduced by the fact that its main track routes cannot handle the long, heavy, fast trains necessary to compete effectively with road transport (Submission 50, pp.16-17).

Westrail noted its strenuous efforts to prioritise discretionary capital works. Adverse consequences of funding constraints are that profit-earning or cost-reduction projects are delayed, planning and construction costs tend to be greater for deferred projects, and there is discrimination against projects with long-term benefits even though the benefits might be relatively large (Submission 43, p.35).

AN emphasised the substantial penalties in efficiency of using old rollingstock with low-speed bogies, the maintenance and fuel costs of their aged locomotives compared with new replacements, and the potential time (15 per cent less transit time between Port Augusta and Kalgoorlie) and fuel savings that can be achieved with modern communication systems (Submission 64, pp.39-41).

Apart from constraints on raising capital and servicing the debt, there appear to be few impediments to the introduction of **new technology** (terms of reference 3a). The effectiveness of any new technology would be just one of many factors in the calculation of the rate of return of any investment. In some cases, low technology investment may be attractive: AN quotes a 25 per cent internal rate of return for replacing wooden with concrete sleepers on 100 km of track between Adelaide and Serviceton. Projects embodying new technology with high rates of return include

AN's advanced train control system, Austrac (Submission 64, pp.39-44). An important point made by AN is that fragmentation of the Australian rail industry does impede introduction of new technology:

... differing standards for track infrastructure, equipment and operating standards seriously diminish the ability to exploit fully the advantages of new technology. Single ownership of track and above rail infrastructure would significantly improve rail's ability in this regard. (Submission 64, p.43)

Tariffs on imported railway locomotives, rollingstock and equipment are currently 17 per cent and, consistent with general tariff reductions, will be reduced to 15 per cent by June 1992 and further to 5 per cent by 1996.

Additional protection has been given to Australian-based manufacturers of such equipment by various government purchasing policies. A National Preference Agreement signed by the Commonwealth and State governments in 1986 prohibited the granting of preference to manufacturers on a State or Territory basis, but governments continued to give preference to Australian and New Zealand goods (thus, the Commonwealth applied a notional discount equivalent to 20 per cent of the Australian and New Zealand content of tendered goods). Although the Commonwealth Government terminated its preference purchasing policy in 1989, State policies continue to give preference ranging from 10 to 20 per cent to Australian and New Zealand manufacturing. QR noted that such purchasing preferences apply only to governmental organisations thereby putting it at a disadvantage relative to its private sector trucking competitors (Submission 50, p.18). The Commission notes that such policies also provide hidden subsidies, paid ultimately by taxpayers, to Australian manufacturers of railway equipment. This dampens the manufacturers' need to remain as competitive as possible. For such reasons the Commonwealth terminated its preferences, but distortions and allied inefficiencies remain so long as State preferences persist.

The SRA claimed that it can be cheaper to import fully assembled passenger trains, even after adding tariff and purchasing preference margins, than to manufacture the trains in Australia. But the SRA also informed the Commission that, with regard to locomotives and freight wagons, standard US models have required extensive and costly design modifications in order to:

- avoid fouling platforms, tunnels and bridges;
- meet the lighter axle loading limits and more sophisticated bogie springing required for the lighter Australian rail and track structures;
- include what are options in the US but are treated as essential in Australia - these include, for example, dynamic braking, air conditioning and vigilance control; and
- provide cabs and controls for two drivers rather than one - this alone adds 10 per cent to the cost of a locomotive.

Referring to locomotives, AN stated that

the cost of imported models from the US is competitive with locally produced derivatives of US designs, once the cost of importation and of representation for spares/service are added in. The problem with using imported locomotives is that there can be problems with spares and maintenance and technical support may not be reliable. (Submission 64, p.42)

The Commission asked participants what scope there is for improved railway efficiency through standardisation of equipment (terms of reference 3c). Australian National Industries Limited (ANI) provided a particularly useful submission addressing this issue. ANI noted that, in contrast to the diverse demands of Australian railways, privately owned railways in the US typically accept standard designs set by the American Association of Railroads. ANI said that in Australia:

- the greatest standardisation gains will come from interstate rail freight services;
- there is scope to reduce 20 bogie designs to three, 24 wheel designs to six, and 30 different couplers to three or four;
- but production large enough to satisfy the domestic market will not be able to match costs of overseas manufacturers; and
- uniform operating and maintenance procedures throughout Australia are likely to provide the greatest savings (Submission 76, pp.4-10).

ANI argued that there is much duplication throughout Australia of facilities to produce and maintain railway equipment, and that efficiency will not be achieved until the government-owned facilities are exposed to competitive pressures. Having the original suppliers of railway equipment also do the maintenance would enhance efficiency, said ANI. The Commission notes, for example, that the SRA's capital expenditure program includes provision for construction of a major locomotive maintenance facility. The SRA is understood also to be considering a possible maintenance contract with a locomotive supplier; it is not clear whether such a contract would have the desirable effect of conserving capital funds otherwise needed for a maintenance facility.

6.2.2 Leasing

An important decision for railways undertaking capital investments is whether equipment should be purchased or leased. Two reasons why leasing may be favoured are:

- tax advantages for the lessor may allow leases to be cheaper than standard borrowing arrangements; and
- where Loan Council borrowing limits are effective (see Section 6.5.3), State governments may favour 'operating' leases, for which the lessor is responsible for all maintenance and servicing, and which fall outside those limits.

Prior to 1984-85, leasing of railway capital equipment was a relatively cheap funding device because the Australian lessor was able to benefit from tax advantages even when leasing equipment to a tax exempt statutory authority. However, the tax arrangements were subsequently tightened and eliminated this advantage (Western Australian Government, Submission 43, p.34). Indeed, AN has indicated that currently:

... domestic leasing transactions are not cost effective for tax exempt authorities. Such bodies can expect to pay around 2 per cent more per annum for such financing compared to optimal funding alternatives. (Submission 64, p.45)

International or 'cross-border' leases, where the benefits emanate from other countries' tax laws, remain attractive. But the extensive and expensive documentation required means that only relatively large lease transactions are worthwhile (AN, Submission 64, p.45).

The Victorian PTC has been heavily involved in leasing of railway rollingstock. As at 30 June 1990, two-thirds of the PTC's rollingstock (\$0.8 billion of a total valuation of around \$1.2 billion) was subject to lease arrangements (Victorian Auditor-General 1990, p.34). During 1989-90 alone, sale and leaseback arrangements for transport equipment (mainly for railways) amounted to \$347 million. There is evidence that these arrangements have been on such a large scale and under such conditions as to be detrimental to the long-term efficiency of rail services in Victoria. In particular:

- the funds raised have been on existing rollingstock previously owned by the PTC, as well as on new equipment;
- the funds raised have gone to consolidated revenue (PTC 1990, p.16) with no benefit to the railways; and
- 'audit examination also disclosed that under these arrangements finance costs are higher than conventional forms of borrowings...' (Victorian Auditor-General 1990, p.34).

In addition, the Auditor-General contended that the nature of the leases is such that they should have been subject to Loan Council borrowing limitations, but they were not (Victorian Auditor-General 1990, p.34).

6.2.3 Debt servicing

As with any commercial enterprise, in making investment decisions the railways must take into account the effect of additional debt servicing on their financial performance. The aggregate situation for all government-owned railways is presented in Table 6.3.

Table 6.3: Interest payments by railways

	<i>Current prices \$ million</i>	<i>Constant 1989-90 prices^a \$ million</i>	<i>As per cent of total operating revenue (current prices)</i>
1980-81	131	261	8.0
1981-82	166	298	8.7
1982-83	256	413	12.4
1983-84	301	455	11.1
1984-85	481	688	15.3
1985-86	634	845	20.2
1986-87	620	771	19.2
1987-88	582	673	17.0
1988-89	793	844	22.3

a Based on the implicit price deflator for non-farm GDP.

Sources: ABS unpublished data (see Appendix C, Table C.12); Commission estimates.

A disaggregation of these data is provided in Appendix C, Table C.12. The rail system in NSW experienced the most rapid and substantial increase in interest payments during the 1980s. These data, however, do not provide a true picture of what is happening. As discussed in Section 6.1, many capital expenditures which are primarily to provide community services do not incur interest payments. And even for projects deemed commercially viable and thus funded by borrowings, there are occasions when State governments simply extinguish the railway debt. This practice removes from railways the incentive to provide and price services which properly reflect the true cost of capital.

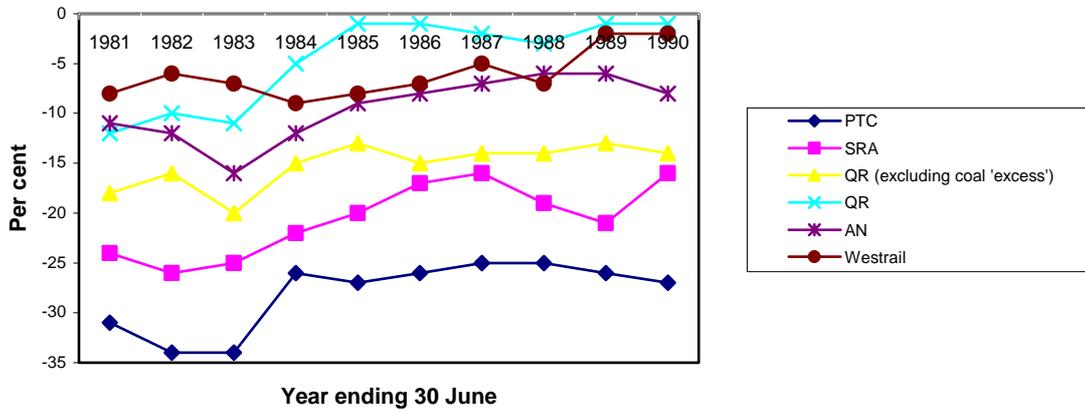
Even AN, whose capital funding arrangements are far closer to commercial norms than other systems, regard railways as having special difficulties in terms of debt servicing.

... AN regards its present level of borrowings as high, and our gearing ratio will worsen before profits are sufficient to begin to offset the increase in debt. The problem is compounded by the large replacement component of the capital programme, wherein a large proportion of the benefits are in the form of prevention of future cost increases, rather than improvement on the existing profit and loss position. (Submission 64, p.46)

6.2.4 Rates of return and asset management

The total stock of railway assets yields large negative rates of return reflecting the magnitude of the deficits incurred. For this inquiry the Commission has extended to railways the analysis done previously on rates of return for a range of other government business enterprises. That analysis indicated, for example, average real rates of return in the three years to 1987-88 of 5.5 per cent for Telecom and 1.0 per cent for Australia Post (IC 1990b). The results for railways are presented in Appendix E and are illustrated in Figure 6.1.

Figure 6.1: **Railway system real rates of return**^a



a The real rate of return is defined as the ratio of economic income to the value of capital stock. Economic income is the difference between operating revenues and operating expenses. Operating revenues exclude the value of any community services and so consist principally of freight and fare revenue.

Source: Appendix E, Figure E.6.

While many of the external benefits and costs of railway operation are excluded from these rate of return measures, that is no different from the situation for Telecom and Australia Post both of which are required to provide some non-commercial services to the community. The rates of return for railways shown in Figure 6.1 suggest that the community has not been getting a reasonable rate of return on the assets that it has tied up in the railways.²

In responding to the draft report on this issue, AN made the reasonable observation that:

...if the rates of return of the road transport sector were calculated on assets which included the road network and related land, servicing and 'control' infrastructure, in the same way that AN's rate of return includes track and related land and other assets, then the road transport sector would also demonstrate very low (generally negative) rates of return. (Submission 115, p.5)

² The Economic Planning Advisory Council has published rates of return estimated on a different basis from that used by the Commission. Their estimates, which average minus 15 per cent in recent years for all railways combined, paint a similar picture to that illustrated in Figure 6.1 (EPAC 1991, Table 1).

In order to illustrate the obverse of this point, AN calculated that the real rate of return on their freight services was 5.8 per cent, if the cost of track infrastructure and the value of government contributions were excluded.

A principal concern is whether there has been any measurable improvement in railway rates of return in recent years. Some improvement is evident from Figure 6.1 for Westrail, QR and AN. An additional year's data for 1989-90, has been added since the draft report was published; it shows some recovery for the SRA after two depressed years. This is consistent with the NSW Treasury view that there are likely to be lags before the reforms and investments of recent years are fully reflected in an improved rate of return. The NSW Treasury (Submission 130, p.2) also pointed to a 5 per cent real reduction in operating costs in 1990-91 (following a 7 per cent fall in the previous year), coupled with a 3 per cent reduction in the government's real cash contribution (down 23 per cent in the previous year), as evidence in favour of an improving rate of return. There is no sign of improvement in the PTC's poor rate of return performance.

These estimates provide clear evidence of the scope for a more disciplined management of railway assets and are relevant to the question of whether or not railways should work towards some set target rate of return on assets. The IAC advocated such targets to improve monitoring and accountability of public enterprises (IAC 1989).

It is anticipated that Westrail will trial rate of return reporting in 1991-92 (Western Australian Government, Submission 43, p.23). The aim is to encourage more efficient use of resources, in particular to assist with rational pricing and investment decisions.

The Australian Chamber of Manufactures judged target rates of return as quite inappropriate:

ACM does not consider that the introduction of real rate of return targets on public authorities will guarantee greater operational efficiency, especially when there is a lack of effective competition (either for regulatory or natural reasons). This is because it is too easy for authorities to achieve such returns via price increases rather than improvements in operational efficiency. (Submission 99, p.8)

Similarly, the Commonwealth Treasury said that:

Pricing to equate demand with available capacity as much as possible - rather than pricing to maximise returns or pricing to meet prior targets - is a fundamental requirement of government business enterprises to foster the efficient use of national resources, especially in the cases of enterprises with monopoly power. (Treasury 1990a)

The Commission notes that rates of return are useful for ranking investment projects and setting priorities but agrees that subsequently setting prices to reach some targeted rate of return on capital may be inappropriate. That approach would likely result in under utilisation of fixed capital and thus inefficient use of resources.

Notwithstanding this, there is merit in setting a target rate of return for government business enterprises and monitoring performances against such a target. As the Commonwealth Treasury put it:

target rates of return for public business enterprises should reflect the return achievable from alternative private sector investments of similar risk that are just viable (marginal). If targets set on this basis were met over time the resources of the enterprises would tend to be channelled to their highest value use from a national point of view and the owner governments could be confident that the community was getting value for money from the public business investments. (Treasury 1990a, p.ix)

In its assessment of the performance of government business enterprises (IC 1990b), the Commission adopted as a benchmark a real rate of return of 8 per cent, equivalent to the real return on long-term government bonds (1985-86 to 1987-88), adjusted for a small margin of risk. In this report the Commission has adopted a benchmark real return of 10 per cent in assessing railway coal freight returns - see Appendix J.

However, a target rate of return cannot play a useful role unless the enterprise has the capacity to take commercial decisions. Accordingly, an enterprise must have:

- the ability to set commercial charges, including for any community services which governments might wish to fund under agreed contracts;
- the ability to deal with its existing assets or liabilities in a commercial manner;
- the ability to control its costs without fetter from government labour, industrial relations, or other like policies; and
- the ability to raise capital in a commercial manner.

These issues have been canvassed in Chapter 3.

Sales of railway assets

The way in which the sale of railway assets is handled offers a good example of inefficiencies resulting from an absence of commercial freedom and allied incentives that is inherent in the present arrangements. Land previously owned by the South Australian Government no longer needed for AN's operations reverts (without payment) to the South Australian Government, under the conditions of their agreement with the Commonwealth. In Victoria, all proceeds from sale of unrequired assets go to consolidated revenue. In NSW the railways until recently were able to retain and utilise proceeds from asset sales, except land no longer needed for railway purposes in which case the funds are credited to consolidated revenue. The situation changed with the 1989 debt reconstruction in the SRA whereby accumulated debt was assumed by the NSW Government; that entailed the surrender to the State of the net cash proceeds from future sales of surplus property (SRA 1990b, p.8). It appears not to have been a truly commercial transaction as the railways are not now paying rent for such properties. In none of these three rail systems do the arrangements

encourage optimal use of existing assets, particularly land. Commercial freedom and a target rate of return are pre-requisites to better asset management.

The Commission is convinced that the railways must control their assets and be permitted to manage them in accordance with commercial objectives. The vesting of control with the railways is an essential element in their incorporation (see Chapter 3).

6.3 Sources of funds

The previous section covered various objectives and constraints in undertaking capital projects and in railway asset management. In this section, consideration is given to sources of funding for both operating deficits and capital expenditure, and their effects on railway operation and efficient resource allocation. The terms of reference (paragraph 3b) specifically cover this issue.

Unless some marked improvement can be achieved in railways' financial performance, it is futile to seek out more efficient sourcing of funds. The railways have been striving to improve their performance within government imposed constraints which vary between systems. They are unlikely to succeed unless many such constraints (see Chapter 3) are lifted. In particular, more freedom is essential in management of their workforces (Chapter 7) and in setting more appropriate fares and freight rates (Chapters 8 to 11). Importantly, railways must be allowed to abandon those services which are not viable unless there are appropriate contracted payments from governments which make the services viable (see Chapters 3 and 4).

Different means of financing railways are as follows.

6.3.1 Government grants

Non-repayable grants from governments, to cover operational deficits or capital expenditure, are the source of funds preferred by railways. Governments often view such grants as appropriate because they regard it as their function to fund rail services not covered by rail revenue. Grants are convenient because they enable governments to avoid demonstrating that a satisfactory return is obtained by the community for the use made for those funds. Governments consider grants for capital purposes as additions to their 'equity' in the rail system although, as discussed above, these grants have none of the usual characteristics of equity. Reasons why they are disadvantageous to the taxpaying community are covered in Section 6.1. In brief, automatic deficit funding removes from railways key incentives to perform efficiently and obscures accountability by governments. While investment projects funded by capital grants from governments may be assessed and prioritised before implementation, once they are operational any losses generated disappear into deficit funding, thereby removing the incentive to ensure that the project actually performs as promised.

Consistent with a more commercial relationship between railways and governments (see Chapter 3), the capital costs of providing any non-commercial services should be embodied in the contractual payments for those services.

6.3.2 Government loans

For most of the State-owned rail systems, capital expenditure on projects allied to the provision of commercial services is funded by borrowings. The railways do not borrow directly from the market but through State Treasury finance corporations at market-related interest rates and typically with an additional fee to reflect the relative riskiness of railway investment.

Railways show debt-servicing costs on these borrowings as operating expenditures in their accounts, an appropriate commercial treatment and one which should impose the discipline of ensuring a satisfactory return from the capital so employed. However, the practice of State governments writing off such debt is short-sighted and fails to address the cause of railways' problems. It reduces government accountability for the true cost to the taxpayer of providing services and thus creates an environment in which inefficient provision and pricing of services can persist. These 'risks' should be avoided by establishing a more commercial relationship between railways and their respective State governments (see Chapter 3).

6.3.3 Other borrowing

In contrast to the State rail systems, AN has been provided only minimal capital funds by the Commonwealth, mainly as an interest-free loan for construction of the Tarcoola-Alice Springs railway. For its ongoing capital expenditure program for both passenger and freight services, AN must borrow in its own name from financial markets, both domestic and overseas. It does so successfully, partly because of an explicit Commonwealth guarantee on borrowings for which AN pays a fee of 0.125 per cent per annum.

It is clear from AN's submission that the available sources of funds are quite satisfactory. Indeed, AN is not attracted to further loans from the Commonwealth:

AN has been able to raise money from a Eurobond issue at a rate net of fees 0.155 per cent below a similar term Commonwealth bond issue.

On its advances from the Commonwealth, AN is currently required to pay 0.95 percent more than the prevailing 10 year Commonwealth bond rate.

Advances from the Commonwealth are in relative terms generally commercially unattractive, i.e. the terms are inflexible and the cost higher than other sources of finance. (Submission 64, p.46)

6.3.4 Value capture

The term 'value capture' refers to the process whereby, in the establishment of a new railway line or in the upgrading of an existing line, the railway itself is able to benefit from the enhanced value of property affected by the new railway services. Value may be captured by the railway participating in commercial development of, for example, its railway stations. Or it may be captured by the railway receiving some share of increased land and property values attributable to the railway line and stations. The process is as old as railways. Many railways in the United States were financed initially from sale of part of land around the right of way, land which was granted by the government as an inducement to build the railway.

The concept had some airing in Australia as the Very Fast Train (VFT) proponents initially considered that the project could be partly funded through a tax on the enhanced value of land.

In relatively high density urban areas, value capture may have most potential in the development of shopping complexes and buildings over and around suburban railway stations. Box Hill in Melbourne and St Leonards in Sydney are good examples. The approach is under consideration for the new northern suburban line in Perth (WA Government, Submission 43, p.36). The principle of value capture has been used in Queensland to a limited degree in development of the Toowong railway station (Queensland Government, Submission 135, p.15). Experience overseas confirms the scope for value capture of this type: the Metrorail system in Washington DC expended \$5 million on its station area development program and obtained a value capture return of between \$32 million and \$42 million (Newman and Kenworthy, Submission 54, Attachment 2). It can be expected that such commercial developments will play an increasing role in the financing of railway operations as railways are allowed to become fully commercial; they are not considered further in this section.

Reflecting the external social and commercial benefits of railways, in particular those in high density urban areas, there is also a common practice overseas that the beneficiaries make a contribution towards railway finances. One example is in Paris where the system is partly funded by a payroll tax levied on employers who thus effectively subsidise their employees' use of the system, and partly by local government contributions (NSW Treasury, Submission 130, p.4).

The Commission has given consideration as to whether any such approach would be appropriate and feasible in Australia. The principal reason for pursuing such value capture is that compared with the present arrangements it would be more equitable and would facilitate more rational and efficient provision of rail services. This is so because the current fare/freight rate and funding arrangements provide substantial subsidies to passengers and some freight users, a relatively small segment of the community. A larger group of people obtain, to varying degrees, indirect benefits for which they make no contribution. And the whole community is required to pay for the services even though most would never use the railways. Any goods or services which are provided in this

way, whereby payments are largely divorced from the true cost of the goods or services, invariably are provided in an inefficient manner.

If payments for railway services can be better aligned with the costs of the services, more efficient outcomes are likely to evolve, including the cessation of some services and the introduction of new services. One aspect of this is that fares and freight rates may need to be changed; see Chapters 8 to 11. The second aspect is the need to obtain payments from non-user beneficiaries.

The question then arises as to who are the non-user beneficiaries. The Commission doubts that employers of train travellers are beneficiaries because typically the rental cost of an office building would reflect any advantages from convenient access to public transport. Employer contributions (as in Paris) thus seem inappropriate means of better aligning payments with beneficiaries. It would appear that as a general rule property developers and owners are the ultimate non-user beneficiaries of public transport services. This would be so for high-rise city office buildings as well as for suburban shops within the vicinity of railway stations and which benefit by the traffic to and from the station. More generally, owner-occupiers of residential housing that is proximate to railway stations benefit from the consequential enhanced value of their properties. In rural communities, property values also are likely to be enhanced by the availability of rail services; in addition, the community may place a value on the existence of the rail services which is not reflected in the extent to which the services are used (see Section 5.4.2).

The most appropriate form of a contribution from all these non-user beneficiaries would therefore be a levy on the value of their properties. However, a levy on property values is the principal means by which local governments raise funds for their expenditures. It is understandable, therefore, that local governments might view this proposal as a tax on them. This is not the intention; it should be viewed as a ratepayer contribution for indirect benefits generated by rail services. The Commission understands that contributions were made to the cost of the Melbourne underground rail loop from a special rate levied on properties.

Should such contributions be mandatory or voluntary? It is unlikely that new or expanded railway lines and services will proceed unless voluntary contributions are forthcoming, particularly with railways functioning as essentially commercial enterprises. In cases where existing rail services are under threat of closure, the option should be made available for communities to demonstrate the extent to which they value continuation of the services; that requires the contributions to be voluntary, as is recommended here.

However, for the purposes of obtaining contributions towards ongoing rail services the railways have little leverage on property owners or local governments. There is thus no prospect of getting voluntary contributions. An additional complication is that in urban areas where non-user benefits are likely to be substantial, reliance on voluntary contributions could result in property owners of one local government jurisdiction making payments but those of an adjacent jurisdiction, with

similar benefits, making no payments. These issues are inseparable from other aspects of urban rail services and therefore are addressed in Chapter 8.

RECOMMENDATION 6.1

The Commission recommends that, in the consideration of new railway lines and services, negotiations be undertaken with the relevant local government authorities with the aim of obtaining contributions towards capital and operating costs. Similar negotiations should be undertaken if the withdrawal of services is under consideration.

In response to the draft report, there was qualified support for such an approach.

In Australia the nexus between railway development and land value capture should be explored as a mechanism for raising development funds. If a railway cannot meet operating costs there is an a priori case for closure. In these circumstances local government could be given the option of providing financial support. (NSW Treasury, Submission 130, p.4)

The NSW Treasury noted, however, that it is difficult to see where local governments would find access to the funds required. But local governments already benefit from the value added to properties within their areas which are proximate to railway services. Local governments have either raised more revenue than they otherwise would have (through the application of a property rate on the higher valued properties) or have been able to decrease the property rate to reflect those higher property values effected by railways. The threat of withdrawal of those railway services can thus be assessed by local governments which must either decide to forgo that part of the revenue attributable to railways or increase their rates to the level they would have been if the railway had not existed.

Similarly, local governments can assess the value to them of a proposed new rail service (as they do for some private proposed investments which confer benefits on the local community) and negotiate a voluntary payment to the railway for the proposed service.

The Queensland Government commented that:

Although Queensland Railways have held negotiations with local authorities in relation to service withdrawal, no contribution to capital or operating cost has been offered; indeed such contribution would be beyond the capacity of the vast majority of local authorities, and as such is likely to be impractical. However, any contributions calculated on the basis of increased property value as suggested by the Industry Commission are not likely to be significant. (Submission 135, p.15)

The Commission can accept this view, if it reflects that the rail service in question (which would often be heavily subsidised by the State-wide population) has little real value to the local community.

The Transport Action Council of NSW agreed with the recommendation but noted that such contributions would fail to cover rail's environmental and road safety benefits which tend to be widely dispersed throughout the community (Submission 127, p.1). The Australian Wheat Board said that implementation of this recommendation would provide increased scope for local governments to impede efficiency-based rationalisation of the rail network (Submission 129, p.3).

There was strong opposition to the recommendation from a range of local government interests. The Bathurst City Council asserted that the provision of rail services is not a function of local government, and that services to locations such as Bathurst benefit all taxpayers in NSW by taking some of the pressure for growth away from the Sydney metropolitan area (Submission 118). The Western Australian Municipal Association ³ noted that the only taxing power available to local government is the levying of rates based on valuation of properties. The Association asked the fundamental question as to where the principle of local government contributions would begin and end - should contributions also be made to educational institutions, for example? And would some local governments be compensated for public services which diminish the valuation base such as remand centres or a high proportion of properties facing railway tracks? (Submission 147, p.2).

The Commission recognises that all these points have some merit. Nevertheless, the thrust of this report is that the widely recognised inefficiencies will only be eliminated if the railways are operated as commercial enterprises. Railways' problems will not be overcome so long as they are treated as public services little different from the existing treatment accorded to prisons, hospitals and schools. Important elements in the approach recommended by the Commission are specific government recognition of, and payment for, community services not covered by fare and freight rates (see Recommendations 3.2 and 4.1) which should be based on commercial principles and free of government intervention. Railways must also adopt the most efficient operating practices; no-one should be required to subsidise inefficient practices. After all these steps are taken, it may be that particular services are not viable unless indirect (but major) beneficiaries of the services also contribute. Those beneficiaries typically are owners of land proximate to railway services and, through them, local governments.

³ Submissions making similar representations also were received from some 15 separate local government shires in Western Australia; they are listed in Appendix A.

6.3.5 Private sector provision of rail infrastructure

Some rail systems have required the private sector to contribute to the provision of rail infrastructure.

This has been the approach adopted in Queensland whereby coal mines paid for the initial capital cost of new lines and rollingstock, ownership of which remained with the State. The mines recouped their capital outlays, spread over many years and generally with no interest provision. While this worked well from the Government's view as a means of funding the infrastructure, the coal miners argue that QR's complete control over the rail system dampens incentives for efficient operation and failed to give the miners an equitable return on their capital contribution.

The Queensland Government in 1989 reviewed its capital funding and coal freight policies and considered the views of the coal industry. Its revised policy aims to encourage the development of new mines by shifting capital costs away from the early stages of development with commensurate increases in the State's returns in the latter years of a mine's life. The Government is:

... to fund, in most circumstances, virtually all railway infrastructure required for the project with the costs being recouped from the project by way of an appropriate capital recovery charge included in the base freight rate. (Queensland Government, Submission 50, p.33)

There have also been complaints about inequities in the SRA's attempts to require the private sector to contribute towards rail infrastructure costs. Such complaints focus on the difficulty in striking a reasonable balance between the private sector capital contribution and the extent of allied reductions in freight rates. Exxon Coal and Minerals (ECMAL) considered tendering to supply coal from its Ulan mine to the Mount Piper power station but did not proceed because the substantial capital contribution sought by the SRA to upgrade the line would have been combined with a rail freight rate claimed to be very much higher than the cost of providing the service. More generally, ECMAL stated that it:

... has no problem with the practice of coal companies providing infrastructure (especially loaders, terminals, dedicated loops etc) or rollingstock on certain conditions:

- they retain ownership;
- they retain control over the maintenance of those assets; and
- freight rates do not contain any component related to these assets. If the assets are used by the railways for activities unrelated to their provider/owner, some reimbursement should be due.

If ownership of such infrastructure funded by private enterprises passes to the railways (eg for permanent way, signalling, rollingstock, etc) the firms concerned should be compensated on a normal commercial basis including by way of appropriately lower freight rates. ECMAL would encourage the rail authorities to continue and extend the practice of offering freight rate incentives for fast loading and unloading performance and capability. Correctly pitched, such incentives can induce private funding and reduce railway capital requirements in a balance that is economically optimal. (Submission 11, pp.42,43)

The NSW Government has recognised the potential for increased private sector provision of infrastructure across a wide range of activities, including rail transport. Its recently announced guidelines (NSW Government 1990) specify that the objectives of the infrastructure policy are to:

- enhance and modernise the State's public infrastructure for the benefit of the people of NSW;
- safeguard the public interest in these projects;
- reduce the Government's financial burden;
- increase efficiencies in operation; and
- provide sound opportunities for private sector investment.

Of the principles to apply to private sector participation, those particularly relevant to the problems encountered with the railways are that there is to be a flexible approach to risk sharing and returns between the private and public sectors, and any restrictions on prices are to be stated clearly (NSW Government 1990, p.5).

In accordance with this infrastructure policy, the NSW Government has called for expressions of interest from the private sector for development, ownership⁴ and operation of a rail link between central Sydney and the airport at Mascot. The policy guidelines open up considerable scope for private sector funding of rail projects with an element of control, thereby tempering the SRA's monopoly power. **As discussed in Chapter 12, the Commission sees merit in this policy and recommends the approach to other State governments.**

The Australian Federation of Construction Contractors has addressed the question of how much the private sector can do in the provision of public infrastructure in a discussion paper (AFCC 1990) included with its submission to this inquiry. The AFCC notes that private sector funding is only possible where there is an identifiable cash flow from the investment. Two types of such investment are where the private sector participant:

- can charge a fee for service or conduct private merchandising in a building owned by the railways; and
- can sell a service to the government, that is, where the private sector participants construct and operate the railway facility.

⁴ It is understood, however, that ownership would be surrendered to the government at the expiration of the lease.

The AFCC points to the NSW guidelines as a good model for the other States and specifies the following initiatives that governments must take to get genuine progress:

- Railways must improve their management of existing assets, identify infrastructure gaps and plan replacement. In so doing they can determine and inform the private sector of projects suitable for its participation.
- Governments must encourage private sector participation by protecting proprietary interests.
- The Commonwealth Government must be prepared to acknowledge that private sector participation will divert losses (and profits) from railways to the private sector so that Commonwealth tax receipts could fall (or rise).

As noted in Section 9.1.6, the issue of the tax treatment for major, long-term infrastructure projects is to be examined at the November 1991 special Premiers' Conference.

6.3.6 Equity

Principally because of explicit government guarantees, State railways can borrow through their Treasury Corporations at rates little different from profitable GBEs. If it were possible to introduce a substantial element of private sector equity participation into railways, such a government guarantee would no longer apply and the cost of servicing the equity (by dividends) would reflect the true risk and therefore be likely to exceed the cost of borrowings. Given railways' substantial financial losses, it probably is not feasible to attract private equity in railway authorities, per se.

In setting up railways as incorporated entities (see Chapter 3), it will be essential for governments to ensure that an appropriate degree of equity is provided and that debt/equity ratios are viable. Essential elements will be the proper accounting for debt (Section 6.1) and the vesting of assets with railways (Section 6.2.4).

6.3.7 Conclusions on sources of funds

The Commission is of the view that large injections of government funds will not guarantee a more efficient railway system; indeed the effect could well be the opposite. There is no solution to the achievement of efficient funding in the absence of determined efforts to achieve commercially efficient operations. A pre-requisite is the removal of government imposed constraints so railway financial performance can be improved. Funding sources can be widened by contributions from local communities which benefit particularly from rail services and increased private sector participation in provision of rail infrastructure accompanied by surrender of some elements of control by the railways.

6.4 Financing of rail and road transport

What are the implications for railway financing of achieving much improved rates of return from some railway activities? This question cannot be considered in isolation from the conditions applying to road transport which is the major competitor to rail.

The principal cost elements in road transport are:

- the opportunity cost of land used for roads (the value of alternative uses for the land);
- the construction cost of the road network and the opportunity cost of the capital embodied in the network;
- maintenance of roads; and
- vehicle purchase and operation.

The opportunity cost of land used for roads is not met by road users; a similar situation prevails for railways. This practice tends to undervalue the cost of using both modes.

The road network is commonly not expected to generate a dividend or rate of return. The Commission is of the view that so long as that situation persists it would be futile and inefficient to demand that the railway infrastructure as a whole meet some target rate of return. Futile because railways already have a formidable task in just reducing their deficits to tenable levels; inefficient because such a requirement may lead to lower rail investment compared with road investment than would be appropriate.

There are two exceptions to this general rule. First, in order to ensure that new additions to railway infrastructure are consistent with the commercial orientation of the railways, it is essential that their capital cost (although not including any economic rate of return on funds employed) be met by users of the services. This approach is equitable between rail and road because road users do effectively pay for expansions to the road infrastructure. Secondly, where there is a dominant user of a line and there is no effective competition from road transport (the principal case is coal), it is appropriate that users pay freight rates which allow for a reasonable rate of return on the rail infrastructure.

With regard to the maintenance of roads, the Inter-State Commission has demonstrated that the user-pays principle is not in effect for some heavier freight transports which are effectively cross-subsidised by passenger cars (ISC 1990). The ISC's recommendations on a national system of user charges aimed to correct most of these deficiencies. While not necessarily agreeing with some of the details of those recommendations, the Industry Commission does recommend that road user charges be modified to reflect more accurately the amount of road use and damage caused by different classes of vehicles (see Recommendation 5.1). Equitable treatment of railways would

require that rail users cover maintenance and upgrading costs of the existing rail infrastructure. At present, with overall rail cost recovery of around 65 per cent of current operating costs, rail users on average clearly are subsidised.

The final cost category, vehicle purchase and operation, is financed completely by the road transport sector; there is no direct government subsidisation. Equitable financing of rail services would require that rail users pay for the capital costs of locomotives and rollingstock, including an economic rate of return, plus all railway running costs. This would require setting fares and freight rates to match long-run avoidable (marginal) costs, after taking into account government payments for community services.

These general cost recovery rules imply the abolition of services not able to cover marginal costs and some substantial increases in prices for some other rail services.

6.5 Commonwealth and State roles

6.5.1 Funding of roads and railways

A wide range of participants, including the Australian Railways Union, the Australian Conservation Foundation, the Australian Consumers' Association and various rail user groups, drew attention to what they regard as inequitable Commonwealth funding of rail compared with road. In the two decades to 1989-90, Commonwealth allocations to the States for railway investment amounted to \$0.6 billion, and were minimal in the latter half of the 1980s. In contrast, Commonwealth allocations to roads totalled \$15 billion. While States have been able to allocate a part of these funds to railways under the Australian Centennial Roads Development program, they typically have preferred to direct those funds to road spending.

The difference in funds allocation between rail and road was said by those participants to reflect the imbalance in the Commonwealth Government's land transport policy. The situation is further illustrated, they argued, by Commonwealth funded expenditure of \$730 million on the Hume Highway between Sydney and Melbourne in the five years to 1988-89, compared with no Commonwealth expenditure on the rail link.

Such analysis is often used to support the view that railways are starved of funds relative to roads. This view seems not to account properly for the different responsibilities of the State and Commonwealth governments. The former are the principal source of funding for railways and have contributed proportionately less to roads. Any comparison of road and rail capital expenditure therefore must be based on spending by all levels of government.

Table 6.4 shows that, for all levels of government combined, rail's share of capital expenditure of road and rail combined fell from 34 per cent in 1981-82 to 23 per cent in 1989-90. These estimates can be compared with rail's share of the value of production of the road and rail industries combined; input-output data for 1980-81 show that share as 25.7 per cent and it increased to 27.5

per cent in 1986-87 (the year for which such data were next compiled). Thus, it would seem that, relative to the value of production of railways, rail capital expenditure was high in the early 1980s and low by the late 1980s. Overall it averaged 28 per cent, about what would be expected based on value of production data. These data provide some evidence which is contrary to the view that railways have been disadvantaged relative to roads over the past decade with regard to capital expenditure.

Table 6.4: Rail industry share of new fixed capital expenditure of rail and road industries combined

	(per cent)
1981-82	34.0
1982-83	35.1
1983-84	31.1
1984-85	25.8
1985-86	28.6
1986-87	26.8
1987-88	26.7
1988-89	22.4
1989-90	23.3
Average 1981-82 to 1989-90	28.2

Source: ABS unpublished statistics.

6.5.2 Diesel fuel excise

In 1982-83 railways lost their exemption from diesel fuel excise which previously had been granted to off-road users of diesel. Railways now pay to the Commonwealth Government approximately \$120 million per annum in such excise. There is no direct link between the payment of such excise by railways and the funding of railways.

As a general principle, the Commission argues against levying any such tax on fuel to be used as an intermediate input, in part because it encourages the substitution of alternative lower taxed fuels (IAC 1986, pp.124-5) which in the case of railways has been electricity. Consistent with this, the Commission is of the view that railways should not be required to pay excise on diesel used for freight services but should continue to pay excise on fuel used for passenger services (which are usually regarded as final consumption).

This approach has ramifications outside the rail sphere. It implies that fuel used by trucks also should be exempt (but not where the excise is a charge for road use - see below). On this general issue, the comments of the Commonwealth Department of Transport and Communications are pertinent.

There are several processes underway which are likely to lead to a review of fuel excise arrangements and its incidence on particular sectors of the economy. These include work on Ecologically Sustainable Development, consideration of a national road user charging scheme, and a report by the Commonwealth Auditor on the efficiency of the current diesel excise rebate scheme.

The Government may wish to delay consideration of this issue until these processes are completed in late 1991. (Submission 128, p.4)

Also pertinent is the agreement reached at the July 1991 special Premiers' Conference for establishment of a National Road Transport Commission with responsibility for developing a road user charging regime. A component of diesel fuel excise is to constitute one element of road charges (SPC 1991c, p.15).

Finally, there is a question of whether diesel fuel used by railways for freight services should be exempt from excise, or whether the railways need to account for usage and claim a rebate after having paid excise. The exemption system which was in use up until 1982 was abandoned because of the administrative difficulties of ensuring that excise exempt fuel was used solely for off-road purposes. The diesel fuel rebate system introduced in August 1982 requires all users to purchase diesel at excise inclusive prices, and provides rebates to certain categories of off-road users; railways are currently not among those categories, mining operations receive partial rebates, and primary producers get full rebates (IAC 1986, Appendix J and AMIC Submission 140, p.6).

RECOMMENDATION 6.2

The Commission recommends that railways should receive a rebate of diesel fuel excise for diesel used in rail freight services.

This recommendation has been modified from that included in the draft report which was for a rebate for all off-road use (including for rail passenger services) of diesel by railways.

On the basis that its recommendations on road user charges would be implemented, the Inter-State Commission (ISC) recommended that railways generally be exempt from diesel fuel excise. The ISC also recommended that an assessment be made of railways' external costs (ISC 1990, Volume 1, p.235). When that information becomes available, consideration could be given to levying a tax on railways equivalent to those costs.

6.5.3 Commonwealth Grants Commission (CGC)

The role of the Commonwealth Grants Commission (CGC) is to advise the Commonwealth Government on a distribution among the States and Territories of all general revenue grants so as to achieve 'fiscal equalisation'. The principle of fiscal equalisation is that

... each State is entitled to receive a level of general revenue funding from the Commonwealth which would enable it to provide, without having to impose taxes and charges at levels appreciably higher than the levels imposed by the other States, government services at standards that are not appreciably different from the standards provided by the other States. (CGC 1990a)

In computing an appropriate distribution, the CGC examines a wide range of State budgetary receipts and expenditures, and the operations of a selection of government business enterprises. Of these, the categories metropolitan transit, non-metropolitan passenger services, and non-metropolitan freight are relevant to rail services. It is essentially the non-commercial services that the CGC attempts to compare across the States.

Two aspects of the CGC's processes are particularly relevant to this rail inquiry. The first is that Queensland, by imposing high rail freights on coal, has obtained favourable Commonwealth grants. The second is the question of whether railway activities should continue to be included in CGC assessments.

Queensland coal royalties

Queensland revenue from (explicit) royalties on coal is relatively low, based on value added, compared with that for NSW. This is one of the many comparisons made in the CGC assessments which focus on relative revenue raising, and relative expenditures, by the States. Queensland's low coal royalties tend to boost its allocation of Commonwealth funds via the CGC processes. Because rail freight services are regarded as inherently commercial activities by the CGC, they are excluded from its assessments - the additional rail revenue does not result in any offsetting reductions to Queensland's allocation of Commonwealth funds.

The CGC recognised and took steps to neutralise Queensland's favourable treatment. During the 1988 review of its methods, the CGC concluded (inter alia) that:

... part of the revenue derived by Queensland Railways from the haulage of black coal was comparable to mining royalties in other States. Consequently, [the CGC] decided to treat part of the Queensland railway revenue as though it was a royalty on black coal. (CGC 1989, p.32)

In simplified terms, the addition to Queensland's coal royalties is derived by the CGC as follows:

- compute NSW royalties as a percentage of value added, excluding labour and capital cost, in the NSW coal industry;

-
- apply that percentage to value added in the Queensland coal industry (about double that in NSW in 1987-88);
 - compare that amount of revenue which Queensland would have raised, if it applied explicit royalties at the same rate as NSW, with actual Queensland royalty revenue; and
 - subtract their difference from Queensland rail revenue and add it to Queensland coal royalty revenue.

The adjustment is thus independent of the coal rail freight rates for either NSW or Queensland coal.

However, this adjustment has some shortcomings. Because it uses NSW as the basis for comparison, changes to value added or the royalty rate in NSW can affect Queensland's grants. For example, in order to assist the ailing coal industry, NSW reduced its explicit royalties between July 1987 and August 1989. When the reduced royalty rate was applied to value added in Queensland, a smaller addition was made to coal royalties and a smaller deduction taken from Queensland rail revenue. As a consequence, the CGC measure of Queensland's overall revenue was reduced which 'contributed to the increase in Queensland's implied general revenue assistance' (CGC 1989, p.33).

Thus, the steps taken to neutralise Queensland's advantage have not been as effective as was intended. The perverse result also disadvantaged NSW (CGC 1989, p.41). The Minister for Administrative Services has instructed the CGC to inquire into this issue prior to its next major review in 1993 (CGC 990b, p.xii).

Railway inclusion

A fundamental question is whether or not the activities of State government business enterprises (GBEs) should enter the relativity calculations. Governments are divided on this question. In its 1990 report on issues in fiscal equalisation (CGC 1990b), the CGC noted that South Australia, Tasmania and the Commonwealth Treasury advocated total exclusion of GBEs from the calculations; Queensland, NT and ACT wanted total inclusion; and NSW, Victoria and Western Australia wanted inclusion only of undertakings providing public goods or facing particular disabilities.

The Commonwealth Treasury's view, for example, was based on the view that it is

not conducive to allocative efficiency to apply equalisation in areas where the benefits of public goods primarily extend only to residents of a particular State... (Treasury 1990c, p.14)

The stance of the various States reflects the impact on their grants if transport GBEs were excluded.

The overall distribution of general revenue grants is away from the two larger States because of the relatively high costs of providing the full range of public services (education, health etc) in the smaller States. In contrast, the net costs (deficits) per capita of providing urban public transport services in Sydney and Melbourne are larger than in the smaller cities, and allowance for this fact

reduces the overall distribution of grants away from the two larger States. If these transport services were excluded from the relativity calculations, there would be a larger overall distribution away from NSW and Victoria and in favour of the remaining States. As indicated in Table 6.5, this redistribution would amount to \$168 million.

Table 6.5: Redistribution of general revenue grants to the States and NT if transport GBEs were excluded, 1988-89

	<i>\$million</i>
NSW	-107
Victoria	-61
Queensland	+71
Western Australia	+55
South Australia	+17
Tasmania	+16
Northern Territory	+9
Total	0

Sources: CGC 1990b and unpublished estimates provided by the CGC.

In its most recent report, the Grants Commission has not accepted arguments for exclusion of GBEs. For metropolitan transit services it comments:

... we are satisfied that the services provide a variety of substantial public benefits, including relief from traffic congestion and pollution. We are also satisfied that the more populous States experience a more costly operating environment than the others. (CGC 1990b, p.74)

The Industry Commission takes a different view. It accepts that certain activities have higher costs in sizeable conurbations than the equivalent activities in smaller cities. Metropolitan transportation is one such activity. At the same time, such conurbations offer considerable benefits to their occupants and to adjacent industry arising from their economies of size and scope. For example, the larger market offered by cities of the size of Melbourne and Sydney provide particular benefits to suppliers of goods and services, who have an accessible market, and to consumers of education, health, entertainment, sophisticated financial services and so on. Occupants also have a wider range of employment and career opportunities in larger cities than they would typically have in smaller cities. The more costly operating environment is thus offset by the benefits associated with larger cities. While some of the costs affected by the size of cities are measurable (such as urban rail passenger systems), the benefits created by larger cities are often considered to be externalities. However, this does not lead to the view that the Australian community as a whole should pay for the measured additional costs when the principal beneficiaries reside in the conurbations.

Furthermore, as suggested by the Queensland Government (Submission 135, p.2), there is no persuasive reason to distinguish between railway services and public bus/tram/ferry services in terms of their treatment by the Commonwealth Grants Commission.

The Commission's recommendations in this report would impose a more commercial operating environment on the railways; continued inclusion in CGC relativity calculations would not be consistent with such changes.

RECOMMENDATION 6.3

The Commission recommends that the Commonwealth Grants Commission be asked to report on the case for excluding all public transport activities from its assessments.

The Commission notes that, independent of the above recommendation, the Grants Commission should continue its current practice (described above) of treating that part of Queensland's rail revenue which is assessed as excess freight charges as though it were a royalty on coal.

In response to the draft report, Dr Colin Taylor noted that this recommendation 'completely ignores the town planning and social implications of such a change in Grants Commission policy' (Submission 108, p.6) because if these services are not run or are priced out of reach then the structure of Australia's cities will be endangered. The Commission does not accept that its recommendation is likely to have the effect posed by Dr Taylor. In any event, it does not see that view as requiring the smaller Australian States to subsidise the public rail transport systems of the capitals of the two most populated States.

The Queensland Government supports this recommendation that a report be prepared but notes that in the past it 'has consistently supported the inclusion of those business undertakings which impact, either positively or negatively, on the State budget' (Submission 135, p.16).

The Victorian Government does not support this recommendation. Neither does New South Wales, and quotes the reform of the SRA as evidence that the CGC assessments do not provide a disincentive for the larger States to improve the efficiency of their railways. More fundamentally, it argues that:

...piecemeal changes to the Commonwealth Grants Commission approach of the nature proposed by the Industry Commission are not appropriate - either the status quo should be maintained or the entire process should undergo reform. (NSW Treasury, Submission 130, p.5)

6.5.4 Loan Council borrowing limits

Commonwealth and State semi-government authorities are constrained from operating in a commercial manner by 'global borrowing limits' set annually by the Loan Council. Each State must ration borrowing within its share of the global limit.

This issue has been under consideration for some time by the Loan Council and also was discussed at the October 1990 special Premiers' Conference.

There are two strands to recent developments: they were announced following the 1991 meeting of the Premiers' Conference/Loan Council. First, it was agreed that there be special temporary additions in 1991-92 for microeconomic reforms which cannot be financed within the existing global borrowing limits. In terms of their relevance to railways, those additions will allow for borrowing to finance electrification and extension of the Perth urban system and for borrowing to finance redundancies in NSW and Victoria (Treasurer 1991, p.5). Secondly, it was agreed to amend the basic borrowing arrangements in order to 'provide scope for government business enterprises which satisfy strictly commercial criteria to be exempted from global borrowing limits' (Treasurer 1991, p.5).

The Treasurer stated that while very few government business enterprises would currently qualify for exemption, this change will provide an incentive for them to operate in a more commercial manner. The Commission suggests that adoption of its recommendations in Chapters 3 and 4 of this report be an essential pre-requisite for the railways to satisfy strictly commercial criteria.

7 MANAGEMENT AND LABOUR PRODUCTIVITY

In the past few decades railways have been characterised by poor management and low labour productivity. Reforms in recent years have included changes to management structures in order to focus better on performance, large cuts in the workforce and elimination of some unproductive services. Such reforms have boosted labour productivity, as has the increased role of bulk rail tasks which are relatively productive. Yet reform must continue. If railways are to survive as viable elements of the transport industry, further management and labour reform must be pursued with vigour. Key elements are the more flexible use of labour, a more skilled workforce, and incentives for productive performance. There remains considerable scope for further workforce reductions.

7.1 Introduction

Labour is a major input into the production of rail services. As a proportion of operating expenditure, labour costs range from fifty to seventy per cent (based on data in 1989-90 rail authority annual reports). With an industry cost recovery ratio of around 60 per cent (see Chapter 6) labour costs absorb all or nearly all of rail authorities' revenues. This emphasises the need to examine how well labour resources are utilised, and in particular staffing levels and productivity.

One of the recurring problems identified by various reports into rail is the productivity performance of its workforce (Booz.Allen & Hamilton 1989a, 1989b; IAC 1989; State Transport Authority of Victoria 1988a). The scope for improving labour productivity is not limited to the elimination of overstaffing, restrictive work practices and the rigid delineation of jobs and their union coverage. Improvements in labour productivity are also realised from investment in physical capital and training. Management also plays a vital role in lifting the productivity of the workforce through its leadership and organisation of work. These issues are examined in Sections 7.2 and 7.3.

Overstaffing and labour market inflexibilities are the commonly identified impediments to productivity improvement. They are legacies of government intervention in rail operations, ineffectiveness of past management, quite rapidly changing market demand and technology, and fundamental resistance to change by managers, employees and their unions. Key aspects of labour flexibility, union amalgamation and award restructuring, are addressed in Section 7.3. Overstaffing and employment reductions are examined in Section 7.4.

7.2 Management and productivity

7.2.1 Managing

Management practices have a major impact on overall productivity of a corporation's resources. This section deals with their influence on labour productivity. Poor organisation and leadership in railways are potentially as important impediments to labour productivity as restrictive work practices. However, unlike work practices they are not subject to a national review framework such as the structural efficiency principle of the Australian Industrial Relations Commission; their reform lies with rail management and governments, as representatives of railway owners.

There are numerous examples which illustrate that reform is needed.

- The SRA yard at Enfield (Sydney) requires five to six times the enginemen/shunters found in a typical US yard handling similar wagon volumes (National Farmers' Federation, Submission 77, p.11).
- Rail terminals operated by TNT are clearly more efficient than those operated by V/line: the TNT terminals use about half the number of men per crane (National Farmers' Federation, Submission 77, p.11).
- Queensland Railways employed 26 blacksmiths and 45 blacksmith's strikers; two assistants for every tradesman.

Total responsibility for these types of inefficiencies does not lie solely with rail managers. Governments (see Chapter 3) and unions have also contributed to the perpetuation of wasteful uses of resources. Their insistence that railways continue to provide services for which labour productivity is particularly low has depressed productivity performance. It is the role of management to identify such inefficiencies and to initiate reform proposals.

7.2.2 Corporate overheads

One simple test of management efficiency is to gauge how many resources are categorised as corporate overheads, and what scope there is for reductions.

Travers Morgan (Appendix K) has estimated the reductions in business and corporate overheads that would result with achievement of international best practice levels of management. Table 7.1 summarises the results and shows that management costs for the rail industry overall could be reduced by about 50 per cent, a potential for saving \$250 million each year.

These estimates are consistent with the observation made by the Australian Federated Union of Locomotive Enginemmen (AFULE) that most rail authorities carry management overheads at a level about double of what could be achieved (Submission 125, p.4).

Table 7.1: Corporate/business overheads for rail tasks, 1989-90

<i>Rail service</i>	<i>Cost</i>		<i>Proportion of total cost</i>		<i>Potential saving</i>	
	\$m	%	\$m	%	\$m	%
Freight	166	12	106	40		
Non-urban passenger	107	21	55	51		
Urban passenger	164	15	89	54		

Source: Travers Morgan (Appendix K)

Passenger services typically require a larger share of corporate and business overheads than do freight services, but they also offer considerable scope for savings (over 50 per cent).

The extent of management varies considerably between systems. A compilation of the proportions of rail employees that occupy positions in management and administration indicates that the highest proportion is in the PTC in Victoria and the lowest in the SRA (see Appendix H, Table H.3). Indeed, the Victorian Minister for Transport has announced that the 1500 redundancies planned for the PTC in 1991-92 will be chiefly from management positions.

7.2.3 Organisational structures

The structure of management has important implications for efficiency. Railways have traditionally organised along functional lines, for example, operations, signalling and communications. The major disadvantage of this type of structure is that the focus of management is shifted away from markets and customers to 'running trains or engineering excellence focus' (Queensland Government, Submission 50, p.4). The SRA, V/Line (a division of the PTC), QR, Westrail and AN have all adopted a market oriented management structure. The Western Australian Government describes the benefits, for decision making, of the change in structure:

Business unit managers have been assigned to specialise in a particular line of traffic. This enables better co-ordination of decision making rather than permitting sub-optimal decisions being made separately within the individual functional areas. (Submission 43, p.27)

A recent comprehensive organisational review of an Australian railway (the Booz.Allen & Hamilton (1989b) review of the SRA) found that there were too many levels of management, which greatly reduced the effectiveness of managers. Excess management disperses responsibility for performance outcomes and can impede the flow of information. The SRA responded by halving the number of management layers. Cityrail is decentralising the management structure; responsibility has been devolved to managers appointed to individual lines who are directly accountable for their allocated resources. The SRA (1990b) comments that this has resulted in major efficiency gains.

7.2.4 Incentives

Establishing new management structures is no guarantee of improved efficiency. Managers need clear objectives, freedom to achieve these objectives and reliable information on which to make their decisions. Professor J. Freebairn stated that rail managers have not operated under such conditions:

... management has not been provided with rewards for improved performance, it has faced somewhat confused objectives and community service obligations, and a number of restrictions have been placed on the discretion of managers...(Submission 1, Paper 2, p.3)

Managers, like everybody else, must have some incentive to improve the efficiency of resource use and, more generally, to take the responsibility for pursuit of the performance needed to achieve corporate goals. Implementation of the recommendation in Chapter 3 that railways be incorporated would provide an environment which would encourage managers to excel.

7.2.5 Industrial relations skills

Changes to management structures result in managers assuming greater responsibility for use of resources. Use of skills not typically associated with railways management are required of managers, particularly industrial relations skills which focus on communication with railway workforces in a way which recognises that all staff are necessary to the achievement of the organisation's goals.

Labour productivity can only be maximised if industrial disputation is minimised. Tables 7.2 and 7.3 trace the industrial disputes record for the rail and other industries over the past ten years. These data show that:

- for the rail industry as a whole, the level of disputation in the past five years was markedly lower than in the early 1980s;
- that is not so in Victoria where strikes were particularly severe in 1987 and 1988;
- in Western Australia the degree of disputation appears stubbornly high in recent years;

- working days lost in the past five years for the whole of the rail industry were no more (on a per employee basis) than in the transport and storage or manufacturing industries;
- compared to the all industries average, the disputation rate in the rail industry has been very high but is improving; and
- excluding Victoria's poor record in 1987 and 1988, the rail industry had relatively few disputes in the latter half of the 1980s.

Table 7.2: Rail industry working days lost per thousand employees, 1980 to 1990^a

<i>Year^b</i>	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>Tas</i>	<i>Rail</i>
1980	349	3 000	148	411	1428	113	1 051
1981	640	504	181	412	123	541	437
1982	577	26	10 320	314	304	65	2 341
1983	4 178	2 282	167	31	252	328	2 047
1984	2 223	113	609	1 466	505	1 846	1 137
1985	618	3 053	544	0	115	0	987
1986	20	59	0	149	222	222	45
1987	50	2 856	4	115	666	222	624
1988	218	1 494	5	226	18	0	413
1989	139	55	27	187	26	0	86
1990	0	172	18	426	66	0	68

a Statistics are presented by State, not rail systems.

b Calendar years.

Source: ABS (1991a) and Labour Force Survey (unpublished data).

Table 7.3: Working days lost per thousand employees, selected industries, 1980 to 1990

<i>Year^a</i>	<i>Rail</i>	<i>Transport & Storage^b</i>	<i>Manufacturing</i>	<i>All Industries</i>
1980	1 051	469	1 078	649
1981	437	970	1 479	797
1982	2 341	593	474	358
1983	2 047	428	243	249
1984	1 137	672	344	248
1985	987	374	126	228
1986	45	142	343	242
1987	624	227	341	223
1988	413	180	358	269
1989	86	162	315	190
1990	68	324	558	217

a Calendar years.

b Prior to 1984 labour force data included communications industry.

Source: ABS (1991a, 1991b).

However, a resurgence of industrial disputes in the railways has been evident in the first half of 1991. For example, there was a prolonged strike during March in Adelaide in protest against staff reductions (driver only operation) on urban rail services, work stoppages in several rail systems during May 1991 because of dissatisfaction with wage negotiations and manning levels, and disruptions during July allied to a proposed labour agreement for the National Rail Corporation. These disputes illustrate the importance of industrial relations skills to the implementation of rail reforms. They also suggest a lack of rail union appreciation as to the severity of the problems facing railways and the need for radical reform to solve those problems.

Authorities are aware of the need to improve the industrial relations skills of their managers.

Day to day management of industrial matters is now a function of line management, reflecting the emphasis on management accountability for productivity. Considerable effort is being expended to ensure that line management acquires the skills necessary for carrying out this function. (NSW Government, Submission 75, Annexure 1, p.35)

There is a case for improving the industrial relations skills and industrial democracy awareness of middle management. (Submission 75, Annexure 5, p.9)

The training of managers and supervisors in appropriate consultation and employee participation will remain an important part of industrial relations policy. (V/Line 1989, p.56)

The Commission understands that in some rail systems there is a tendency for unions to raise potential disputes or problems in the first instance with the Minister for Transport rather than with railway management. This practice reflects an unsatisfactory industrial relations climate for which the principals must bear part of the blame. The separation of government from immediate involvement in such negotiations is an important pre-requisite to achieving a better climate.

7.3 Specific labour productivity issues

Substantial labour productivity growth has been recorded in the rail industry over the last decade. Most improvement is evident in freight - see Figure 7.1 and Appendix H, Table H.4. Slower growth has occurred in passenger employee productivity, with country passenger employee productivity showing the least growth - see Appendix H, Table H.5.

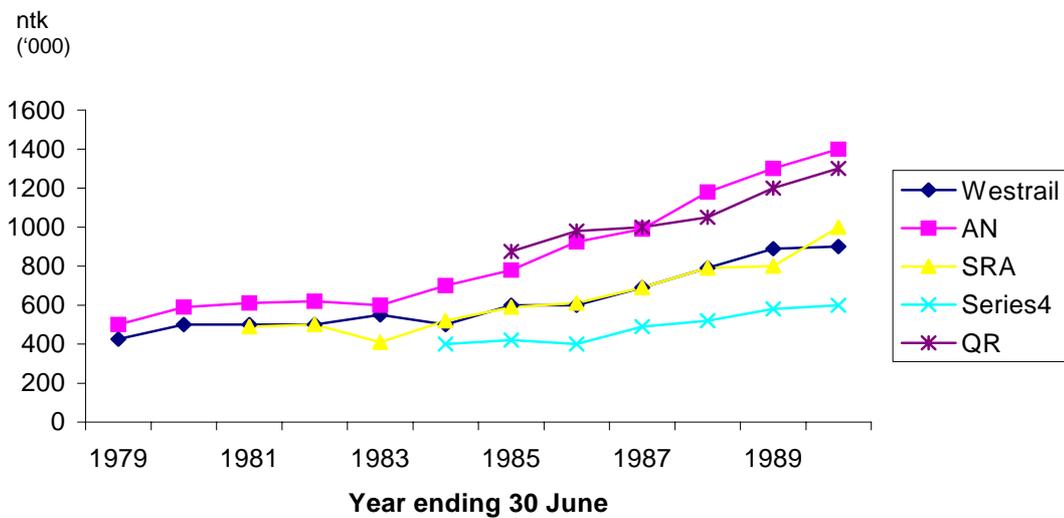
The growth in labour productivity is attributable to several factors:

- staffing reductions;
- a reorientation of tasks away from labour intensive unprofitable tasks to profitable capital intensive tasks, particularly bulk freight; and
- capital investment.

The Western Australian Government submission provides the following example of service reorientation:

The transportation of "less than car load traffic" was abandoned and the haulage of bulk traffics became the major area of business. (Submission 43, p.25)

Figure 7.1: Freight employee productivity, 1978-79 to 1989-90, thousand net tonne-kilometres per employee



a Westrail's productivity is measured in 'task units' defined as follows: task units = net tonne-kilometres + 1.5 passenger-kilometres.

Source: Rail authorities.

Rail labour productivity growth can be viewed as comprising two phases. Phase one is the reduction of overstaffing, removal of restrictive work practices and reorientation of services. Phase one has not been finalised by any railway. Some railways have addressed phase one issues with more vigour than others, particularly overstaffing. These issues are examined in Section 7.4.

Phase two involves more fundamental changes to the workforce that will yield longer term productivity growth. The remainder of this section examines key issues for achievement of that labour productivity growth: contracting out, union amalgamation, award restructuring, training and incentive structures.

7.3.1 Contracting out

Various services can be provided from within the rail system or by contract from an outside supplier. It is important that railways have the option of contracting out so that all opportunities can be harnessed for improving efficiency. Even if outside suppliers cannot establish their superior efficiency compared with internal railway provision, the mere possibility of work being contracted out can provide an incentive for better performance within the rail system.

The Department of Industrial Relations has noted another benefit.

Contracting requires public agencies, such as rail systems, to specify and justify the need for services more precisely than they have done in the past, revealing information about the nature of current operations and the costs of providing a certain level of service. This allows the public greater scrutiny and control over the distribution of public funds. (Submission 136, para 6.4)

Travers Morgan (Appendix K) identified the following areas as key targets for contracting out if international best practices were to be adopted: the cleaning of carriages and maintenance of railway facilities, the selling of tickets and the revenue accounting associated with ticketing. The National Farmers' Federation suggested that there are several other non-core activities that can be contracted out and there is a reluctance by some authorities to divest them (Submission 77, p.17).

There is evidence of increasing use by railways of contracting, particularly for non-core activities. AN provided the following examples:

A three year contract has been let for a high speed tamping machine to carry out most of AN's production standard gauge tamping. Considerable cost savings were made in this area. The average per kilometre cost for AN employees is \$2500; for contractors the average per kilometre tamping cost is \$1 160. (Submission 64, p.66)

A contract for the installation of fixed heel switches across the Nullarbor from Kalgoorlie to Port Augusta is proving to be a successful, with a saving of up to 40% over doing the work with AN staff. (Submission 64, p.66)

In responding to the draft report, the NSW Treasury supplied this information on the SRA:

Over the past few years the following support services have been put out to competitive tender or sold:

- printing
- legal
- medical
- station retail business
- outdoor advertising
- some CityRail cleaning and station maintenance
- traction motor work in Elcar
- most Trackfast road operations and most road motor vehicle maintenance
- increasing amounts of Countrylink work.

In 1990-91 Freight Rail workshops will be competing for 20 per cent of its work with outside suppliers. Freight Rail has recently gone to tender for the supply of locomotive services. This supply will be either purchased or fully maintained locomotives will be hired on a per kilometre basis. The latter option would constitute a partial withdrawal from loco maintenance activity. (Submission 130, p.5)

Contracting out

The use of contractors provides an incentive for more efficient production. Some railways are making greater use of contractors, particularly in non-core activities.

- The SRA has closed its medical section, all pre-recruitment medicals are done through local contracted practitioners.
- QR makes use of contractors for works such as bridge building.

Contractors are also being used in what might be considered core rail activities.

- AN let a three year contract to carry out production standard gauge tamping.

But there is also resistance to divest activities best done by contractors.

- V/Line still operates a printing works. This is despite recommendations from three inquiries that it should be closed (National Farmers' Federation, Submission 77, p.16).
- The Commission understands that the State Transport Authority (South Australia) generally does not contract out.

In contrast, QR seems to have steered away from contracting out other than for some construction and maintenance tasks.

Queensland Railways have achieved considerable economies in the internal delivery of services ... and would seek to continue to do so by adopting world best practice methods Mechanisms will be set in place to ensure that internal service provision is comparable in cost and quality to that available outside the organisation. (Submission 135, p.17)

The use of contractors to carry out tasks traditionally performed by rail employees is an issue for unions and thus for management. The views of the Australian Railways Union are:

... we are opposed to the practice of contracting out work or the provision of services, which can be carried out or provided by permanent workers within the industry. (ARU 1990, p.7)

The long run effect of these employment practices is to break career paths for low paid and low skilled workers and prevents access to and the provision of ongoing and higher training in the various facets of railway work. (ARU, Submission 141, p.9)

The Commission understands that some State governments - perhaps at the behest of unions - impose a policy on railways which allows only a minimum amount of contracting out, if any.

The Department of Industrial Relations (DIR) warned that contracting has costs if there is a permanent loss of skills which the organisation requires, and if flexibility is sacrificed by contractors working to the specificity of a contract even though changed conditions may call for some modifications (Submission 136, para 6.5). The Commission regards these as issues confronting any commercial organisation and not sufficient grounds for restricting contracting by railways; DIR concurs (Submission 136, para 6.6).

RECOMMENDATION 7.1

The Commission recommends the removal of all restrictions on the contracting of tasks so that railways can take every opportunity to attain maximum efficiency. Contracts could be competed for by other rail systems, between elements of the same system, or by the private sector.

7.3.2 Union amalgamation

The need for union amalgamation arises from the inflexibilities in the use of labour that the multiplicity of union coverage breeds. The current structure of union coverage can be detrimental to productivity in three ways:

- in lost productive time due to demarcation disputes;
- in limitations to the range of tasks workers can safely undertake; and
- in impeding the adoption of new methods of work.

Table 7.4 lists the union coverage in each railway. The types of unions involved in the rail industry are products of the nature of the tasks performed in rail and historical developments; they range from industry specific to craft based. In total there are thirty unions with coverage in the industry; each authority has at least 10 unions covering its employees. Eight of the unions ¹ have a membership limited to the rail industry; their combined membership is of the order of sixty per cent of total employment in public railways. The remainder of rail unionists belong to twenty-two craft and industry unions.

¹ Association of Railway Professional Officers of Aust., Australian Federated Union of Locomotive Enginemen, Australian Railways Union, National Union of Rail Workers of Australia, Queensland Railway Union of Employees, Railway Salaried Officers Union of Employees, WA Locomotive Engine Drivers, Firemen's, & Cleaners Union and Western Australia Railway Officers Union.

Table 7.4: Union coverage 1990

<i>Unions</i>	<i>SRA</i>	<i>PTC</i>	<i>QR</i>	<i>Westrail</i>	<i>AN</i>	<i>Total</i>
Amalgamated Metal Workers' Union	1 267	1 180	1 014	326	523	4 310
Amalgamated Metal, Foundry & Shipwrights Union	82					82
Amalgamated Society of Carpenters and Joiners of Aust.	22	40	609		23	694
Association of Architects, Engineers, Surveyors and Draftsmen of Aust.			18			18
Association of Professional Engineers	329	300	53	78	21	781
Association of Railway Professional Officers of Aust.	661	320		141	101	1 223
Australasian Society of Engineers	353				75	428
Australasian Society of Engineers, Moulders and Foundry Workers Industrial Union of Workers, WA				205		205
Australian Federated Union of Locomotive Enginemem	3 190	1 600	2 631		945	8 366
Australian Public Sector and Broadcasting Union					190	190
Australian Railways Union	11 325	10 010	10 008	2 310	1 759	35 412
Australian Transport Officers Federation	5 047	3 200		67	714	9 028
Australian Workers Union	190			75	1 185	1 450
Building Workers Industrial Union	100					100
Construction Mining and Energy Union					6	6
Electrical Trades Union	Na	890	277	101	144	1 412
Federated Clerks Union			79			79
Federated Ironworkers Association	145		307		32	484
Federated Liquor & Allied Industries Employees Union	10					10
Federated Timber Workers' Union of Australia	26					26
Municipal Officers Association		900				900
National Union of Rail Workers of Australia	1 097				15	1 112
Operative Painters and Decorators Union of Australia	83		53		14	150
Plumbers and Gasfitters Union	120	40	112		27	299
Printing and Kindred Industries Union	15	30				45
Queensland Railway Union of Employees			1 866			1 866
Railway Salaried Officers Union of Employees, Queensland			30			30
Vehicle Builders Employees Federation of Australia	406		222		76	704
WA Locomotive Engine Drivers, Firemen's, & Cleaners Union				850		850
Western Australian Railway Officers Union				1 129		1 129
Total	24 468	18 510	17 279	5 282	5 850	70 390

Source: Rail authorities

The complex pattern of worker representation imposes large and unnecessary costs on rail customers and union members. Apart from the costs of demarcation disputes and inflexibilities in the use of labour, other costs identified in submissions to the inquiry include:

- impediments to effective negotiations of management initiatives;
- dispute settlements which are more complex and difficult than if fewer unions were involved; and
- a lesser range of services available to members of smaller unions.

The following views from the Queensland and Victorian submissions illustrate the types of benefits rail authorities perceive from union amalgamation.

A rationalisation in the number of unions - to reduce the scope for demarcation disputes, to improve work practices and to improve the efficiency of negotiations - is one major benefit of amalgamation. (Victorian Government, Submission 58, p.24)

The large number of unions presently in existence allows for diverse and conflicting views to be held. This acts as an impediment to the effective negotiation of management initiatives. It is believed that a reduction in the number of unions would allow intraunion processes to resolve much of the conflict which presently characterises a diverse rank and file membership. (Queensland Government, Submission 50, p.14)

It is sometimes argued that union amalgamations are to the detriment of members of smaller unions. A larger, better resourced union can provide a wider range of services to its members, which would be the main gain for those previously belonging to smaller unions. The challenge for the amalgamated union is to represent effectively the interests of all separate groups so that none feels a sense of alienation. Similarly, all the diverse groups must recognise that whilst each vocation may have special needs, none is paramount to the industry's performance.

Demarcation

Multiple union coverage imposes unnecessary costs on the rail industry, as illustrated by these disputes.

In April 1990, members of the Amalgamated Metal Workers Union (AMWU) and the Australasian Society of Engineers (ASE) at AN's Islington workshops imposed a ban on working with and on any work performed by Australian Railways Union (ARU) tradespersons in the wheel shops. The ban was in place for over 2 months.

In July 1990, again in AN, 20 ARU members placed bans on the receipt of incoming goods after an Australian Workers Union (AWU) member refused to join the ARU

The multiplicity of trade unions is acknowledged as an industry problem by employers and unions.² All rail authorities expressed support, in their submissions, for the notion of union amalgamation. For example:

The Department of Transport favours a reduction in the number of unions serving the rail industry. (Queensland Government, Submission 50, p.14)

... AN would also favour amalgamation of rail unions. (AN, Submission 64, p.38)

At the Canberra initial public hearings AN and the SRA testified that a single award rather than a single union was a goal of more relevance than union amalgamation to railway authorities. However, the committee investigating the establishment of the National Rail Freight Corporation (NFI 1990b, p.4) noted that the establishment of a new award structure 'would be assisted by a reduction in the number of union organisations and branches'. The issue of award rationalisation is discussed in Section 7.3.3. Rail authorities will derive benefits from union rationalisation but are not in a position to play a dominant role in the process. The need to maintain good relations with existing unions and their leadership is probably foremost in the thinking of rail authorities, especially given that rationalisation has a long time frame.

Union rationalisation was also a Railway Industry Council (RIC) recommendation for labour market reform in the rail industry.

The number of unions in the rail industry be reduced, and steps toward this end be given a high priority by the union movement. (RIC 1990b, p.9)

In evidence to this Commission, the ARU advised that preliminary agreement has been reached between it and four other unions on the need to work for the creation of a new public transport workers union.³ There remain several significant unions outside these negotiations, including the Australian Transport Officers Federation (ATOF) and two major workshop unions, the Electrical Trades Union (ETU) and the AMWU. These unions do not have a membership confined to the rail industry; in fact, the latter two have only a small rail component in their membership. The announced ACTU proposals⁴ for rationalising union coverage in an industry by classifying incumbent unions into three categories, principal, significant and other, if applied in the rail

² A dissenting view is expressed in the submission by the West Australian Locomotive Engine Drivers', Firemens' and Cleaners Union. It argues that members will lose access to union officers that have a more intimate knowledge of the membership.

³ The other unions are the Australian Federated Union of Locomotive Enginemmen, the Australian Railway Professional Officers Association, the National Union of Rail Workers of Australia and the Australasian Tram and Motor Omnibus Employees Association.

⁴ Under these arrangements a 'principal union' will have the right to recruit all workers in its industry. 'Significant unions' will be able to continue recruiting new members, but only within occupational categories they already cover, and only if they undertake to combine with other unions to form a single bargaining unit. 'Other unions' can retain their existing members but cannot recruit new members or block their transfer into principal unions.

industry should facilitate amalgamation. The guiding principle for classification should be the union's relevance to the rail industry. For example, if workshops remain an integral part of railways, then as a facilitative step towards an industry union, workshop unions should be classified as 'other unions'. With this classification they can retain existing members but cannot recruit new members or block the transfer of existing members to the principal industry union. The current legislative provision of the Industrial Relations Act, s.118, is sufficient basis for arbitration where agreement cannot be reached.

Union rationalisation, in the rail industry, has as a potential outcome the formation of enterprise unions. The amalgamation of existing State branches of unions would leave one union to cover the employees of each rail authority. Enterprise unions are likely to be associated with a closer commitment to the firm, resulting in more realistic bargaining outcomes.

Union rationalisation is a precondition for improved labour flexibility in railways. The negotiation of award changes to existing work arrangements may improve flexibility but they do not remove the problem that, so long as unions compete for membership within an industry, there will be incentives to protect jobs and thus membership bases.

Multiple union coverage imposes unnecessary costs on the rail industry. Enterprise unions are the most desirable outcome from union amalgamations in the rail industry.

7.3.3 Award restructuring

The notion of establishing a formal framework to remove productivity impediments in awards came under serious consideration in 1986. It was formalised in March 1987 with the then Australian Conciliation and Arbitration Commission's (ACAC) introduction of the restructuring and efficiency principle, commonly known as the second tier arrangements. Under these arrangements a wage increase of up to 4 per cent was available in return for genuine productivity and efficiency improvements. These included changes in restrictive work and management practices, reduction in demarcation barriers, multiskilling, measures to facilitate the introduction of new technology, broadbanding of award classifications and improved training arrangements. Rail employees received second tier wage increases. With the exception of Westrail and the SRA, little emphasis was given to the second tier outcomes in their annual reports. This seems to suggest that most changes were not regarded as significant reforms by the rail authorities.

The structural efficiency principle (SEP) replaced the restructuring and efficiency principle in 1988. Both principles share common elements but differ in approach. The restructuring and efficiency principle involved iterative changes, through a series of trade-offs, to existing work arrangements. The SEP has a longer-term objective of redefining employment arrangements. Hence its greater emphasis on structural issues such as career structures and training.

While both approaches have the same objective, improving productivity and efficiency, they are fundamentally different ways of achieving these goals. The SEP involves a much broader and deeper examination of work arrangements. All rail authorities and unions are involved in the award restructuring process.

Two wage increases of 3 per cent have been awarded in the rail industry under the SEP. The first increase was granted after the unions agreed to participate in the process and the parties formulated a framework for negotiations. The second increase was to have been paid subject to the relevant tribunals being satisfied that the SEP had been implemented effectively. In the event, the granting of the second structural efficiency increase proceeded when tribunals were satisfied that authorities and unions negotiations were progressing satisfactorily. At the initial public hearings in Canberra the managing director of AN described the benefit of the SEP in these terms:

This whole business of award restructuring and structural efficiency has provided an environment where things can be now talked about and discussed and even changed, where 3 years or 4 years ago there were areas which we could not even talk about. (Initial hearings, p.518)

The following examples illustrate the type of improvements achievable in labour flexibility.

- AN multiskilled wagon repairers thereby reducing the staff required from 91 to 37.
- Westrail introduced broadbanded classification structures in several of its branches. For example salaried staff pay points were reduced from 200 to 43, in 9 classification levels. Broadbanding allows greater flexibility in using staff within the same classification level while allowing staff to acquire and use a broader range of skills.
- AN commenced driver-only operation trials on both mainline and shunt working.
- The SRA negotiated an increase in the span of ordinary hours and introduction of 12 hour shifts.
- CityRail negotiated more flexible rostering agreements.

The Commission asked the rail authorities for more details of the achievements of the award restructuring process and of the magnitude of their impact. It seems that the effects have been only modest. Queensland Railways has been 'unable to measure benefits at this early stage but trials currently being undertaken, particularly in the civil maintenance area, are showing results that are very encouraging' (Queensland Government, Submission 135, p.22). The SRA made a tentative prediction of cost reductions 'in the area of 10 to 15 per cent'. Other railways could not provide any measure of benefits.

Travers Morgan (Appendix K) provided the following estimates of the scope for cost savings if international best practice were adopted in the principal labour inputs. Award restructuring provides the framework for the adoption of such practices.

Table 7.5: Costs and potential saving of principal labour input in railways

<i>Rail service</i>		<i>Total cost</i>	<i>Proportion of total cost</i>		<i>Potential saving</i>	
			<i>\$m</i>	<i>%</i>	<i>\$m</i>	<i>%</i>
Freight:	train crew	294	14	112	38	
Non-urban:	train crew	37	7	14	38	
	on-train crew	47	9	16	34	
Urban:	train crew	226	21	82	36	

Source: Travers Morgan (Appendix K).

In commentary on the scope for achieving such savings, Travers Morgan identified the following specific reforms.

- Completion of the transition from three-man to two-man crewing.
- One-man crewing for point-to-point freight trains where there are adequate communications between train and base. (Two-man crews would continue to be necessary where any shunting is involved.)
- Further increases in untenably low distance/shift limits for train drivers. Productivity also could be increased by removal of work practices that require a crew change at depots rather than ‘working through’ depots.
- Overall, productive crew time (‘footplate hours’) could be increased substantially to 1100 hours per crew per annum - equivalent to 25 hours per week for 44 weeks per year.
- Driver-only operation of suburban trains; it would be reasonable to maintain one other train crew for every four drivers in order to ensure passenger security on evening trains and to inspect tickets.
- Changes to traditional straight shift worked by railway crews where that is incompatible with peak demand.

With regard to the last of these points, Travers Morgan commented as follows:

A key issue in suburban rail operations is to align worked hours more closely to vehicle hours by changing work practices, either through the introduction of broken shifts (as has recently been done in Adelaide) or through other forms of flexible rostering which keep working hours constant but increase the ratio of productive time.

These suggestions are consistent with the observations of others. In particular, the SRA noted (Business Review Weekly 1990, p.50) that the current shift arrangements result in drivers spending too little time utilising the skills for which they are paid. The proportion of productive time to shifts was estimated by Booz.Allen & Hamilton (1989b, p.VII-12) at about 30 per cent for freight enginemen. Other reforms, such as part-time employment, were said by the SRA to increase its ability to attract key employees who are not available to work full time.

In summary, while considerable energies have been devoted to the formation of career paths, the reform of restrictive work practices appears to be lagging. The pace of reform needs to be accelerated. More satisfying jobs will not be realised until the productivity impediments inherent in current work arrangements are removed. More tangible reforms should be demanded by the owners of railways from the award restructuring process which has now been under way since the introduction of the second tier arrangements in 1987. There remain several changes that would further improve the flexibility and productivity of the labour force.

RECOMMENDATION 7.2

The Commission recommends that all rail authorities strive for more efficient use of their most costly input, labour. There remains considerable scope for increased labour productivity from more flexible use of their workforce. Such changes might include:

- **employment of permanent part-time staff (particularly for peak periods);**
- **more extensive use of casual and temporary employment;**
- **wider shift spans and split shifts; and**
- **continued multi-skilling in order to reduce fragmentation of the workforce and demarcation disputes.**

In response to the draft report, the ARU noted that rail unions have already accepted wider shift spans, from 7.30am - 5.30pm to 6am - 6pm, as part of the structural efficiency principles (Submission 141, p.11). The ARU also said that:

The issue of split or broken shifts in the context of train operations is fraught with difficulties and inequities. (Submission 141, p.11)

The AFULE made similar points.

Split shifts impose social problems and often result in alcohol consumption. The high standards required for train drivers do not lend themselves readily to this type of working, or part-time casual employment. (Submission 125, p.5)

The Commission draws attention to the fact that split shifts for train drivers are in effect in the Adelaide suburban system and that driver-only operation of trains is currently being implemented (State Transport Authority of South Australia, Submission 123, p.1), albeit with a degree of industrial disputation.

Elsewhere in the public transport arena, the State Transit Authority of New South Wales (bus and ferry services) has implemented split shifts for bus drivers so as to better match labour costs with morning and evening peak hour services.

Apart from train crewing, there is of course considerable scope for more effective use of labour by manning suburban railway stations with part-time staff. The SRA indicated that negotiations are under way with the unions concerning permanent part-time employment (Draft report hearings, p.184). The Queensland Government, however, judges there is only limited scope for casual, temporary and permanent part-time employment in QR (Submission 135, p.18).

7.3.4 Training

Training is an important means of achieving a more productive workforce. The formation and development of skills through training potentially enhances productivity in two ways:

- by workers developing existing skills that enable current tasks to be performed more efficiently; and
- by developing new skills, workers can efficiently perform a wider range of duties increasing the flexibility of the workforce.

As award restructuring continues, workers will require a wider skill base as their range of duties expands with the progressive introduction of broadbanding and multi-skilling. Thus there is a direct link between the outcomes of award restructuring and future training needs.

In the past there has been little incentive for employees to obtain additional skills. Where career paths have existed they tended to be narrowly defined with promotion based on seniority. One of the stated aims of the SEP is the establishment of skill-related career paths which provide an incentive for workers to continue to participate in skill formation (ACAC 1988, p.11). All rail authorities are currently addressing this area in their award restructuring negotiations. The common approach has been to establish a hierarchy of committees, constituted by management, union officers and employees, to formulate new career structures. Negotiations are currently underway on the refinement of these structures; those developed to date appear to provide for greater vertical progression but not much scope for horizontal movement by employees.

The relative immobility of railway workers is a consequence, in part, of the fact that many of their skills are not recognised outside the rail system in which they were acquired. There is scope to reduce immobility by adopting national training standards. RIC has recommended that:

... rail employees skills be based on a system of national accreditation with consistency of qualifications and licences, and with appropriate training and retraining programs for employees under the supervision of a national railway training board. (RIC 1990b, p.9)

Such a move would provide benefits, to rail employees and the whole community, by removing formal impediments to the flow of labour between systems.

The movement of certain labour from the rail industry to other industries will be difficult as the skills possessed by many employees are industry specific. For instance locomotive drivers, shunters and train examiners are unlikely to be in great demand outside the rail industry. While skill accreditation for these employees is unlikely to improve the prospects of moving between industries, it may provide a signal to other employers as to the level of general skills possessed by these employees.

The lack of national recognition of rail industry training and skills is an impediment to labour mobility.

Railways devote considerable resources to training. Many occupations require skills that cannot currently be acquired outside the industry and in-house training is conducted on-the-job or at formal training centres. The SRA has four training centres and QR has a driver training centre at Rockhampton, a technical training centre at Redbank and a headquarters training centre in Brisbane. The Commonwealth Department of Employment, Education and Training (DEET) has reported training expenditure for all major rail systems in excess of the 1.5 per cent level stipulated in the Commonwealth Government's training guarantee legislation: 1.8 per cent for QR, 2.0 per cent for AN, 2.8 per cent for the PTC and 5 per cent for the SRA (Submission 101, p.7).

Training can be expected to make a greater call on the resources of the rail system in the future. A national training standard, apart from improving intra-industry mobility, also has the potential for the systems to reap economies of scale in training infrastructure.

DEET has advised the Commission that a steering committee has been formed to undertake initial investigations on the feasibility of establishing a National Public Transport Training Committee. As the name implies, its concerns would not be limited to rail transport. Such a committee would be autonomous and tripartite, with membership representing employer and employee associations as well as governments. Similar committees, owned and controlled by their industry, have already been established for some industries under the auspices of the Industry Training Support Program (Submission 101, p.16). Some State training committees already are considering issues of rail training (Department of Transport and Communications, Submission 128, p.8).

The ultimate objective of the Committee would be to establish national skill standards and training, and the final stage of the process would be to have those standards accredited by the National Training Board.⁵

This is the approach preferred by the Australian Railways Union:

We see it as important that there be nationally consistent standards for training, consistent with and part of the uniform standards for training which are being developed for Australian industry as a whole under the auspices of the National Training Board. (Submission 141, p.12)

Achievement of this objective will require considerable commitment from the different rail systems (DEET, Submission 101, p.16); their reactions to the Commission's draft report suggest that may not be forthcoming.

- The Queensland Government is concerned that many differences between Australian rail systems will make the task enormous and the costs could well outweigh the benefits (Submission 135, p.17).
- Queensland Railways believes it should be exempt because of its closed, narrow gauge system (Submission 135, p.17).
- Westrail is concerned about cost-effectiveness because of their isolation from the other rail systems.
- AN regards it essential that separate schemes be established for urban public transport systems and non-urban rail in recognition of the different skills involved in such disparate operations (Submission 115, p.1).

In contrast, the SRA supports the concept of a national accreditation scheme and is participating in the initial work of the steering committee mentioned above (NSW Treasury, Submission 130, p.6).

The concerns held by some others seem to focus too much on the differences between rail systems and fail to recognise core competencies common to all railway operations. DEET assesses the situation as follows.

The barriers to the development of co-ordinated training arrangements across systems have been correctly described as 'more imagined than real'. It is therefore difficult to believe that training courses and programs in core competencies and skills could not be developed. Individual rail systems would be free to develop their own short training courses in system specific skills as required by their different operating procedures and equipment. Training structured in this way is becoming an increasingly accepted approach in a number of industries and has two distinct advantages. First, the rail industry as a whole would be better placed to exploit economies of scale in

⁵ The National Training Board (NTB) commenced operations in April 1990. Its owner members are the Commonwealth, State and Territory Ministers responsible for vocational education and training. The NTB operates under a Memorandum of Understanding whereby the Ministers have all agreed to provide and accredit vocational education and training nationwide within the framework of the national competency standards. The NTB's role is to assist industry to develop and then endorse national competency standards for occupations and classifications in industry or enterprise awards or agreements.

training activities and facilities. Second, rail workers could move across systems with greater transferability of skills and reduced needs for retraining. (Submission 101, p.9)

The Department of Industrial Relations supports the concept of a national accreditation scheme for skills acquired in the rail industry (Submission 136, para. 7.2).

RECOMMENDATION 7.3

The Commission recommends that a national accreditation scheme be established, perhaps under the auspices of the National Training Board, for the recognition of rail skills.

The Commission notes that this recommendation is consistent with initiatives announced at the July 1991 special Premiers' Conference for the development of national competency standards for occupations and for the implementation of mutual recognition of skills (SPC 1991c, pp.11-12).

7.3.5 Occupational health and safety

The payoff to railways from improving occupational health and safety is greater workforce productivity at lower cost. Productivity improvements are possible as accidents disrupt work and increase downtime. Moreover, workers are typically restricted in their duties during rehabilitation. Booz.Allen & Hamilton (1989a) estimated the annual cost to CityRail of medically restricted staff to be \$30 million. Improvements in occupational safety and rehabilitation provide a demonstrable dividend to rail authorities. Lower injury rates should result in lower workers' compensation premiums, further reducing the on-costs associated with labour input.

7.3.6 Incentives

The reward system is an important factor in creating an environment of high labour productivity. The following impediments can be identified in existing rail promotion and remuneration systems:

- seniority based promotion stifles the incentive to perform as speed of promotion depends on length of service as much as ability;
- salary structures pay the job rather than the person; and
- automatic lines of progression reduce competitive pressures for future promotions.

There are signs that change is taking place. The SRA has reached agreement with unions on a timetable for the abolition of seniority (NSW Treasury, Submission 130, p.6) and has recently recruited externally for trainee locomotive drivers. The introduction of broadbanding in Westrail should increase the scope to include productivity increments in employees' remuneration.

Career paths now being developed as part of award restructuring should include incentives for productive performance. As a first step, progress through seniority, where still in place, should be abolished. Secondly, salary structures should allow some scope for elements of performance based pay and/or more flexibility in rates of pay for particular jobs, depending on an employee's skills, qualifications and experience (DIR, Submission 136, para 8.2).

Seniority based promotion, automatic lines of progression and existing salary structures provide no incentive for improving productivity.

RECOMMENDATION 7.4

The Commission recommends that rail authorities establish incentives for productive performance including:

- **the abolition of seniority based promotion and the introduction of merit based promotion for all employees; and**
- **the introduction of salary structures that allow some scope for recruitment or promotion of employees to different levels within a salary range, depending on an individual's skills, qualifications and experience.**

7.4 Workforce reductions and productivity

7.4.1 Past and planned

One of the significant features of rail labour markets over the last decade has been large reductions in employment. Total railway employment in Australia has declined from 110 000 in 1980-81 to 79 000 in 1989-90, a drop of 29 per cent. Appendix H.1 provides the annual figures for each system; they are depicted in index form in Figure 7.2.

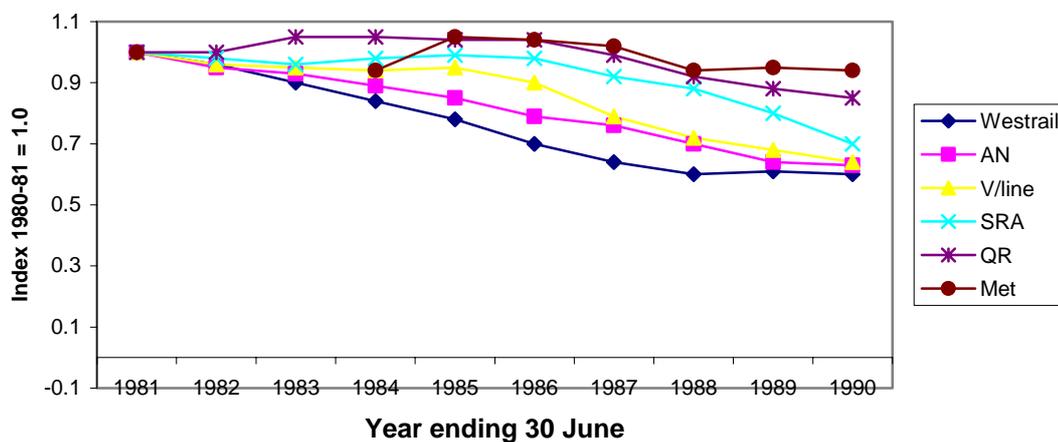
The reductions have been achieved to date via natural attrition, redeployment and voluntary redundancy rather than compulsory separations. Accordingly, substantial workforce reductions have been achieved without major industrial disputation (see Tables 7.2 and 7.3).

Employment reductions

The percentage reductions between 1980-81 and 1989-90 were:

▪ All systems	29
▪ The SRA	32
▪ Met (Melbourne urban rail)	07
▪ V/Line	37
▪ QR	17
▪ Westrail	41
▪ AN	39
▪ State Transport Authority (Adelaide urban rail - not in Figure 7.2)	14

Figure 7.2: Railway employment by system, 1980-81 to 1989-90



Source: Rail authorities.

There are several factors that have enabled reductions of these magnitudes:

- initial overstaffing;
- rationalising services;
- capital substituting for labour;
- changes to work practices; and
- changes to work organisation.

Changes in the way work is organised and performed, and facilitated by technological improvements, have reduced the demand for labour (and will continue to do so) in rail. Some examples illustrate this permanent decline in labour demand.

- Reductions in train crewing: freight train crews have been reduced from three to two or one person operations.
- The increased use of block trains has reduced the need for shunting.
- New rollingstock has been introduced that requires less labour to maintain.
- Labour-intensive tasks such as track maintenance have been mechanised.
- Workforce multi-skilling and broadbanding of occupations have increased the range of tasks that individual workers can be required to perform.

Each rail system has its own special conditions and constraints, but some indication of the scope for further workforce reductions is provided by the SRA's future program. From the June 1990 level of 28,842, the SRA plans to cut the workforce by some 35 per cent to 18,500 by 1994. Achievement of that objective would put the workforce at 44 per cent of its 1980-81 level despite substantial increases since then of railway freight and passenger transport.

SRA voluntary redundancy initiative

- Letters were sent to all SRA employees asking who is interested in accepting a voluntary redundancy package and, for those employees, seeking suggestions as to how their jobs might be restructured so that the positions are no longer required.
- By end-January 1991, 2000 employees had indicated willingness to accept a redundancy package; one third of those had made suggestions for eliminating their positions.

Scope for labour force reductions is also illustrated by AN's achievements and intentions. Following the substantial reductions already achieved as shown in Figure 7.2 and the accompanying box, AN plans to reduce employment by another 17 per cent, from the present level of 6000 to 5000, by 1993-94 (Submission 115, p.5). In evidence to the Commission, the AN representative stated that an eventual employment level of around 4500 might be appropriate if suitable capital investment were undertaken (Initial hearings, pp.548-549). A workforce of that size would be equivalent to 43 per cent of AN's actual workforce in 1980-81, much the same as the overall reduction in prospect for the SRA.

The experience of the New Zealand Railways Corporation (NZRC) also is pertinent. In 1983 the consultants Booz.Allen & Hamilton recommended staff reductions of 4500 to make NZRC competitive with road transport. In fact the workforce was reduced from 21 000 in 1983 to around 6500 in 1990 with little change in the total rail task. Appendix I.1 describes developments in NZRC.

The SRA plans the following employment levels for the CityRail system:

1989-90	13 014
1990-91	10 914
1991-92	9 822
1992-93	9 690 (Submission 75, Annexure 5)

These achievements and plans raise questions as to why relatively little labour cost savings have been achieved in the Victorian urban rail system (part of the Met), the Adelaide urban rail system (part of the State Transport Authority, South Australia) and in QR.

The Commission notes that crew costs per train kilometre on the Victorian and South Australian urban rail systems are higher, by 29 per cent and 22 per cent respectively, than the Australian urban average (based on Commonwealth Grants Commission data). In the South Australian case, the State Transport Authority has defended the relatively modest contraction of its labour force during the 1980s on the grounds that it had only a small employment base from which savings could be made. It also has drawn attention to the recent implementation of driver-only trains (105 guard positions abolished) and of split shifts (Submission 123, p.1).

The relatively low reduction (17 per cent) in the QR workforce between 1980-81 and 1989-90 is attributable in part to substantial growth in the volume of coal hauled. But the Queensland Government, in its first submission to this inquiry, indicated that QR had been heavily constrained by government policy in achieving labour cost reductions.

Government policy has been supportive of QR in the reduction of staffing levels although there has been some reluctance to reduce staff number in remote areas. Reductions have been achieved within the constraints of a policy of reduction by natural attrition (including voluntary early retirement) which has been supported by the Government. (Submission 50, p.10).

However, in its later submission the Queensland Government observed that QR is now operating according to commercial strategies and that:

Future staff levels will depend on the finalisation of business plans and acceptance of a new corporate strategy. (Submission 135, p.22)

The Commission understands that QR could undertake its current volume of work with between 12,000 and 15,000 employees. Even if the lower bound of this range were achieved, the overall percentage reduction since 1980-81 for QR would be less than for the other large rail systems and may not be sufficient to lift QR's total factor productivity to a level comparable with the best of Australian railways (see Appendix E, Figure E.5).

The summation of these various targets and informal estimates suggests that the current rail tasks could be performed with approximately 50 000 employees, about one third less than the current level of employment. Independent estimates are consistent with this conclusion - see Section 2.6. The adoption of 'best practice' by the pending National Rail Corporation is a new development which will put pressure on participating rail systems to reduce further their workforces.

In its draft report, the Commission included a recommendation that governments remove all policy constraints on railways with respect to their efficient management of labour resources. This prompted similar observations from the Commonwealth Department of Industrial Relations, from the New South Wales Treasury and from the Queensland Government that government business enterprises are expected to observe some very general principles pertaining to public sector employment.

The Commonwealth Government in 1988 significantly reduced its policy constraints on enterprises such as AN which 'now has largely unencumbered discretion in commercial management of its operations, including the management of its labour resources' (DIR, Submission 136, para 9.3). However, as long as AN remains a Commonwealth Government owned entity it is required to follow Commonwealth guidelines on retrenchment, redundancies etc. DIR has stated that AN has not, in practice, been constrained by such requirements.

The New South Wales Government also imposes restrictions, the most important of which is a prohibition on forced redundancies. This has not yet been a significant practical constraint given the willingness of employees to take voluntary redundancy packages (NSW Treasury, Submission 130, p.6).

The Queensland Government is committed to equity and redeployment priority in public sector employment and intends to establish guidelines that preserve those principles and yet not conflict with management autonomy for government business enterprises (Submission 135, p.18).

The Commission is of the view that no railway can operate efficiently so long as there are constraints on the efficient use of the principal input, labour. The recommendation in Chapter 3 that railways be incorporated should result in a more commercial approach to the management of all resources. The advantages of such incorporation will be reduced if governments continue to impose any special restrictions on railway employment conditions, especially because so doing reduces the competitiveness of railways compared with road transport. Even if governments retain ownership, they must demonstrate true 'arms length' relationships by ensuring that railways are not required to meet labour market requirements more demanding than those faced by the private sector. In particular, cyclically high unemployment throughout the economy should not be grounds for deferring workforce rationalisation in railways. Truly commercial enterprises typically undertake their most substantial restructuring during recessions.

RECOMMENDATION 7.5

The Commission recommends that, with respect to their management of labour resources, railways not be subject to government policy constraints that are more restrictive than those applying to private sector enterprises.

The preceding comments on past and planned workforce reductions do not take into account any significant change in the types of services which railways might provide. If a more commercial approach were adopted, some low productivity tasks would be abandoned; specific examples are discussed in Chapters 8-11.

7.4.2 Redundancy packages

A common experience reported by railways is that natural attrition alone cannot achieve adequate reductions in the workforce; it needs to be complemented by some form of redundancy package.

To date employment reduction targets have been achieved with voluntary redundancies. Table 7.6 gives some indication of the number of persons leaving the industry with a voluntary redundancy or early retirement package in the past seven years. For the four authorities shown, a total of 10 734 employees received a redundancy or early retirement payment.

Table 7.6: Redundancy separations and payments

<i>Authority</i>	<i>Number</i>	<i>Period</i>	<i>Payments \$m</i>
SRA	2 100	1988-1990	32.2
PTC ^a	4 056	1983-1990	na
QR	1 633	1985-1990	na
Westrail	811	1984-1990	12.9
AN	<u>2 134</u>	1985-1990	<u>61.7</u>
	10 734		na

a Separations are for all Victorian public transport authorities.

Source: Rail authority Annual Reports.

While the packages offered by each authority are different, they do have some common characteristics:

- acceptance is voluntary;
- re-employment with the authority is prohibited for a set period after the redundancy;
- offers are not open ended, final approval resides with the employer; and
- redundancy payments are made only after retraining, relocation options are exhausted.

Taking the SRA, Westrail and AN together, the average redundancy payment was around \$20 000 per employee. Typically the maximum redundancy payment is equivalent to wages for one year. In addition, there are payments for accumulated annual leave, long-service leave and superannuation. Table 7.7 summarises most of the schemes offered by railway authorities.

Only AN has provided the Commission with any detail on the potential stream of savings from redundancy schemes. Total savings of \$474.2 million were estimated over a ten year period after their introduction. These schemes deliver substantial savings because those positions that are targeted contribute less to output than to costs.

The Commission has been convinced that redundancy packages have been fairly cost effective in achieving relatively large labour force reductions with minimal industrial disputation.

The Commission understands that some railways, particularly the PTC in Victoria, have difficulty in funding redundancy payments. While the actual redundancy payment provides few problems, there are difficulties in obtaining funds from consolidated revenue to pay out long service leave and superannuation entitlements. No doubt reflecting these constraints, the Victorian Government suggested establishment of a public transport retraining, redeployment and redundancy scheme to fund future downsizing (Submission 58, p.23).

During the course of this inquiry, no government advised the Commission that Commonwealth grants were needed for the specific purpose of funding redundancy payments. The Commission is of the view that such grants would not be appropriate; redundancy payments should be funded by the railways. However, for those railways not able to fund from internal cash flow both redundancy payments and other termination entitlements (long service leave, superannuation), it may be appropriate for the Commonwealth to provide borrowing approval for the termination entitlements. Such an approach was considered at the special Premiers' Conference in October 1990 when agreement was reached that transitional funding of reforms with large up-front costs and delayed benefits might be accommodated within special additions under the global approach to Loan Council borrowings.

Indeed, at the May 1991 Premiers Conference/Loan Council it was agreed:

that special temporary additions for 1991-92 be provided to NSW and Victoria to finance redundancies as part of reforms to improve the performance of the public sector and public enterprise efficiency. The amounts agreed were \$200 million for NSW and \$300 million for Victoria. (Treasurer 1991, p.5)

Only part of those amounts will be used for railway redundancies (see Section 6.1).

Table 7.7: Rail industry redundancy and early retirement packages

<i>Authority</i>	<i>Package</i>	<i>Description</i>	<i>Gratuity^a</i>
SRA	Voluntary Severance	Offered to employees who cannot be redeployed.	2 weeks pay for each year of service, max. 26 week payment. 4 weeks pay in lieu of notice.
	Voluntary Early Retirement	Offered to employees who are not surplus but are prepared to retire to make way for redeployed staff.	As above.
PTC	Early Retirement Plan (ERP)	Introduced in September 1983 and offered to employees over 50 years of age.	
	Transfer, Redeployment and Redundancy Scheme (TRRS)	Introduced in August 1986 and operated essentially as a redundancy scheme although redeployment was a key feature of the scheme.	
	Transfer, Redeployment and Retraining Program (TRRP)	Introduced in 1988-89. Its emphasis is on retraining and redeploying surplus staff. Retrenchment is only considered in exceptional circumstances.	
QR	Voluntary Early Retirement Scheme	For employees occupying positions surplus to QR's needs and who have at least 5 years of service.	Employees with superannuation: . under age 55, 26 weeks' pay plus 1 week for each year of service . age 55 and over, 1 week of pay for each year of service Employees without super: . 26 weeks' pay plus 1 week for each year of service plus retiring allowance.
Westrail	Selective Voluntary Severance Scheme	For employees who become surplus to requirements and their skills are not required in some other position. Other employees can participate if they can be replaced by a surplus employee.	2 weeks pay for each year of service, maximum payment 45 weeks.
AN	Voluntary Redundancy Incentive Scheme (VRIS)	Operated continuously since 1987. Targets positions rather than individuals.	2 weeks wages for each year of service, maximum payment 52 weeks. Lump sum reduces for each year of service after age 55.
	Separation Incentive Gratuity Scheme (SIGS)	Used in 1985 and since 1988. Available to employees over 55.	As above.
	Voluntary Termination Incentive Scheme (VTIS)	Aims to reduce employment in areas where positions are not redundant.	As above.

a Employees also receive cash equivalent of annual leave, long service leave and superannuation benefits.
 Source: Rail authorities.

With regard to redundancies, the Railway Industry Council (RIC) recommended that:

Government, systems and unions adopt a single national transfer, redeployment and retraining agreement and in circumstances where rail industry restructuring may require reductions above the level of natural attrition, a uniform retirement/redundancy package be negotiated. (RIC 1990b, p.9)

The Commission is of a view that a uniform package would be likely an impediment to labour market flexibility. Each system and its unions should be free to negotiate a package that reflects local conditions.

7.4.3 Redundancy experiences

A survey of redeployed and redundant rail workers was conducted by the Bureau of Transport and Communications Economics in 1989 (BTCE 1990a). 1298 responses were received from the SRA, V/Line, AN and Westrail workers redeployed or made redundant between January 1987 and June 1988. No compulsory redundancies were made by railways during this period. The results of the survey indicate that:

- Of those workers that accepted a redundancy package, and did not retire from the workforce, 56 per cent found alternative employment. Despite the fact that 51 per cent of the re-employed were earning less money, 67 per cent expected their financial prospects to be better.
- 44 per cent remained unemployed after redundancy and two thirds of these for at least 13 months. Lowly skilled employees accounted for 56 per cent of the unemployed.
- 89 per cent of the unemployed workers had not applied for available government retraining schemes. 84 per cent of the unemployed had not applied for assistance schemes designed to help workers with long-distance job search or relocation expenses. Only 7 per cent of the unemployed respondents said they remained unemployed because they did not want to move to another area.

Retraining and job search assistance may reduce the proportion of redundant workers that remain unemployed. It appears the availability of these schemes is not widely known to redundant workers. Liaison between the government departments, promoting the schemes, and rail authorities may improve the situation.

7.4.4 Regional effects

The reduction of employment in regional centres as railways reduce their workforces is one of the more obvious effects of the rationalisation process. Three separate studies have been undertaken by the BTCE (for RIC), by DEET and by Fagan (for the ARU) to determine these regional effects. The results are not conclusive.

This is illustrated by findings on Grafton. The BTCE study, covering only a twelve month unemployment period, found Grafton to have a good capacity to absorb displaced rail workers. DEET, however, noted that such a short time span meant it was not feasible to gauge the long-term regional impact of rail redundancies.

To overcome this weakness, the DEET analysis recognised the importance of identifying regions with persistent unemployment problems where the impact of rail displacement is likely to be most severe. Incorporated into their analysis were factors of long-term unemployment such as:

- the proportion of unemployed job seekers registered for twelve months or more;
- the proportion of unemployed job seekers registered for twelve months or more who are male and are 45 years of age or over.

DEET concluded, in contrast to the BTCE study, that Grafton had a relatively poor capacity to absorb displaced rail workers.

These different findings indicate that a broad range of factors need to be considered in determining regional effects; for example, indicators of a region's employment and social structure. Fagan's analysis on the SRA downsizing attempts to incorporate such information.

Fagan uses a variety of published data to construct a set of indicators for assessing the degree of vulnerability of each of the targeted labour markets. These were an aggregate index of economic vulnerability, three key labour market measures and a measure of average income relativity. From these Fagan assesses the degree of vulnerability of the local labour markets to economic fluctuations and their ability to absorb any substantial job-shedding. He identifies those labour markets where reductions are likely to have significant impacts by comparing his aggregate measure of vulnerability (the sum of the indices) with the proportion of local employment represented by the SRA's announced cuts.

Nine towns in NSW are identified as likely to experience the most severe impacts (Grafton, Casino, Taree, Ivanhoe, Newcastle, Werris Creek, Junee, Cootamundra and Parkes). In four other NSW towns (Lithgow, Narranderra, Goulburn and Bathurst) major impacts will fall on a selective area of the labour market. Moreover, Fagan predicts that the announced cuts will cause a change in the stability of labour markets as a core of public sector employment opportunities is removed.

The magnitude of the effects cannot be predicted from Fagan's research. More detailed data on the employment reductions and the structure of the local economy, than was available to Fagan, is necessary if the total effects of the employment reductions are to be estimated.

There is no simple relationship between the number of retrenchments and the effect on local employment. Whether unemployment will increase depends on several factors:

- age distribution of the retrenched workers;
- skills of the retrenched; and
- structure of local employment opportunities.

Unemployment may not increase in the same proportion as the number of retrenchments. Older workers may withdraw from the workforce and workers may search outside the local area for employment (particularly younger, more mobile workers).

The existence of local employment opportunities does not guarantee the absorption of retrenched workers. Skill profiles of the retrenched workers may not match those required by local employers. Recruitment outside the local labour market is a possibility as long as costs of training local labour exceed the costs of recruiting outside labour. Moreover, retrenched rail workers may be disadvantaged by unfavourable perceptions of the railway working 'culture'.

The withdrawal of rail services may lead to an increase in employment in other transport sectors, particularly road. However, it does not automatically follow that these employment opportunities will be generated in the local labour market; they may be experienced in other regions. The distribution of employment increases may not match the mobility patterns of labour. One area of employment increase that may absorb some ex-rail workers is road maintenance (Hooper 1987).

The contraction of employment opportunities will initially reduce the demand for labour in regional labour markets. Moreover, the structure of employment opportunities will change as the size of public sector employment reduces. Whether or not the effects of rail employment reductions result in additional employment losses depends on the structure and characteristics of each regional labour market. The adverse effects of employment reductions are not sufficient grounds for maintaining underutilised labour. This view was expressed in the submission by Action for Public Transport.

Whatever happens to country rail services, job losses in traditional railway activities appear inevitable and country towns will be badly affected. However it is wrong to burden a commercial railway with unnecessary tasks as this reduces its ability to compete. (Submission 40, p.7)

The competitiveness of railways must not be put at risk by requiring them to support regional development objectives. If there is concern about the effects on local regions, alternative regional development strategies will be more beneficial than maintaining rail employment above efficient levels.

8 URBAN PASSENGER SERVICES

The urban rail deficit is more than double the revenue earned on urban rail services. Losses on urban rail services account for a little over half of the total rail declared operating deficit of \$2.1 billion. There is little justification for such substantial subsidies from taxpayers. Passengers and other beneficiaries should meet the operating costs of all services and, when the line begins to reach capacity, contribute to infrastructure costs.

The financial performance of services can be improved by reducing costs and increasing fares. Rail authorities should be committed to a program of cost reductions, so that costs are declining while fares increase and changes in the fare structure are being phased in.

8.1 Urban networks

All capital cities except Canberra and Hobart operate urban rail systems. Figure 8.1 illustrates that Sydney's rail system accounts for over twice the number of passenger-kilometres as the Melbourne system. This result needs some qualification. The Sydney rail network is defined to include long-distance commuters (such as those travelling from Newcastle to Sydney) while in Melbourne such commuters (for example, those travelling from Bendigo to Melbourne) are excluded from Figure 8.1. Nevertheless, long-distance commuters are included in the discussion in this chapter. After taking this into consideration, the number of passenger-kilometres on the Melbourne rail system is likely still to be about half of that in Sydney. Of the remaining States the Brisbane rail task is relatively large; while rail transport in Adelaide and Perth account for relatively few passenger-kilometres in comparison to the other systems.

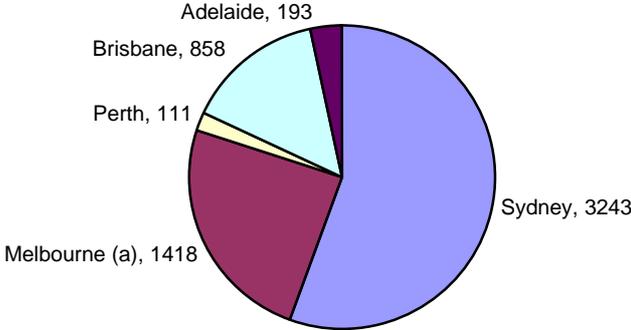
In Australia all urban rail services are operated by the relevant State government. On the other hand, bus services may be run directly by the State government or contracted out to private operators. In Brisbane, bus services are provided by the city council. As illustrated in Appendix I, in several countries overseas urban transport, including rail, is the responsibility of city councils.

The rail urban networks in Australia are extensive by international standards, particularly in the smaller cities. It is widely recognised that:

... low density of urban population and dispersed pattern of trips reduces the economic viability of public transport services. (BTE 1981, p.7)

Comparisons between Australian and overseas urban rail networks are given in Table 8.1. Australian networks have a low passenger density (measured as annual passenger journeys per kilometre of track), and an extensive system of track for the size of the population (measured as rail kilometres per head of population). This has implications for the amount that rail users could contribute to the cost of the rail infrastructure.

Figure 8.1: Urban rail passenger-kilometres (million), 1988-89



a Does not include long-distance commuters (see text).
Source: CGC (1990a).

Important aspects of Australian urban public transport, particularly rail, for individual cities are as follows.

Sydney

CityRail, a division of the SRA, is responsible for urban rail services and long-distance commuters. The State Transit Authority (STA) operates ferries and buses in the central areas of Sydney. Other bus services are contracted out to private companies.

Table 8.1: Extent of urban rail networks in selected cities

City	Population	Extent of heavy rail network	Rail km per million population ^a	Annual rail passenger journeys	Annual passenger journeys per track km	Annual passenger journeys per person ^a	Number of lines	Number of stations	Average distance between stations
	(million)	(km)	(km)	(million)	(million)				(km)
Sydney	3.4	560	165	200	0.4	58.8	9	174	3.2
Melbourne ^b	2.9	330	114	91	0.3	31.7	15	200	1.7
Brisbane	105	196	131	43	0.2	28.7	7	120	1.6
Perth	1.1	63 ^c	57 ^c	10	0.2	9.1	4	49	1.3
Adelaide	1.0	149	149	12	0.1	12.0	6	105	1.4
Auckland	0.8	64	80	2	0.03	2.5	4	-	-
Boston	2.6	69	27	94	1.4	36.2	3	84	0.8
New York	13.3	393	29	1 058	2.7	79.5	25	466	0.8
Washington	3.0	112	37	135	1.2	45.0	4	64	1.8
Osaka	2.6	99	38	922	9.3	354.6	6	79	1.3
Tokyo									
(TRTA lines)	11.9	142	12	1 927	13.6	161.9	7	132	1.1
(TOEI lines)	11.9	61	5	480	7.9	41.2	3	64	1.0
Barcelona	2.6	69	26	258	3.7	99.6	4	89	0.8
Hamburg	2.4	93	39	182	2.0	75.8	3	82	1.1
London (underground)	6.7	408	6 ^d	798	1.9	119.1	9	273	1.5
Liverpool	1.5	144	96	46	0.3	30.7	3	72	2

a Comparisons between cities should be treated with caution because the relative importance of heavy rail in the total transport system varies significantly between cities

b Does not include long-distance commuters.

c This will increase by one third when the Northern Line is opened.

d London also has a suburban rail network which is not taken into account in this figure.

Source: Bushell (1989); various submissions.

Investment in CityRail is funded by State grants. The NSW Government has committed \$2000 million over seven years, commencing in 1989-90, for a substantial investment program in Sydney's rail system. This is to include purchasing rollingstock, refurbishing maintenance facilities, upgrading stations, rebuilding track, upgrading signalling and purchasing a new operating and communications system. Such investment will reduce for some time the amount the SRA needs to spend on maintenance.

In addition to new investment CityRail is implementing policies to reduce costs. In 1989-90 it achieved a 9 per cent reduction in staff numbers and a 13 per cent increase in staff productivity (SRA 1990a).

CityRail is undertaking feasibility studies into several major investment projects. One project, known as Metro-West, is to build an underground rail line and two stations in the western area of the central business district (CBD). The feasibility study will be completed in mid-1992 and the line could be operating early next century. This project is designed to relieve rail congestion on inner-city lines and cope with future traffic growth. CityRail intends the private sector to fund station development. It is estimated that the track work and tunnelling would cost \$350 million.

The NSW Government has called for expressions of interest from the private sector for development, ownership and operation of a rail link between central Sydney and the airport at Mascot.

Melbourne

The Public Transport Corporation (PTC) is an umbrella organisation which trades under the name of The Met for Melbourne's train, tram and bus services, and V/Line for long-distance commuter and non-urban passenger services. There were 3.3 million journeys by long-distance commuters in 1989-90.

The PTC recognises that Melbourne's public transport system has a poor public image.

... the reliability of services fell well short of our targets because of shortages of well maintained rollingstock. These problems were compounded, particularly with trains, by vandalism and graffiti becoming more prevalent than before. (PTC 1990, p.6)

Some progress has been made in improving the reliability and cleanliness of trains. However, major reforms are needed. The Victorian Government is concerned about the size of the losses on the urban system. At the end of the 1989-90 financial year:

The Public Transport Corporation had suspended payment of many bills to try to contain a budget blowout of more than \$50 million, its chief executive, Mr Ian Stoney, said yesterday. (The Age, 24 May 1990, p.3)

The PTC has had difficulty implementing reforms, such as MetTicket and staff reductions, to reduce this deficit.

Brisbane

Brisbane's public transport includes bus, ferry and train services. Bus services are run by private operators and the Brisbane City Council. The Queensland Government subsidises these private operators an amount equivalent to between 30 and 40 per cent of fare revenue. It also subsidises the Brisbane City Council an amount equivalent to around 60 per cent of fare revenue. The Council bus service receives an additional subsidy from Brisbane rate payers. Queensland Railways (QR) is responsible for urban and non-urban rail services in Queensland.

QR has begun work on new tunnels to duplicate the two rail lines between Roma Street and Brunswick Street stations. These lines are becoming congested and are expected to reach capacity by 1993. Work has commenced on duplicating the line between Kuraby and Beenleigh, purchasing rollingstock and designing the new Gold Coast Railway.

It is expected that over the next 5 years, in excess of \$460 million investment in capital extensions will be required to meet increasing demand.

Perth

The Metropolitan (Perth) Passenger Transport Trust (trading as Transperth) is responsible for urban bus, ferry and train services. Train services are provided by Westrail under contract to Transperth. Westrail is in the process of substantial investment in its urban rail system. The network is being electrified, new electric rail cars purchased, automatic ticket vending machines and centralised train control introduced and the track extended north of Perth to Joondalup. This extension will increase the size of the system by one third. The feasibility of further extensions is also being considered.

Adelaide

The State Transport Authority of South Australia provides Adelaide's bus, tram and train services. Investment is funded by State grants or loans from the South Australian Financing Authority. Recently South Australia has purchased new diesel-electric rail cars and it proposes to build a new rail/bus interchange on the southern side of the central business district.

Rail services account for only 16 per cent of public transport journeys but 45 per cent of the cost of operating public transport (derived from Submission 74).

8.2 Current levels of cost recovery

The financial performance of Australian urban rail services is poor. In 1989-90 they accounted for a little over half of the total rail declared operating deficit of \$2.1 billion.

Each passenger travelling on Australia's urban rail systems receives a subsidy of approximately \$2.50 per trip.

Rail services have consistently lower levels of cost recovery than bus services. In Sydney rail cost recovery is less than 40 per cent while the State Transit Authority has a

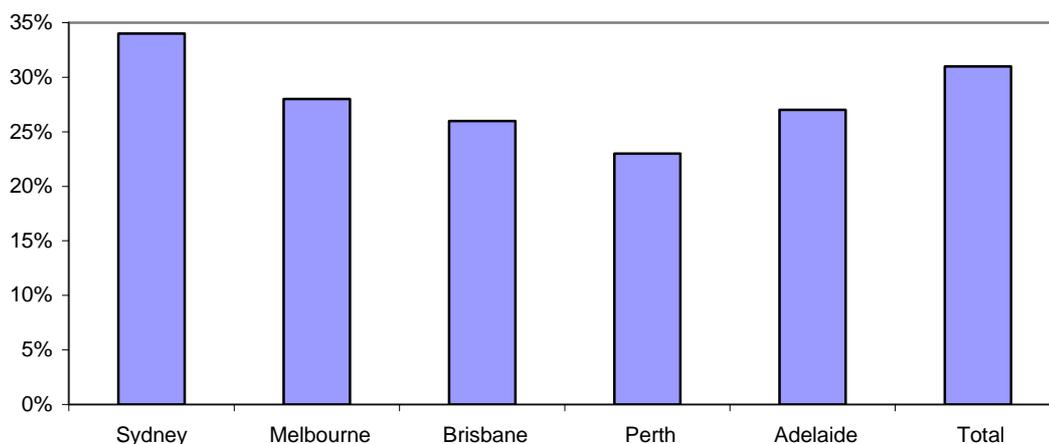
... goal of eliminating the operating deficit by the 1991-92 financial year and to achieve an overall break-even by the following year. (STA 1989, p.5)

When calculating cost recovery for bus services the STA includes as revenue both fares collected and fares forgone due to concessions. In 1990-91 cost recovery is expected to be 90 per cent based on this method. The STA considers the remaining 10 per cent to be a community service contribution from the New South Wales Government. Using fare revenue alone, the STA's cost recovery falls to a little over 50 per cent.

In Adelaide cost recovery before the government reimbursement for concessional fares is 19 per cent for trains and 37 per cent for buses. In Perth it is 15 per cent for trains and 31 per cent for buses.

Cost recovery estimates calculated by the Railway Industry Council (RIC 1990a) for 1986-87 are presented in Figure 8.2. The RIC estimates include 'ownership costs' such as debt financing and leasing costs and, on the revenue side, reimbursements for concessional travel.

Figure 8.2: Cost recovery rates for Australian urban railways, 1986-87



Source: RIC (1990a, p.13).

In NSW long-distance commuters are more heavily subsidised than passengers travelling within the Sydney metropolitan area (Draft report hearings, p.188). If long-distance commuters were excluded from the cost recovery estimate for Sydney, as they are for Melbourne, Sydney's cost recovery would be higher; further increasing the difference in the performance of CityRail compared to other systems.

Cost recovery levels significantly less than 100 per cent imply that services are heavily subsidised. Subsidising rail services imposes costs on many members of the community who do not use rail services or even benefit from them indirectly.

Low levels of cost recovery would attract into the system large numbers of public transport users who value the services at less than the cost to the community of providing them. The increased demand would draw into the public transport area resources which could provide greater community benefit in other sectors of the Western Australian economy. Pressure to address the problem can be expected to increase as the public transport deficit grows. (Western Australian Department of Transport 1990, p.14)

All taxpayers throughout each State, many of whom cannot or do not use public transport, are contributing to funding urban rail deficits. Reducing this subsidy would allow the government to reduce State taxes, for example payroll tax.

Therefore, the reasons for subsidising rail transport should be considered carefully.

8.3 Assessment of arguments for subsidising urban rail services

Environmental groups, unions, rail authorities and groups representing rail users have all argued that subsidies to urban rail transport should continue.

... public transport cities are much nicer cities to live in; there is the carbon dioxide reduction. There is a whole range of things - traffic congestion, pollution, smog - all sorts of things which are related to the use of the car which are not present. (Greenpeace, Initial hearings, p.192)

... everyone should be able to use it (public transport) or benefit from it as freely as possible. (Action for Public Transport, Initial hearings, p.229)

Subsidies to urban rail can be justified on the grounds that they encourage peak-hour travel away from main roads to and from the Central Business District and other major commercial and industrial centres of Sydney, thereby reducing air pollution and congestion. (NSW Government, Submission 75, Volume 1, p.20)

Some of the arguments for subsidising rail transport are discussed in earlier chapters. This section summarises the conclusions reached as they affect urban rail passenger services.

8.3.1 Social costs of road transport

The social costs of road transport most relevant to the urban environment include, congestion, noise pollution, atmospheric pollution and greenhouse gas emissions. Energy efficiency issues were also cited as important in discussions on urban transport. As recognised by the Inter-State Commission these social costs are very difficult to quantify (ISC 1990, Volume 1, p.95). Evidence available on the magnitude of the social costs of transport is considered in Appendix G.

In that appendix it is recognised that there are significant social costs generated by road-based transport in cities. The discussion by Action for Public Transport was typical of participants who supported this view. It argued that in Sydney society was \$637 million better off because of the urban rail system (Submission 139, p.A5).

Several policy options are available to address the social costs of road transport. Community groups and individuals advocated increasing the use of urban rail as a good way of alleviating the social costs of road transport. However, rail transport is not environmentally neutral. Subsidising rail would encourage the overuse of transport in general, to the detriment of some aspects of the environment. Therefore, it is better to deal with the social costs of road transport through road-based policies. In addition, the discussion in Chapter 5 concludes that, under current conditions, increasing subsidies to rail alone is not an effective way of reducing the use of road transport.

- Studies indicate that car drivers are unresponsive to changes in rail fares. Therefore, it would be difficult to attract them off the road.
- There is no guarantee that moving existing motorists off the road and onto rail will result in a sustained fall in road traffic. The initial decrease in road traffic will reduce congestion. This will encourage an increase in car trips and the total number of vehicles on the road may not fall.
- Finally, rail transport currently accounts for a relatively small proportion of urban travel. In the short term the rail system could not accommodate the increases in traffic necessary to provide any significant reduction in car journeys. In the long term an expansion in rail infrastructure would be needed. The cost, both financial and environmental, of such an expansion in a developed city is very high and large guaranteed benefits would be needed to justify the cost. Because of the two factors mentioned above these benefits are not guaranteed.

Increasing the quality of rail services may be more effective in enhancing rail's attractiveness to commuters and its ability to attract cars off the road. However, the problems of the relative size of the rail task and the additional road trips consequent on reducing congestion remain. Any reductions in the social costs of road transport still will be small.

Successfully ameliorating the social costs of road use requires a coordinated strategy which both discourages the overuse of road transport and changes city land use in order to reduce the need to travel. This approach is discussed in Chapter 5. It concludes that subsidies to rail transport would

be more effective in reducing the social costs of road use, if they were part of a coordinated policy. In Australian cities the current policy approach to rail and road use does not appear to be part of such a strategy. In fact, policies such as subsidising parking and not charging directly for external costs encourage the use of road transport, and therefore exacerbate environmental problems. A coordinated strategy should include policies directed at reducing the use of roads by restricting traffic to the levels for which the roads were designed, better road pricing, reducing subsidised parking and developing an urban structure which decreases the need to travel. An efficiently provided rail service, offering an alternative to road travel, would be a major part of such a package in the larger cities.

8.3.2 Welfare

It is often argued that urban public transport, including urban rail, is necessary on welfare grounds and that concessional fares for disadvantaged groups and general subsidies are therefore warranted.

Concessional fares provide reduced price rail travel to specific groups. Commercial concessions are justified, if the fare is not less than marginal cost (the additional cost of carrying the concessional passenger) and if there is an increase in profit from introducing the concession. Currently, full fares often do not cover the marginal cost of carrying passengers; it follows that concessional fares can increase this deficiency, particularly during peak periods. In addition, the demand for rail services is generally inelastic, although more so in peak than in off-peak periods (see Section 8.6.1). That is, a reduction in fares will not increase patronage sufficiently to increase revenue. Therefore, those rail concessions which the government requires railways to provide should be assessed on social welfare criteria and, in accordance with Recommendation 3.2, should be paid for by the government under a community service contract between the government and the rail authority.

Providing welfare is the responsibility of the government not the rail authority. There are alternative ways for the government to provide welfare, other than concessional fares. In Chapter 4 it is argued that the pension should be sufficient to provide an adequate standard of living for pensioners. Providing all benefits through the pension eliminates the need for welfare concessional fares, which cost more to administer than a pension only system, and reduces the efficiency with which the economy uses its scarce resources (see Section 8.6.2 for further discussion). The Combined Pensioners Association of NSW was critical of the proposal to replace concession rail passes with pension increases. It argued that:

States can and have greatly increased transport fares overnight - way above increases in the cost of living index (eg NSW in 1988). Obviously Commonwealth Budgets will not permit an immediate response to this situation nor is it likely that the Commonwealth would respond at all if only one of two States make such increases.

Pensioners would therefore always be behind ... (Submission 143, p.1)

Also in Chapter 4 the option of moving to a voucher system for welfare concessional fares is discussed. Vouchers, however, are not a practicable option for urban transport, where the extensive use of welfare concessions would make the administration of a voucher system far too costly.

Rail services are used by a much broader section of the community than the disadvantaged. After examining the type of people who benefit from rail services it is difficult to justify the general subsidies now available to all rail users.

... many middle and higher income persons also use the railway system for transport, especially urban transport. That is, subsidising fares is a blunt and inefficient instrument for redistribution. In fact, Travers Morgan (1989) suggests that the outcome is regressive. (Freebairn, Submission 1, Rail Transport: Scope for and Direction of Change, p.7)

Travers Morgan (1984) estimated that, for Adelaide, households with incomes above the average received 59 per cent of the total rail subsidy (that is, the general subsidy plus reimbursements paid to the State Transport Authority for concession fares). Excluding reimbursements for concessions, the percentage of the general subsidy which accrues to high income households is even higher.

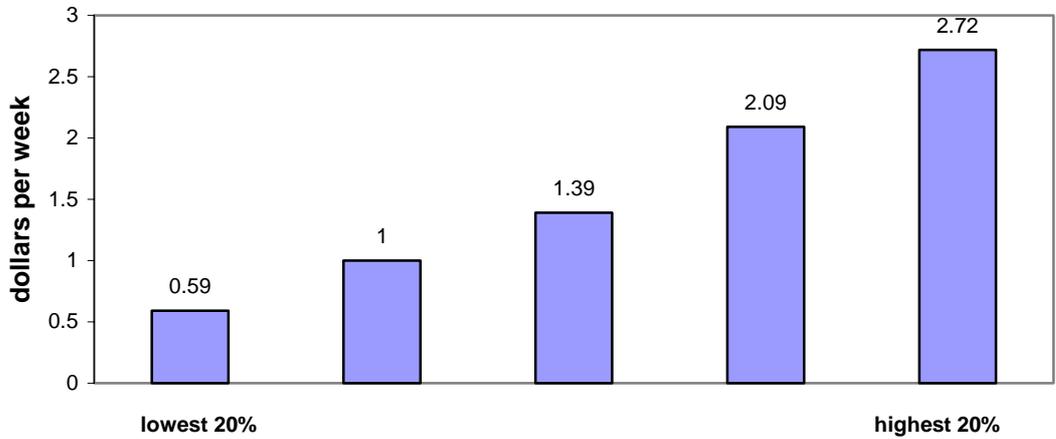
This is supported by ABS data which indicate that across all Australian cities people on above average incomes use rail services, as much, if not more than those on lower incomes. Specifically, ABS household expenditure survey data (Figure 8.3) indicate that in the capital cities, those with the highest incomes spend five times more on rail fares than those on the lowest incomes. The data also show that as income increases, there is no substantial change in the proportion of total expenditure that each household spends on rail travel.¹

The 1986 census provides information on the personal income of people travelling to work by train. The proportion of all train travellers falling into different income groups is illustrated in Figure 8.4.

The data indicate that very few of the people travelling to work by train are in the 10 per cent of the workforce earning the lowest incomes. Most train travellers are distributed relatively evenly among the other 90 per cent of the workforce. That half of the workforce which earns the highest incomes accounts for 55 per cent of train travellers.

¹ These figures from the household expenditure survey exclude rail travel for holidays, but include all other travel, such as travel to work, for shopping or for leisure purposes.

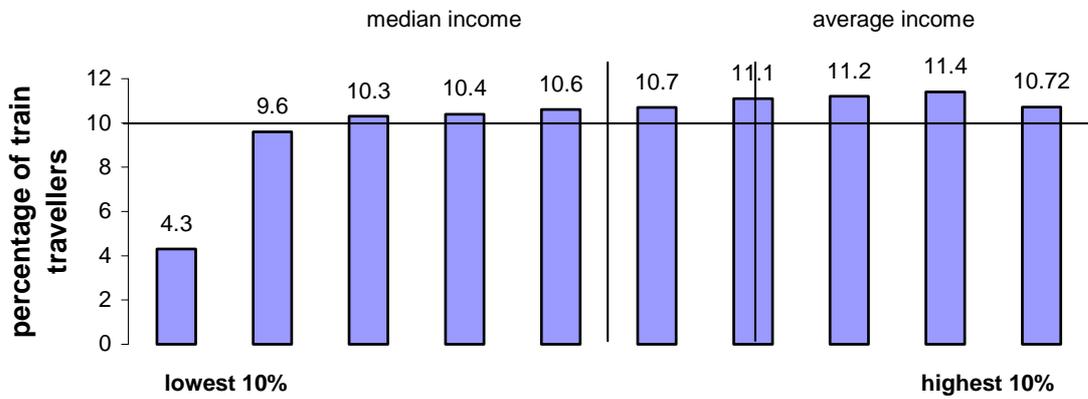
Figure 8.3: **Household expenditure per week on rail fares by income group, capital city households, 1988**



household income (5 income groups with equal numbers in each)

Source: ABS, Household Income and Expenditure Survey, 1990, unpublished statistics.

Figure 8.4: **Proportion of train passengers travelling to work, by income group, 1986**



personal income (10 income groups with equal numbers in each)

Source: ABS, unpublished census statistics.

The data in Figure 8.4 refer to only those people who travel to work by train. An analysis of all workers, again using the 1986 census data, reveals that across a wide range of incomes the proportion of people travelling to work by train also varies very little with income. If anything, the use of rail services increases slightly as income increases. The exceptions are those on the lowest and highest incomes. Relatively few of the workforce in the lowest 15 per cent and the highest 2 per cent of incomes choose to travel to work by train.

The population census data indicate that the proportion of workers travelling on trains does not vary much with workers' incomes, while the household expenditure survey shows that high income households spend about five times more on rail fares than low income households. There is insufficient information to determine the exact reasons for this apparent contradiction, but a number of factors could be contributing. For example:

- people on high incomes may travel longer distances to work; and
- children from high income households travel longer distances to attend private schools.

Therefore, broad subsidies provide benefits to individuals and households at all income levels, and even benefit those on higher incomes more than those on low incomes. This makes across-the-board subsidies an ineffective way of achieving welfare objectives.

8.3.3 Natural monopoly

Australia's urban rail networks display characteristics consistent with a natural monopoly. The costs of duplicating the rail network and the benefits of coordinated scheduling indicate that the costs of providing urban rail transport are likely to be lower if the whole system is operated by one organisation. However, as noted in Chapter 4, no empirical studies are available to confirm this.

The presence of natural monopoly does not make government intervention essential. Chapter 4 suggests that, if there is sufficient competition, either from within the industry or from competing modes of transport, this will minimise the extent to which the monopolist can exploit its position. There is potential for urban rail to compete with bus services, although buses often operate as extensions to, rather than in competition with, urban rail services.

In some areas bus and coach and rail operations are in direct competition. In other areas, particularly in urban transit systems, commuter or route buses feed into the urban rail transport network. (Australian Bus and Coach Association, Submission 102, p.3)

In any event, government intervention would be directed at preventing the natural monopolist from exploiting its market power and earning excess profits. The monopolist would still need to cover the cost of operating the services. It is obvious from the cost recovery estimates in Section 8.2 that no Australian urban rail system is even close to covering its costs. Therefore, the problem of monopoly pricing is not an issue under current conditions.

8.3.4 External benefits

Cities generate commercial benefits by increasing the ease with which companies and individuals can trade. To realise these benefits people need to have access to communications and transport infrastructure. In large cities rail passenger transport, in particular, has a number of advantages and benefits groups other than rail users. The Australian Railways Union identified those it believed benefit from the urban rail system and proposed ways of charging them for the benefits they receive.

- Business and employers benefit from the transport of employees to the workplace, greater customer access to their premises and reduced expenditure on car parking.
- Road users face less congestion, faster travel times, easier parking, and lower air pollution and risk of being involved in an accident.
- Property developers benefit from higher land values, increased saleability of land and less expenditure on transport infrastructure.
- Property owners are advantaged by higher property values, increased saleability of property, and less need to own more than one car.
- Retailers benefit from greater customer access to their shops and reduced expenditure on providing car parking. (Submission 63, p.17)

The Western Australian Government also indicated that people other than transport users benefit from an urban rail system.

We are pleased to note that the draft report recognises that urban public transport services provide external benefits to all urban residents, not just the users of the services. This view underpins the significant investment program in public transport currently underway in Perth. (Submission 131)

Beneficiaries are principally located within the city where the transport system operates. Rather than the present system of imposing the burden of funding urban rail losses on all State taxpayers, it would be more equitable if those who benefit from (but do not necessarily travel on) the rail system contribute financially to its operation. Mechanisms for so doing include the development of shopping complexes and buildings over rail stations and the levying of transport taxes on local businesses and ratepayers (see Sections 6.3.4 and 8.6.4). Some States are looking at ways of levying charges on these non-user beneficiaries.

The Western Australian Government is actively investigating means by which non-user beneficiaries can be charged for the benefits they receive. However, until suitable charging mechanisms have been identified and implemented, we believe that it remains appropriate for the government to provide a general taxpayer subsidy to public transport in recognition of these broader community benefits. Given the highly urbanised nature of this State such a decision may not result in any significant inequity between urban and non-urban taxpayers. (Western Australian Government, Submission 131)

In Western Australia 30 per cent of the population lives outside of Perth (ABS 1991c, p.122). Similar percentages apply in South Australia and Victoria. Given the Commission's recommendation that non-urban passenger services cover their costs (see Chapter 9), it would be inequitable to expect country residents to pay also for the subsidies to urban rail transport.

It is common overseas for local governments to be responsible for the urban rail network, and to fund revenue shortfalls from taxes on urban residents.

A common practice in Europe is to recover costs of urban rail services from local Government. (NSW Treasury, Submission 130, p.4)

In Chapter 6 the Commission recommends that when considering new rail lines and services or the withdrawal of services the rail authority should negotiate with the affected local council with the aim of obtaining voluntary contributions towards capital and operating costs. Chapter 6 also notes that in the case of funding existing urban services the rail authority would have insufficient leverage with the property owners or local governments to obtain voluntary contributions. An additional complication is that in urban areas a reliance on voluntary contributions could result in property owners of one local government jurisdiction making payments but those of an adjacent jurisdiction, with similar benefits, making no payments. To avoid these problems the State government needs to collect a mandatory payment from non-user beneficiaries to contribute to the funding of existing urban rail services.

8.4 Who should pay?

The preceding discussion indicates that the justification for all taxpayers subsidising urban rail services is limited; passengers and other urban beneficiaries should be responsible for meeting the costs of an efficiently provided service. Which costs should be included in those to be met by passengers and other beneficiaries will depend on whether the government has made appropriate investment decisions in the past.

If governments have over invested in building rail lines which will never reach capacity, passengers and other beneficiaries should still meet at least their marginal costs. Those costs can be approximated by operating costs, including labour, fuel, carriage maintenance and track maintenance. They include the cost of replacing rollingstock when the carriages are being fully utilised, but exclude the cost of fixed infrastructure and interest payments on that infrastructure. Most parts of Australia's rail systems are operating below capacity and therefore should be funded in this way, with passengers and other beneficiaries meeting the operating costs.

When a line or a section of the system is covering its operating costs and is approaching capacity this indicates that there has not been overinvestment in that line. It is then justifiable that passengers fund future investment in infrastructure. This policy would also help to ration the use of the congested rail lines and provide appropriate signals to rail authorities on when and where new investment is justified. Parts of the Sydney system, for example, have already reached capacity; prices should be increased so that these parts are contributing to the cost of extending the infrastructure. Similarly, parts of the Melbourne and Brisbane systems are also reaching capacity constraints in peak periods.

For new investment to be undertaken it should be expected that ultimately demand will be sufficient to cover capital costs. Recovering the capital costs of rail infrastructure is a long-term objective. Because of the lumpiness in investment, the government (possibly with some contribution from other beneficiaries) may have to fund interest payments on the infrastructure for many years until demand reaches the level for which the system was designed, at which time the original capital costs can be recovered from users.

For all urban rail services, operating costs should be fully funded by users and other beneficiaries. Costs to be funded would include maintenance of the permanent way and associated infrastructure, and the replacement capital and maintenance costs of rollingstock. When the line nears capacity users should also contribute to the costs of the infrastructure.

The general taxpayer subsidy to urban rail services should be eliminated. Costs should be recovered by a combination of reducing costs, increasing and restructuring the fares paid by passengers, and increasing the contribution of other urban beneficiaries to the provision of urban rail services. The rest of this chapter discusses these approaches in detail.

8.5 Costs

The operating costs per passenger for urban rail depend crucially on load factors (that is the number of passengers per carriage and per train). Rail is a very effective mass people mover over dense corridors. However, as the number of passengers falls it loses its advantage over buses very quickly. The density of traffic varies significantly over each urban system so that some parts of the systems are clearly more viable than others.

... unless a "critical mass" of patrons exists to sustain the basic level of convenient service the whole rail system goes into decline. (Town and Country Planning Association, Submission 110, p.7)

The report prepared by Travers Morgan for the Industry Commission includes estimates of the potential reduction in the operating costs of Australia's urban rail systems which could be achieved by adopting international best-practice input costs (see Appendix K). Travers Morgan estimates

that on average the operating costs of urban rail passenger services could be reduced by 36 per cent and that sizeable cost reductions are possible in most areas of urban rail operations.

- Train crewing costs could be reduced by 36 per cent by: adopting driver only operation; and introducing broken shifts and changing work practices to align working hours more closely with peak demand.
- Vehicle maintenance and cleaning costs could be reduced by 33 per cent by updating depots and changing maintenance and cleaning schedules.
- Fuel costs could be reduced by 2 per cent.
- Passenger handling and terminal costs could be reduced by 43 per cent by introducing automatic ticketing and contracting out station maintenance.
- Signalling and control costs could be reduced by 33 per cent by modernising the equipment.
- Infrastructure maintenance costs could be reduced by 25 per cent by, for example, maintaining infrastructure at night to increase the amount of usable time between trains and reduce the need for costly safe working practices.
- Corporate and business overhead costs could be reduced by 54 per cent.

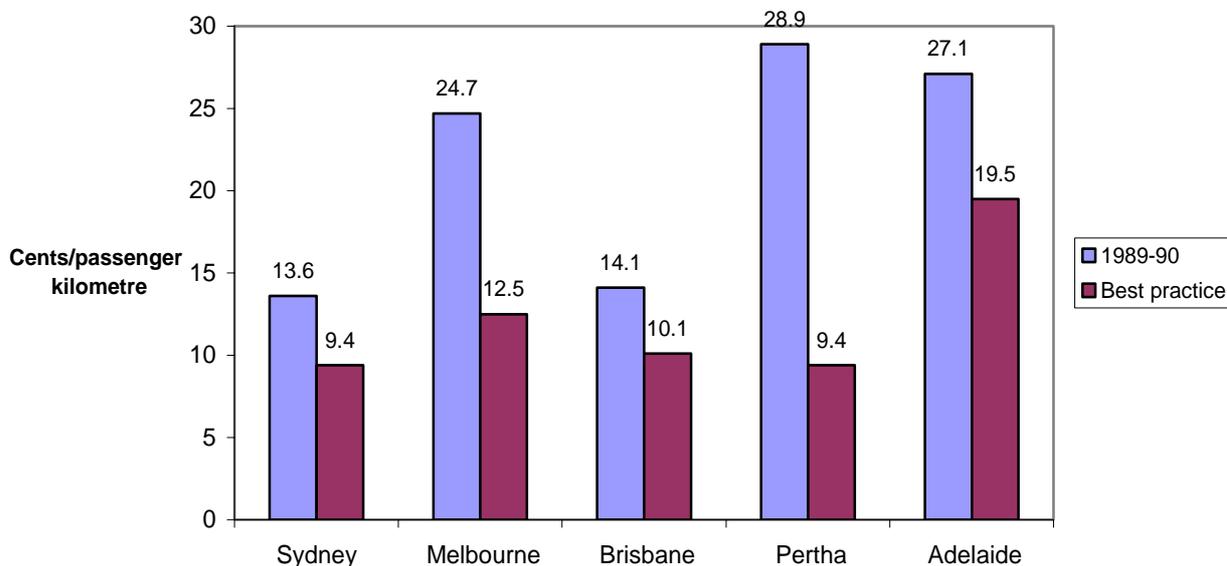
Travers Morgan estimates that the largest reductions in costs could be achieved by adopting automatic ticketing, reducing corporate overheads and changing work practices to introduce driver-only operation and split shifts.

Figure 8.5 illustrates that operating costs per passenger-kilometre (not including replacement capital costs) differ greatly between urban rail systems. If all cities move to international best-practice input costs for the current passenger tasks, the urban rail systems in Adelaide and Melbourne, which have low passenger densities, would have the highest costs per passenger-kilometre. This is because Melbourne, despite its high population density, has a passenger density of about half that of Sydney. In Adelaide the number of passengers per train is about one quarter of that in Sydney (Appendix K).

Travers Morgan also provides estimates of international best-practice costs which in addition to operating costs include the replacement of rollingstock, locomotives and sleepers, but exclude fixed capital costs such as earthworks, bridges, signalling and tunnels. If urban rail services are to continue in the long term it would be appropriate for these costs to be met by passengers and non-user beneficiaries. Therefore, when assessing the increase in revenue needed to cover costs, provision should be made for replacement capital.

The Travers Morgan estimates of best-practice costs, including replacement capital, measured in cents per passenger-kilometre are 17.9 cents in Sydney, 21.9 cents in Melbourne, 15.1 cents in Brisbane, 14.9 cents in Perth and 28.0 cents in Adelaide. Again the cities with the highest cost structures are Adelaide and Melbourne.

Figure 8.5: Rail operating cost, cents per passenger-kilometre, 1989-90



a The large disparity in costs in Perth between existing and 'best practice' reflects both assessed efficiency improvements and the impending conversion of the Perth system from an ageing diesel system to a new electrified system.

Source: Travers Morgan (Appendix K, Table 5.3).

Other studies also have identified significant cost inefficiencies in Australia's urban rail systems. The Booz.Allen & Hamilton (1989a) report into CityRail compared it with three US operators in the vicinity of New York, Long Island Railroad, Metro North and New Jersey Transit. CityRail performed worse than all three in service speed (km/hour) and service efficiency (passenger-km/vehicle-km) and only Metro North was behind CityRail on staff efficiency (vehicle-km/staff).

The Fielding Report into public transport in Adelaide stated that:

Transit in Adelaide is more costly to produce than is transit in Brisbane, Perth and Auckland. Cost per kilometre was reduced between 1986 and 1987 and further economies should be possible. (Fielding 1988, p.12)

The State Transport Authority of South Australia (1990, p.12) showed that while operating cost per passenger journey did fall from 1987-88 to 1988-89 it began to rise again in 1989-90.

The Victorian MetPlan (State Transport Authority of Victoria 1988b) argued that:

With more efficient use of existing resources, up to 2800 staff could be released for retraining and redeployment. Redeployment of such resources would result in staff levels being reduced ...

However, with 6500 staff in 1989-90, Met employment has fallen by only 150 since the MetPlan was published in 1988.

Over the last decade there have been large reductions in employment in the rail industry. However, the majority of reductions have been in freight. The performance of urban systems is lagging behind, particularly in Melbourne (see Chapter 7). The SRA is rationalising its urban labour force and plans to achieve a reduction of 35 per cent from 1989-90 to 1992-93. Westrail also plans to reduce its urban labour force and its new electric trains

... have been designed for safe operation by one person ... This will significantly reduce the crewing costs of trains. (Western Australian Government, Submission 43, p.68)

However, there has been substantial industrial resistance to the introduction of one-person crewing in Perth and in Adelaide.

There is still scope for rail authorities to make substantial cost savings by reducing their urban labour force and improving productivity.

8.5.1 Reducing costs

After investing large amounts of money in consultants' reports to identify where efficiency improvements need to be made, State governments and/or their rail authorities often fail to act on the recommendations. While it is too early to determine whether long-term gains will be achieved, recent initiatives suggest that NSW may be an exception to this general conclusion. Many factors work to resist change in urban transport. In Melbourne:

While several major reforms were planned for this year, including dramatic changes to the ticketing system (MetTicket), these reforms were resisted by unions and community groups and were not successfully implemented, resulting in severely disrupted services and the erosion of public support for the PTC. (PTC 1990, p.6)

Because cost cutting is difficult to achieve, mechanisms need to be introduced to ensure that once gains have been made the benefits will not be eroded over time. Corporate plans which set targets and performance indicators such as rates of return and labour productivity to check progress, are useful tools to help sustain improvement. However, increasing competition, where the success of the operation depends on its ability to minimise costs, would be more successful in ensuring continued benefits.

Rail authorities could potentially contract out a number of operations to private companies. Methods of contracting out these services can be implemented which will significantly increase the pressure on the provider to minimise costs, as discussed in Chapter 7.

There are also benefits in writing contracts with the government for the services it requires rail authorities to provide (see Chapter 3). Such contracts provide information about the costs of particular services and put pressure on the rail authority, through the process of re-negotiating the contracts, to keep costs down. They also assist the government to make decisions on which services are no longer warranted. In some cases significant cost reductions could be achieved by increasing the use of buses to replace low patronage rail services, such as some weekend and evening services.

An important constraint in cutting costs is that service quality must be maintained and even improved. If services are to be retained in the long term it should be recognised that cutting costs may change the current and future quality of the service. The SRA is now facing problems in operating its system because of

... reductions in several key maintenance functions under the misplaced assumption that they can be deferred as discretionary investment. (Booz.Allen & Hamilton 1989a, pp.11-17)

Service quality can include travel time taken, reliability (delays, cancellation), comfort, safety, aesthetic appeal and convenience of service. The issues of safety and reliability have received a lot of public attention recently. However, which service factor is most important will depend on the priorities of individual passengers.

It appears that there is considerable scope currently for rail authorities to cut costs while retaining or even improving the quality of service. However, a stage will be reached where cost/service trade-offs have to be made. In its submission the NSW Treasury argued that increases in fares would enable the SRA to improve service quality (Submission 130, p.13).

The SRA has set a target of reducing CityRail expenditure in real terms by 7 per cent per annum (SRA 1989). If this target can be achieved each year it will take CityRail less than 5 years to reduce costs by the 36 per cent suggested by Travers Morgan as necessary to reach international best practice.

RECOMMENDATION 8.1

The Commission recommends that rail authorities immediately implement policies to reduce the cost of operating their urban rail services, with the objective of achieving international best practice within five years.

8.6 Revenue

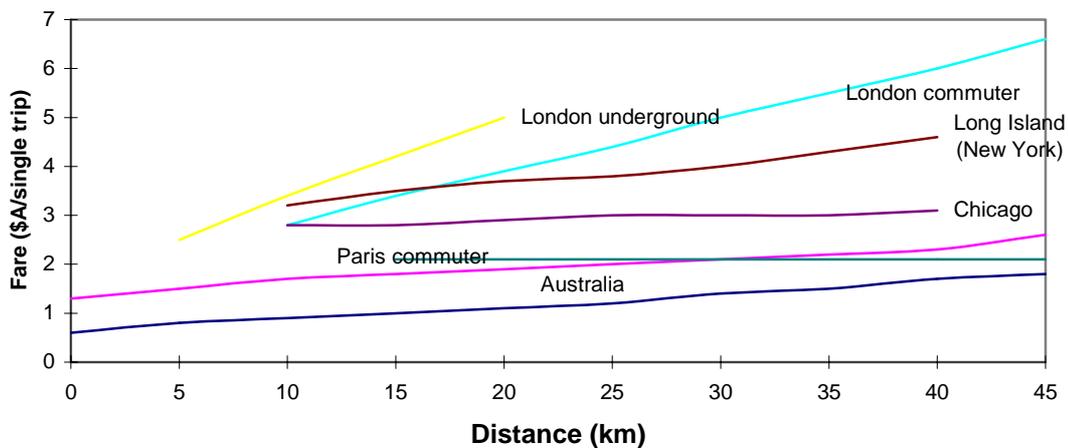
In Australia, urban rail services are financed primarily by fares and government subsidies funded from general tax revenue, with subsidies being the dominant component. Minor sources of funds include advertising and the leasing of property at rail stations. Section 8.4 concludes that it is more appropriate for the cost of an efficiently run rail service to be funded by passengers with some contribution from other urban residents and businesses who also benefit from the rail service.

The primary purpose of urban rail services is to provide transport. It follows that most of the benefits of urban railways accrue to those who travel on the trains. Therefore, passengers should be responsible for meeting most of the costs.

The proportion of costs met by passengers is much greater in Australian bus services. The State Transit Authority in Sydney has undertaken major reforms, by reducing costs and increasing fares. It has been able to improve its cost recovery to a level where fares (including a provision for the value of concessions supplied) cover 90 per cent of operating costs. The STA is of the view that the remaining 10 per cent of operating costs is equivalent to the value of community services (in addition to concession fares) that it provides.

Figure 8.6 illustrates the fare per trip for a monthly ticket over different distances for Australian and some overseas rail systems. Fares for Australian systems fall between the two lines joined by vertical stripes. They are substantially below overseas fares in nearly all cases.

Figure 8.6: **Fares for peak period trips using monthly rail passes**



Source: Rail authorities and published fare schedules.

The Commonwealth Department of Transport and Communications noted that there are

... examples of overseas UPT [urban public transport] systems that are able to at least cover their operating costs
... (Submission 128, p.5)

Based on the performance of bus services and some rail services overseas, the Commission suggests that urban rail authorities should aim to substantially increase the level of revenue from fares. This view is supported by work undertaken by the World Bank.

Clearly defined subsidies may be justified where social and economic benefits have been accurately assessed and outweigh all the costs. But in general, it will be extremely difficult for cities to rely on subsidized public transport to meet future massive demands, which are growing much faster than revenues. (World Bank 1986, p.ix)

Railway costs should be covered fully by a combination of fare revenue and payments from governments for community service contracts. Community service contracts should be written to include not only reimbursements for welfare concessional fares but also the contributions by urban residents who benefit from but do not use the rail service. These latter contributions are unlikely to be more than 20 per cent of costs.

Fares provide valuable signals to rail authorities and users. If prices are set to reflect more closely the costs of providing services, the level of demand will indicate to rail authorities how much passengers value the service, where additional investment is needed and where services should be reduced or increased.

Prices which reflect costs properly also provide signals to users. For example, higher prices during peak periods will encourage some users to travel off-peak, reducing congestion and making better use of rollingstock.

8.6.1 Fare structure

The structure of fares will affect the pattern of rail usage and the costs of fare collection. Some basic information about fare structures is included in Table 8.2. If urban rail authorities become more commercial they will automatically tend towards adopting the most efficient fare structure,

taking into account the advantages of differentiating fares for different types of travel and the costs of administering such a system.

It is likely that the most appropriate fare structure will vary between cities because of their different demographic characteristics. However, the basic characteristics of an efficient fare system are the same for all rail systems.

Fares should vary with the distance travelled, the amount of congestion on the rail lines and the time of day, with charges higher for peak compared with off-peak periods.

Table 8.2: Urban Rail Fare Structures

City	Fare variations for distance travelled	Period that tickets are valid	Fare variations for time of day	Fare collection & enforcement	Intermodal transfers	Concessions
Sydney	. Price increases with distance travelled	. One trip	. Off-peak fares available after 9 am	. Ticket sales at stations an a few vending machines . Manual checking at station	. Some	. Pensioners \$1 for suburban travel, \$2 for outer metropolitan travel \$3 to Newcastle . Children & students half of full fare
Melbourne	. Zonal system where fares increase with number of zones travelled	. 3 Hours	. Off-peak fares after 9. 30 am to city only	. Tickets sold at manned stations, Met shops and some retail outlets . Roving inspectors	Yes	. Children primary & secondary students, half of full fare . 60 yrs & over maximum of \$1 per day . Tertiary students, half of full fare after purchase of concession card *\$64.60/year)
Brisbane	. Zonal system where fares increase with the number of zones travelled . Weekend discounts	. One trip	. Weekend discounts	. Some vending machines . Tickets sold at manned stations . Onboard sales on some trains . Manual checking at heavily patronised stations	. No ^a	. Pensioners senior citizens, children and students half of full fare
Adelaide	. Zonal system where fares increase with the number of zones travelled	. 2 Hours (most)	. Inter-peak fares from 9. 01 am to 3 pm weekdays	. Automatic ticket validation . Tickets sold at post office and licensed vendors . Roving inspectors . Installing vending machines	. Yes	. Children under 15 and secondary students free ^b . Other concessions flat fare across all distances with off-peak discount Approximately 33% of full fare
Perth	. Zonal system where fares increase with the number of zones travelled	. 2 hours	. None	. Vending Machines . Roving inspectors	. Yes	. Seniors and pensioners, approx half of full fare for short distances with proportion falling as distance increases . Children & students, approximately 60% of full fare for short distances with proportion falling as distance increases

a Some coordinated tickets are available which can be used for connecting bus and rail services

b Only before 6 pm daily

The NSW Treasury argued that currently ‘... there is no clear link between existing fares and costs’(Submission 130, p.13).

It is often argued that the structure of fares in a number of cities does not vary sufficiently with the distance travelled. The Western Australian Government pointed out that ‘Zonal fare increments are not based on distance-related operating costs ...’(Submission 43, p.6).

Booz.Allen & Hamilton (1989a) noted that CityRail's fare structure substantially reduced the fare per kilometre as the distance travelled increased. It recommended substantial increases in long-distance fares.

In Melbourne it appears that long-distance commuters, for example those travelling from Geelong to Melbourne, are more heavily subsidised than those travelling within Melbourne.

Because the costs of selling tickets and loading and unloading passengers does not vary with distance travelled, and the costs of station construction and congestion are likely to be less in the outer suburbs, from where most long-distance passengers originate, it would be expected that the fare per kilometre should fall with the distance travelled. Nevertheless, the evidence available suggests that long-distance fares are currently much less than can be justified based on costs of the efficient provision of such services.

It was proposed in Section 8.4 that rail users should contribute to the fixed infrastructure costs of the rail system when use of the system approaches its design capacity. Congestion on rail (or signs of congestion) is occurring in the CBDs in Sydney, Melbourne and Brisbane. Therefore, fares for journeys originating or terminating in the CBDs in these cities should be greater than for comparable journeys elsewhere on the system.

All systems except Brisbane and Perth offer some type of off-peak fare discounts on weekdays (see Table 8.2). Transperth plans to introduce them in the next few years as part of a fare reform package. Given the large differences in demand and marginal costs, fares should vary substantially between peak and off-peak periods. The level of peak demand determines the quantity of rollingstock needed to operate the system; therefore peak period passengers mainly should be responsible for the costs of this rollingstock. The rail systems also become congested during peak times, particularly in the larger cities. Therefore, prices should reflect this high level of demand. In the off-peak, however, there are often empty seats on the trains. The cost of adding passengers to these trains is very low and therefore fares should be much lower in off-peak than in peak, but still sufficient to cover marginal costs.

In addition, raising peak fares more than off-peak fares is justified because passengers travelling at different times of the day respond differently to increases in fares. Off-peak passengers will react more strongly to fare increases than peak passengers.

The Australian Railway Research and Development Organisation (ARRDO 1981) noted that the results of overseas studies on the price elasticity of demand for rail services were generally between -0.4 (off-peak) and -0.1 (peak). This implies that if rail fares were increased by 10 per

Peak fares should be increased to cover the efficient costs of:

- station and train staff;
- running costs;
- administrative costs;
- track, signalling and rollingstock maintenance; and
- purchasing new rollingstock when it is needed.

cent, off-peak patronage would fall by four per cent while peak patronage would fall by only one per cent.

The price of tickets should, among other things, reflect the costs of selling tickets. It is much cheaper to sell multi-trip tickets or passes than single journey tickets, particularly if a conductor is employed to sell individual tickets onboard the train. Therefore there should be a discount on pre-purchased multi-trip tickets and passes. This occurs on most systems but the size of the discount varies. The NSW Treasury argued that the SRA could not realise the benefits of selling multi-trip tickets until it could employ ticket selling staff on a casual or part-time basis.

The Transport Action Council of NSW suggested that:

... fare differentials could be designed to increase the surcharge on peak period travel (as the Commission recommends); on CBD directed travel; and on shorter distance travel. All these differentials (though they are admittedly a blunt instrument for redistributing income for welfare purposes) would tend to bear more heavily on the middle class middle ring CBD commuter than on the outer suburban user; they would also reduce the tax impost on the outer suburban non-user insofar as they increase revenue. Importantly, they would not cause hardship to the outer suburban poor who do rely on rail services. (Submission 127, p.10)

It has already been noted that increasing fares in the peak periods and increasing fares for travel to and from the CBD would both improve the efficiency of the fare structure. The additional advantage is that these policies would have little impact on low income households and their immediate introduction is justified. The discussion on the distance component of fares noted that the efficiency of the fare structure would be improved by increasing long-distance fares. The impact this would have on low income households is not clear cut. Many wealthy people travel long distances to work. A recent report by the Australian Institute of Family Studies has looked at the income level of households in Sydney and Melbourne. It concluded that the low income suburbs were distributed throughout the cities, in middle, inner and outer areas, and that residents of some of the outer suburbs were relatively wealthy. These results contrast with the views of the Transport Action Council of NSW and suggest that manipulating the distance component of fares would not be a good way of targeting support to low income households.

8.6.2 Fare concessions

If the government provides support to the disadvantaged through concessional fares, it should do so in a way which minimises the impact on the financial performance and efficiency of the rail system.

‘Welfare-based’ concessional fares are provided in all capital cities. The size and coverage of welfare concessions varies but they generally include the unemployed, the elderly, pensioners (disability pensions etc), students and children. Concessions are available throughout the day, in both peak and off-peak periods in all cities.

Substantial discounts are available to the elderly in Sydney and Melbourne. Sydney offers a welfare concession to people over the age of 60 which entitles them to travel anywhere, any time in the suburban area for \$1 per day, travel from Sydney to Nowra (150 km), Moss Vale (150 km), Lithgow (150 km) or Newcastle (170 km) for \$3 per day and travel in the area between these locations for \$2 per day. In Melbourne people over the age of 60 not in paid employment are entitled to travel anywhere, any time, in Melbourne for \$1 per day.

A survey undertaken in Melbourne in 1987 concluded that 21 per cent of urban public transport passengers travel on concessional fares (State Transport Authority of Victoria 1988b, p.31). In Adelaide 45 per cent of passengers travel at concessional rates (35 per cent during the peak and 62 per cent off-peak). In 1989-90 concession travel, including children, was 50 per cent of all trips in Brisbane (Queensland Department of Transport 1990).

Efficiency aspects

The availability of concessions increases the number of passengers travelling on the system. Currently not even full fares cover the costs of carrying passengers. Therefore, even if rail authorities are compensated to the value of the full fare, the additional loss-making passengers will increase losses overall. This problem is greatest during the peak period when the cost of carrying passengers is greatest.

Economic efficiency is concerned with getting the maximum benefits out of the resources available. To achieve this, resources must be used to produce rail services only when the benefits which passengers and other beneficiaries receive are at least equal to the costs of supplying the service. Because welfare concessional fares are below the cost of providing rail services, the benefits which some passengers receive are less than the true cost of supplying the service. Resources used to supply rail services could be diverted to other activities where the benefits to consumers are greater.

Welfare concessional fares, by attracting more customers, also affect the signals which rail authorities receive to invest in new capital. With the additional concession passengers the system becomes congested sooner (especially in peak periods) so that investment in new rollingstock and in network expansion would be required sooner than would otherwise occur.

The effects of welfare concessions can be moderated by providing them in the off-peak period only.

- In the off-peak period the difference between the concessional fare and the marginal cost of carrying passengers is likely to be less. Therefore the incentive to channel resources into inefficient rail services is reduced.
- Providing concessions only in the off-peak would also remove the problem of concession passengers aggravating peak congestion problems, and would reduce the pressure from the additional concession passengers for more investment in rail services.

The elimination of concessions in peak periods would affect school children who must travel in the morning peak. One option is to exempt school children but this has large costs. It is expensive to provide peak-period concessions to children because they increase the investment in new rollingstock and even in new infrastructure needed to meet peak-period demand. Considering that the children who travel farthest by train tend to be those attending private schools, this welfare concession has the most benefit for high income families.

The Combined Pensioners Association of NSW was concerned about the Commission's recommendation to limit concessions to off-peak travel. It believed that this would cause hardship because off-peak services were said to be inadequate to meet the needs of passengers, with insufficient time between the morning and evening peak for people to carry out their business. The point also was made that some concession holders are involved in voluntary work which requires them to travel during the peak (Submission 143, p.2). The Commission acknowledges such views but emphasises the fundamental point that in order to meet their responsibilities to the whole community, railways must operate their urban services in order to make maximum use of rollingstock and infrastructure throughout the day. That objective cannot be achieved if concessional users contribute to an overloading of peak-period services.

RECOMMENDATION 8.2

The Commission recommends that urban rail welfare concessions should generally be available only in off-peak periods.

Further to this, the Commission recommends that governments should give consideration to reducing the range and number of urban rail welfare concessions.

Funding of concessions

Typically governments provide explicit reimbursement to rail authorities for providing welfare concessions, thereby reducing the impact of welfare concessional fares on the profitability of the rail authority. Funding for all welfare concessional fares should be via this direct method and not through deficit funding. In this way rail authorities can identify the revenue they receive for carrying concession passengers, that is, the fare plus the reimbursement, and take this into account in their decision making processes.

To improve accountability and transparency further the welfare concessions should be part of the budget of the State government department responsible for those receiving the concession. For example, pensioners and the unemployed would be part of the State welfare budget (see Chapter 4).

When determining government funding for welfare concessions the difference between the concessional fare and the full fare should be determined, the number of passengers travelling on concessional fares measured, and the difference paid to rail authorities. If Recommendation 8.2 is adopted, all welfare concessions should be funded up to the value of the full off-peak fare. If the education department wishes to provide welfare concessions to school children it should pay the rail authority the difference between the school concession and the full peak fare.

Because even the full fare is at present less than the cost of carrying an additional passenger, this approach would under fund the community service. The shortfall can be minimised by increasing the full fare closer to the cost of carrying the passengers.

The rail authority should be funded also for additional capital investment needed to meet the additional demand from concessional passengers. This requires estimation of the change in demand resulting from the welfare concession and the additional capital needed to meet that demand. The government should fund the initial investment and future replacement of this capital (and any return on capital that the government may have set as a goal for the rail authority).

8.6.3 Fare levels

Fares are the major source of user funding and therefore determine the financial performance of the rail systems, and the extent to which they place a drain on tax revenue.

Setting fare levels

In all Australian urban rail systems the government currently controls rail fares. The extent of this control varies between States.

In NSW each year from 1981-82 to 1985-86 the State Transit Authority increased bus and ferry fares by more than the CPI. STA fare increases approximated the CPI in the following two years but from 1 July 1988 there was a 66 per cent increase in cash fares and approximately a 10 per cent increase in charges for multiple-ride tickets and weekly passes. Equivalent increases have not been implemented in rail fares. According to the NSW Government, rail fares

... are determined in accordance with the Transport Administration Act, and this involves discussion with the Minister for Transport. They are not related to demands for services, nor is there any connection between the cost of services and the fares charged. Constraining increases is an indication to CityRail not to raise fares above the CPI in a particular year. (Submission 75, Annexure 5, p.15)

The Booz.Allen & Hamilton report (1989a) recommended that NSW CityRail increase fares by the annual rise in the CPI plus 7 percentage points from 1 April 1989 and a corresponding amount from 1 April 1990. These recommendations, which alone would not result in fares covering operating costs, were not implemented.

The Government in Victoria made a 'family pledge' in 1989 that the total cost of a basket of goods, including public transport fares, electricity charges and third party insurance premiums would not increase in nominal terms during the life of the Government. However, there was a 4 per cent increase in urban fares in 1989 as a result of an offsetting fall in third party premiums. The current Victorian Premier abandoned the 'family pledge' in mid-1990. In the 1990-91 State budget, fares were increased by an average of 15 per cent. They were further increased by 10 per cent from 10 March 1991.

In Queensland, changes in urban rail fares are determined by Executive Council. The Premier assesses fare proposals against a general policy that rail charges should, on average, not increase by more than the CPI.

The South Australian Government controls the fares charged by the State Transport Authority and restricts average increases to the CPI rise. From 1 July 1990 State Transport Authority's fares were increased and the relationship between different types of fares was changed slightly. Long-distance fares were increased more than those for shorter distances. For multi-trip tickets the regular fare was increased by approximately 5 per cent and the concessional fare by 7 per cent. For single trip cash tickets the regular fare was increased by 11 per cent and the concession fare by 20 per cent.

The Western Australian Government has made a commitment not to increase public sector charges, including urban rail charges, by more than the CPI. It is claimed that this has:

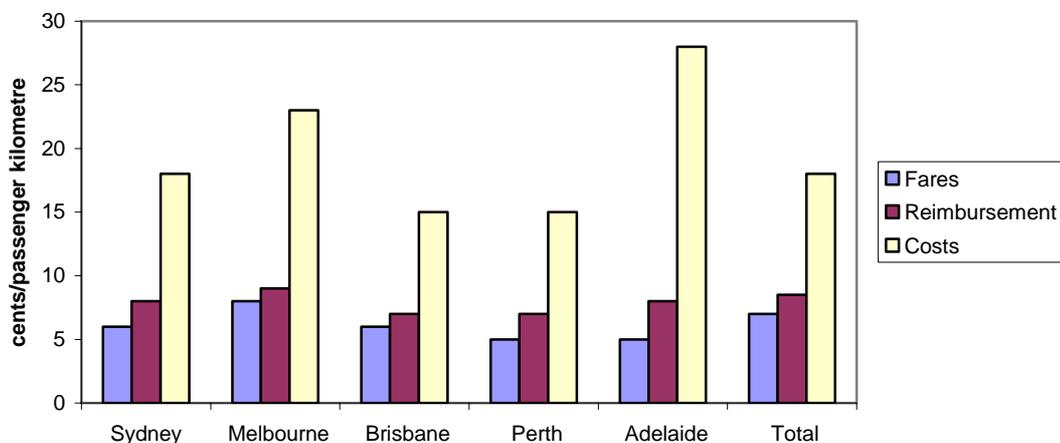
... direct consequences on the level of cost recovery ... cost recovery for urban rail services in Perth in 1986-87 was lower than in all other States and the restrictions placed on fare increases by Government in recent years suggest that this situation would not have changed. (Western Australian Government, Submission 43, p.67)

Currently fare increases appear to be tied to the political process. To make fares more flexible and better able to reflect the cost of providing services, rail authorities need to be given more freedom to alter fare levels. If fares increase to the level where they cover costs, this freedom would have to be monitored to prevent rail authorities from exploiting their monopoly power.

Fare increases

Current revenue is compared to best-practice costs in Figure 8.7. Revenue includes fares and reimbursements for welfare concessions and costs include operating costs and the cost of replacing rollingstock, locomotives, rails and sleepers. In all systems revenue is currently much less than best-practice costs.

Figure 8.7: Urban rail revenue and best-practice costs, cents per passenger-kilometre, 1989-90



Sources: CGC working papers, Travers Morgan (Appendix K) and Commission estimates

The results in Figure 8.7 should be interpreted cautiously. It is difficult to obtain consistent information on fare levels, government reimbursements for welfare concessional fares and the number of passenger-kilometres for different systems.

These problems mean that the relationship between revenues and costs presented in Figure 8.7 are indicative. However, after examining several data sources the Commission concludes that even if best-practice costs are introduced sizeable increases in fares per passenger-kilometre will still be necessary.

From the information presented in Figure 8.7, rail authorities would need to increase fares by an average of 138 per cent to cover international best-practice costs. The necessary fare increase varies between cities with 127 per cent for Sydney, 155 per cent for Melbourne, 132 per cent for Brisbane, 137 per cent for Perth and 306 per cent for Adelaide. Such increases would result in fares which would not be out of kilter with international levels (see Figure 8.6). These estimates are broad orders of magnitude only because many factors will alter the degree to which fares need to be increased. As noted previously, fares in Melbourne have been raised recently: by 15 per cent in the 1990-91 budget; and by 10 per cent in March 1991. These increases will reduce the extent to which Melbourne needs to increase fares in the future. Taking into account recent fare increases the average fare across Australia needs to be raised by 130 per cent. Also, finding cost effective ways of reducing fare evasion will reduce the need to increase fares. Similarly, increasing patronage on existing services would boost revenue.

The Travers Morgan estimates of cost reductions are based on continuing all existing rail services at current levels. Additional cost reductions may be possible by closing lines or discontinuing services with very low cost recovery. Replacing high cost, low patronage rail services with buses may be one way to achieve cost reductions. The appropriate mix of modes of transport will vary between cities. In cities where there are low passenger densities there should be more reliance on bus services.

The need to raise fares is reduced if State governments find ways to obtain contributions from urban residents who benefit from (but do not use) rail services. For example, if a government could obtain a contribution from these other beneficiaries of 20 per cent of costs, the average fare increase needed would be 90 per cent.

Figure 8.7 presents averages across all passengers and all time periods. Because the cost of operating trains in the peak, including the capital cost of the rollingstock and the cost of congestion, is much greater than the cost of operating trains off-peak, this differential between fares and costs per passenger-kilometre is likely to be much greater during peak periods. Restructuring fares can also help to reduce costs in the long run. Increasing the use of peak period pricing and restricting most concession travel to off-peak will help to reduce the number of passengers in peak periods and increase the number travelling in the off-peak period. This would even out the utilisation of rollingstock and reduce the number of carriages needed to service peak periods; it would also reduce the cost of servicing rollingstock and the level of investment in new carriages or track extensions needed in the future.

Effects of fare increases

Studies, both Australian and overseas, indicate that if fares are increased total revenue would increase, even after the resulting fall in patronage. While elasticity's vary between cities, depending on access to alternative modes of transport, and with the time of day, peak passengers are less responsive to changes in fares than off-peak passengers. Nearly all estimates of the price elasticity of demand for rail services are less than one.

As far as the short- to medium-term effects are concerned, however, there can be no doubt that, in general, the elasticity of demand with respect to fares is relatively inelastic, so that an increase in fare will bring about an increase in revenues. Indeed, reliable estimates of fares elasticity's greater than unity are extremely rare and so it seems probable that, even at the detailed level, fare increases applied to particular services, times of day or types of passenger will be very unlikely to lead to a loss of revenue. (Bly et al. 1980, p.xvi)

Most studies have concluded that the average price elasticity of demand for rail services is around -0.3. This implies that if fares are increased by 10 per cent patronage will fall by only 3 per cent. Therefore, raising fares would increase the revenue earned by rail authorities.

The Transport Action Council of NSW made the point that:

Sudden massive increases in fares would cause hardship to people who have arranged their lives around current norms. Of course all change causes temporary dislocation, and in the longer term settlement patterns would alter in response. This is not an argument against change; but we consider that it is a reasonable argument against sudden massive change. (Submission 127, p.9)

To reduce severe dislocation fare increases should be phased-in in conjunction with cost reductions. For Sydney the increase of 127 per cent over five years would be achieved by an increase of 19 per cent each year, in addition to CPI increases. Most rail authorities would be able to achieve the needed fare increases over the next five years. In Adelaide, where very large increases in fares are necessary, serious consideration might be given to converting the rail system to an alternative public transport mode.

Given the low level of revenue relative to costs and the likelihood that increasing fares will reduce this differential, there is a strong case for phasing in increased urban transport fares, particularly for peak periods.

Substantial increases in the level of fares may encourage some rail passengers to switch to road transport. The size of this move and the effect it would have on congestion and noise pollution is likely to be small, particularly if the increase in fares is backed up by urban land use strategies such as appropriate road use pricing.

- In the short term many rail passengers, particularly peak period commuters travelling to the CBD, are locked into rail transport.
- Some of those who move from rail to road will take the bus so that there will not be a substantial effect on the number of vehicles on the road.

-
- In the long term, increases in road use will be tempered by businesses' and workers' residences relocating closer together. This is already occurring in Australia's larger cities (see Chapter 5); increasing the cost of travel by raising rail fares is likely to accelerate this process.

8.6.4 Value capture

The Commission suggests that it would be appropriate for up to 20 per cent of the cost of an efficiently run rail service to be funded from non-user beneficiaries. Currently the use of value capture to fund urban rail services varies between States. Section 6.3.4 outlines examples of existing policies. All States have some commercial development at city stations. Other approaches include a proposed rate surcharge based on the rise in property values resulting from the new rail line north of Perth, and the government negotiating with property developers in Melbourne to contribute to the funding of additional public transport services needed as a result of their developments.

Recovering up to 20 per cent of the cost of rail services from other beneficiaries will require the government to adopt a more coordinated approach to value capture in most States. Policies should be directed at levying taxes directly on the beneficiaries of urban rail services. Access to public transport increases the value of the commercial and residential properties close to railway stations. Hence funds could be raised to meet some of the costs of urban rail services by rates on residential or commercial land values.

RECOMMENDATION 8.3

The Commission recommends that over the next five years rail authorities increase urban fares so that fare revenue plus government payments for community services (including contributions from non-user beneficiaries) cover the operating and new capital costs of urban rail services.

8.7 Conclusion

The previous discussion has identified that there is substantial potential to reduce the costs of operating urban rail services and increase the revenue earned from passengers.

To achieve economic efficiency, rail authorities need to at least cover the marginal cost of operating rail services. However, rail authorities currently do not have sufficient information to identify what is the marginal cost of individual services. Until such information is available average operating costs should be used as a proxy for marginal costs.

If Australia's urban rail systems reduce their costs to best practice, fares would need to be increased by an average of 130 per cent. Costs could be reduced further by discontinuing unprofitable services and by changing fare structures. These measures would enable fare increases to be less than 130 per cent. The necessary fare increase also can be reduced by State governments obtaining contributions from urban residents who benefit from (but do not use) rail services.

To reduce the disruption which may result from the changes, the Commission recommends that cost reductions and fare increases should be phased in over the next five years. In Adelaide, where very large increases in fares are necessary, serious consideration might be given to converting the rail system to an alternative transport mode.

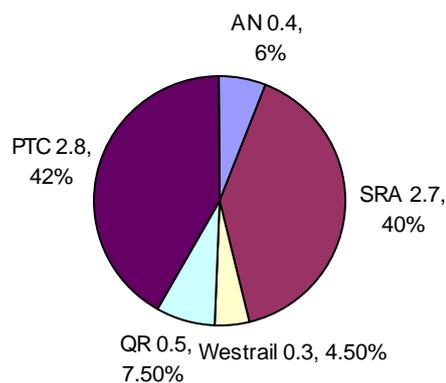
9 NON-URBAN PASSENGER SERVICES

Country and interstate rail passenger services are heavily subsidised. A strong case in support of such large subsidies, whether on welfare or other grounds, has not been made. Costs must be reduced and fares increased so that operating costs at least are covered. Some services clearly will never be viable and should be replaced with coach services at much less cost to the community. The extensive availability of concessional rail fares is leading to an overuse of rail services and continuing deficits; any concessions that governments decide to retain for non-urban passenger services should be voucher based and not specific to rail.

9.1 Non-urban passenger networks

This chapter is concerned with country and interstate passenger services. Such services include regional travel, and travel between cities and regional centres, as well as interstate travel between major cities. Commuter travel from nearby towns into capital cities (for example, those commuting from Newcastle to Sydney or Bendigo to Melbourne) is covered in Chapter 8 on urban services. The regional issues arising from discontinuing non-urban services are discussed in previous chapters. Chapter 5 looks briefly at the significance of rail closure for regional development, while Chapter 7 considers unemployment in regions where rail workers are displaced.

Figure 9.1: Rail authorities: number of non-urban passenger journeys (million)^a, 1988-89



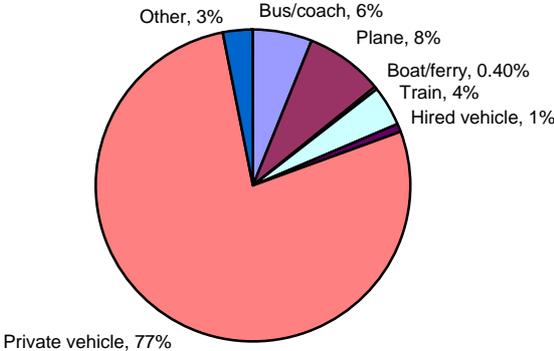
a Includes rail and coach services operated by rail systems. Includes some double counting for interstate services.

Source: Rail authority Annual Reports.

Rail services in all states except Tasmania carry some non-urban passenger traffic. The State Rail Authority of New South Wales (SRA) and the Public Transport Corporation of Victoria (PTC) together account for about three quarters of the total non-urban passenger journeys.

Overall, rail accounts for a very small proportion of total long-distance passenger journeys. The majority of such movements are by motor vehicle. Figure 9.2 illustrates the proportion of travel¹ by Australian residents by various modes of transport; only 4 per cent of such travel is by train.

Figure 9.2: Mode of transport for domestic trips, 1987-88



Source: BTR (1989).

9.1.1 New South Wales

The State Rail Authority of New South Wales runs both road and rail services. It operates passenger rail services from Sydney north to Brisbane and Murwillumbah, north-west to Tamworth, west to Dubbo and south to Canberra and Melbourne (the last in cooperation with the PTC). All are XPT (express passenger train) services except to Canberra for which older diesel locomotive-hauled stock currently is used. Coaches are run primarily to replace discontinued rail services. All SRA road coach services are contracted out to private operators.

¹ Travel by Australian residents involving a stay away from home for one or more nights but less than three months, requiring a journey of at least 40 kilometres from home, and undertaken for any reason other than to take up temporary employment.

The NSW long-distance coach passenger market was deregulated in November 1988. Permits are still required to operate tourist coaches and new entrants must satisfy public interest and other suitability conditions.

The SRA is in the process of implementing reforms to country passenger services. These include: consolidation of ticket sales outlets; rationalisation of workshop and maintenance depots; elimination of the financial loss on onboard services such as catering; and the introduction of multi-skilling of onboard crews.

Following the Booz.Allen & Hamilton (1989b) report the NSW Minister for Transport, Mr Bruce Baird, announced the Government's intention to improve efficiency by

... withdrawing services from grossly unprofitable lines, replacing some other rail services with road transport and streamlining management and operating practices. (NSW Minister for Transport, Media Release, 13 July 1989)

This involved: reducing the number of rail services; using XPT trains for most remaining rail services; contracting out coach services where the rail services were closed; and removing motorail, dining and sleeping cars.

These measures resulted in a decrease in the number of trains and a corresponding increase in the number of coach services. For example, coaches now operate most of the services from Sydney to Canberra (in competition with private providers), and have replaced the rail service from Dubbo to Broken Hill.

Following that 13 July 1989 announcement, the Minister decided that some additional passenger trains should be retained. The purchase of special purpose trains is being considered for services from Sydney to Armidale and Moree, and from Sydney to Canberra. These services will not be operating before 1992. The NSW Government is required to pay the SRA to run these services subject to community service contracts.

In response to the public outcry when the North Coast sleeper and Motorail services were discontinued, the NSW Government set up a public review in February 1990. The review was completed in September and resulted in the Government deciding to reinstate sleeping services, despite the finding that sleeping services were required by only 1600 persons. The reinstated sleeping services will use new XPT carriages which were estimated to take 18 to 28 months to construct.

9.1.2 Victoria

The Public Transport Corporation is an umbrella organisation which trades under the name of V/Line for non-urban freight and passenger services. V/Line runs a substantial network of coaches and country passenger trains. Since 1985-86 patronage in terms of passengers per carriage has increased by 31 percent. This includes the transport of long-distance commuters; for example, people who work in Melbourne and live in Geelong. Of the 7.5 million rail and coach passengers

travelling on V/Line, 2.8 million are true country passengers, that is, other than long-distance commuters. About 20 per cent of V/Line non-urban passengers travel by coach.

V/Line operates an extensive passenger network. Train services from Melbourne operate north to Dimboola, Mildura, Swan Hill, Cobram and Albury/Wodonga, west to Warrnambool and east to Bairnsdale and Leongatha. V/Line contracts out road coach routes to private operators to service a substantial network of towns between those served by rail. It is also responsible for interstate road coach services to Broken Hill, Canberra and the NSW South Coast. The private operators contracted to provide these services receive a subsidy, if needed, to ensure that a 'suitable' standard of service is provided.

Private coach companies operate under a compulsory licensing system. To receive a licence the operator must show no disbenefit to existing services (road or rail). V/Line and existing coach operators can appeal against new licences.

9.1.3 Queensland

Queensland Railways (QR) operates all rail passenger services in Queensland. In 1989-1990 QR accounted for 695 000 country passenger journeys, half of which were Kuranda tourist train trips. Non-urban passenger services operate from Brisbane north to Rockhampton and Cairns, with three services extending west from this line. Patronage has increased on some lines, especially after the introduction of the Spirit of Capricorn, an electric train service between Brisbane and Rockhampton. QR contracts out and subsidises some road coach services. For example, from Cairns to the Atherton Tableland: 50 450 passengers used this service in 1989-90.

Coach services are privately provided and licensed with restrictions on pickup and set-down points. Some of these restrictions are designed to prevent competition with existing urban and local bus services. The requirements to gain a licence include character references, experience in public passenger transport, financial viability, adequate infrastructure and the ability to meet safety and quality standards.

In 1989 Queensland completed the electrification of the main line from Brisbane to Rockhampton, after which electric passenger services began operation. One of the western services is now faster because it is hauled on the electrified system for some of its journey.

9.1.4 Western Australia

Westrail operates rail and coach non-urban passenger services, carrying 335 000 passengers by train (236 000 country passengers and 99 000 interstate) and 186 000 by coach in 1989-90. It runs two passenger trains, the Australind from Perth to Bunbury and the Prospector from Perth to Kalgoorlie. The Australind generated a 15 per cent increase in passengers in 1988-89. Patronage on the Prospector has also increased. Westrail is responsible for the Indian Pacific and Trans Australian services west of Kalgoorlie.

Westrail runs 24 road coach services which replaced former rail services and provide transport to the less populated areas of the state. Coaches travel as far north as Kalbarri and Meekatharra and as far east as Kalgoorlie and Esperance. The demand for coach travel is increasing.

All private and public coach services must be licensed. Licences are assessed on the governments judgement of need for the service, its effect on existing services, the qualifications and financial stability of the applicant and the interests of the community. There are restrictions on the departure times of private coach services to Kalgoorlie which are designed to minimise coach competition with the Prospector rail service.

Westrail has combined the administration of its road and rail divisions to improve the coordination of services. For example, the booking and reservation system has been centralised to improve seat occupancy, control resource utilisation and allow for staff reduction (Western Australian Government, Submission 43, p.60).

In 1988 tenders were called to operate all or regions of Westrail's coach network. There was insufficient interest in any substantial part of the system and as neither the Government nor Westrail was interested in tendering out individual routes the offer was withdrawn.

9.1.5 Australian National

AN does not run coach services on the mainland or any passenger services in Tasmania. It controls interstate rail passenger services while they are operating over its lines and is responsible for most of the journey of the Overland from Adelaide to Melbourne, the Trans Australian from Adelaide to Perth and the Indian Pacific from Sydney to Adelaide and Perth. The deteriorating cost recovery of the Indian Pacific ² has led to a request by the NSW Government that AN take over the running of the Indian Pacific from Sydney.

² Since the deregulation of interstate aviation there have been large reductions in air fares to Perth. This has encouraged people travelling to and from Perth to fly and the number of passengers on the Indian Pacific has fallen significantly.

AN is the sole operator of the Ghan from Adelaide to Alice Springs. In 1990 AN completed a \$2.5 million project to refurbish the Ghan and reposition it in the market. This has significantly improved the financial performance of this service. AN believes that it can also improve the performance of its other interstate services, however it is

... going to require some fairly important policy initiatives to be taken at state and federal government level, such as the corridor management of passenger trains; [and] a focusing on the more successful passenger business activities ... (AN, Initial hearings, p.535)

In November 1990 the Commonwealth Government announced that it had

... agreed to a request from Australian National to close South Australian regional rail passenger services ... the costs of maintaining the services were simply too high. (Commonwealth Minister for Land Transport, Bob Brown, Media Release, 212/90)

Opposition from local communities affected by AN's move to close unprofitable passenger services has gone some way to reversing this decision. In April 1991, the Commonwealth appointed an independent arbitrator to determine the future of the Adelaide to Mt. Gambier service the 'Blue Lake'. The arbitrator's decision to reinstate the 'Blue Lake' was based on the claimed disadvantages which rural communities would suffer as a consequence of closing the service. These include: isolation from other communities; reduced mobility for the aged and disabled; and lack of access to necessary services. The Commonwealth has announced that it will abide by this decision.

9.1.6 Very Fast Train

The Very Fast Train (VFT) is a proposal for a new high-speed rail system between Sydney, Canberra and Melbourne, first announced in 1984. Although it would use electrically-powered locomotion running with steel wheels on steel rails, the operational speed of 350 km/h means it would be significantly different from existing rail technology operating in Australia; in effect, the VFT represents a new transport mode. Its primary market would be passengers (including those currently travelling by air), but it would also carry some freight.

With a projected cost of \$6.5 billion (1990 dollars), the VFT proposal is the largest investment project currently under consideration in Australia. It is planned to be funded, built and operated by private enterprise. The project is dependent, amongst other things, upon a favourable feasibility study and government support/cooperation to facilitate acquisition of both public and private land for the route. At one stage the VFT Joint Venture (comprising four companies) was also keen to have governments permit development along the route in such a way as to contribute to the financing of the VFT.

The size of the project has raised some concern by those who consider the venture to be a low priority:

... the VFT construction programme would be likely to absorb all the specialised resources available for railway projects, so that for some five years the reconstruction of the rest of the rail system would be slowed down. (W.C. Wentworth, Submission 107, p.1)

The investment proposal has been subject to a long evaluation process commencing with the preparation of a Concept Report and most recently a Project Evaluation report by the VFT Joint Venture. There have been inquiries or reviews by the Victorian Government, the Senate Standing Committee on Transport, Communications and Infrastructure and the ACT Government. A VFT Government Task Force was established to coordinate the involvement of the Commonwealth, New South Wales, Victorian and ACT Governments in responding to the VFT Project Evaluation Report (VFT 1990) and the VFT Joint Venture's tax and finance proposals to the four governments.

The Northern Territory Treasury pointed out the problem for provision of infrastructure inherent in the present tax system:

A taxation system which has developed in an environment of government provision of major infrastructure is unlikely to be able to efficiently address the issue of major infrastructure needed in today's environment. (Northern Territory Treasury, Submission 145, p.3)

Arguing that the present tax system discriminates against major long-term infrastructure projects financed by the private sector, the Joint Venture proposed a new tax regime to assist in financing the project. In August 1991 the Commonwealth Government acknowledged the potential benefits of the project, but stated there was no case for special taxation treatment for the Very Fast Train and that the implications of allowing wider access to tax losses for all taxpayers ruled out such a policy at this time. With this announcement all work on the VFT proposal was suspended indefinitely. However, the issue of tax treatment for such major long-term infrastructure projects is on the agenda for the November 1991 special Premiers' Conference.

9.2 Cost recovery

Cost recovery on non-urban rail passenger services is low. Comparing the Railway Industry Council (RIC) cost recovery estimates in Figure 9.3 with Figure 8.2 for urban passengers, the performance of non-urban passenger services is similar to urban passenger services in all systems except Queensland. In Queensland cost recovery on non-urban passenger services is clearly lower than that on urban services.

The level of cost recovery in Queensland is reduced by the poor performance of the three western services.

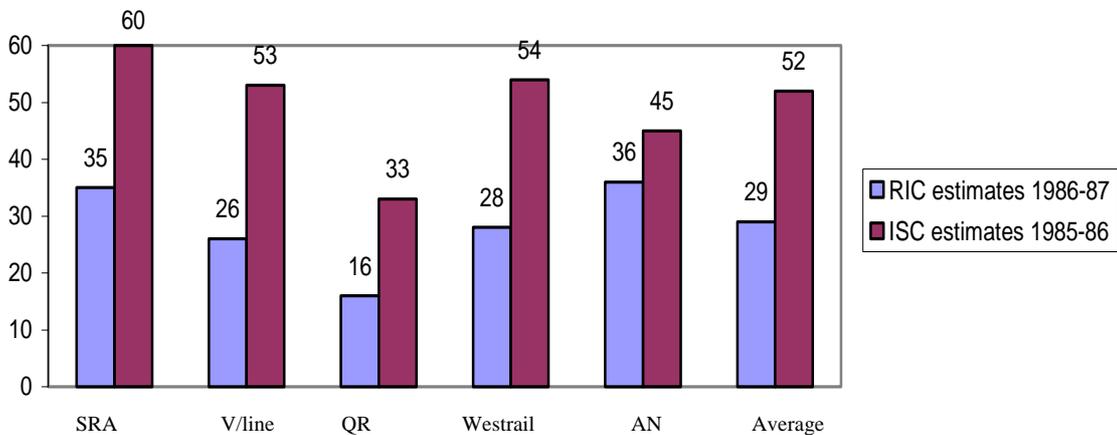
The patronage of the three western air-conditioned services continued at a low level, and overall cost recovery is less than 10% ... in total, the revenue received from the operation of these services does not even meet the fuel bills for these trains. (Queensland Railways 1989, p.12)

The worst performer in Queensland is the Westlander which has a cost recovery of 7 per cent and a loss per passenger of \$314.

The Indian Pacific has a cost recovery of 50 per cent and an average loss per passenger of \$254.

Figure 9.3 presents two estimates of the level of cost recovery in non-urban passenger services. RIC (1990a) included estimates of cost recovery for 1986-87 in each State. The cost estimates included capital (debt financing and leasing charges) as well as operating costs. The Inter-State Commission (ISC 1987b) estimated cost recovery for interstate passenger services, based on short-run avoidable costs (excluding capital costs, debt financing and leasing charges) which were taken as a proxy for short-run marginal economic costs. Because marginal costs are typically less than average total costs, the ISC cost recovery ratios are all higher than those used by RIC. The ISC ratios also are higher because they cover only interstate services which typically recover a higher proportion of costs than do intrastate services; the RIC estimates cover both interstate and intrastate services. Despite these differences, both sets of estimates indicate that the SRA achieved the highest degree of cost recovery (matched by AN for one measure) and QR suffered the lowest.

Figure 9.3: **Cost recovery (per cent) for country passenger services a**



a RIC and ISC definitions of cost recovery are included in the text.

Sources: ISC (1987b, p.114); RIC (1990a, p.10).

Cost recovery objectives differ between rail authorities. The PTC has been unable to achieve its cost recovery target of 50 per cent of operating cost on non-urban passenger services. The Commonwealth Government has told AN to increase its cost recovery on country passenger services to 60 per cent of fully distributed costs. AN has achieved this on the Ghan after substantial investment in the train, and aims to lift its level of cost recovery on the Indian Pacific also. Prior to deregulation of the airlines cost recovery on the Indian Pacific and Trans Australian was 50 and 52 per cent respectively; since deregulation it has fallen much lower.

The Booz.Allen & Hamilton (1989b) report concluded that country passenger services in NSW would never be profitable. But the SRA intends to improve cost recovery.

Countrylink's cash operating deficit was projected to decline progressively over the next four years, resulting in improved cost recovery for long distance passenger services from 37 per cent in 1987-88 to 78 per cent in 1993-94. However, with the proposed introduction of the Explorer trains, these projections are being re-assessed. (Submission 75, Annexure 3, p.2)

The SRA is moving to assess their non-urban passenger services on an avoidable cost basis, an approach expected to increase measured cost recovery significantly.

The variation in the cost recovery targets between the systems implies that these targets are not derived from economic principles but based more on what is judged to be politically acceptable.

Operating cost recovery levels substantially less than 100 per cent imply that services are heavily subsidised. Non-urban passenger services account for a small part of the total non-urban rail task. However, they generate a large proportion of the non-urban deficit. Figure 9.4 illustrates the magnitude of the non-urban passenger rail deficits. Subsidising rail services imposes costs on many members of the community. Taxpayers throughout the State, many of whom cannot or do not use public transport, all contribute to funding these deficits.

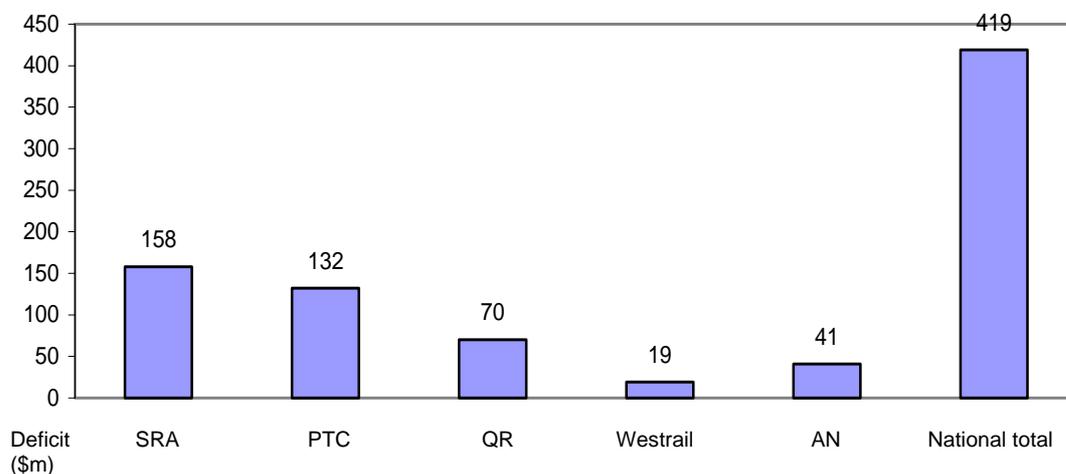
In addition, mining companies argued that non-urban rail services, like all community services, should be funded directly by State governments because under the current conditions mining freight rates are more likely to be artificially inflated to help finance rail losses in other areas. Exxon believes that means other than mineral freight rates must be found to support non-urban passenger deficits:

ECMAL considers that any rail related income support mechanism be met deliberately and explicitly through some other mechanism.(Submission 138, p.18)

Similarly:

Such an approach would also limit the cross subsidisation of community service obligations by overcharging for bulk commodity transport - provision of community services should be a responsibility borne by the broader community. (BHP-Utah Coal Ltd, Submission 52, p.9)

Figure 9.4: Total non-urban passenger deficits (\$ million) a, 1986-87



a Estimates include 'ownership costs' such as debt financing and leasing costs, and direct reimbursement for concessions.

Source: RIC (1990a, p.10).

On the other hand, the SRA has stated that it does not cross-subsidise between passenger and freight services, because overall, its freight operations incur a deficit.

Given the cost to taxpayers of subsidising non-urban passengers, and given that ready improvements in the performance of passenger services would achieve significant reductions in the non-urban deficit, the reasons for continuing subsidised services should be considered carefully.

9.3 Assessment of the arguments for subsidising non-urban rail services

Participants expressed different views on the approach which should be taken for non-urban passenger transport. Community groups and individuals saw a need to expand the role of country rail services. Colin Taylor's submission was representative of many others, arguing that:

Between all major population centres a pattern of fast and convenient passenger services should be provided, with sleeping and dining facilities where journeys over about seven hours are overnight. Motorail services should be re-introduced on major routes. Special attention should be given to intramodal and intermodal transfers, that is, connections between trains and the interchange between rail and other transport modes. (Taylor, Submission 26, p.36)

State governments traditionally see country passenger services as community services. NSW stated:

Recent experiences in NSW have demonstrated the importance that the community attaches to the availability of affordable rail travel between major population centres. The NSW Government recognises its legitimate role in providing such services in response to community preferences. (NSW Government, Submission 75, p.15)

Western Australia said:

The primary concern of the Western Australian Government's regulatory policy affecting regular inter-town country passenger services is to maintain reliable, high standard services at reasonable cost to both the users and the State. (WA Government, Submission 43, p.61)

Some of the arguments for subsidising rail transport are discussed in earlier chapters. This section summarises the conclusions reached as they affect non-urban rail passenger services.

9.3.1 External costs of non-urban road transport

The external costs of road transport most relevant to non-urban passenger services are greenhouse gas emissions and accident costs. Energy efficiency is also raised as an issue. The arguments addressed in Chapter 5 indicate that there is no clear case supporting claims that non-urban passenger rail services are always environmentally better or more energy efficient than road based transport.

Greenhouse gas emissions, CO₂ in particular, are closely related to fuel consumption. The BTCE estimated that for non-urban passenger services the energy consumption per passenger-kilometre of rail is over twice that of coaches. This result does not necessarily mean that coaches are intrinsically more fuel efficient, but reflects the differing load factors between rail and coach. The more intensive passenger task associated with coaches allows for an advantage over rail in energy consumption per passenger-kilometre. Car travel consumes more fuel per passenger-kilometre than either of the other modes (see Chapter 5). The BTCE also estimated that coaches produced less than half the CO₂ in grams/passenger-kilometre than either car or rail transport. Again the result for rail transport was significantly less than that for cars (BTCE 1991).

The justification for subsidising passenger rail services to reduce coach accidents is limited also. Private motorists are responsible for the largest number of road accidents, but it is very difficult for non-urban passenger rail services to make an impact on the number of cars on the roads. Data on the relative accident rates of road coach and rail services are inconclusive (see Appendix G). In fact, the Federal Office of Road Safety (FORS) argued that:

... although the two multi-fatality crashes involving coaches in NSW in October and December 1989 will no doubt have changed the picture, the long term history is that coach operations are comparable in safety to rail operations, and may be the safest form of land transport ... (FORS 1990, p.193)

9.3.2 Welfare

It is often argued that rail services should be subsidised on welfare grounds.

Many old people prefer rail to any other form of transport. Their preferences should be taken into account. Those who are infirm or disadvantaged in some way cannot cope with buses and many find air travel too expensive. Such people may not be able to drive cars and are mostly unhappy, uncomfortable, afraid, or physically sick on buses. What applies to old people and the disabled also applies to people with young children. The withdrawal of rail services can result in distress, anger and genuine hardship. (Taylor, Submission 26, p.11)

This argument is used to support welfare concessional fares and general subsidies to all rail users.

Welfare concessional fares provide reduced price travel to specific groups. Such fares could be justified on commercial grounds if they cover the costs of carrying concessional passengers and increase revenue by filling vacant seats on a train which would have run anyway. In practice, full fares do not cover the cost of carrying passengers; it follows that non-commercial fares, particularly those offering free travel, increase this deficiency.

Concessions are provided on social welfare rather than commercial grounds and distort the pattern of demand for Countrylink services. (NSW Treasury, Submission 130, p.7)

The proportion of passengers travelling on welfare concessional fares is too high on most services for them to be simply filling otherwise unoccupied seats. Concession passengers affect the number of carriages needed, the frequency of services and in some cases whether the service is run at all. For example, in Queensland, on the Inlander from Townsville to Mt Isa, 85 per cent of passengers travel on concessional fares with 50 per cent travelling free. Those concessions which the government requires the rail authorities to provide and which cannot be justified as commercial decisions should be assessed on social welfare criteria.

Even if support of this kind was justified, there are alternative ways of providing welfare support, other than concessional fares. The approach favoured in Chapter 4 is making the pension sufficient to provide an adequate standard of living for pensioners. Such a pension should eliminate the need for concessions which cost more to administer than a pension-only scheme and which contribute to a misallocation of scarce resources (see Section 9.6.1 for further discussion). Among objections to this proposal is the concern that pension increases will not be consistent with fare increases because State governments determine fare levels while pensions remain a Commonwealth responsibility (Combined Pensioners Association of NSW Inc., Submission 143 p.1). Chapter 4 also discusses the option of moving to a voucher system for concessions. If welfare concessions are to be provided, the voucher system is particularly suited to non-urban passenger transport.

The argument most often used to support the continued provision of non-commercial fares is to provide essential mobility to the transport disadvantaged. This argument is strongest in urban areas where access to public transport may be necessary to carry out daily activities. Only a small proportion of non-urban passengers are travelling for essential purposes, for example medical treatment. Most welfare concessions are used for recreational purposes. The BTE undertook a survey in 1987, part of which asked rail passengers the purpose of their trips between Sydney and Canberra, and Sydney and the North Coast of New South Wales. It concluded that approximately two-thirds of rail passengers in both corridors undertook the journey as part of a holiday or to visit friends and relatives (BTE 1987, pp.19-20). Similarly, in Queensland when the Stockman's Hall of Fame was opened in Longreach there was a doubling in the number of pensioners using their free travel vouchers on the Midlander to Longreach. Pensioners travelling free make up half of the total number of passengers on this train.

In response to the draft report, the Transport Action Council for NSW said that the Commission's comments on recreational travel showed a 'cavalier approach to the social needs that travel can fulfil' (Submission 127, p.5). The Council stated that elimination of some non-urban rail services may result in a small benefit to a large segment of the community but also in a serious loss of welfare to a small group (those who find the alternative, coach travel, intolerable) in the community.

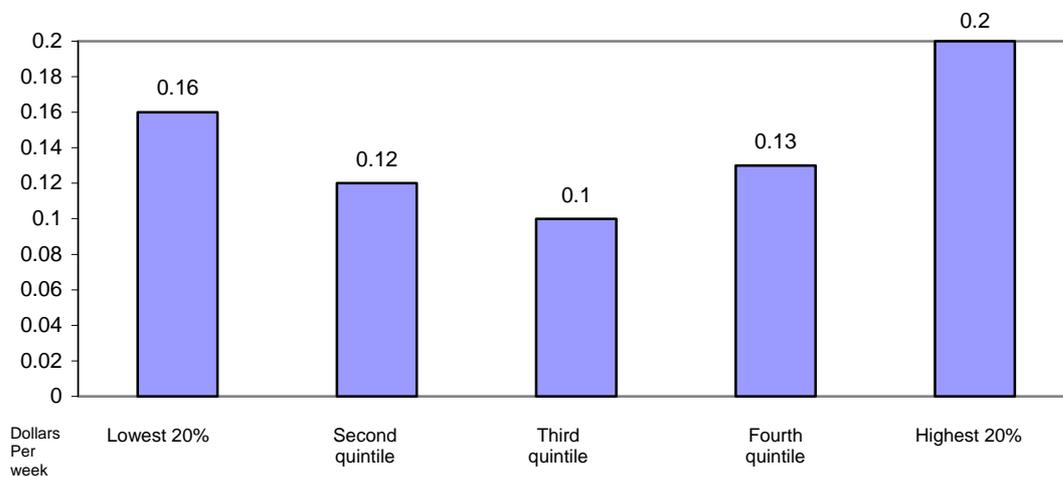
The other side to that point is that the benefits of non-urban rail travel accrue to relatively few. The Booz.Allen & Hamilton report argued that in NSW only a small number of people receive very large benefits from subsidised non-urban rail services. It calculated the average subsidy per passenger at \$93 for each trip. However

It is estimated that 10% of the users account for 60% of the journeys (an average annual subsidy for these frequent users of over \$5600). (Booz.Allen & Hamilton 1989b, p.VII.60)

The number of concession passengers travelling by rail indicates the importance of non-urban rail travel to some low income earners. Data from the ABS household expenditure survey indicate that people on middle range incomes spend less on holiday rail fares than those on the lowest incomes. However, the amount spent on holiday rail fares increases sharply for those in the highest income groups (see Figure 9.5).

Those on high incomes are most likely travelling on luxury services, such as the Ghan. However, even these luxury services receive large subsidies. The subsidy per passenger on the Ghan is \$138.

Figure 9.5: Household expenditure per week on holiday rail fares, 1988



Source: ABS, Household income and expenditure survey, 1988, unpublished statistics.

If the intention of rail subsidies is to provide cheap transport to the poor, the possibility of using coaches should be considered. Private coach fares (which cover costs) are generally as low or lower than the full rail fares for the same journey. In addition, it is often much cheaper to run coach services than rail services, particularly on low patronage routes.

9.4 User pays

The preceding discussion indicates that the justification for subsidising non-urban rail services is limited. In Chapter 5 it is noted that remote communities may place a value on the existence of rail services, which is not reflected in patronage. It is concluded that communities facing the prospect of losing services should be given the option of providing the funds for the services to be maintained. If communities are not willing to contribute to funding rail services, passenger fares should increase to be sufficient to meet the costs of these services. Different ideas were presented by participants on what measure of cost should be used to assess the viability of a passenger rail service. AN assesses its services on the basis of fully distributed costs. A number of other participants argued that alternative approaches are more appropriate.

The costs of community service activities considered as a marginal activity (for example, passenger rail services operate on lines primarily used for freight) may appear inflated if their marginal costs and revenues are not accurately isolated. (NSW Transport Action Council, Submission 23, p.11)

The extent to which passenger fares cover the costs of a service should depend on how significant passenger services are compared to total traffic on the line.

Passenger services, running on lines which carry little or no freight traffic, should cover the costs of operating the passenger service and maintaining the rollingstock, generate funds to replace the rollingstock in the future, and cover the cost of maintaining the rail lines. Only a few passenger services fall into this category. Most services operate on lines provided primarily to transport freight. For example, in NSW only 237 km of track (from Tamworth to Armidale and from Casino to Murwillumbah) are provided primarily for passenger traffic (Booz.Allen & Hamilton 1989b).

If passenger services are a minor traffic on a line, they should be required to cover at least the costs of operating the service, maintaining the rollingstock and generating sufficient return to replace the rollingstock in the future.

If it is not possible to obtain revenues sufficient to meet these costs then the service should be phased out. This may involve the continuation of the service in the short term until the rollingstock ceases to be viable. During this period passengers should be required to meet only the costs of operating the service.

AN has followed this practice with the phasing out of its regional services, yet the Commonwealth Department of Transport and Communications (Submission 128) noted that, even in the process of running down the rollingstock, none of the services was meeting operating costs.

Likewise, the Commission is not aware of many other non-urban passenger services which currently achieve this lowest level of cost recovery. If the existing services are to be retained their financial performances need to be improved. The operating costs, level of fares and fare structure all need to be addressed.

RECOMMENDATION 9.1

The Commission recommends that the revenue earned on non-urban passenger services, including reimbursement for non-commercial fares, should at least cover the operating costs of those services, with a return sufficient to finance the replacement of rollingstock. If this is not achieved the service should be phased out.

In response to the draft report all systems claimed that they were improving operational efficiency of non-urban passenger services. With respect to Recommendation 9.1, most systems argued that even when operating efficiently no non-urban passenger services could be viable.

Only AN and the Northern Territory Government supported withdrawal of services which are not viable. The NSW Treasury stated that if a railway cannot meet operating costs there is an a priori case for closure. The Western Australian Government suggested it is appropriate that governments retain the option to finance non-urban passenger operations as community services. The Queensland Government remained unconvinced that withdrawing non-viable services would be of benefit to the community.

In commenting on the draft report, the Combined Pensioners' Association of NSW said that this recommendation:

- is completely unacceptable in the absence of
- . recognition of the community service obligation aspect
- . provision of an alternative for public transport service
- . any explanation of the context in which operating costs are to be estimated ... (Submission 143, p.3)

Similar points were made by the Commuter Council (Submission 144).

The Commission points out that the community service aspect of such services would be reflected in government payments to the railways for concessions provided, that alternative transport services would be available via a voucher system to be used on any mode of transport (discussed in Section 9.6.2), and that only the operating costs (no infrastructure costs) would be taken into account where passenger services are a relatively minor traffic. Further to this, there exists scope to limit fare increases through reducing the costs of the service. Issues of cost reduction and improved service quality are discussed in the following sections.

9.5 Improving efficiency and service

There were different views expressed in submissions as to whether non-urban passenger rail services can be run without a subsidy. No Australian rail authority believes it is possible to run these services profitably. The situation is similar overseas. However, with increased investment and single management of trains, AN contends that its interstate services could be improved significantly.

AN considers that the east-west passenger services could achieve similar or better cost recovery (than the Ghan). The East/West trains provide an even bigger opportunity than the Ghan as a larger market exists in Perth and Sydney. (Submission 64, p.64)

Some other participants argued that the rail authorities' accounting is inaccurate and they are not making an effort to provide an adequate service. For example, the NSW Transport Action Council stated that it:

... does not accept the Industry Commission's apparent assumption that no long distance passenger train has the potential to be operated profitably on a marginal cost basis. Further detailed study is needed of the economies of different types of passenger trains, including the potential revenue available from competent marketing and increased market share, and the potential savings available from reform of marginal cost structures. (Submission 25, p.3)

Action for Public Transport viewed improved infrastructure as integral to cutting costs:

What if rail speeds were doubled through straighter and less graded tracks? ... Energy would be saved through less cycling through the speed range, and earnings per hour would increase faster than costs. (Submission 139, p.5)

But, there remains the need for revenue to pay for the increased capital applied to reduce operating costs.

Service quality is discussed further in Section 9.5.2.

9.5.1 Cutting costs

The Commission accepts that there is considerable scope to reduce the costs of operating non-urban passenger services in all States. Travers Morgan estimates (reported in Appendix K) suggest that reductions of up to 36 per cent may be achieved if international best practices were adopted. This result is calculated on all operating non-urban services, suggesting further cost savings could be achieved if those services with the lowest cost recovery were discontinued.

Travers Morgan identified many areas for cost reduction including the rationalisation and multi-skilling of crew, and the contracting out of cleaning and some maintenance. Corporate and business overheads stood out as the area with the greatest potential for savings with estimated reductions in the order of 50 percent which would account for about one quarter of all savings in non-urban passenger services. Most rail systems are implementing cost reduction plans.

Table 9.1 provides a summary of the costs and areas of largest potential savings in non urban passenger rail if international best practices were adopted.

Table 9.1: Costs and potential savings in Australia's non-urban passenger rail

<i>Cost area</i>	<i>Total cost</i>		<i>Potential savings</i>	
	\$m	% total	\$m	% total
Train	37	7	14	38
On train crew	47	9	16	34
Carriage maintenance	104	20	39	38
Corporate/business overheads	107	21	55	51

Source: Travers Morgan (Appendix K).

The SRA has recognised there is substantial scope for reducing costs.

Mr Baird said the consultants [Booz.Allen & Hamilton] had found that the Country operations of SRA were seriously over-staffed and recommended a 45 per cent reduction in staff numbers from 18 000 to 10 000 over the next three years.

State Rail is confident that even with 8 000 less staff it can operate 95 per cent of what we are doing now on a more reliable scale ... (NSW Minister for Transport, Media Release, 13 July 1989)

The Booz.Allen & Hamilton report had estimated the total possible saving from improved efficiency in the SRA's country passenger services at \$75 million, approximately half of its deficit of \$160 million (see Figure 9.4). It saw three areas of potential cost reductions: overheads such as station staff; the cost of onboard services such as catering; and a smaller non-XPT fleet with consequent lower maintenance costs (Booz.Allen & Hamilton 1989b).

Similarly AN believes considerable potential exists for cost reductions. Among the reforms involved would be changes to work practices, staffing levels and maintenance arrangements. AN predicts that while these changes involve costs of capital investment and union resistance, any increase in costs would be outweighed by the potential savings. (AN, Final report hearings, p.411)

The Victorian Government has recognised also that cost reductions could be achieved by:

2 person crewing on passenger trains; further increases in productive time of train crews; improvements in maintenance and utilisation of rolling stock; and improvements in track maintenance. (Submission 58, pp.13-14)

It is also important to recognise that passenger train operations can increase costs elsewhere, such as by delaying freight trains and thereby frustrating the development of a viable freight rail service. For example, the rail line between Sydney and Brisbane is congested, so that there are increasing problems with train priorities, and passing passenger and freight trains on crossing loops. In addition, freight lines that accommodate passenger services require a higher standard of track maintenance to achieve acceptable levels of safety.

Significant improvements in cost recovery can be achieved by discontinuing the worst performing services. But government concerns with what is politically attractive can make it difficult for achieve substantial reform of non-urban passenger services. In response to the Booz.Allen & Hamilton report an extensive program was announced to improve the financial performance of NSW's non-urban passenger services. Since that announcement the NSW Government has reversed some of the major changes which the SRA had planned to make. The Government has decided to retain some of the rail services which the SRA intended to discontinue and to re-introduce sleeper services.

The potential for systems to reduce operating costs provides the opportunity for greater cost recovery levels and service viability. Such cost reductions might not be enough, but if this potential is realised, returns will not be sufficient to justify the continuation of services.

9.5.2 Service quality

The viability of a passenger service is not just a function of its potential for cost efficiency and fare increases. Its survival may depend on its ability to attract as much revenue as possible (without raising offsetting levels of cost) through different levels of service quality.

If passenger services are to continue, it should be an objective of governments and rail authorities to provide a service quality which generates the best possible financial return. Decisions have to be made on the age at which rollingstock is replaced, the type of accommodation, whether sit-up or sleeper, and additional services such as entertainment, dining or motorail facilities. Other factors such as ticketing systems, promotion, information facilities and timetables are also important. Improving any of these factors may increase the cost of operating the service. Each has to be assessed in terms of how much it will cost, the effect it will have on patronage and whether passengers are willing to meet any additional costs. Similarly, when reducing the cost of passenger services it is important to consider how the cost cutting affects the quality of the service provided: will the new service have a place in the market?

The Commission does not have sufficient knowledge of the passenger rail market to determine what is the appropriate service mix. However, a number of submissions raised questions about current methods of operating passenger rail services. Examples of areas which received particular attention are coordination of interstate services, onboard facilities, timetabling of country passenger services and the speed and frequency of services.

For example:

Logic suggests that State Rail, the lynch pin in the national system, would amend to its timetable information on other states services. In fact State Rail does not, thus continuing the century old tradition of no national timetable existing in Australia. (Taylor, Submission 26, Appendix 3)

Provision of new XPT seats as planned will, we understand, create a three class train. Whilst the seats will improve comfort they, will in no way reach the standard of the present Day Niter seats on conventional trains, replace a sleeper, nor attract those who demand a sleeper service. (Lachlan Regional Transport Committee, Submission 39, p.6)

... the remaining passenger train services from Canberra to Sydney are slow and inadequate and it is difficult to understand how these could possibly be intended to attract passengers. (Canberra/Queanbeyan Regional Transport Action Group, Submission 42, p.8)

Obtaining the appropriate level of service and quality is fruitless if consumers are not aware of what is available. The more commercial operation of railways requires that the systems to go out into the market and sell their product.

CQRTAG has found that the railways have frequently made little effort in the local situation to go out and actively compete for business ... railways have superior facilities to market over road operators, and surely could develop marketing skills commensurate with their product. (Canberra/Queanbeyan Regional Transport Action Group, Submission 116, p.3)

Most rail systems are aware of the role service quality has to play in developing a viable non-urban passenger business and identified in their submissions factors such as the upgrading of rollingstock, improved speed and better marketing. NSW has addressed the issue with higher performance trains, refurbishments and the introduction of the TRAINS reservation system with national timetable coordination.

Significant gains in service quality, such as better marketing and operating efficiency, would result from single corridor management of passenger services. This option is discussed in Section 9.5.4.

9.5.3 Alternative modes of transport

If passenger services cannot be run without imposing unreasonable burdens on taxpayers, alternative forms of transport should be considered. Coach services are the most obvious alternative. The Queensland Government stated that

It is hoped that QR's new objectives will result in an improved financial performance generated by business growth, particularly in markets more suited to rail and in the substitution of road services for rail where road is more appropriate. (Submission 50, p.6)

The State Transport Authority of Victoria (1988a) STAP Report stated that if all passengers were transported by coach instead of rail, cost recovery would increase to 111 per cent.

It should be recognised that many people perceive coach services to be a poor substitute for rail services.

... rail transport provides advantages over roads. These include:

- a. Greater safety in operations.
- b. Superior on board facilities provided
- c. Improved carrying capacity
- d. Facility for continuous travel are available
- e. Environmentally friendly
- f. Enhanced human dignity for travellers
- g. More energy efficient
- h. Absence of congestion
- i. Avoidance of crash costs, so significant on roads. (Canberra/Queanbeyan Regional Transport Action Group, Submission 42, p.6)

The perceived advantages of rail travel over coach travel would imply that passengers should be prepared to pay more for rail travel. However rail fares tend to be set at levels similar to coach fares, and increases in rail fares (or reductions in the fares of other modes, for example air) result in passengers transferring to other modes. This suggests that most people do not value the advantages of rail enough to pay for them.

When assessing whether to provide rail or coach services, State governments need to consider both the cost and quality of the service. While coach transport has significant advantages in cost savings, Travers Morgan (Appendix K) claims that this is not necessarily at the expense of quality transport:

It has been demonstrated several times, both in theory and in practice, that a substitute bus service can provide an equal or better level of service as most country trains at a substantially reduced cost.

Where it may be possible to provide superior quality rail travel, Travers Morgan argued that passenger demand levels could not justify the extra costs involved such as renewal of rollingstock and improved track and signalling.

There are a number of cases in the United Kingdom where private coach companies receive a subsidy to provide coach services which would not be commercially viable otherwise. This also occurs in Australia where unprofitable routes are contracted out to private operators who receive a subsidy to maintain the service, at less cost to the community than provision of a rail passenger service.

Ownership of coach services

Most rail systems currently contract out coach services. In most cases these replace previous rail services and are often timetabled to connect with an existing rail service. Rail authorities argue that it is necessary for them to retain control over coaches to ensure that customers receive a complete service.

There are three types of operation of coach services which can be adopted: the rail authority can own and run the coach service; the rail authority can determine where it wishes the coach service to be run and tender out the provision to the private sector; or the decision to provide coach services can be left up to the private sector.

By operating their own coach services rail authorities can help ensure that the service provided meets the standards they require. Westrail operates coach services along these lines. However, it does have disadvantages. It eliminates competition for providing the service and therefore reduces the incentive to minimise cost or maximise service and quality choices. Alternatively, if the rail coach service does compete with private operators, the favourable tax treatment of rail authorities gives them an unfair advantage.

The SRA and V/Line each call for competitive tenders from the private sector to provide all their coach services. Under such schemes the rail authority retains the right to determine the type and quality of service, and review of arrangements at regular intervals as the tenders are brought up for renewal. Queensland Railways contract out some passenger services to private coach operators. These include the Atherton Tableland service in North Queensland and the Brisbane Valley service in South East Queensland. Such contracting does not itself meet all concerns, for example, those relating to reduced choice.

Alternatively, the provision of passenger coach services could be left to the discretion of private operators. If there is sufficient demand for coaches which connect with rail services, private companies would be interested in servicing that market. In addition, if rail passengers were not restricted to one coach company there would be an incentive for companies to compete for customers by reducing fares and/or improving service. The potential for the private sector to do this is restricted, in some States, by regulations on the licensing of coach services.

Prior to the deregulation of coach services in NSW there was a six-month trial liberalisation of entry into the intrastate coach market between Sydney and Canberra, and Sydney and the NSW North Coast. The results of this liberalisation were monitored by the BTE which concluded that:

The major beneficiaries of the trial were the travelling public due to the significant improvement in bus service frequencies and reduced bus fares over both trial corridors. (BTE 1987, p.24)

Given the existing regulations in other States (see Section 9.1.1) similar reductions in fares and improvements in service quality could be expected from increased liberalisation.

Similar reductions in fares and improvements in service quality could be expected if more competition between coach companies is allowed on other intercity routes. Governments should not deprive consumers of those benefits without strong cause.

9.5.4 National rail passenger corporation

A number of participants suggested that the efficiency of interstate passenger services would improve significantly if responsibility for all passenger operations lay with a single body, similar to the National Rail Corporation (NRC) which is to be responsible for intersystem freight.

There are differences between rail authorities in operating practices and the type of services they provide. Participants identified problems which arise because of fragmentation in the administration of interstate passenger services.

The flow of commercial information between systems is severely restricted by the lack of connectivity between rail system's information systems. It is, for example, not possible for a rail booking made in Brisbane for travel between Brisbane and Perth to be made using one system, although airlines have had national and international reservations for many years. (Queensland Government, Submission 50, p.22)

In its submission AN outlined a number of advantages in single corridor management of passenger services. These include: better presentation and marketing of services; increased flexibility in pricing and greater responsiveness to market changes; and improved operational efficiency through centralised terminal facilities (Submission 64, pp.63-64). These benefits would be available not only on AN's passenger services but would extend to all interstate services coming under single management. Negotiations between the SRA, QR and V/Line for single management of the Brisbane to Melbourne corridor are well underway.

While agreement has been reached between the States on establishing a National Rail Corporation for freight (see Chapter 11), the same concept for passenger rail has thus far received only minimal consideration. It appears that the most significant gains in the performance of interstate passenger services could be achieved by single management of each train. For example, one authority running and marketing its train service from Sydney to Melbourne. This does not require one rail authority to control all interstate passenger services, only that each service be controlled by the one organisation from start to finish.

9.6 Fares

In Australia non-urban passenger services are financed primarily from government subsidies and fares. Minor sources of funding include on-board catering and advertising.

An examination of Australian rail fares with those of comparable overseas services indicates that Australian non-urban rail fares are low by international standards.

A 22-hour journey on an economy class seat with Amtrak costs A\$265 which is \$100 more than the Australian fare for a journey from Adelaide to Perth. The additional 14 hours required for the Australian trip suggests that Australian non-urban passenger rail fares are almost two thirds lower

than fares in America. Further comparisons indicate fares in Europe to be up to twice as high as those charged in Australia.

Previously rail authorities appear to have directed most of their efforts towards reducing costs. Limited attention has seemingly been given to substantially increasing or restructuring fares.

9.6.1 Fare structure

In all States, non-urban passenger fares increase with the distance travelled. Some systems also offer rail passes, which for a fixed price allow unlimited travel for a set period, but these account for only a small part of total travel. Queensland offers rail passes for 14 days, 21 days and one month.

Non-urban passenger fares should also vary between peak and off-peak seasons. For example, fares should be higher over the Christmas and Easter holidays when demand for rail travel is greatest and approaches full capacity. However, the use of differential pricing is very limited. The Commission is unaware of any system with a price schedule where fares increase during peak holiday seasons - although this year V/Line introduced a 30 per cent discount on fares between Melbourne and Sydney for travel during February, which is traditionally a month of low demand. QR offers free motorail service on the Queenslander during off-peak periods and standby fares on the lower patronised Cairns to Townsville route. In addition fares on the Kuranda Tourist train are now based on comparable tourist attractions/tours. In NSW there has been a successful trial of discount fares in off-peak periods and proposals are under consideration for the introduction of load management techniques during peak periods.

Discounting fares on services that do not already cover their marginal costs would only increase the losses to railways. Increasing peak fares, therefore, would avoid the loss of discounting fares that are too low.

9.6.2 Concessions

Concessions which are typically non-commercial are generally available to children, students, pensioners and the unemployed. They may also be available to certain people travelling for specific purposes. On some systems the rules for eligibility for concessions are extremely complex and substantially increase the costs of administering the concession system.

For example, in NSW there are about 27 different categories of concessions, about 16 organisations eligible for concessional travel and about 31 different types of free travel passes. Half fares are available to children, students, pensioners and the unemployed. Discounts are also available to specific groups, for example: children (crippled) under 16 years of age and attendants, travelling to any station for medical treatment; and incapacitated ex-members of the Australian Defence Forces resident in the Australian Capital Territory, travelling to Sydney. NSW is not the only system with such complex arrangements. Some systems also have gold passes which provide the holder with

free travel. These are generally issued to existing and some ex-rail employees but can also be held by government office holders, judges etc.

In Queensland pensioners are each year entitled to two free economy rail trips or one free first class trip anywhere on the QR network.

Many submissions that supported the use of welfare concessions in rail argued with respect to pensioners. However, pensioners do not account for the whole cost of concessional travel. The many different categories of eligibility involve substantial costs, not just in their availability, but in their administration. NSW is currently reviewing the 27 different categories of concession it administers. AN is also moving towards limiting the concessions made available. A proposal that allows for reimbursement of AN travel by other systems' employees is expected to save several millions of dollars a year. The reciprocal arrangement, where AN intends to pay for its staff to travel on other systems, has yet to be taken up by all the authorities. While this promises considerable savings for non-urban passenger rail the complete removal of all staff welfare concessions on systems other than the one on which they are employed would be of a greater cost advantage. Implicit support for limiting welfare concessions was also evident in the Queensland, Northern Territory, and Victorian Government submissions.

The proportion of passengers travelling on welfare concessional fares varies between services. In Western Australia 57 per cent of rail passengers travel on welfare concessional fares. The BTE (1987) assessed that 65 to 70 per cent of rail passengers travelled on welfare concessional fares between Sydney and Canberra and between Sydney and the North Coast of NSW. In Queensland the proportion of concessional passengers varies from approximately 70 per cent on the coastal route to 84 per cent on the inland routes. About 40 per cent of AN's passengers travel on welfare concessional fares.

Economic efficiency is concerned with getting the maximum benefits out of the resources available. To achieve this, resources must be used to produce rail services only when the benefits which passengers receive are greater than the costs of supplying the service. Because welfare concessional fares are below the cost of providing rail services, the benefits some passengers receive are less than the true cost of supplying the service. Resources used to supply rail services could be thus diverted to other activities where the benefits to consumers are greater.

But the discussion also suggests that, for non-urban travel, no convincing case has been made to justify welfare concessions or the increased fares necessary to fund this purpose.

The existence of welfare concessional fares increases the demand for non-urban rail services when even full fares do not cover the costs of carrying passengers. So, even if the government compensates the rail authority for the difference between the concessional and full fare (consistent with Recommendation 4.1), the additional loss-making passengers attracted by the low welfare concessional fare increase the loss overall.

Welfare concessional fares also distort the signals which rail authorities receive to invest in new capital. The increased level of passenger travel induced by concessional fares leads to more investment in carriages and locomotives than otherwise would be required.

On some services, particularly during peak holiday seasons, the trains are full so that the carriage of concessional passengers can prevent full fare paying passengers from buying a ticket. This should be avoided. The airlines reduce this problem by restricting the number of concessional passengers on each flight. During Easter 1991, when boarding schools closed for the holidays, the SRA found that

... many schools utilising free school passes had completely booked out State Rail services on certain corridors, effectively denying the general public of transport on that day. (Department of Transport Circular, as quoted by Sydney Morning Herald, 28 March 1991, p.1)

In part to overcome this problem, the children were provided transport by coach rather than train.

Chapter 4 notes that welfare concessions are not an effective means of targeting income support because they direct assistance according to social characteristics which do not necessarily coincide with social disadvantage. Also, as most non-urban rail travel is for recreational purposes, judgements need to be made on whether there are more pressing projects which should have a higher priority for government funding.

State governments need to re-assess both the rationale for providing non-urban fare concessions and the methods use to provide any concession they decide to retain.

The effects of retaining concessions could be moderated by moving to a voucher system. Vouchers entitle the holder to a fixed dollar value of transport discounts each year. Under this system the concession could be available for travel on any mode of transport (rail, coach or air) and concession holders could choose the mode which best suited their needs. Vouchers would not involve subsidising private industry rather than State institutions as was implied by Taylor (Submission 108, p.7); the private transport enterprise would be compensated only to the extent of revenue forgone in providing welfare concession fares not available under normal commercial practice.

It is a suggestion of the Australian Bus and Coach Association that bus and coach services (Submission 102, p.7) be given the same opportunities as rail to meet the social obligations of transport. Vouchers would assist here by separating the provision of welfare from the operation of the rail services, placing rail on an equal competitive footing with other non-urban transport modes.

Transparency would be further enhanced if funding of vouchers was the responsibility of the relevant government department. For example, it would be more appropriate to provide concessions to pensioners through the State's welfare agency.

Concerns over the complexity and costs of running voucher schemes have limited their introduction in NSW, yet the NSW Treasury believes new technology could make vouchers a more viable option in the future (NSW Treasury, Submission 130, p.7).

RECOMMENDATION 9.2

The Commission recommends that governments should significantly reduce the number of welfare concessions available for non-urban passengers. If, however, governments choose to subsidise concessional travel, vouchers for any mode of non-urban travel should be provided to a limited value per annum per entitled person.

9.6.3 Fare levels

There is debate about the impact of increasing rail fares on revenue earned by the rail authority. The low level of cost recovery (Figure 9.3) on non-urban passenger services indicates that fares are currently much less than the cost of carrying passengers. Therefore, increasing fares would be expected to improve the financial performance of the rail authorities by both raising additional revenue and reducing the number of loss-making passengers.

Some rail authorities argue that increasing full fares will not result in reduced rail losses. They argue that if fares are increased full fare paying passengers would opt to travel by alternative modes such as coach, and that additional concessional passengers would fill any vacant seats, so that the loss made on the service would rise.

Adopting Recommendation 9.2 would alleviate this problem because rail authorities would receive the equivalent of the full fare for all passengers. For passengers entitled to concessions the cash fare plus the government refund for the voucher would equal the full fare.

Given the low level of fares compared to costs, and the limited justification for continuing these substantial subsidies, fares should be increased significantly, though the extent to which this is necessary may be limited by the considerable scope that exists for reducing operating costs. In Recommendation 9.1 the Commission suggests that non-urban passenger services provide sufficient revenue at least to cover operating costs and finance the replacement of rollingstock.

A substantial shift of passengers from rail to coach services in response to increased fares indicates that passengers find coach travel a cheap and sufficiently attractive alternative to rail transport, and the rail service should be discontinued.

10 BULK COMMODITY FREIGHT

Railways have a competitive advantage in transporting bulk commodities over relatively long distances. This, combined with regulations restricting the movement of most bulk traffic to rail, has enabled government rail authorities to extract monopoly rents. This has disadvantaged bulk commodity rail users compared to their overseas competitors and other industries in Australia. In addition, because of the lack of competition, railways have not had enough incentive to match best international efficiency practices, with the consequence that monopoly rent has been reflected in super-normal profits and/or inefficient operations.

The deregulation of bulk commodities to rail would reduce monopoly pricing opportunities and apply increased pressure for efficiency improvements. In many instances such deregulation alone will not be enough. Where rail remains in a monopoly position due to its competitive advantage over other transport modes, administrative reform will not fully rectify current pricing and operating practices. It thus may be desirable to allow captive shippers to participate in the ownership and operation of bulk freight lines and/or oversee pricing through a regulatory authority.

Bulk commodity freight is railway's major market segment. It contributes around 55 per cent of all railway revenues and is the only area of rail operations where profitability is either a reality or in prospect. Section 10.1 gives a description of the current bulk freight tasks while Section 10.2 looks at the regulatory and institutional settings which form the basis for the transport of bulk commodities. Sections 10.3 and 10.4 look at pricing in the transport of grains and coal and other minerals respectively, while Section 10.5 deals with the operational efficiency of bulk rail haulage. Finally, some other issues are discussed in Section 10.6.

10.1 Description of bulk rail freight tasks

Defining what constitutes a bulk commodity is complicated because some commodities are transported both in bulk and non-bulk forms (for example, cement and fertilisers) and some goods, such as steel and logs, are classified differently by rail systems. This chapter is concerned predominantly with coal and grains, with some mention of other bulk commodities such as other minerals and petroleum. Other bulk commodities are counted in the bulk task (see Tables 10.1 and 10.2), but are not examined further in this report. All other types of freight are categorised as non-bulk freight which is the subject of the following chapter. Precise quantification of the bulk commodity freight task is difficult because of the definitional problems. Where necessary, an

assumption is made concerning the predominant characteristic of the commodity in an attempt to count it as either bulk or non-bulk.

Government rail accounts for around 11 per cent of the total bulk commodity tonnage carried by all modes and 19 per cent of the total tonne-kilometres. As seen in Table 10.1, government rail authorities have a strong presence in the transportation of coal and to a lesser extent in the transportation of grains and other bulk commodities. As a general rule, road transport of bulk commodities is used for relatively short distances, rail for longer hauls and coastal shipping for very long distances.

Table 10.1: Estimated bulk freight transport tasks, 1987-88

	<i>Coal</i>	<i>Grains</i>	<i>Iron ore</i>	<i>Other bulk^a</i>
Government rail				
Tonnes (million)	102.0	14.6	-	26.5
Tonne-km (billion) ^b	21.4	5.2	-	4.5
Average distance (km) ^b	209.6	355.7	-	167.9
Private rail				
Tonnes (million)	8.5	-	94.6	10.7
Tonne-km (billion)	0.1	-	30.2	0.23
Average distance(km)	15	-	319	22
Road				
Tonnes (million)	39.6	33.8 ^c	8.5	320.0
Tonne-km (billion)	1.1	3.8 ^c	0.5	10.8
Average distance (km)	28	112	59	34
Sea				
Tonnes (million)	2.9	-	6.4	30.1
Tonne-km (billion)	5.8	-	29.6	52.6
Average distance(km)	2000	-	4625	1748

a Includes: ores and minerals, concentrates, coke, limestone, gypsum, sand, gravel, stone, clinker, quarry products, most fertilisers, most petroleum products, most cement and most sugar.

b Commission estimates.

c Wheat accounts for 19.3 million tonnes and 1.7 billion tonne-km.

Sources: Rail authority Annual Reports; BTCE (1989b); ABS (1990a); DOTC (1990).

In terms of tonnages and revenue, coal is the major bulk commodity hauled by rail authorities, followed by grains (primarily wheat) and other minerals. While all rail authorities participate in the haulage of these commodities to some extent, the significance for each differs. Table 10.2 gives tonnages and revenues for the haulage of bulk commodities by each government rail system for 1989-90.

In Table 10.2, tonnages carried of particular other bulk commodities vary widely between systems, although other minerals dominate. The SRA hauled several million tonnes and QR carried almost 5 million tonnes of minerals other than coal. Westrail hauled 1.3 million tonnes of mineral sands, slightly more than its coal task but much less than the six million tones of bauxite and five million

tones of alumina. No single commodity dominated in Victoria where, among other things, the PTC carried some 303 000 tonnes of briquettes. AN hauled 711 000 tonnes of concentrates, 478 000 tonnes of limestone and one million tonnes of gypsum.

Table 10.2: Government bulk rail freight tasks, 1989-90

	<i>Coal</i>		<i>Grains</i>		<i>Other bulk^a</i>	
	<i>Tonnes (m)</i>	<i>Revenue (\$m)</i>	<i>Tonnes (m)</i>	<i>Revenue (\$m)</i>	<i>Tonnes (m)</i>	<i>Revenue (\$m)</i>
SRA	35.6	225.6	4.3	97.1	4.0	43.8
V/Line	0.3	5.6	2.6	47.6	2.2	25.9
QR	67.9	823.8	1.9	30.7	7.2	96.2
Westrail	1.2	13	4.9	68.0	14.7	87.0
AN Mainland	2.9	na	1.2	na	3.2	na
AN Tasrail	0.4	5.8	-	-	0.4	na
Total	108.3		14.9		31.7	

a Includes: ores and minerals, concentrates, coke, limestone, gypsum, sand, gravel, stone, clinker, quarry products, most fertilisers, most petroleum products, most cement and most sugar.

Source: Rail authority 1989-90 Annual Reports.

Coal

Rail is suited for the transportation of coal (along with iron ore) more than any other bulk commodity in Australia because of geographically concentrated production, high tonnages, relatively more certain consignments and its robust nature. The great majority of coal is produced in and exported from NSW and Queensland. In 1988-89, for example, each of these States accounted for around 48 per cent of total black coal production. Rail freight charges account for a significant share of the free-on-board (fob) coal price in both these States. In 1989-90, for example, the average freight rate as a percentage of the average fob coal price stood at 15.5 and 22.2 per cent for NSW and Queensland respectively.

Grains

Unlike coal, the production of grain is not geographically concentrated. An extensive rail network is thus required to service the grain market. Grains are typically transported from farm to local railside storage facilities by road. Transport is then by rail to seaside grain terminals (if for export) or to major distribution centres (if for domestic consumption). Wheat is by far the largest grain commodity hauled and according to the Australian Wheat Board (AWB), rail accounted for around \$160 million of its \$170 million total transport costs for the commodity in 1988-89. This excludes road costs from farm to local railside storage facilities.

While the grain industry is a significant customer for rail authorities, it is also an unreliable one; grain tonnages vary considerably from year to year. This has implications for the level of rail resources required to service the market which may see them lying idle in some years and stretched

to the limit in others. In part at least because of past regulations requiring grains to be moved by rail, the development of the grain industry has been closely linked to the expansion of the rail system. Grain storage terminals and port facilities have been designed primarily around the rail network.

Iron ore

Around 95 per cent of iron ore is transported by private railways. These are mainly located in northwest Western Australia (Newman to Port Hedland, Shay Gap to Port Hedland, Paraburdoo to Dampier and Pannawonica to Cape Lambert); in 1987-88 these railways transported 94.6 million tonnes.

10.2 Regulations and restrictions on mode of operation

This section outlines the current arrangements under which bulk commodity freight is transported. Section 10.2.1 looks at intramodal competition, or the lack of it, while section 10.2.2 outlines the regulatory and institutional settings under which intermodal competition takes place. The focus is on regulations which restrict the options available (in terms of preferred modal choice) and which reduce the incentive for rail authorities to contain costs and improve efficiency.

10.2.1 Intramodal competition

While private rail operations exist in a number of States, they are situated in relatively isolated areas or are not integrated with state railways. Even so, the task performed by private railways is a considerable one. As seen in Table 10.3, private railways perform a similar task to government railways in terms of tonnes and tonne-km of bulk freight.

Table 10.3: **Non-government railways, operating statistics, 1987-88**^a

	<i>Route length</i> (km)	<i>Tonnes</i> (million)	<i>Tonne-km</i> (million)	<i>Average distance</i> ^d (km)
Iron ore	1 393	94.6	30 218	319.4
Sugar	3 679	23.6	425	18.0
Coal	78	8.5	126	14.8
Other ^b	197	10.7	230	21.5
Total	5 347	137.3	30 998	225.8
Govt rail (bulk)	38 162	143.0	31 100 ^c	217.5 ^c

a Railway operations of the following are included: Blue Circle Southern Cement Ltd; BHP Steel International; Comalco Aluminium Ltd; Goldsworthy Mining Ltd; Hamersley Iron Pty Ltd; Mount Newman Mining Co. Pty Ltd; Omya Southern Pty Ltd; Robe River Mining Co Pty Ltd; State Electricity Commission of Victoria; The BHP Co Ltd; The Emu Bay Railway Co Ltd; and the operation of sugar tramways associated with major mills.

b Includes quartz, limestone, clinker, cement, lead, zinc, bauxite, and various mineral concentrates.

c Commission estimate.

d Calculated as net tonne-km divided by net tonnes carried.

Sources: BTCE (1989a); Rail authority Annual Reports.

There is scope for freeing up the conditions under which private railways are established. This would provide intramodal competition which would in turn restrain the monopoly pricing capabilities of government rail authorities by ensuring that they did not charge more than the stand-alone cost of the alternative private sector line. These issues are discussed in Chapter 12.

10.2.2 States' reasons for restricting intermodal competition

Apart from regulations which restrict intramodal competition, there are also - and most importantly - regulations which forbid or limit road/rail competition in the haulage of some freights by placing restrictions on road movements. These are summarised in Table 10.4 for both bulk and non-bulk commodities. As the table indicates, most of the tonnage of regulated traffic is bulk and the extent of regulation varies from State to State with the exception of South Australia where there are no regulated traffics.

Table 10.4: Regulated commodity traffics by State

<i>State</i>	<i>Traffics</i>
New South Wales	Under the NSW Environmental Protection Act coal is usually required to be transported by rail, if available. The use of road transport for export grain is constrained by limited road receival facilities at export ports.
Victoria	Domestic grains, cement, briquettes, limestone and petroleum are regulated to rail, with carriage by road allowed under permit in certain circumstances.
Queensland	Coal, coke, domestic grains (except seed grains), limestone, liquefied petroleum gas, minerals and ores and raw sugar are regulated to rail. With the exception of grains, road permits are issued when 'road transport is more competitive for the carriage of these restricted goods' (Queensland Government, Submission 50, p.26). 'An important consideration in the issue of the permit is the degree to which costs attributable to road damage can be recovered' (Queensland Government, Submission 135, p.27).
South Australia	No restrictions
Western Australia	Truck licences are not granted for domestic grains, fertilisers, bulk petroleum, bulk ores and minerals, or some timbers. Bulk petroleum and fertiliser transport have recently been partially deregulated.
Tasmania	Permit fees apply to the road haulage of bulk cement, bulk fertiliser, limestone, timber, logs, coal and sulphuric acid.

Sources: Various submissions and Rail authority Annual Reports.

There are several reasons why State governments might want commodities to be transported by rail. They include: to protect the State's investment in the rail system; to reduce the adverse effects of road haulage on road maintenance, congestion, pollution and accidents; to provide revenue through monopoly pricing; and for safety reasons.

In its submission to this inquiry the Western Australian Government stated that:

... there are three key principles governing current thinking on regulation in WA:

- the market-place must be free of significant distorting influences which might result in misallocation of resources or inflated rail deficits if deregulation occurred;
- if regulation is maintained, rail rates should be set at least as high as those which road transport would charge if it were permitted to operate assuming charges covered road track costs (ie, "competitive" rating);
- a public interest argument exists in favour of regulation where it can be established that it does not impose significant efficiency losses and promotes other policies such as minimisation of the undesirable social and environmental externalities associated with road transport. (Submission 43, p.93)

The Victorian government said:

Deregulation of the regulated commodities is not proposed. The Government believes that imperfections in the market, whereby not all social costs of alternative modes of transport would be taken into account in the modal choice decision, dictate that the final outcome of deregulation would be undesirable for the community. (Submission 58, p.25)

On the objectives of the Rail Protection Fees scheme, the Tasmanian Government stated that:

Whereas the original aim was to limit modal competition and ensure a base level of freight and revenue for rail, the emphasis has changed to social objectives. These include limiting road damage by heavy vehicles, reducing the social and environmental impacts associated with heavy vehicle traffic in sensitive areas, and most importantly, discouraging an increase in heavy vehicle traffic on Tasmanian roads. (Submission 35, p.8)

Protecting State investment

At the Commission's public hearings in Melbourne, representatives of the Victorian Government pointed out that the State had invested heavily in rail infrastructure for specific purposes, and regulations were kept in place to protect these investments (Initial hearings, pp.465-467). For cement and petroleum, the regulations are not applied throughout the State, but only to the locations where rail investments have been made. The regulations are intended to ensure a return on these investments, somewhat in lieu of contracts. However some of these investments are now superseded or found to be inappropriate. Although such a policy may appear to be efficient from the perspective of the PTC, from the broader perspective of the Victorian Government these regulations should be seen as perpetuating a misallocation of resources and reducing the State's welfare.

Reducing the effect of externalities

Although the Commission recognises the costs that would be imposed on some communities from an increased number of trucks on the road, it believes that regulating commodities to rail does not produce the most satisfactory outcome for the community. This is because users are not able to choose the transport mode which best suits their needs (in terms of price and quality) even after all attributable costs have been met; railways face less pressure to improve operational and pricing efficiency than they otherwise would; and resources in the transport sector in particular and the economy in general are misallocated.

The Commission believes that to the extent that trucks impose additional costs (such as increased pavement damage and air pollution), the charges levied upon them should reflect these costs. In situations where rail enjoys a small competitive advantage over road, deregulation would apply some pressure on railways to contain costs and operate more efficiently.

Safe movement of dangerous goods

Some dangerous goods (for example, some chemicals) are regulated to rail because it is regarded as a safer mode of transport than road. Two reasons are put forward as to why this may be the case. First, a train is believed to be less likely to have an accident than a truck and second, even if there is a train accident, its effects are thought to be less severe than those of a truck accident. This is because trucks go through residential areas and share roads with other vehicles, while trains have a buffer zone between them and residential areas and/or roads. It should be noted that a shift of dangerous goods from rail to road would have little effect on the number of trucks in densely populated areas. This is because trucks have to be used for pickup and delivery to and from rail freight terminals.

While the Commission is not convinced that rail is always a safer mode of transport than road for movements of dangerous goods (for example, consignment of dangerous goods by rail often leads to (a) a larger aggregation of such goods in a single area than would typically occur if transported by road and hence the possibility of a bigger disaster, and (b) additional handling in loading/unloading from road to rail which itself has dangers), provided that States do not use the safety argument to regulate goods to rail for other purposes, the Commission has no current objection to the retention of such regulations.

Uniformity across Australia of regulations relating to dangerous goods is addressed in Section 10.6.2.

State revenue

To the extent that State governments seek to raise their revenues through the monopoly pricing of rail services, the practice acts as a tax on rail users. Consequently, users' purchasing decisions are

likely to be distorted, costs will be higher than necessary and the competitiveness of the user industries will be reduced.

When commodities are reserved to rail, the role of competition in promoting the internal efficiency of rail operations is neglected, with subsequent adverse consequences for the competitiveness of users and the overall efficiency of resource use. Many of the productive inefficiencies identified in Chapters 6, 7 and Section 10.4 are the direct result of the lack of competition. For example, in the absence of the threat of competition, over-investment in rail infrastructure can be supported by higher prices. Likewise, absence of competition makes possible over-staffing and other inefficient work practices.

Competition is a powerful force which encourages service providers to meet the requirements of users at least cost. Where bulk commodity forwarders are able to choose between alternative modes of transport, the seller of overpriced or inferior quality services is likely to experience declining market shares. In situations where rail enjoys a small competitive advantage, even the threat of competition from road will create similar pressures, because railways will not be able to offer a price (for a given level of quality) above that offered by road without losing some of its market share. Hence the rivalry associated with actual or potential competition will help promote the supply of rail (and road) services at least cost (for a given quantity), as well as encourage rail and road to respond to changing market conditions to exploit opportunities for improving product delivery and price competitiveness.

An example of how users are disadvantaged by the regulation of commodities to rail in terms of the price they pay was provided to the Commission by Cockburn Cement Limited, which uses Westrail to transport coal, gypsum, manufactured products, cement and quicklime. (Submission 7, p.4). The first two commodities are regulated while the latter three are not. Rail freight rates compare unfavourably to road rates for the regulated products (average rate of 9.12 c/tkm compared to 6.16 c/tkm) and favourably for the unregulated products (average rate of 4.4 c/tkm compared to 7.15 c/tkm).¹ The Western Australian practice of competitive rating (see above) would often result in customers paying monopoly prices for services provided by railways. This is because the cost to the transporter of moving bulk products over distance can be much less for rail than road.

Shell Australia expressed concern about requirements imposed by the Victorian and Western Australian Governments that transport of petroleum products to rural areas be undertaken primarily by rail. For example, in Victoria regulation via a general prohibition on the movement of bulk petroleum products by road transport to places beyond 80 km of the place of consignment has actually been strengthened in recent years through the introduction of total volume requirements. Rail transport of petroleum products in Victoria increased from 350 000 tonnes prior to 1989 to 550 000 tonnes in 1990. Shell noted that it is economic to transport by rail to Mildura, and also to

¹ Cockburn has occasionally transported regulated goods by road when trains were unavailable.

Wodonga but only in the absence of B-Doubles. For other centres it would be more economic to use road transport, even with conventional road vehicles. Shell stated:

- Neither road nor rail is an inherently preferred mode of transport.
- Rail by its very nature creates inefficiency due to increased need to double handle, rather than direct deliver.
- Least cost should be the basis for choice.
- Regulations forcing distributors of bulk petroleum products to use rail rather than road leads to increased costs and ultimately higher prices.
- Governments should pass on the appropriate costs of each transport mode to the user, but not force the use of a particular mode. (Submission 100, p.i)

The Commission's preference is to deregulate, but it recognises that this may create additional pavement costs and external costs in some situations. It is aware that some pavement costs will not be captured by the national road user charging regime endorsed by the July 1991 special Premiers' Conference, because the charges will not recognise that the same heavy vehicle causes more damage to a local road than to an arterial road. Furthermore, heavy vehicles can create additional safety, congestion and pollution problems, especially in urban areas. The Commission is nonetheless of the view that these difficulties should be addressed through charging mechanisms rather than through restrictions.

In Chapter 5 the Commission recommends that local authorities should be able to levy additional specific charges on heavy vehicles for identifiable pavement damage in excess of the average on which national road user charges will be based. The recommendation extends the same charging capacity to charging for some externalities in localised areas which can be identified with specific road users.

The draft recommendation referred to deregulation 'without delay' and advocated charges for localised pavement damage and externalities. State government responses concentrated on the relationship between deregulation and changes to road vehicle charges. AN supported deregulation in conjunction with full financial, social and environmental costs on competing heavy vehicles. The Queensland Government is moving towards deregulation but is wary of introducing local charges. It is considering provisions to allow it to levy special fees on the movement by road of certain commodities (primarily those currently restricted to rail) to reflect road damage costs which would not be recovered by other charging mechanisms (Submission 135, p.14). The SRA does not seek or support regulation of goods to rail, although it is a beneficiary of regulations which are exercised on environmental grounds. It supports revised road vehicle charges. The Victorian and Western Australian Governments want appropriate charging mechanisms in place for pavement damage and externalities before they will consider deregulation.

RECOMMENDATION 10.1

The Commission recommends that State governments eliminate all regulation of traffics to rail, with the possible exception of dangerous goods, at the same time as appropriate road user charging mechanisms for pavement damage and externalities are introduced.

Commonwealth regulatory powers

While the deregulation of bulk commodity freight might seem to lie mainly in the hands of State governments, this is not always the case. The great majority of bulk rail tonnage (for example, coal and wheat) is transported to port for export and the Commonwealth Government has power under the Constitution to legislate over its movement. Section 51(i) of the Constitution states that

The Parliament shall, subject to this Constitution, have power to make laws for the peace, order, and good government of the Commonwealth with respect to:- (i) Trade and commerce with other countries, and among the States: ...

A recent example where the Commonwealth Government has used (the threat of) these powers is in the transportation of export grains.

Until recently, the transport of export grains was legislatively restricted to rail by most States; most State wheat and other grain handling boards thus had no choice but to enter into rail freight agreements with their rail authorities. The 1988 Report of the Royal Commission into Grain Storage, Handling and Transport recommended that grain marketers and growers be given greater choice in selecting least cost transport pathways and that marketing authorities' charters should include minimisation of transport costs. The report estimated that the removal of road transport restrictions (with all other institutional arrangements remaining) would result in a resource cost saving of around \$6 per tonne in 1986-87 (Royal Commission into Grain Storage, Handling and Transport, Volume 1, p.74). The Commonwealth Parliament has now implemented changes consistent with the recommendations in those areas where it has direct legislative control. Revisions to the Wheat Marketing Act and complementary changes to Commonwealth legislation in 1989 have resulted in the deregulation of export grain transport. There are already signs that road is gaining an increasing market share of grain transport and, while rail authorities seem to be winning grain contracts, they are doing so by offering a reduced price.

If the Commonwealth Parliament were to implement similar legislative changes for the transportation of export coal and minerals, the Commission notes that the great majority of the transport task would continue to be undertaken by rail. This is because of rail's competitive advantage in transporting bulk commodities over relatively long distances.

The Commission notes that the Commonwealth's powers under Section 51(i) relate to imports also.

10.3 Rail freight charges for grains

The great majority of grains are transported by rail with road acting mainly as an intermediary mode from farm to rail track silo.

A feature of the contracts between grain boards and rail authorities is that freight rates are based mainly on distance. The Western Australian Government commented that:

Provided avoidable costs are covered on each haul it is economically rational for rail to pitch its rates at levels approximating road charges in order to hold or win traffic. Such an approach, which inevitably will create a strong link between rail rates and distance (because road rates reflect the latter), is an appropriate response to the price discrimination requirements of an enterprise with substantial fixed and sunk costs which is facing competition. (Submission 131, p.5)

Because distance is only one of many factors that determine costs, railway haulage rates give incorrect signals to producers as to the relative efficiency of producing grains in different locations. Because of these incorrect signals, growers who use silos on relatively high volume lines are subsidising those who deliver to silos on small volume lines.

Because costs are not published by market segment, only estimates of the level of under recovery can be made. A discussion paper released by the Railway Industry Council (RIC 1990a) estimated that in 1986-87 rail authorities recovered 84 per cent of the fully distributed costs incurred by their grain operations. The Australian Road Transport Federation (Submission 124, p.21) quoted the SRA as saying that it achieved a cost recovery ratio on export wheat of 51 and 73 per cent for 1989 and 1990 respectively, generating a cumulative loss of over \$60 million. The Commission is not aware of any recent improvement in cost recovery. It is unlikely however that all grain hauls are making a loss. The most heavily used lines are probably profitable.

There seem to be several reasons for railways operating rail haulage of grain at an overall loss. The first is that railway authorities believe that the market is potentially profitable. This depends on authorities significantly increasing the efficiency of their operations (discussed in Section 10.4). An important factor is that grain growers have exerted political pressure to keep grain haulage rates at a 'low' level. This is evident in the decision of the Victorian Parliament that rail transport of grain should be subsidised by excluding from freight rates all 'below-wheel' costs (that is costs related to infrastructure and its maintenance).

Bulk Grains Queensland contends that:

It is anticipated that further efficiencies can go a long way towards achieving full financial cost recovery from grain haulage operations. However, given the combined community resource costs of road and rail, the Grain Industry does not believe that it should absorb the full burden of full cost recovery, particularly during periods of downturn and depressed grain prices. (Submission 16, p.29)

Although grain growers are being undercharged relative to existing operating costs, if grain rail haulage operations were conducted using international best practices current freight rates may be adequate in providing full cost recovery (which includes a rate of return on capital employed). As the AWB pointed out:

In the heavily regulated non-competitive grain transport environment, growers and their representatives have had little option other than political pressure to force efficiencies onto the railways by demanding rate containment. It could also be argued that these rates are only 'low' against some preconceived arbitrary base. When compared to international freight rates on a cents per tonne kilometre basis, Australia's rates are far from competitive. (Submission 131, p.6)

Travers Morgan (Appendix K) estimated that overall rail grain haulage operating costs would decrease by nearly 30 per cent with the introduction of best-practice costs. The gains would arise almost equally from five areas: crew, for example, from the introduction of driver-only operation; wagon and locomotive maintenance; terminal handling (and, to a minor extent, marshalling); infrastructure maintenance, reflecting the comparatively large part of the network primarily attributable to grain; and business and corporate overheads. Further comments on operational efficiency are made in Section 10.5. If some of the lightly used lines (which will not be able to cover operating costs even if international best practice were achieved) were closed, a further considerable decrease in the costs of running the grain system would result.

From the broad figures available to the Commission it seems that if railways were operating at international best practice and followed a commercial charter (which would lead to closure of unprofitable branch lines) the current level of freight rates for grains would be adequate to cover costs (including a return to capital). This implies that grain freight rates, on average, would not need to change much in real terms from their present levels. Indeed, some might fall. Although there is a target of full cost recovery, the grain industry should not be made to pay for rail's inefficiencies. Consequently, governments should refrain, during the transition period, from increasing average prices. The emphasis should be on moving to international best practice as quickly as possible, including by allowing rail authorities (especially in Queensland and NSW) to close unprofitable grain services. If the grains industries object to such closures, railways should be allowed to impose increased prices to cover the consequent costs. In Victoria, if the Parliament requires the Government to continue the below-wheel subsidy to grain freight, the revenues forgone by the PTC should be supplied to the PTC in the form of an explicit community service contract.

In recent years AN has closed several lightly used grain lines and now only carries around 25 per cent of the total SA grain transport task. The SRA has also been trying to withdraw some of its grain lines. Apart from looking at road transport replacing rail for some lightly used lines, in 1986 it offered the farming industry the option of running trains if they felt they could do it more effectively. The Lachlan Valley Railway Society has taken up this offer and seems set to haul wheat in the near future along a closed branch line to the main line. Near the State borders, where competition from QR in the north and the PTC in the south is possible, the SRA in 1987 closed the North Star-Boggabilla and Narrandera-Tocumwal lines respectively.

In recent times, a third factor - competitive pressures from road transport as a consequence of the deregulation of the transport of export grain - has limited the ability of rail authorities to raise prices and in some cases has forced them to reduce rates so as to retain the traffic. As the Australian Road Transport Federation points out:

... rather than allocate the export task to the most efficient transport mode, rail maintains almost total control of the export grain task, by the use of rebates. The railways approach export grain on the basis of revenue maximisation rather than cost minimisation. (Submission 124, p.15)

As mentioned previously, the port and to some extent the road infrastructure does not allow road to be an option in many cases. State rail authorities - as the sole possible suppliers of rail services - have used their position to arrange contracts for the whole export crop with their respective State marketing boards which have sole control in the transportation of export grains. While the Commission recognises that there is merit in continuing to operate unprofitable branch lines, if efficiency gains are expected to result in them operating profitably (in a competitive environment), lines that do not and are not likely ever to operate profitably should either be closed, or kept open each season only long enough for grain movements, or kept open so long as they cover short-run avoidable costs without replacing the infrastructure.

Lastly it is implied by several participants (for example, Victorian Government, Submission 58, p.24) that the losses that would be borne by rail authorities in the transport of grain are lower than the losses borne by the general community from external costs (in terms of congestion, pollution etc) associated with increased road usage.

The Commission does not subscribe to the view that road externalities should be addressed through legislative restrictions on road transport. If the road haulage of grains causes negative externalities, road transport should be made to pay for them directly (see Chapter 5). All governments should aim to ensure that rail and road are on an equal footing and shippers are able to choose the mode that best suits them in a competitive environment. In any event, as discussed above, States are now unable to restrict transport modes for export grains and thus have the incentive to ensure that external costs are internalised (borne by user) to the maximum extent.

Elimination of government subsidies to bulk rail freight is incorporated in Recommendation 10.3 which is presented at the end of Section 10.4.

10.4 Rail freight charges for coal and other minerals

10.4.1 Monopoly pricing

In Section 10.2 it was shown that a large part of bulk commodity freight is regulated to rail. Apart from this regulated monopoly, there is also a competitive advantage that rail has over road in transporting bulk commodities over relatively long distances. The absence of any real competition for the services provided by rail authorities to their bulk commodity customers sometimes allows railways to engage in monopoly pricing.

Whereas the rail transportation of grains seems not to be recovering costs partly because of policies which restrict the pricing options of rail authorities, the opposite is generally the case for the rail transportation of coal and other minerals. It should be emphasised from the outset that apart from the general incentive for railways to maximise revenue through the exercise of monopoly power, there is also a stated desire by the Queensland Government to recover mineral rents (royalties) through its rail system. The Queensland Government stated that:

Coal and mineral freight rates are more than simply a charge for carrying out a transport service, they are also a means of deriving an additional royalty from the development of the State's coal and mineral resources. (Submission 50, p.25)

On the other hand, the NSW Government argued that:

State Rail does not currently charge any indirect royalty on any of its traffics. Even the most commercial traffic, namely export coal, does not presently recover fully distributed costs (Submission 75, Appendix 1, p.32)

Two comments can be made on the NSW Government statement. The first relates to the word 'currently'. Coal freight rates in NSW have fallen significantly in the last five to six years in both real and nominal terms. Between 1986 and 1989, they fell by around 30 and 10 per cent in real and nominal dollar terms respectively because prices were frozen from 1987 to June 1989. In early 1990, the SRA announced that it would lower real coal rates by 2 per cent per annum in each of the three years 1990-91 to 1992-93. The falls, together with the SRA's use of the word 'currently', support other evidence suggesting that the SRA was overcharging in past times. In October 1988 the NSW Minister of Transport, Mr Bruce Baird, stated that:

There is no doubt that in the past, coal freight rates in particular have been set well above costs. It is equally naive to assume that there is no relationship between costs and the rate set, however there is also no doubt that the cost of freight operations has itself been too high because of the inefficiencies within the organisation, so the industry has lost on both counts. It has been subsidising the inefficiencies of SRA, then being slugged for rates well above costs. (Ramsden 1988, p.10)

Secondly, it is possible for the SRA to be making a loss on its coal operations as a whole and still be overcharging particular mines. It is in the SRA's interest to price discriminate amongst mines, charging each one on its ability to pay. The existence of cross-subsidisation was acknowledged in the SRA's submission where one of its objectives was stated to be 'the progressive elimination of cross-subsidisation within the coal freight structure' (Submission 75, Annexure 1, p.30).

In contrast to the implications in the SRA's statements on overcharging, coal companies in their submissions gave consistent support to the opposite view. Exxon Coal and Minerals (ECMAL) said:

The SRA's 1990 charge [for the Mount Thorley Coal Loader] is more than double the actual cost to the SRA of providing the service as assessed by the consultant [Ern Easton].

... The SRA's 1990 charge [for Ulan] is substantially higher than the actual cost to the SRA of providing the service as assessed by the consultant. (Submission 11, pp.23, 24)

CRA, referring to freight rates charged by QR and the SRA, stated:

Neither rail system levies freight rates based on the cost of efficiently delivering the service. Rather, both exploit their monopoly position to charge rates significantly above their costs (including a return to capital where appropriate). (Submission 72, p.4)

Shell Australia said:

The relationship between costs and charges for the Shell mines is similar to the average of mines included in the Easton study. Shell is suffering to a similar extent as these mines from excess rail freight rates for coal. (Submission 90, p.11)

Pasminco Mining Limited commented:

Government pricing strategies are, we believe, based more on the concept of 'hidden taxation', than on commercial principles which would charge a fair margin on the genuine cost of efficiently provided services - that is both AN and SRA set freight rates according to what the "traffic will bear".

As a consequence, we believe that we have been substantially overcharged for the services provided. We estimate that for the 12 months ended July 1990 Pasminco was charged \$7.55 million in excess of the actual rail costs incurred for the movement by rail of lead and zinc concentrates. (Submission 66, p.5)

If rail authorities involved in transporting coal and minerals behave rationally, they will charge what the market will bear. This is not denied by any of them and is admitted to by some of them. While the practice may be in their best interests, the potential consequences of monopoly powers available to the rail authorities suggest that it might not be in the best interests of society. Excess charging disadvantages the users that are being overcharged compared to those within the industry that are not and compared with other industries. Resources will be misallocated and society will be worse off.

10.4.2 Estimates of excess charges

In the absence of publishable data from rail authorities that would give an estimate of excess charges for particular commodities, the Commission has drawn estimates from a number of studies which have attempted to quantify the extent of over-charging, along with material that was provided in submissions to this inquiry. Table 10.5 summarises this evidence which strongly indicates that Queensland and NSW mines were charged considerably more than what it was costing rail authorities to provide the service.

In Table 10.5 costs for Queensland mines include only operating costs because the mines have already funded the rail infrastructure. For NSW annual capital charges have been assessed in relation to historical costs and no additional profit margin for the SRA has been included.

Commission assessment of coal freight charges

The estimates of costs and excess charges in Table 10.5 are averages over a number of mines. Because costs per net tonne-kilometre vary with length of haul, terrain, train length, and track and rollingstock utilisation, simple averages are unreliable measures in these circumstances. Weighted averages are of some use, but disguise both the systematic variation with distance and any cross-subsidisation between mines.

Although the Commission received a number of individual mine-to-port freight rates and cost estimates, due to the confidential nature of most of this information it cannot draw on this evidence explicitly. All the public cost estimates provided in evidence for this inquiry were prepared by Mr Ern Easton. They are based on existing practices - not on least cost practice.

The Commission finds that the Easton operating costs were estimated in a correct manner but has some reservations. Corporate overheads are reflected in an uncertain way. Such costs account for a considerable share of total SRA costs and one would expect that they account for a considerable share of coal costs. It is also difficult for observers accurately to estimate capital usage rates and the consequent correct apportioning of these costs between tasks.

Easton used the government bond rate to calculate capital costs for locomotives, wagons and rail infrastructure. This approach implicitly assumes that either (a) investment in the rail haulage of coal is riskless or (b) public sector investment should be treated differently from that of the private sector (that is, there is no equity share in public rail). The approach does not have any significant bearing on the Queensland estimates (due to the up-front capital contribution made by the mines), but it is critical for the NSW estimates. These issues are discussed in Appendix J.

Table 10.5: Costs, revenue and excess charges (\$/tonne)

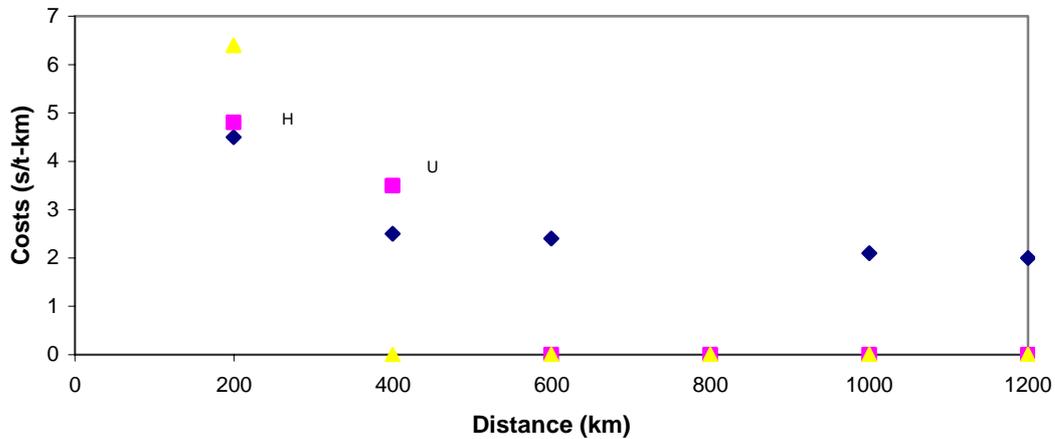
Study	Reference point	Cost	Revenue	Excess
NSW				
IAC	NSW Average (1985)			
	Efficient price	6.00	12.00	6.00
	Road freight			0.50-3.60
	Overseas charge			4.50-6.00
	Competitive cost			7.00
	Private rail			7.50
Freebairn and Trace	Northern NSW (1986)	3.08	7.78	4.70
	NSW Average (1986)			5.20-5.59
Easton	NSW Average (1986)	2.84	7.80	4.96
Easton	Hunter Valley (1986)	2.62	7.58	4.69
Hunter Valley (1990)	3.84	7.29	3.44	
Queensland				
IAC	Qld Average (1985)			
	Efficient price			6.50
	Overseas charge			3.50-7.50
	Competitive cost			3.50
	Private rail			8.00
Easton	Qld Average (1985)	3.03	9.99	6.96
Easton	Qld Average (1990)	4.10	11.38	7.28

Sources: IAC (1988); Easton (1988); Freebairn and Trace (1988); various submissions.

In the absence of public evidence on coal costs from QR and the SRA the Commission explored alternative estimates. Hence the use of Easton's estimates, and comparisons with overseas. For the overseas data, the Commission assumed that costs plus a reasonable return on assets equalled revenues (that is, there was no excess charge).

Coal freight costs to railways measured in \$/tonne and cents per tonne-kilometre are plotted against distance in Figures 10.1 and 10.2. The plotted points are for the lower Hunter Valley and Ulan (indicated by H and U) and averages over restricted ranges of distances for the US, Canada and South Africa. Figure 10.1 shows, as expected, that costs per tonne-km are high for short distances. This can be attributed to the lower utilisation of resources (locomotives, wagons and crew) for short hauls where a much greater proportion of time is spent queuing, loading and unloading rather than travelling. Short hauls also include a larger proportion of travel on spur lines which have relatively low traffic densities. These have higher average capital costs than very long hauls where a high proportion of travel is on main lines with high traffic densities.

Figure 10.1: Coal freight costs to railways (per tonne-kilometre), 1989-90a



a Including a reasonable return on capital.

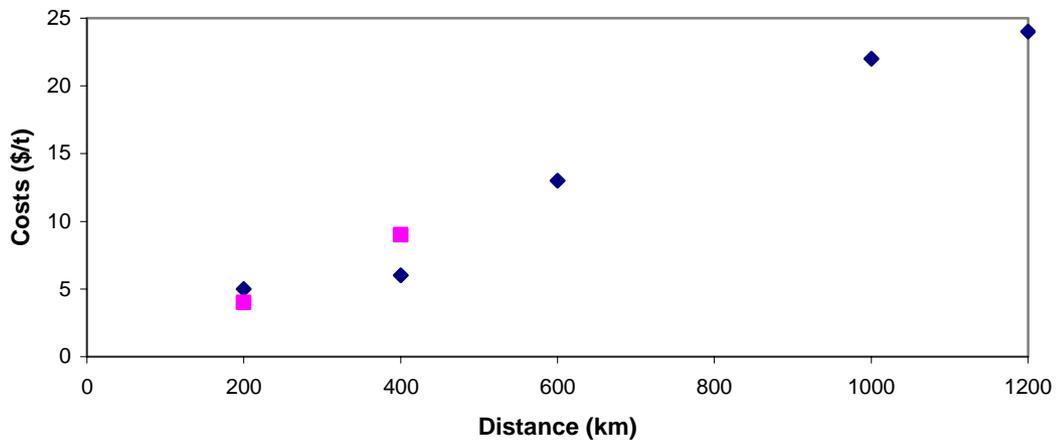
Sources: ECMAL, Submission 11, pp.23-24 and Submission 91, Tables 1 and 2; NSW Coal Association, Submission 31, p.7.

Figures 10.1 and 10.2 show that costs to railways of transporting coal are related to distance and that costs for northern NSW coalfields, as estimated by Easton and adjusted by the Commission,² are not inconsistent with overseas data. Variations in costs for the same distance are to be expected to mainline coal hauls. The Commission concludes that Easton's estimates of costs are reasonable.

The Commission has examined the differences between freight rates, which have been supplied on confidential basis, and Easton's costs as adjusted by the Commission. Although the detailed results cannot be disclosed, the examination did reveal that there were differences between freight rates and equivalent costs - including a 10 per cent real rate of return. Such \$/tonne differences can be interpreted as excess charges. The differences appear to decrease with the length of the haul for northern NSW coalfields, confirming that there is price discrimination within NSW coal freight.

² The Commission has accepted Easton's operating costs but has replaced his capital costs by a 19 per cent rate of return (that is, 10 per cent real in 1989-90) on his asset values. It recognises that these asset values, which are estimated replacement costs, may be high.

Figure 10.2: Coal freight costs to railways (per tonne), 1989-90^a



^a Including a reasonable return on capital.

Sources: ECMAL, Submission 11, pp.23-24 and Submission 91, Tables 1 and 2; NSW Coal Association, Submission 31, p.7.

The earlier, identified excess charges for NSW (see Table 10.5) are now lower because freight rates have been reduced and the Commission's calculations allow for a rate of return. The SRA claims that its coal business did not even cover fully distributed costs in 1988-89, let alone make a return (Initial hearings, p.645). The Commission has not been able to calculate an average excess charge for NSW. If based on existing inefficient costs it would, on average, be measurably lower than Easton's \$3.44/tonne. It should be recognised, however, that an overall average obscures differences in excess charges between peak and off-peak users and between different mines, especially between northern and southern coalfields.

Mines which organise ship arrival times and coal movements to port in an orderly manner receive no reduction in charges relative to those who create peak demands and hence additional costs. As the NSW Government pointed out:

State Rail is concerned about the high costs associated with providing surplus rolling stock which is needed to cater for peaks in demand. (Submission 130, p.20)

The SRA conservatively estimates that approximately 22 per cent of Freight Rail's locomotives and wagons would be excess if more even demand patterns existed. If allowance were made for this effect, the better-organised mines may well have higher excess charges than the Easton figure, while those mines whose peak demands impose additional costs may be subsidised.

Given the differences in total tonnage and tonnage per mine between the northern and other NSW coalfields, and the fact that they use separate parts of the rail system, the Commission considers that they should be treated as separate traffics. If that were done, excess charges borne by northern NSW coalfields are likely to be significant.

The SRA rejects this proposition saying that there are interdependencies within the coal business which suggest that a clean separation of areas cannot be readily achieved. It says that there is a single management and corporate overhead structure, which provides economies to coal producers in all areas: up to 20 per cent of rollingstock dedicated to coal business is regularly re-located between the Hunter Valley and Western coal fields to meet demand fluctuations; and coal originating in the western coal fields is sometimes transported to Newcastle while Hunter Valley coal is sometimes transported to Port Kembla. The Commission does not see why exchanges of rollingstock between the two areas could not be dealt with on a commercial basis rather than requiring that all transport activities be part of one system, especially as Freight Rail's management structure already includes regional general managers in the north, south and west.

10.4.3 SRA coal pricing policy

The SRA has released 'Coal Pricing Policies in State Rail' (Submission 98) which sets out the principles that the SRA applies in setting its coal and minerals freight charges. Two main principles are applied:

- i) Overall revenue adequacy will be assessed against a commercial rate of return on assets employed taking proper account of the cost of capital and the commercial risks involved.
- ii) Prices will be "market-based" through negotiated contracts with individual companies. Price differentiation will recognise factors specific to particular mines. However, insofar as price differentiation is sustained:
 - no user will be charged less than their long run avoidable costs
 - no user will be charged more than their "stand alone" costs. (Submission 98, p.14)

This policy is totally consistent with the efficient pricing principles that the Commission set out in Chapter 4, provided that stand-alone costs are interpreted as applying to the collective costs of any subset of users. However, there is evidence which indicates that the SRA is charging some mines more than stand-alone costs. According to the SRA

It is our intention that rates be within these limits (i.e above long-run avoidable cost and below stand-alone cost). Obviously any reduction in those rates that may exceed stand-alone costs would have to be counter-balanced by an upward shift in other rates to achieve adequate levels of cost recovery and ultimately provide an adequate rate of return on assets. (Submission 130, p.19)

We are certainly - we may well be overcharging on some clients. (Draft report hearings, p.230)

The SRA and mining companies agree that marginal cost pricing would lead to the railway making a loss due to the economies of scale inherent in rail operations. For this reason there need to be charges in excess of marginal costs to ensure that rail operations are viable. The differences between the SRA and the mining companies lie in how these charges should be determined.

Some mining companies argue that there should be a uniform mark-up on the cost of each operation (see ECMAL, Submission 11, p.43), while the SRA contends that any additional revenue required to meet financial targets should be related to what the market will bear. The former argument is based on the notion that each coal mine should be looked at as a separate business and charged according to the costs it imposes on the system. If this practice were to be adopted, the SRA would - by definition - achieve its target rate of return (which would be uniform across the coal freight system) and the mining industry would receive better signals as to the relative efficiency (costs) of mining at different locations.

The SRA's pricing policy is based on a 'within-industry' notion of Ramsey pricing in which unattributable costs are allocated among users in inverse relation to their demand elasticity's (see Chapter 4). Shippers which are relatively sensitive to price changes would be charged a lower mark-up than shippers which are relatively less price sensitive. The SRA does not attempt to measure price elasticity's for its customers, nor realistically can it, but uses the concept of Ramsey pricing as a justification for charging different mark-ups on different users. For practical purposes it intends to charge what the market will bear within the limits of the above mentioned constraints.

Although the mining companies' common mark-up proposition may seem intuitively fairer and more equitable, it could see some existing and potential users excluded from using rail transport. If the SRA sought to apply a common mark-up to all operations, it would lose those customers who would be prepared to meet marginal costs but would not be prepared to pay the average mark-up. The total traffic task would decrease, in which case the remaining shippers could end up paying a larger proportion of attributable costs. So long as a user can pay its long-run marginal costs and a share of fixed infrastructure costs, other users will benefit.

The Commission agrees with the SRA's pricing policy in principle, but holds two significant reservations on its application. First, there is no external constraint to prevent the SRA from departing from its pricing policy and charging what the market will bear even when the target rate of return has been exceeded and even where the costs are inefficient. Secondly, as costs and revenues for each operation are not published there could be mines that are not paying their long-run marginal costs and are thus being cross-subsidised by others. This could happen for a number of reasons. Most importantly

State Rail acknowledges some degree of price differentiation between freight rates within the industry which has arisen due to historical circumstances, largely driven by lobbying to the Government by individual coal companies. (Submission 98, p.2)

One way of overcoming these concerns is for the SRA to be required to disclose, perhaps on a confidential basis, disaggregated information of its costs and revenues for individual operations to an independent body (such as the Trade Practices Commission) which would be responsible for ensuring that monopoly power was not abused.

In addition to differences between the SRA and coal companies in the matter of calculating coal prices for individual mines, there are also differences in the determination of the overall return to the SRA. These differences concern the valuation of railway assets, the appropriate rate of return for capital employed and the use of efficient costs.

Asset valuation for rate of return

The SRA currently employs different methods of calculating capital costs for different types of assets. For non-renewable assets (for example, infrastructure), an annual rate charge is calculated on an historical cost basis, while for renewable assets (for example, locomotives and wagons), a replacement cost depreciation policy is followed (using 7 per cent real interest rate over the assessed economic life of the asset, based on the current replacement cost which is updated each year) - see NSW Coal Association, Submission 31, p.11. The SRA is considering the use of depreciated replacement cost valuation for track as well as rollingstock, but inflated historical costs for non-replacement capital (for example, tunnels, bridges and buildings).

The SRA methodology includes a replacement cost element which gives a high asset value, whereas the coal companies prefer a purely historical cost approach because it produces a smaller asset base and hence smaller returns and freight rates.

In the Commission's view, information on the valuation of assets of government business enterprises may need to serve two purposes. The first is to provide the readers of annual reports with information about the performance and financial standing of the enterprise. Using historical costs for this exercise may provide, for example, incorrect or misleading information about the market value of the firm. The second is to provide to the investor in the corporation information

about the return received on investment and whether the investment maintained its value in real terms. For this second purpose use of replacement cost (which includes an inflation factor) and a target rate of return (which also includes a factor for inflation) would lead to higher charges than appropriate.

Corporate tax

The SRA has calculated its required rate of return on coal freight on the assumption that it is liable for the payment of corporate taxes, even though neither the SRA as a whole nor its coal business pays such taxes. The calculation is made on the assumption that coal freight is conducted as a separate business under the same conditions as if it were in the private sector.

Some submissions from the mining industry have argued that since the SRA is not subject to company tax, no provision should be made for it in the rate-of-return calculation. According to ECMAL

It is inappropriate for an allowance to be added to SRA's costs in lieu of the income tax obligations which a private sector rail company would have. From our point of view that would be like paying for a public sector agency twice - once as a taxpayer and again as a user. (Submission 138, p.61)

Similarly the NSW Coal Association stated:

An allowance has been made for company tax which State Rail is currently not subject to, as are other Government Trading Enterprises and should, therefore, not be included in calculation of the nominal rate of return ... (Submission 133, p.7)

The Commission supports the SRA position, for two reasons. First, if GBEs do not have to pay corporate taxes they will replace private sector investments because the public sector will be able to offer goods and services at a cheaper price than private enterprise for a given return on assets employed - even though the private sector investment may be more efficient. Secondly, if railways do not have to pay corporate taxes, railway customers can be charged less than a fair price compared to that in a competitive private sector market, if such existed. This distorts the input costs of coal companies relative to those of other industries which do not use public rail transport.

On the other hand, calculations of rate of return taking into account taxation ought not affect prices unless the use of capital is approaching capacity. It does, however, have a constant role in determining hurdle rates to justify new investment (see below).

Rate of return

The SRA states:

With its new commercial charter State Rail is investigating the issue of what constitutes an adequate rate of return in the coal transport business. It has not yet formulated a specific target. For the interim, it has tested some major new capital investments against a real discount rate of 15% per annum. This is supported by some preliminary capital market analyses contained in [its] Appendix C. (Submission 98, p.15)

The SRA, since release of the rail draft report, has finalised its analysis of the required rate of return for its coal freight activities. This replaces the preliminary analysis presented in Submission 98. It has now estimated the value of assets employed in SRA coal traffics, devised a methodology for determining the required rate of return for the SRA coal business, and calculated the achieved rate of return for 1989-90.

Although the analysis as a whole is confidential, some of the results can be made public. In particular, the estimated value of SRA coal business assets in 1989-90 was \$1.157 billion and the estimated nominal pre-corporate tax economic rate of return for this business was 12.7 per cent, compared to a target rate of return of 19 to 22 per cent, as described below. According to the SRA:

The economic rate of return is calculated by dividing economic income by the market value of the total assets employed. It is a measure of pure operating performance and is independent of the capital structure of the enterprise (ie it excludes payments of interest and dividends). The economic rate of return provides a value to compare with the target or required rate of return. The required rate of return is based on an assessment of commercial rates of return for businesses facing similar market risk. The economic definitions and concepts adopted in this report closely follow those outlined in a recent Commonwealth Treasury Economic Paper.

The rate of return calculations are based on the Capital Asset Pricing Model (CAPM) and a treatment of taxation described in Treasury (1990a). SRA Coal, treating itself as if it were a private business, has calculated a 1989-90 post-corporate tax rate of return for an investor in the SRA, taking account of taxation and risk. The SRA then assumed a long-run bond rate of 12.9 per cent, a market risk premium of 8 per cent, an asset risk coefficient (β) of 0.82 for coal freight and an effective tax rate on corporate profits of 11.7 per cent; the consequent desired nominal rate of return was calculated to be 19.2 per cent. Assuming an expected inflation rate of 8.3 per cent, the required real return is 10.1 per cent. In order to achieve this result, SRA Coal would require a pre-corporate tax nominal rate of return of 21.7 per cent (or 12.4 per cent real). Using a market risk premium of 6 per cent, the after-corporate tax rate of return falls to 17.6 per cent nominal (or 8.6 per cent real) and the pre-tax rate of return to 19.2 per cent nominal (or 10.1 per cent real).

The CAPM methodology is described in Appendix J, together with estimates of the rate of return calculated using the Commission's preferred estimates of parameter values. There are also estimates of the effects that changes in parameter values have on results. The Commission estimates the pre-corporate tax required rate of return for coal traffic to be around 15 per cent nominal at present or 10 per cent real. It is noted that the nominal rate will fluctuate according to changes in the long-term bond rate; the real rate fluctuates less.

Although the CAPM methodology provides a sound basis for setting target rates of return for public enterprises there are difficulties in obtaining values for the parameters used and attention should be given to the efficiency of providing the service and whether any capacity is underutilised. There are several criticisms of the SRA methodology and results.

First, it is unreasonable for railways to seek the same returns as that of an efficient (that is, least-cost) organisation when it is not. Coal companies will be penalised because they are not receiving the service at least cost but are paying for it as though they were. If railways want a commercial rate of return then they should first have to operate as efficient commercial organisations. To the extent that least-cost practices are not in place, they should be discounted in setting prices and rates of return. This would remove consumption distortions, but production inefficiencies would remain.

According to Travers Morgan (Appendix K) operating costs for the SRA and QR together would decrease by about 22 per cent with the introduction of best-practice costs in the haulage of coal and other minerals. Similar reductions can be expected for the costs of replacement capital (that is, tracks and rollingstock) and non-renewable capital, which includes such items as the initial track construction, upgrading the standard of the track, electrification works and signalling infrastructure.

Unfortunately, the SRA and QR did not allow the Commission to receive a separate estimate for each system. However, current costs in some of the purpose built coal lines in Queensland are already closer than the SRA's current costs to the best that could be achieved; in NSW, coal is in many cases hauled over old lines which have steep gradients and impose operational limitations.

Rather than demanding least cost prices immediately, a practical solution would involve a phased reduction in freight rates as rail moved quickly towards international best practice. Given the current return on the haulage of coal and the possible operating cost reductions, the SRA should be able to offer - on average - real freight rate reductions to its coal customers. As mentioned in Section 10.4.2, the SRA announced that it would lower real coal rates by 2 per cent per annum in each of the three years 1990-91 to 1992-93.

Secondly, pricing of coal rail freight services so as to achieve a target rate of return (that is, setting prices to cover not only current operating costs and the loss in the value of associated assets but also the financial opportunity cost of capital tied up in coal freight operations) might seem to be a practical pricing strategy but has a number of shortcomings relating to the efficient use of the existing capacity of the coal rail system. Use of a target rate of return is appropriate when evaluating an investment proposal, but once that investment has been made it is not appropriate - even for a monopolist - to set prices solely to achieve that target. Rather, pricing should seek to ensure that after marginal costs are recouped, the capacity inherent in the investment is fully used by customers. It is not appropriate, for example, to set prices on the basis of total long-run economic costs when that includes the costs of capital associated with a productive capacity which does not match demand at those prices, even when costs are efficient. If capacity exceeds demand, pricing on the basis of total long-run economic costs will unnecessarily choke off demand and leave capacity underutilised. The opposite is true if capacity cannot meet demand.

Thirdly, the SRA calculations of required returns are overstated because indexation of prices is allowed for in both the valuation of assets and the calculation of the required rate of return.

Finally, railway's freight pricing strategies often do not allow for differential pricing between slack and peak periods of demand for the railway's services. An appropriate approach is to price individual services flexibly, so that available capacity meets demand at all times without excessive queuing during peak or slack periods, so long as marginal costs are met. With this pricing strategy, the economic rate of return earned on each service would indicate whether new investment should be undertaken to increase capacity or whether capacity should be reduced. Capacity would be increased when sustainable economic returns above required rates of return were realised, and capacity decreased when less than the required rate of return was realised.

The SRA supplies trains on demand without any price adjustments during peak or slack periods. The peak demands arise because the stockpiles at port, unlike those in Queensland, are quite small and usually less than a shipload. (While peak demand can be decreased by increasing the size of each stockpile, the effect of the current pricing policy inhibits the use of such a solution.) Often mining companies enter into spot price sales as opposed to longer term contracts where deliveries (and thus the demand on the rail system) are known well in advance. During busy periods where there is little or no excess capacity, spot sales will place a strain on the system and a higher than average cost in performing this additional unexpected task. Similarly, during slack periods where excess capacity exists, the cost of performing such a task would be less than the average.

Based on information supplied by the SRA, the Commission estimates that the current 'supply on demand' policy is increasing the SRA's coal business total costs, relative to a steady flow of traffic, by 5 to 10 per cent. This is due to the additional rollingstock required, together with higher wages for overtime, the additional costs of deferred maintenance, and additional queuing delays.

The Commission considers that the SRA should introduce a pricing strategy more consistent with the above-mentioned comments. It should allow for differences in prices between slack and peak periods of demand for its coal freight services. If such a strategy were in place, demands for coal freight services would give a better indication than at present of where new investment should be made.

10.4.4 QR coal pricing policy

The collection of ‘royalties’ by means of excess rail charges in Queensland is of interest to this inquiry to the extent that the excess charges contribute to inefficiencies in QR (both operational and pricing) which in turn affect the efficiency and competitiveness of the Queensland mining industry.

The Queensland Government devised the present method of extracting royalties via excess freight rates because it maximises the return to the Government. Coal producers in Queensland agreed to contracts on a specific freight rate per tonne of coal while making an upfront payment for the rail infrastructure to haul it. The infrastructure cost was repaid by the State Government but coal producers then paid again for the infrastructure with the haulage rate including a capital cost component. This arrangement helped Queensland in two ways. First, coal producers used the Commonwealth tax system to write off the infrastructure costs against income for Commonwealth tax purposes; and secondly, it understated Queensland's capacity to raise revenue because the extra rail revenue was absorbed as a charge - not a tax - thereby advantaging the State in the distribution of Commonwealth general revenue grants as recommended by the Commonwealth Grants Commission. While a recent attempt to neutralise that advantage has been only partly successful (see Section 6.5.2), it seems only a matter of time until the royalty component of rail freight rates in Queensland is accurately calculated and taken into account in the distribution of general revenue grants. This may help explain why Queensland is currently reviewing its coal rail freight policy. At the time of the writing of this report no decision on royalties and rail freight rates had been made.

There are many criticisms of using excess rail freights to recover resource rents.

- Where rail does not have a competitive advantage it is necessary to regulate and preclude competition from other modes so that royalties can be collected through higher haulage rates. Apart from any resource misallocation which this creates between rail and road the regulated public monopoly has, other things equal, less of an incentive to improve efficiency. This results in the costs of providing the service being higher than they otherwise would be, thus disadvantaging the cost competitiveness of Australian coal.
- There is a view that royalties should be based on the market value of the resource. In periods of volatile prices, specific royalties which are based on the volume of output - as are rail freight rates - ought thus to be adjusted frequently to allow for changes in the mineral rent earned by the deposit. Continuous adjustment of freight rates, as well as being administratively costly, gives no guarantee that it will accurately reflect changes in the mineral rent. Furthermore, continuous adjustments increase the industry's level of uncertainty which in turn has a negative effect on exploration and development decisions. In practice, excess charges have been relatively unresponsive to changes in mineral markets, and then adjusted only after extensive lobbying. The NSW coal industry had to

sustain financial losses for three years (1983-84 to 1986-87) before the SRA responded by lowering freight rates.

The Queensland Government points out that ‘there is also the view that if a developer makes a commercial decision to commit to its project on the basis of a defacto royalty arrangement, then it may inappropriate to change this arrangement afterwards’ (Submission 135, p.28).

Some mines endorse this position. The Queensland Mining Council said ‘It is important, we believe, to provide those users who have entered into rail service agreements with the option of seeing those arrangements run their full term’ (Submission 148, p.2).

- The mechanism of collecting coal royalties through excess rail freight rates is not transparent because excess freight rates are not shown in State budgets and therefore are not subject to the same scrutiny and review as other State budgetary items. For no other reason, the royalty component of individual freight rates should be made publicly available; the coal producers have a right to show their contributions to general State revenue and the community would be able to assess whether the amounts were reasonable.
- A side effect of collecting royalties through rail freight rates is that the freight rate is negotiated with Queensland Treasury rather than QR. The freight rate setting arrangement provides little opportunity for negotiating more efficient ways of running services that would benefit both the coal industry (in terms of lower freight rates) and QR (in terms of lower costs). In practice, so long as a mine can cut its costs in terms of loading and turnaround times, it will do so irrespective of the cost it places on QR (see Section 10.5.2).
- Finally, because excess charges are hidden in QR's revenues they obscure losses in other QR operations and reduce the pressures for increased efficiency gains in those sectors.

10.4.5 Economic gains from efficient pricing

Under the assumption that all of the excess rail charges were monopoly rents, Freebairn (1988) simulated the effects of a \$7/tonne reduction in average coal rail freight rates in 1988. The results showed an estimated annual net gain in national economic efficiency of around \$75 million and \$140 million (in 1988 prices) a year in the early and late 1990s respectively.

The Centre of Policy Studies (COPS) in a study commissioned by CRA (Submission 72), simulated the effects of the removal of excess charges as estimated by Easton for 1990 - \$3.40/t in NSW and \$7.30/t in Queensland (see Table 10.5). A modified version of the model used by Freebairn (1988) was used and the results of the study showed that:

- By the turn of the century coking coal exports would increase by about 22 million tonnes or 30 per cent and steaming coal exports by around 33 million tonnes or 40 per cent. The

expansion in Queensland would be around 41 million tonnes or 46 per cent while in NSW 15 million tonnes or 21 per cent.

- By 1995-96 exports would increase by about 3.3 million tonnes and \$1.5 billion (in 1988-89 prices) and by the turn of the century by about \$2.5 billion (in 1988-89 prices) per annum.
- An improvement in the allocation of Australia's capital, labour and other resources leading to a net increase in national income of around \$102 million in 1995-96 and \$151 million in 2000-01.
- Considerable redistribution of income from the NSW (-\$169 million in 1995-96 and -\$199 million in 2000-01) and Queensland (-\$508 million in 1995-96 and -\$571 million in 2000-01) State Governments to mining industry investors (+\$475 million in 1995-96 and +\$562 million in 2000-01), and to the Commonwealth Government (+\$304 million in 1995-96 and +\$359 million in 2000-01) which gains from the 30 per cent corporate taxation of extra gross mining industry returns.

In both of these analyses it is assumed that the excess component of freight charges is removed without being replaced by any form of minerals or resource rent tax. Freebairn (1988) points out that if governments introduce additional mineral rent resource taxes or increase existing taxes the estimates of net efficiency gains will be affected but not significantly.

For example, higher royalty rates as a trade-off for lower excess freight charges would mean a world of negligible effective changes. Alternatively, replacement of the excess freight charges, which are a form of per unit taxes, with a resource rent tax based on economic profit would have much smaller industry distorting effects. (Freebairn 1988, p.98)

Note also that the magnitude of the effects of lower rail freight rates in both studies is critically dependent on the long-run export demand elasticity's for Australian coal. Freebairn (1988) used long-run export demand elasticity's of -16 and -142 for coking and steaming coal respectively, while the COPS used values of -16 and -75 for coking and steaming coal respectively. If export demand elasticity's were inelastic, reduced export prices would have little effect on export volumes and it would be overseas buyers rather than Australian producers (and Australia as a whole) that would reap the benefits. As Koerner pointed out

This assumption [elastic long run elasticity's of demand in all international markets] would appear to require a policy change by the Japanese, our most important buyer. Without such a change, the price elasticity of demand for Japan will remain inelastic in the long run. Additional coal export volumes resulting from lowered freight charges would then tend to be sold into the other major importing area, which is Europe. In this market, Australia suffers an ocean freight penalty of about \$US5/tonne relative to the USA. At an exchange rate of \$US0.75 to the \$A (assumed more realistic in the long run than the present exchange rates), the rail freight reduction of \$A7 recommended by the Monash study would approximately offset this ocean freight differential, and Australia's fob price for any increased volumes might not need to fall much further to compete on a cif basis in Europe with US coals having the ocean freight advantage. The resulting increased price competition in this market might then

increase the consumer surplus for the EEC steel or electric utility industry imports. A certain loser from adoption of the recommendation is the state of Queensland. (Submission 13, p.20)

Koerner's position is that international trade in coal does not take place in an idealised competitive market. Japan, as the largest importer of coking coal, exerts considerable influence on prices. According to Koerner it pays US producers more than Australian producers for similar coal, and it has a 'purchasing policy which precludes larger imports of Australian coal by reasons of supply security, irrespective of reduced prices.' He also describes market distortions in other Pacific markets and Europe. While Koerner has delivered a salutary reminder about the assumptions of competitive pricing, it is difficult to believe that there will be distortions in all markets in the long term. His conclusion that Queensland would be a certain loser if cost-based freight rates were adopted is necessarily true only if the overall long term export demand elasticity were between 0 and -1, which seems unlikely. Furthermore, Koerner writes from the perspective of removing all excess freight charges without the introduction of an alternative resource rent tax.

In response to Koerner's position the Queensland Mining Council said

The Koerner thesis, in our view, is a prescription for the type of short-term 'rule of thumb' administration of rail charges which the coal industry is attempting to overturn in Queensland. We refuse to believe that reductions in rail charges, and by implication other unit costs, count for nothing. This is not supported by logic nor by experience. (Submission 148, p.2)

The Australian Bureau of Agricultural and Resource Economics in its submission, analysed alternative systems of charging for coal resources and concluded that a combination of profit based taxes and cash bidding for mineral rights would provide an efficient mechanism for allocating resource access rights. Consistent with the system applying for the crude oil industry, the level of resource tax used in the analysis was set at 40 per cent of any real returns over and above 10 per cent per annum. The results showed that national income could increase by an amount equal to 15 per cent of resource rents if a resource rent tax were used to raise revenues rather than the present system of royalties and excess freight charges (Submission 73, p.3).

In summary, the collection of 'royalties' by means of excess rail charges: has advantaged Queensland relative to other States in the distribution of Commonwealth general revenue grants; hides the true facts about both royalties and freight rates; provides little opportunity for negotiating more efficient ways of running services; enables unprofitable QR services to be cross-subsidised; and undermines the possible economic gains from more efficient ways of collecting coal royalties.

RECOMMENDATION 10.2

The Commission recommends that super-normal profits, whether described as ‘royalties’ or otherwise, should not be obtained via rail freight rates. In the case of Queensland, this could initially be achieved by identifying, and separating, the royalty component from the freight charge, and requiring that the royalty be paid directly to the Queensland Treasury.

In response to the corresponding draft report recommendation, the NSW Treasury asserted that the SRA does not extract super-normal profits from its customers (Submission 130, p.8). Supporting SRA claims are reported in Sections 10.4.1 and 10.4.3 of this chapter. The Queensland Government responded that

Coal rail freight policy is currently the subject of review in Queensland. This study is continuing and the Queensland Government is at this time unable to declare a position. (Submission 135, p.20)

The discussion in Sections 10.2 and 10.4 leads to another recommendation.

RECOMMENDATION 10.3

The Commission recommends that governments eliminate all their subsidies to bulk rail freight, in the first instance by not restraining their rail authorities from reducing costs to international best practice. This reduction should be achieved within three years. During the transition period, authorities should refrain from increasing average bulk freight rates (in dollar terms).

The draft report simply recommended the elimination of all subsidies to rail freight. The Queensland Government and the NSW Treasury agreed with the recommendation in principle, in the sense of avoiding provision of a subsidy which conferred on rail a competitive advantage. However, they pointed out that governments may decide that subsidised freight services should be provided in certain cases (for example, in the absence of commercially viable transport alternatives), in which case the funding would be by means of community service contracts (Submission 135, p.20 and Submission 130, p.8). The Commission has not seen persuasive arguments which would justify the provision of freight subsidies to shippers for other than short-term reasons such as that discussed in Section 10.6.1.

The Western Australian Government argued that elimination of rail subsidies can lead to misallocation of resources between road and rail freight if railways are forced to price at fully distributed levels. It said that it would be economically and financially unwise to walk away from services which cover avoidable costs but do not cover fully distributed costs (Submission 131, p.6). So long as prices cover short-run marginal costs with some contribution to fixed costs, the Commission would agree that no cross-subsidisation need be involved.

10.5 Operational efficiency

This section examines the operational efficiency of rail in transporting bulk commodities. The focus is not on increases of operational efficiency induced by capital injections but on current arrangements and how they can be improved.

10.5.1 Scope for improving efficiency of operations

Travers Morgan (Appendix K) estimated the cost savings that would result with the adoption of international best-practice costs. Although the potential savings in the haulage of coal other minerals and grains are not as great as those possible in other traffics, they are considerable, with reductions in operating costs of 22 and 28 per cent for coal and grains respectively.

In the haulage of coal and other minerals one of the most significant changes would be the general use of driver-only trains (see Appendix K). In the haulage of grains potential efficiency gains are similar across all systems, reflecting system-wide impacts in such areas as linehaul crew levels, terminal working and mechanical and infrastructure maintenance. The gains are rather smaller in Westrail and larger in V/Line, reflecting the general level of input costs and traffic density on the grain network in those two systems, with the other systems approximating the national average (see Appendix K).

As in many other areas of rail operations, a major impediment to the least cost provision of rail services to bulk commodity shippers lies within labour practices. While rail authorities in recent times have moved towards reducing their labour costs both by reducing their total staffing levels and by improving work practices (see Chapter 7), there is scope for substantial improvement.

Exxon Coal and Minerals said:

While the coal industry acknowledges that State Rail has made considerable improvements in rail efficiencies in recent years, there is nevertheless considerable scope for further improvements in performance. (Submission 11, p.12)

Rail authorities are the first to admit that inefficiencies exist. They include:

- Less than optimal productive time of train crews. An example of this is in the Hunter Valley where a round trip from the Mount Thorley Coal Loader to Port Waratah Coal Services can take just over 8 hours. Given 8 hour shifts, a traditional 15-20 minute 'smoko' break after loading requires at times a crew change before the round trip is concluded.
- Train crews can be reduced from two to one.
- In Victoria two people are used in shunting operations where one could do the job with the assistance of radio communication.
- In many instances staff are designated to specific rail lines, which reduces the flexibility of operations.
- Labour awards are not flexible enough to permit crews to continue a journey above a specified distance or time on board. When trains don't run to schedule, there are additional costs associated with transporting crew to and from the train.

Ageing rollingstock is also contributing to rail's poor performance. In NSW the average age of the mainline diesel fleet is 23 years, whereas the norm in the US is 13 years. This adds substantially to maintenance costs. Booz.Allen & Hamilton (1989b) estimated that annual maintenance costs of the SRA's older locomotives ranged from \$100 000-160 000 in 1988 compared to a range of \$25 000-35 000 for new locomotives, while availability for service of the fleet at the time was 77 per cent compared to a minimum of 90 per cent for the newer fleets in the US.

In Queensland, until recently, the average age of locomotives was slightly lower at 20 years. In the first 4 months of 1991 though, more than 40 DEL/DHL locomotives were classified as surplus and stored. Excluding these older locomotives the average age fell to 13 years. The wagon fleet remains outdated and a considerable number of wagons are designed for approximately 12.5 tonne axle loads thus allowing 20-30 tonne payloads for a net to tare ratio of 2:1 compared to newer wagons with payload to tare ratios of around 5:1.

AN is rapidly reducing its use of old GM class locomotives which it services every 30 days. Service maintenance requirements for newer locomotives range from 45 to 90 day intervals. According to AN, a rise in locomotive availability of 10 per cent would result in a capital cost reduction of \$2.5m in terms of the number of locomotives required to service the market, and a maintenance saving of approximately \$40 000 per year per locomotive.

Victoria and WA also feel that their ageing fleets are contributing adversely to the efficient provision of services.

Although rail authorities recognise that investment in new rollingstock would reduce the overall cost of providing rail services, the incentives for following the least cost path are distorted by the way governments fund rail operations. A rail authority is assured that its operating deficit will be funded at the end of each financial year while capital investment funds carry an interest burden (see Chapter 6).

An example of inefficiencies in operations which arise from the poor state of capital equipment employed by rail authorities is poor communications between railways and mines concerning train scheduling, delays and rescheduling. In many cases customers are not notified of train cancellations. In NSW there is no way of telling where a train is at any point in time as there are no tracking devices to monitor a train's position. When a train is overdue, the only way to locate it is to check with stations along the line to find if any one has seen it go past.

The NSW Coal Association expressed the view that:

The coal industry believes improvements are required to the existing communication and signalling system. This would enable smoother running of trains and assist train planning to meet coal haulage requirements. Use of the computer traffic communication system by SRA should be investigated. (Submission 31, p.15)

In contrast QR coal trains operate under centralised traffic control where their progress is continually monitored from a central control centre. Radio contact is also maintained with all trains at all times and it is common for coal trains to be diverted en route to meet coal producers' needs. Outside organisations (for example, Bulk Grains Queensland, Dalrymple Bay Coal Terminal) have been allowed restricted access to QR's on-line Rollingstock Information Control System.

Another example of operational inefficiencies which arise from the poor state of capital equipment occurs in the use of bottom dump wagons for hauling coal and grains. These are unreliable and dangerous to use. The Dalrymple Bay Coal Terminal said:

Despite continual pressure on Queensland Railways, wagon door performance on original wagons has improved from 40 per cent reliability to only 60 per cent reliability. Poor reliability of the door opening mechanisms plus the need to initiate coal flow using jackhammers results in our overmanning the operation by one man per shift, a cost of approximately \$400,000 per year. (Submission 8, p.2)

The Queensland Government disputed this saying that:

It cannot be agreed that bottom discharge wagons are fundamentally either dangerous or unreliable when adequate care is taken. All equipment with high mass and consequently inertia are potentially dangerous if not treated with respect. It must be realised however that some operators of discharge terminals elect to open doors manually rather than use the pneumatic mechanisms provided and this increases the risk to unloading staff. (Submission 135, p.24)

In reply to the additional overmanning costs incurred by the Dalrymple Bay Coal Terminal, QR points out that the cost of replacing all bottom dump wagons in coal traffics with units that would give close to 100 per cent reliability is around \$300 million in May 1991 dollars.

At Port Waratah Coal Services in NSW a similar problem is faced and manual opening with crowbars is found to be time consuming and dangerous.

10.5.2 Contractual agreements

The existence and/or continuation of some of the above inefficiencies is partly a result of the incentives (or lack of incentives) inherent in the contractual agreements between government railways and users. In a normal business environment, contractual agreements between two parties include - amongst other things - penalty/reward clauses when a party fails to meet a predetermined level of responsibility or performs above a pre-specified standard. Performance clauses are important because they give incentives to each party to increase the efficiency in delivering its part of the agreement. Coal freight agreements in NSW, for example, include rebates for volume and speed of loading. Participants in this inquiry pointed out that while a penalty/reward system is in place between them and the rail authorities, in many cases it is very one sided. For example, there is no penalty on the SRA for non-arrival of trains. This one-sidedness can be traced back to the monopoly position that rail authorities have for a large part of the bulk commodity freight task.

Oakbridge Ltd said:

The obligations on the coal producer are imperatives, backed up by the powerful economic threat of a downgrading of operating standards (and hence, freight rebates) and the ultimate threat of termination of the agreement in the event of a continuing breach. State Rail, on the other hand, agrees only to provide transport capacity to carry producer's export coal, subject to the "reasonable capacity of State Rail". (Submission 47, p.10)

Similar views were put forward by the Hunter Valley coal mines during industry visits by the Commission. It should be pointed out that because the SRA does not price appropriately, it is difficult to commit itself to a level of service due to the fluctuating demands of users.

The New South Wales Government said:

This pattern [of unpredictable peaks and troughs] is particularly relevant to export coal. For Balmain deliveries, on 150 days each year, there are no deliveries to the Port, whilst for 65 days of the year, over half the total annual quantity is transported. Many daily deliveries are three to four times higher than the average daily volume for the year. This pattern, although less pronounced, is mirrored in the daily volumes transported to Port Kembla and Newcastle. (Submission 75, Annexure 1, pp.30,31)

In periods of peak demand, rail resources are stretched to the limit and in trying to meet the demands of one user the demands of another may suffer. The SRA has offered to build into the contracts clauses that have penalties/rewards for the SRA provided that coal mines can guarantee that they will load a specified number of trains per week. Perhaps because of the imbalance in rewards and penalties faced by the SRA and the mines, this offer has not been taken up by any mine. The Commission is of the view that it is appropriate for numbers of trains per week to be addressed in the contracts, but not in the form suggested by the SRA. Rather, there should be penalties/rewards on mines for numbers of trains per week, and penalties/rewards on the SRA for performance, without the two being conditional on one another.

Contractual agreements for hauling coal in Queensland lack penalty/reward clauses altogether, in part because freight rates are not negotiated between the coal company and QR, but with the State Treasury, which is not an expert on coal transport practices. There are no penalties for below-target loading and discharge rates, for variation in loading pattern, or for short shipments, or corresponding rewards for above average performance. This means a lack of incentive for QR to become more efficient, and the same is true for the coal mines. As CRA commented:

The operating practices of some mines are directed towards minimising their internal cost irrespective of the cost penalties they impose on the overall rail system. The only way to get each participant to manage their own operations in ways that are consistent with an efficient coal delivery system is to introduce a pricing policy that encourages decisions that increase industry competitiveness. This implies a departure from the existing "average" pricing system to a more commercially oriented pricing system. (Submission 72, p.6)

Contracts in the transportation of grains have been more commercial than those in coal and other minerals and the rewards in terms of increased efficiency have at times been quite significant. According to the Australian Wheat Board:

The AWB has been able to negotiate rail freight contracts which incorporate performance incentives. (Submission 61, p.5)

In NSW, the SRA and the AWB meet every month and tally up penalties and rewards incurred by each side. After an initial trial period this practice is now in its second year and seems to be working well. There are 8 major clauses which apply to both sides and are used to determine performance and the eventual freight rate. These include the length of the train, speed of loading and unloading and adherence to a specified weight per wagon. If the SRA does not deliver on time it has to pay the full cost imposed on the AWB due to the delay. Both sides seem to be happy with the arrangement. The SRA said:

State Rail is able to negotiate contracts which contain incentives for customers to perform in ways that are cost efficient for State Rail, while at the same time creating cost savings for the customers. The evidence of such benefits is that more contracts are being signed with extensive "packaging" of rates which contain service conditions. By the end of 1991 all significant grain freight movements will be covered by negotiated contract. (Submission 75, Annexure 1, p.27)

When asked why the reciprocity in penalties and rewards which existed in the grain contracts with the AWB was not pursued in coal contracts, the SRA said 'With the Wheat Board we have one customer' (Draft report hearings, p.242). This can be the result of a monopoly supplier (SRA) facing pressure from a monopsony customer (AWB), which has sole control over grain movements. It is to be expected that a monopsonist would do better than a coal company which is one of many customers and cannot exert such pressure.

In Queensland unit train incentives were introduced in the 1983 grain rail freight agreement between Bulk Grains Queensland (BGQ) and QR. It was agreed that QR would reimburse BGQ a rebate of \$1 per tonne for all grain loaded to trains which are defined as unit trains. This was conditional upon BGQ undertaking capital projects designed to facilitate rail wagon turnaround (primarily the upgrading of rail sidings). Since the 1983 agreement, around \$4.1 million had been spent by BGQ up to 30 June 1990 and another \$5.3 million had been committed for work in upgrading sidings. By June 1989 around 70 per cent of grain outloaded in Queensland was transported in unit trains.

10.5.3 Escalation of freight rates.

Escalation clauses for adjusting freight rates over time also introduce economic distortions. In Queensland, because the current escalation formulae apply to the total freight charge, which apart from supply costs includes an excess charge component as a resource tax, excess charges will increase at the same rate as supply costs. More importantly, the escalation index makes no allowance (either in Queensland or NSW) for productivity gains or for changes in the weights of cost components in the formula. A consequence could be that charges increase although costs of providing a service have declined. The Queensland Coal Association gave such an example

In 1983 a reduction in train manning caused an increase in escalation of the freight rates even though it yielded savings on total railway costs. This was because wage increases granted to remaining rail personnel were picked up by the escalation formula but the compensating reduction in overall employment and wages was not. (Submission 60, p.15)

It is clear that any productivity improvements in rail operations should not penalise users but should benefit them in the form of lower freight rates.

MIM in its submission suggested that:

... the present escalation arrangements should be changed to a CPI base and used only to escalate freight rates. To enable benefits from future productivity gains to be shared to some extent between the railways and the mining companies, the escalation arrangements should include a price gap of the form CPI minus "x". The value of "x" should be based on realistic expectations about future productivity gains, and should be fixed for a period of 3 to 5 years. (Submission 22, p.35)

The SRA currently offers this option to its customers and has set "x" at 1.75 percentage points per annum.

Another alternative offered by the SRA is to base escalation on the current-cost based formula plus the options of a component based on either movements in road haulage rates, and/or movements in the export price of coal. The majority of customers have favoured the CPI minus "x" formula, while those favouring a cost-based formula have generally not favoured any of the above mentioned components.

The SRA does not see the role of the escalation formula to be that of incorporating changes in productivity or changes in input prices as the mining companies advocate. Rather:

It is simply a mechanism to ensure some degree of rate stability over the contract period. (Submission 130, p.23)

Pasminco noted the difficulties it has had in including productivity gains in its escalation formulae with AN:

... despite repeated pleas by the company for inclusion of a productivity element in the adjustment formula, Australian National has consistently rejected the concept on the alleged grounds of increasing costs. Reference can be made to a statement from an executive of Australian National to the Transport Reform Conference in June, 1990, that Australian National's freight operating costs have decreased upwards of 60 per cent in the 12 years to 1989. This is in sharp contrast to their statements to Pasminco in recent times. (Submission 132, p.6)

Although the CPI minus "x" formula may seem intuitively appealing there are a number of problems associated with it which the Commission has pointed out in its Energy Generation and Distribution Report (IC 1991b, Volume 2, pp.88-90). Most importantly, if "x" corresponds to the recent and prospective productivity performance of the railway, the incentives for additional cost efficiency will be severely blunted.

So long as rail authorities find themselves in a monopoly situation, no matter what escalation formula is used, the outcome is likely to disadvantage the user. Thus it is preferable to seek to reduce the monopoly scope of rail enterprises, as discussed in Chapter 12.

10.6 Other issues

10.6.1 Western Coal Equalisation Scheme

Some mines in NSW receive subsidised rail freight rates under the Western Equalisation Scheme. The scheme was introduced by the NSW Parliament on 1 January 1984 to provide freight concessions for western coal to Port Kembla at the same rate as for coal to Balmain. This arose out of a government decision not to proceed with its announced plans to replace the ageing Balmain coal loader with one at Port Botany but to build the loader at Port Kembla. According to the NSW Minister of Transport at the time:

The attraction to the Government of equalising the freight rates between the Balmain and Port Kembla coal loaders was the promise that significantly increased exports would lead to increased employment opportunities and stability in the western region coal fields. (Correspondence from Ministry of Transport to NSW Coal Association, supplied to the Commission by the NSW Coal Association)

To the extent that some western NSW mines were developed under the assumption that the Balmain coal loader would be replaced with one at Port Botany, there may be some justification for them to be compensated by the NSW Government for the additional costs imposed by the change of policy. Such compensation can be related to reduced returns achieved on the capital equipment which was installed in those mines in the expectation that a loading facility would be built at Port Botany.

It has been more than seven years since the Western Equalisation Scheme was introduced and no date has so far been set for its termination. Retention of the scheme gives incorrect signals about the efficiency of mining in the areas covered by the scheme relative to areas elsewhere. The Commission suggests that a date should be set on which the scheme will be terminated. This date could be related to the remaining economic life of equipment which was installed in the mines on the understanding that there would be a Port Botany coal loader. This would provide sufficient time for mines which would not be viable after the withdrawal of the scheme to divest their investment. Existing uneconomic mines would either close down or phase down operations and the entry of potential mines which would be viable only under the scheme would be deterred. As Oakbridge Ltd pointed out:

Such a move would have considerable impact on current operations in the Western District and would hamper, if not completely stop, any further development within that area for production of coal to be placed into the export market. (Submission 117, p.1)

In 1990-91 the NSW Government paid the SRA around \$11 million to provide reduced freight rates for movements of 3.3 million tonnes of export coal from western coalfields to Port Kembla, an average of about \$3.3 per tonne. The Commission would prefer an arrangement under which the SRA charged full commercial rates and the NSW Government paid subsidies directly to the mines sufficient to cover the additional cost of freight to Port Kembla instead of Balmain.

The SRA would welcome the clear separation of the Scheme from the SRA's direct involvement, either by payments directly to the beneficiaries or by community service contracts with the NSW Department of Minerals and Energy (NSW Treasury, Submission 130, p.8).

10.6.2 Uniformity of dangerous goods regulation.

Regulation of dangerous goods to rail was discussed in Section 10.2.2. Another issue is whether there should be uniformity of such regulations across Australia.

Currently, different States have different codes and regulations for the transportation of dangerous goods. For interstate movements of dangerous goods, complying to different regulations will add to transportation costs and sometimes to the danger - if compliance means additional handling of the product.

MIM in its submission said:

The existence of requirements for the transport and handling of dangerous goods which differ between States has effects on the efficiency with which such goods can be treated. For some goods, we have been told there is too much regulation; for some not enough. The regulation of the handling and transporting of dangerous goods should clearly be uniform across the country. (Submission 21, p.34)

As to the amount of regulation, the Commission subscribes to the view presented at the October 1990 special Premiers' Conference .

The overall guiding principle should be that only that level of regulation necessary to give effect to specific, well-defined community objectives should be implemented or maintained. (SPC 1990b, p.2)

On the uniformity issue, the Commission in its 1989-90 Annual Report pointed out that mutual recognition of regulations between all governments in Australia would have many advantages (IC 1990a). Some of these are: reduced administrative costs; greater homogeneity of regulatory structures between States in the longer term; external pressures to regulate at minimum cost and maximum effectiveness; less likelihood that rigid and prescriptive technical standards would be adopted; and acknowledgement that unanimity of views across the detail of regulatory schemes is unachievable.

The July 1991 special Premiers' Conference agreed to a mechanism leading to uniform codes of practice covering heavy vehicles (for example, loading codes) and States should adopt a similar practice for dangerous goods regulations.

The Commission acknowledges that there may be limits in applying the concept of mutual recognition across the whole range of dangerous goods. In some instances a uniform standard could provide better results.

Finally, differing regulations covering the same good in different regions may be superior because of the influence of geographic, climatic or demographic factors.

11 NON-BULK FREIGHT

Railways generally have been losing non-bulk rail freight business to private sector trucking. Railways are unlikely ever to have a comparative advantage in LCL and some intrasystem freight because of the low volumes, double-handling and relatively short distances involved. There is justification for retaining such services only if their revenues at least cover short-run avoidable costs. The viability of intersystem rail services is hampered by poor coordination between rail systems. Major operating cost reductions can be achieved. More reliable services are essential. Improved terminal operations are crucial. The establishment of the National Rail Corporation is important because it aims to overcome many of these problems. There is merit in allowing for competition within the intersystem rail freight market so that the potential of this mode can be realised.

11.1 Non-bulk rail freight tasks

This chapter is concerned with rail freight tasks other than bulk. As outlined in Chapter 10, some commodities such as steel and timber have both bulk and non-bulk characteristics; they are discussed in this report as non-bulk freight. It is not always possible to separate data on bagged (non-bulk) freight from bulk freight for commodities such as cement and fertiliser, in which case an assumption is made concerning the predominant characteristic of the commodity in an attempt to count it as either bulk or non-bulk.

The non-bulk freight tasks comprise three segments:

- less-than-car-load (LCL) freight;
- other non-bulk intrasystem (or country) freight including containers, livestock, timber, petroleum products and steel; and
- intersystem freight including containers, piggyback (laden or unladen road trailers with or without prime movers), steel, paper and new motor vehicles.

When concern is with the actual characteristics of the freight being carried, intersystem and other non-bulk intrasystem are very similar and need only be distinguished from LCL. As far as organisational characteristics are concerned, the dominant influence on freight operations is whether the task extends across more than one rail system. Thus, although State borders coincide with system boundaries (the major exception being AN for whom some intrasystem services such as Adelaide-Alice Springs are interstate), the emphasis in this chapter is on system boundaries rather than state boundaries. Organisationally, LCL and other non-bulk intrasystem are identical and need only be distinguished from intersystem, as is generally done in this chapter.

Non-bulk freight intrasystem and intersystem tasks undertaken by each rail system, measured in tonnes and net tonne-kilometres are detailed in Table 11.1. Also included for each system is non-bulk freight revenue. The task varies between systems, although intermodal/shipping containers/freight forwarders' freight comprises a strong share of intersystem freight, followed by iron and steel. For intrasystem freight, major non-bulk freights include manufactured products, agricultural products and livestock (in Queensland, in the year under consideration).

Table 11.1: Non-bulk rail freight tasks: 1989-90 a

Task	System						Total
	SRA	PTC	QR ^b	Westrail	AN Mainland	AN Tasrail	
	Tonnes (thousand)						
Intersystem ^c	6 064	4 362	2 648	1 598	4 208	-	18 880
LCLintrasystem ^d	110	188	170	-	-	-	468
intersystem ^c	9	62	-	-	-	-	71
Other intrasystem ^d	2 772	577	2 856	2 317	641	1 047	10 010
Total c	8 955	5 189	5 674	3 915	4 849	1 047	29 429
	Net tonne-kilometres (million)						
Intersystem	na	1 672	426	359	4 989	-	na
LCLintrasystem ^d	na	19	112	-	-	-	na
intersystem	na	17	-	-	-	-	na
Other intrasystem ^d	na	138	2 379	1 325	666	249	na
Total	na	1 846	2 917	1 684	5 655	249	na
	Revenue (\$m)						
Intersystem	161.9	58.9	22.0	64.0	153.7	-	460.5
LCLintrasystem ^d	25.7	16.2	15.0	-	-	-	56.9
intersystem	1.8	1.7	-	-	-	-	3.5
Other intrasystem ^d	57.1	10.8	74.0	47.0	21.1	15.0	225.0
Total	246.5	87.6	111.0	111.0	174.8	15.0	745.9

a Where it has been impossible to separate non-bulk from bulk freight, the freight has been counted as the predominant type; this may have resulted in some over- or under-estimation of the non-bulk task in each system.

b Freight travelling on intrasystem and also intersystem trains is counted twice.

c Intersystem tonnages are counted in each system through which freight passes, implying at least double-counting.

d Some intrasystem tonnages may include road-only movements.

Sources: Rail authorities.

11.2 Intrasystem freight

11.2.1 Regulation

The regulation of intrastate freight activity ranges from direct modal restrictions of commodity transport to implicit regulation. There is less economic regulation for non-bulk intrastate freight than formerly existed, although implicit regulation still exists in the form of restrictions on the introduction of new technology (for example, B-Double road vehicles in Victoria ¹) and the application of surcharges to road movements (as recently imposed and subsequently removed for road fertiliser cartage on rail-competitive routes in Western Australia).

As noted in Section 10.2.2, the Commission finds little justification for such regulation (see Recommendation 10.1).

11.2.2 LCL freight

Although railways were traditionally required to carry small shipments of general merchandise destined mainly for country areas, such regulations no longer exist. There is a noticeable trend amongst railways to move away from freight consolidation activity including that involved in LCL freight. The rail authorities which still perform the task are giving it close scrutiny. LCL freight consigned with private freight forwarders is consolidated for linehaul travel, much of which is by rail (in containers or vans). The issue, then, is whether rail can perform the total LCL task as or more efficiently than private forwarders.

AN no longer carries LCL freight. Westrail carries LCL by road only, through a joint venture with a private firm.

Queensland Railways' general freight operations recorded an operating loss of \$300 million (or \$480 million on a fully distributed costing basis including debt charges) in 1989-90 with cost recoveries of as low as 9 per cent and losses of \$500 per tonne being quoted for some significant amounts of QR's LCL traffic. In seeking to reform its general freight operations, QR is reducing the number of freight centres it operates from 312 to a minimum of 23 major centres. It will run fast freight trains between the major centres and use road transport to collect and distribute freight to smaller centres.

¹ Victoria is moving to allow greater operation by B-Double vehicles and the decision of the July 1991 special Premiers' Conference to establish a National Road Transport Commission (see Appendix D.9) will allow the operation of B-Doubles under nationally uniform conditions.

The day of the small train trundling slowly between small country centres with a wagon or two for each location is gone. Road transport is much more efficient at providing this type of distributive service and is much more convenient for the customer. (Queensland Department of Transport 1990, pp.72-3)

Notwithstanding this, the Queensland Government stated in its submission,

Although small freight is generally considered not profitable or efficiently handled by rail, it is believed that scope does exist for QR to provide a marketable service in certain areas. (Submission 50, p.42)

It is stated that there is only a problem in country areas which cannot sustain both QR's service and freight forwarders moving consolidated LCL on rail. QR thus intends developing a policy for LCL on an 'area by area' basis whereby for any particular area it will adopt one of the following options:

- (i) QR promoting one (or more) forwarder in a given area and ceasing its own retail activities, (i.e. effective partnership with forwarder);
- (ii) QR not providing a wholesale service to forwarders but retailing direct;
- (iii) QR competing with forwarders in certain areas.

Options (ii) and (iii) are to be maintained in the long term only where QR can demonstrate that it can add value to the line-haul, by offering a retail service (or where Government provides specific CSO funding). (Submission 50, p.25)

Options (i) and (ii) appear to require regulation which suggests that QR is actually not competitive in LCL. If option (iii) is not feasible, it is apparent that QR should not be operating its own LCL services. No option should preclude QR operating a linehaul service for forwarders if such is profitable for the railways.

After a V/Line proposal in 1986 to abandon the LCL market, union and public pressure caused the Victorian Government to direct the retention of LCL services (Andrews and Gray 1990). In Victoria, freight is now moved by road and rail through a rationalised network of country freight centres. The PTC has stated that it is exploring options for its LCL 'Fast Track' service including the improvement of cost recovery, selling the business, or entering into a partnership.

Although a Booz.Allen & Hamilton report (1989b) recommended divestiture or shutting down of the SRA's LCL 'Trackfast' service, the NSW Government chose rather to 'trial' the rejuvenation of LCL freight. Under the Trackfast Recovery Plan agreed to in 1989, Trackfast has until June 1993 to cover fully-distributed costs (and until December 1991 to break even on operating costs). This decision has been explained as being principally for industrial relations purposes: union acceptance of major staff reductions across the SRA depended on a survival plan for Trackfast (Australian Transport and Distribution Management 1990).

As part of the Recovery Plan, the SRA has made extensive changes to Trackfast. The service is being heavily marketed (for both LCL and full container loads) and it too is using road for part of its LCL service - much to the chagrin of parts of the road transport industry such as the NSW Road Transport Association. The Association has accused Trackfast of severely destabilising existing freight rates, and has complained about Trackfast's road operations being exempt from many taxes which other road transport companies pay. Trackfast also has access to deficit funding.

In NSW, rail is used only for the linehaul between Chullora (Sydney) and five major freight centres, with the pickup and delivery (PUD) and remaining haulage being by road, mainly using private contractors. The NSW Treasury stated that 'The phasing out of State Rail's road operation in favour of contract haulage is a key factor in cost reduction' (Submission 130, p.24). This is an example of complementary roles for road and rail in performing a freight transport task, a trend which is economically rational.

A review of Trackfast announced in July 1991 by the NSW Transport Minister indicates that the NSW Government is considering the sale of Trackfast because of its deteriorating financial position as a result of the recession. A range of options is being considered, including the involvement of the private sector and employees. One possibility is the use of rail for only the linehaul to major centres and private operation of terminals and private pickup and delivery. Expressions of interest were sought in August 1991 for the future commercial operation and/or ownership of Trackfast.

11.2.3 Costs, freight rates and cost recovery

Most of the following discussion is relevant to intersystem as well as intrasystem freight; it thus is not confined solely to intrasystem activity.

Costs

The costs of providing non-bulk rail freight services relate to several discrete physical tasks: pickup and delivery costs, terminal costs and linehaul costs. Pickup and delivery costs are involved in the LCL freight task. The trend away from such pickup and delivery appears sensible given the relative advantage of road transport in the PUD task. Thus, if rail remains in the LCL business, the increasing involvement of road vehicles in their LCL operations is also appropriate - subject to such operations being operated commercially which may mean private provision of road services.

The more that terminal activity can be minimised the greater the advantage of rail over road by virtue of the large economies of density in its linehaul activity. Thus AN states:

Train operations must be simplified and based solely on terminal-to-terminal movements. General goods trains for containers, steel and manufactured products can achieve high productivity and reliability by operating like present coal and other bulk commodity trains, as permanently fixed units of sufficient size to obtain economies of large scale. The very high costs involved in marshalling, shunting and ad hoc repairs must be eliminated.

Rail and road transport should be closely coordinated by creating effective interfaces at all major capital city freight terminals. Rail's strength as potentially the most efficient form of line-haul transport should be complemented by road transport's unique ability to provide for door-to-door distribution. (Submission 64, p.8)

Travers Morgan has undertaken work for the Commission, reported as Appendix K, which indicates the possibility of a reduction in operating costs for intrasystem freight (other than coal, other minerals and grain) of 35 per cent under international best-practice costs. It suggests, for the current freight task, reductions for the SRA of 32 per cent, the PTC 40 per cent, QR 39 per cent, Westrail 21 per cent and AN 27 per cent. The savings vary by system, but for the existing task these reductions would not be sufficient to eliminate deficits. Greater reductions are forecast for intersystem freight, reported in Section 11.4.

Freight rates

For LCL and other intrasystem non-bulk freight which is not regulated, freight rates are very much influenced by the competitive pressures of road transport. Road freight charges effectively set an upper limit and, given the perceived lower quality and service of rail, it is argued that rail needs to be 15 to 20 per cent cheaper than road rates to be competitive (Beasley and Kettle 1985). It may be noted that AN set charges much higher in a successful bid to discourage the carriage of LCL traffic (IAC 1989), and eventually moved out of the business altogether. Where systems are able to set rates without government interference, a more commercial and efficient approach can be followed. The SRA's Trackfast, for instance, now negotiates rates for LCL freight. This is consistent with the NSW Government's view that the SRA's freight prices are, and should be, negotiated on a cost-plus basis. It further stated that,

As a general principle, the Government is of the opinion that efficiency is maximised when the price to the user is an accurate reflection of the real cost (including externalities and the cost of capital) (Submission 75, p.4).

The Western Australian Government stated that Westrail's freight rates are generally set in a quasi-competitive manner and are partly determined by expected road freight rates - even for regulated commodities (Submission 43, p.48). In the first instance, though, Westrail's rate setting policy is closely related to costs such that rates are required at least to cover avoidable costs of moving a particular freight, while being competitive with the market, as seen in its explanation:

- (i) rates must at least cover avoidable costs;
- (ii) given that (i) is satisfied, rates as a whole must be set sufficiently above avoidable costs to cover (or seek, to cover) the fixed costs in the system;
- (iii) simple formula approaches to recovering fixed costs, while appearing to be equitable, may well be counterproductive if, as a result, traffic is either lost to competition or does not move at all;
- (iv) as a result of (iii) rates must be set above avoidable costs in a manner which reflects the costs of services available from competitors (including service factors of value to the user); and
- (v) provided avoidable costs are covered, variations in rates do not constitute cross-subsidisation of one user by another. (Western Australian Government, Submission 43, p.48)

As noted in Section 10.2.2, these principles allow monopoly pricing of regulated commodities.

AN's freight rates are influenced by principles determined in accordance with statutory requirements, corporate objectives, particular community services and agreements entered into with other rail systems. AN comprehensively explained its policy as follows:

Rates and fares are determined by AN in a manner which accords with commercial practice, taking into account relevant factors including the cost of providing services, projected future revenue rates and fares and levels of service which are or could be provided by competitors, and any financial assistance provided to the Commission by the Commonwealth or by the States of South Australia and/or Tasmania.

Unless the Commission considers it desirable for commercial reasons or other reasonable cause, rates are in general sufficient to cover:

- Costs incurred for the continuing operation of a service, including the cost of operation, maintenance of rollingstock, permanent way, buildings and structures, interest and depreciation on capital employed, and for the management and administrative services of the Commission.
- An allowance to meet the financial targets of the Commission, including any dividend to the Commonwealth determined in accordance with Section 57 of the ANRC Act 1983.
- Consistent with AN's corporate plan and with annual financial requirements set down by Government, implementation of these principles is aimed at retaining as much as possible of AN's business in the long term. (Submission 64, pp.16-17)

In summary, this policy involves prices covering at least long-term avoidable cost in respect of each commodity origin-destination movement, and contributing towards earning a rate of return on the assets employed. AN argues that its

market environment and its corporate commercial goals including the need to generate revenues to cover reinvestment to ensure the long term viability of its operations, provide sufficient incentive to ensure the implementation of an effective pricing policy. (Submission 64, p. 28)

Cost recovery

The rail systems mostly are adopting the goal of full financial cost recovery for their total non-bulk freight operations. AN, for example, is compelled to operate on a commercial basis, that is cover all costs (including the costs of capital) in the long term. Rail systems ought to be able to achieve cost recovery for non-bulk freight if they concentrate on commercial services.

It is not appropriate to continue operation of particular freight activities when, in the long-term, avoidable costs will never be covered and no contribution made to fixed costs. Even in NSW where the SRA has made a major effort to improve the financial performance of its LCL services, Trackfast had an operating deficit of \$10 million in 1989-90 with revenue of \$27 million. Although this represents an improvement over previous years - Trackfast lost \$41m in 1987-88 and \$32m in 1988-89 - it is difficult to envisage Trackfast succeeding even in the longer term. Indeed the NSW Transport Minister has suggested annual losses will be at least \$14m in the subsequent two years. This represents an annual loss of about \$25 000 per employee. Political and industrial pressures appear to have preserved this service in the short term, although the continued operation of Trackfast is currently being reviewed.

The rail systems must not be obliged to operate non-commercial services unless receiving compensation under a community service contract, such that full cost recovery should still be achieved. Thus, as AN stated,

As far as the rail system is concerned, the task is to achieve a commercial result taking revenue supplements into account. (Submission 64, p.29)

Although there may be a requirement to achieve full cost recovery in aggregate, there is no economic rationale for every particular freight activity to achieve this. For instance, given the existence of rail infrastructure for other tasks, the short-run marginal cost of providing a particular service may be fairly small, in which case it should be retained so long as it is covering such costs (even if in the short run it may be making no contribution to other costs). Such does not appear to be the case for LCL services.

RECOMMENDATION 11.1

The Commission recommends that individual freight services, in particular LCL, should be retained only if they at least cover short-run marginal costs (including all applicable taxes and financial imposts) and in the longer term will make a contribution to fixed costs.

Regarding Recommendation 11.1 the Victorian and Western Australian governments made no comment. The NSW Treasury appeared to be in basic agreement (Submission 130, p.9). Several inquiry participants, including the Commonwealth Department of Transport and Communications (Submission 128, p.7) and the Queensland Government (Submission 135, p.21), expressed the view that the retention of individual freight services, in particular LCL, should be a matter of commercial judgement by railways. The Commission agrees, so long as railways are operating commercially, in which case they should reach the same conclusion as that in Recommendation 11.1.

The Australian Road Transport Federation considered the recommendation not strong enough, stating:

This recommendation sentences the railways, and the community, to continued deficits. Drastic action must be taken to rationalise the railways' operations. The "soft" option of only covering short-run avoidable costs, which because of the high fixed cost structure of the railways, means that optimisation of the railway network and services will be slow and subject to creative costing approaches. By setting a low standard for the minimum price to be attained tends to institutionalise short-run avoidable costs as the price to be achieved. The significant short-run unavoidable costs merely become the new deficit. (Submission 124, p.18)

The Commission appreciates this concern, but would not wish to exclude the possibility of continuing to operate, at least in the short run, services which meet short-run marginal cost.

Although revenue data are reported in Table 11.1, costs and hence data on cost recovery are difficult to obtain in disaggregated form. One example is that in 1989-90 there were losses of about \$70 in QR for every tonne of general cargo and livestock (as defined by QR) carried, or about \$480 million for LCL and other intrasystem freight (on a fully distributed carting basis including debt charges), and \$14 million for intersystem freight.

The Public Transport Commission of Victoria tabled evidence of its total freight financial performance which shows revenue is not covering train running and traffic semi-variable costs (as calculated by Railcost) with revenue contributing 61 per cent of total costs in 1988-89. Cost recovery for the Fast Track LCL service currently stands at about 50 per cent, losing the PTC about \$10 million a year.

If railways agreed that LCL and other intrasystem non-bulk traffics were inherently unprofitable, a decision to withdraw from these services would save the community several hundred million dollars.

11.3 Intersystem freight

Both the problems and potential of non-bulk rail freight are particularly evident in the intersystem freight segment. This was clearly recognised in the establishment in 1989 of the National Freight Initiative Committee (a short history of which is outlined in Appendix D) and the agreement to establish formally the National Rail Corporation (NRC) at the special Premiers' Conference in July 1991. The NRC ought to facilitate the resolution of the many difficulties which currently face this segment of the non-bulk task and which are noted in subsequent sections of this chapter. In general, the Commission's findings strongly support establishment of the NRC.

11.3.1 Current arrangements

Intersystem freight is the responsibility of two or more systems. Because of different gauges, transshipments or bogie exchanges are sometimes required. An extreme example is of freight travelling from north of Brisbane to Perth which needs transshipment from narrow to standard gauge in Brisbane and which traverses four rail systems.

Details of rail freight tonnages between each system are shown in Table 11.2, while Table 11.3 gives rail's market shares on particular intersystem corridors.

Table 11.2: Intersystem rail freight activity ^a, million tonnes, 1989-90

<i>Origin</i>	<i>Destination</i>					<i>Total</i>
	<i>SRA</i>	<i>PTC</i>	<i>QR</i>	<i>Westrail</i>	<i>AN</i>	
SRA	-	1.23	1.40	0.46	0.46	3.55
PTC	0.87	-	0.27	0.46	0.77	2.36
QR	0.62	0.13	-	0.01	0.07	0.83
Westrail	0.11	0.15	0.03	-	0.19	0.49
AN	0.38	0.74	0.16	0.61	-	1.89
Total	1.99	2.25	1.86	1.52	1.50	9.12..

a Includes small amounts of bulk freight.

Source: National Freight Group.

As indicated in Table 11.2, flows vary considerably by direction on several routes. For example, Sydney to Brisbane which carries the highest tonnage of any corridor, handles more than double the tonnage of Brisbane to Sydney yet has a smaller percentage of the market (see Table 11.3). Rail has lower market shares than road in the shorter eastern corridors; in the longer Adelaide-Perth corridor rail is dominant.

As noted in Chapter 5, the Commission received evidence of concern about the effects of road freight activity on the community. This concern should be seen in context. The total annual Australian freight task performed on land amounts to 170 billion net tonne-kilometres. Of this, over 30 billion ntk, or about 19 per cent, is total interstate freight (see Table 2.1). The media representation of road freight as large six-axle trucks plying the open interstate highways is not representative of most road freight activity which is actually urban and intrastate. Rail cannot sensibly transport all intrastate freight. It is already an important carrier of mineral and grain transport and much of the remainder - in terms of tonnes - needs to be transported within cities or - to a lesser extent - to where there is no convenient railhead.

Table 11.3: Intersystem non-bulk rail freight activity by corridor ^a, 1988-89

<i>Corridor</i>	<i>'000 tonnes</i>	<i>Tonnage shares (per cent)</i>		<i>Distance (km)</i>	
		<i>Rail</i>	<i>Rail^b</i>	<i>Road^b</i>	<i>Rail</i>
Sydney-Melbourne	1 338	22	78	960	870
Melbourne-Sydney	1 195	22	78		
Sydney-Brisbane	1 881	33	67	989	1 020
Brisbane-Sydney	757	40	60		
Sydney-Adelaide	976	25	75	1 692	1 422
Adelaide-Sydney	644	25	75		
Melbourne-Adelaide	1 227	25	75	700	740
Adelaide-Melbourne	1 055	31	69		
Adelaide-Perth	1 524	65	35	2 657	2 795
Perth-Adelaide	497	60	40		

a Freight activity on a corridor includes any intersystem traffic moving within the corridor; for example, the Sydney-Melbourne corridor includes tonnage moving Sydney-Melbourne only, Wollongong-Melbourne and Melbourne-Brisbane. This leads to some freight being counted on two or more corridors.

b Non-bulk freight.

Sources: NFI (1990a), ISC (1990, Volume 2, pp.266-7).

For interstate land non-bulk traffic, rail accounts for 47 per cent of ntk, or 38 per cent of tonnage. On a tonnage basis, the interstate rail freight task represents less than one per cent of the total land freight task in Australia and an even smaller share of the total (land and sea) freight task. If interstate land freight ceased to be carried by rail, there would be a considerable increase in interstate highway usage by interstate trucks. However, even if rail carried all interstate traffic, it would not imply the elimination of trucks on the interstate highways, because many of those trucks are involved in intrastate or local transport activities.

From another perspective, interstate rail freight represents less than 20 per cent of total government rail system revenues and its strategic importance varies by system. Intersystem freight is more important than the remaining non-bulk and bulk freight segments only for AN. This goes some way to explaining the reason for railways' traditional disinterest in intersystem freight - except by AN.

Intersystem rail freight involves four main customer groupings: overseas shipping containers, steel, freight forwarders, and other non-bulk freight (such as paper, motor vehicles, cement, petrol). Four customers together account for nearly half the intersystem rail freight revenue, and thus have a very strong interest in intersystem developments.

The carriage of general freight for freight forwarders is a major and growing part of the intersystem freight business. Unitised intermodal freight continues to increase in importance. In 1989-90, 61 per cent of the intersystem rail tonnage comprised intermodal loading, being carried in containers (term hire, private/rail owned, or overseas shipping) or by piggyback. The remaining 39 per cent, comprising non-intermodal loading, was carried directly by rail vans and wagons. BHP Transport Limited (BHPT) expressed concern about the concentration on intermodal services in the railway domain and called for a much higher profile for non-intermodal freight, noting that revenue earned from the two broad traffic types is about the same (although it recognised that revenue is not necessarily directly related to a traffic's contribution to costs) (Submission 111, p.4).

The rollingstock used for the intersystem freight task is owned by the various systems, but controlled by a centralised wagon monitoring system, CENWAG, which is administered by the Railways of Australia Committee (ROA). CENWAG also coordinates intersystem freight activities and monitors and reports operational and service quality performance.

Intersystem rail freight is handled by various types of rail service, each providing different price/quality characteristics. Ordinary general freight and container trains tend to operate in off-peak times and do not provide high speed or overnight transit times. Trains hired on an annual basis by several major freight forwarders operate daily between Melbourne, Sydney and Brisbane. There are unit trains operated for major customers such as those carrying steel for BHPT, automobiles for Ford and overseas shipping containers for Linertrains. The railways' premium container trains are the Superfreighter services. These use point-to-point unit trains operating in both directions - most with one or two daily services - on the following corridors: Sydney-Melbourne, Sydney-Brisbane, Melbourne-Brisbane, Sydney-Adelaide, Sydney-Perth, Melbourne-Adelaide, Adelaide-Perth and Adelaide-Alice Springs.

The National Freight Group (NFG) within ROA coordinates intersystem marketing (including setting rate structures and allocation of revenue between systems) having the objective 'to improve the contribution of individual rail systems from their intersystem traffic' (ROA 1990).

Despite the formation of the National Freight Group, national freight customers are still dissatisfied with their relationship with the rail service. They accept that some progress has been made but consider the five systems do not have sufficient cohesion or flexibility to see the whole freight task from the customer's point of view. (RIC 1990a, p.58)

The dissatisfaction appears justified, but the NFG has an uneasy role and has not received sufficient support from the State rail authorities. Although it can claim many achievements in its coordinating role, there is an urgent need for more effective coordination.

Apart from the fragmented management and lack of centralised operational and management control, efficient operation of interstate services is considerably hampered by differences between the rail systems. Major technical incompatibilities between railway systems relate to the following:

- railway gauge;
- rollingstock gauge outline;
- engineering standards of standard gauge track;
- crossing loop length;
- work practices;
- safeworking and control systems;
- wagon design standards; and
- terminal capacity.

Consider the likely plight of a typical container sent by rail between Sydney and Perth and which will or could be subjected to the following:

- 3 non-integrated rail systems (AN, SRA and Westrail);
- 4 changes of locomotives;
- 5 different sizes of loading gauge;
- 10 different engineering standards of the basic standard gauge rail track; and
- 12 or more hours at sidings/junctions for crew changes, refuelling, inspections, etc.

(House of Representatives Standing Committee on Transport, Communications and Infrastructure 1989)

What have an even greater impact are the fundamental differences between rail systems in the strategic importance of intersystem traffic. This is well explained by the Inter-State Commission (ISC) as follows:

... the strategic importance afforded to interstate traffic in System A is determined by System A's priorities, not by the railway system as a whole; marketing to customers in System B is restricted to System B's marketing officer, even if the greater operational and financial impact is on Systems C and D; System C undertakes investments according to the costs and benefits to System C, not to the network as a whole; System D assesses the financial performance of a traffic on the basis of its own share of costs and revenues, not those of the business segment as a whole. (ISC 1989, vol 2, p.233)

As stated in the Final Report of the National Freight Initiative (NFI 1990a), the investment priorities of rail authorities do not favour intersystem freight, even though significant sections of the Melbourne-Sydney-Brisbane corridor exist primarily for interstate traffic.

The Commission, in company with many previous reviewing bodies, finds that the efficiency of intersystem operations is hampered by differences in standards between systems and by the lack of a coordinated freight management system.

Particular areas of concern are canvassed in the following sections.

11.3.2 Costs, freight rates and cost recovery

Setting of freight rates for intersystem movements is undertaken by the NFG with all systems having an influence on determination of rates, none of which is regulated. Rates are 'market-based', with six-monthly reviews of interstate rates. These reviews do not lead to simple changes in rates by a constant percentage, no matter what the route and task. However, for the majority of intersystem traffic, rates are actually set by individual rail systems which have discretion to negotiate interstate rates 'for special packages of freight'. There appears not to be a pricing structure which for any particular traffic takes account of both the extent of road competition and the contribution to fixed costs. Also, rates generally do not allow bonuses and penalties to take account of the performance of the system and the customer. BHP Transport Limited noted, however, that it now has two agreements incorporating such provisions (Submission 111, p.9), although the costs of non-performance are infinitely more than the penalties (Draft report hearings, p.58).

Several inquiry participants asked for details of rail freight deficits. Presenting a comprehensive breakdown of non-bulk freight deficits is no easy matter given the involvement of five systems and the difficulties of allocating costs between different services. At the aggregate level, intersystem rail freight revenues and estimates of costs (using Railcost) for 1987-88 were prepared for the Inter-State Commission by ROA on behalf of the rail systems (ISC 1990, Volume 2, Appendix XV). These estimates indicated that in 1987-88 the avoidable costs (direct variable plus semi-variable costs) for the five systems totalled \$455 million out of total costs of \$652 million. With total revenue for the five systems amounting to \$417 million, the rail systems failed to achieve cost recovery of total costs (54 per cent) and even of avoidable costs (92 per cent). For the individual systems, AN and Westrail achieved full recovery of intersystem rail freight costs. AN would not

have achieved full cost recovery if it had depreciated its rollingstock at replacement costs as did the other systems.

The final report for the National Freight Initiative (NFI 1990a, p.45) presents aggregate figures for the NFI network (basically intersystem services plus Adelaide-Alice Springs) for 1988-89 showing revenue of \$490m, long-run avoidable costs of \$443m (and thus cost recovery of 110 per cent) and fully distributed costs of \$792m (and thus cost recovery of 62 per cent). The annual deficit of interstate rail freight services being commonly quoted at the establishment of the National Rail Corporation was around \$375 million.

As Section 11.4 indicates, there is significant scope for cost reductions. If intersystem freight services were operated at world standard efficient costs, there would be a reduction in current operating costs of 44 per cent, saving about \$270 million annually.

Although AN and Westrail are the only two systems that can boast of anywhere near satisfactory financial performance in their intersystem operations, the Inter-State Commission (1990) makes the following observation:

Improvements to services and productivity will allow interstate freight traffic to make a greater contribution in the recovery of total costs as costs fall and revenues increase. Higher prices set to cover the costs of inefficient operations will not necessarily lead to improvements in overall cost recovery, as rail is likely to lose traffic. Furthermore, it would be short-sighted to require railways to rationalise services in the interim that could cover avoidable costs in an efficient operation in the longer term. Any requirement for railways to recover all of their financial costs, however, should lead to more efficient operations in the long run, providing there are no abuses of monopoly power.

The Commission finds that a strategy is required which involves a determination to decrease costs through improved operating efficiency, and revenue enhancement through increased market share and more efficient pricing.

Intersystem freight revenue is allocated according to a formula contained in a 1968 ROA Minute (and subsequent amendments) administered through the ROA. The formula divides revenue on a standard distance basis after deducting 'ancillary charges' for terminal (loading and unloading) allowances, local charges (for suburban locations) and transfer costs (for bogie exchanging, transferring and transshipping) (ISC 1987a).

The formula offers little incentive for railways to improve marketing, operating performance and investment decision-making because it takes no account of marketing costs, too little account of terminal costs, and no account of topographical differences affecting linehaul (distance) costs. For example, the SRA stated in hearings that generally Australian rail freight terminals are not up to modern standards, suggesting 'that one of the reasons is because the revenue sharing has not provided the requisite funds to enable the railways to build those terminals.' (Initial hearings, p.623). The NSW Treasury stated that:

NSW has by far the most difficult terrain for trains to negotiate on its interstate routes. A recent internal analysis estimates that if revenue was apportioned on an efficient cost basis, NSW could benefit by up to \$50 million per year, albeit at the expense of some systems. (Submission 130, p.25)

AN suggested that:

The problem suffered by some rail systems in relation to revenue sharing arrangements results from high levels of costs, not from inadequate revenue shares. (Submission 115, p.6)

This raises the questions regarding what are efficient costs, and on what investment levels and timings these costs should be based. In other related revenue-sharing matters there have been proposals to introduce a revenue generation allowance as part of the terminal charge, and AN states that other factors such as the daily wagon maintenance levy are more significant than the revenue sharing arrangements (Submission 115, p.7).

Having one organisation responsible for intersystem rail freight ought to obviate these problems.

The Commission finds that the current revenue sharing arrangements contribute to the poor performance of intersystem rail freight because they result in inefficient investment decisions, poor marketing and inefficient operating practices.

11.3.3 Service characteristics

In considering cost recovery aspects of the non-bulk rail freight task, discussion of rate setting has been abstracted from the service characteristics of the rail freight product. Like any other good or service, rail freight services can be provided in a range of price-quality bundles. As intimated in Section 11.2.3, rail presently needs to offer a discount on road rates because of its perceived lower quality.

Market analysis consistently suggests that road services generally are perceived as being reliable, fast, flexible, and competitively priced door-to-door, whereas rail generally is not. Reliability - however defined - is consistently mentioned in submissions and other reports as being the key factor. It is apparent that the impact on rail market share of improvements in any other service characteristics is likely to be minimal until reliability is achieved.

Rail's actual performance in terms of service characteristics is generally seen to be appalling. As one example, Grocery Manufacturers of Australia Ltd (GMA) identified (from its perspective) the following list of shortcomings of existing rail services:

- Relatively high costs
- Lack of reliability
- Lack of flexibility
- Outdated, poorly maintained terminal facilities
- Slow transit times

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- Damages in transit
 - Susceptibility to industrial disruption
 - Lack of customer orientation (Submission 12, p.1)

The GMA also noted the lack of system coordination and lack of available rollingstock. On a positive note, in a survey of GMA members, most referred to an increasing 'commercial consciousness' in the rail systems, reflected in improved rates particularly on long haul routes, and improved services such as the overnight and Superfreighter services.

Another aspect is presented by BHP Transport Limited, rail's largest single non-bulk customer. BHPT stated that it is generally pleased with the high quality service which individual rail systems can provide, however, it is concerned with the relatively poor level of interstate rail service. The key adverse issue cited is reliability. The following material submitted by BHPT presents a very sorry picture.

One of the major difficulties in measuring service performance is the lack of timely, reliable data available from the rail systems on transit times and on-time running. Accurate monitoring and recording of data covering all aspects of train operations to establish outages and causes of delays is vital if improvements to service are to be expected.

As an example service plans for Newcastle (Moorandoo) to Perth, and for Port Kembla have been drawn up by National Freight Group (ROA) together with rail systems and BHP as a step towards a more orderly flow of steel traffic. These show, and rail systems confirm, that four days is a reasonable, achievable target transit time from works sidings to customer sidings.

Regular achievement of the accepted target rather than efforts to reduce the transit time to say three days is of much more importance to BHP.

Recent monitoring of wagons in our East-West corridor indicate no transit times of four days are achieved at all, and actual transit times ranging from five to ten days are the norm. Reasons given for delays included "red-carding" at Forrestfield for repairs, and wagons held at Kalgoorlie for load adjustment. Another reason for unscheduled delays is the selective dropping-off of steel wagons (being treated as non-time sensitive traffic) at Kalgoorlie, due to mis-matches in loco power between AN and Westrail.

ROA (Cenwag) statistics indicate that wagon transit target achievement (with target achievement being for 80% of wagons to arrive with target transit time of 4 days) to be between 15% and 40% on a monthly basis over a six month period. (Submission 32, p.12)

Notwithstanding the above comments, in a later submission BHPT stated that 'it is fair to say that progress has been, and is being made by rail, in improving its service for the movement of steel products' and mentions several encouraging developments (Submission 111, p.6).

Other witnesses referred to poor service levels: Nissan Motor Manufacturing Co (Australia) Ltd applauded recent attempts by rail authorities to improve motor vehicle transport service levels, but stated,

... experience has shown schedules are not being maintained. Transit times are thus unreliable and remain generally poor, with feedback and communication on vehicle movements virtually non-existent. By contrast road transport operators offer guaranteed delivery times and have sophisticated vehicle tracking systems. (Submission 37, p.2)

To put it simply, a customer generally would rather a cargo took a longer but guaranteed time, than a shorter but uncertain time. For customers seeking to minimise inventory holdings with just-in-time arrangements, this is critical.

These chronic reliability problems are recognised by some of the systems. AN, for instance, acknowledged that reliability of service is the key factor in inducing users to shift long-distance road freight to rail. AN noted the need for improvements in reliability of scheduled transit times, reduced terminal delays, and faster transit times for selected time-sensitive goods (if they can be reliably delivered). AN also reported market studies indicating that rail's market share in key interstate corridors could be improved by at least 10 per cent, if reliability were improved. AN stated that:

The market researchers accordingly recommended that for the short term, rails' pricing strategy should be geared towards fund generation for the purpose of financing service improvements and promotion rather than towards buying market share. (Submission 64, p.70)

AN reported significantly lifted on-time performance of Superfreighters on several major corridors (Submission 115, p.7). In NSW the SRA was reported to have made considerable efforts to improve the reliability of scheduled services, it being noted that:

Organisational restructuring in recent years has been aimed at making the business more commercially driven, with the needs of the customer taking priority over operating traditions. (NSW Treasury, Submission 130, p.25)

AN mentioned a major internal reorganisation aimed at lowering costs and improving service levels. AN is grouping within one division, the rail transport division, all of those functions which are necessary to operate trains. Another division, AN Freight, will contain all those functions which interface with the customer. Each division will operate on a profit centre basis. The result:

... will make the people who operate the train service and provide the infrastructure for those operations rather more accountable for what they do in terms of the quality of the service and the costs. (Submission 115, p.414)

The Commission concludes that there is still a need for major improvements in the service level provided by rail, primarily its reliability, if it is efficiently to provide non-bulk freight services.

Particularly important is the need to understand the nature of the freight market which rail is seeking, and the need for rail systems to define the nature of their freight business. In its submission, AN argues the case for rail to provide services in markets only where it can achieve a long-term competitive advantage.

Rail should specialise in line-haul point-to-point movements of substantial volumes of freight, sufficient to provide frequent loading of efficient-sized trains (at least 1.5km long). This includes inter-capital movement of domestic and shipping containers, manufactured goods (including steel, cars, white goods, foodstuffs) and bulk products.

Rail should rely on freight forwarders to provide the distribution links to users, other than major producers and distributors of manufactured and bulk products. Box-car services to small sidings and LCL (less-than-wagonload) consignments would be converted to road distribution and freight forwarder business respectively. (Submission 64, p.7)

Also of importance is the need for rail to provide a customer-oriented service. Yet management apparently struggles to provide even basic customer information - often because it has little idea itself what is happening, particularly for interstate trains for which responsibility is diverse. Even within States, systems admit to the need for improved performance monitoring. Westrail is currently considering possible indicators to measure service quality including services run to schedule, services available when required, transit time, and communications (providing required information to clients). The relevant business groups within the SRA have established service quality indicators including mis-trucking rates (that is, for wrongly directed consignments), average train speed, percentage locomotive availability and on-time running.

AN has for some time had extensive procedures for monitoring performance against annual targets for customer service, notably relating to transit time and reliability of the rail line haul, with the results being widely published. It also has weekly freight performance measures which detect deviations from specified parameters. In its submission AN reported an attempt, made at its instigation, to monitor theft and related damage to freight consignments; due to lack of reliable incident reporting by most systems, this has thus far been unsuccessful. With respect to interstate freight, AN also noted that it is particularly difficult for rail systems to reach agreement on service specifications for each freight service. Without these it is impossible to establish an adequate system of service quality performance monitoring. AN proposed that improved customer relations would follow from:

- Service standard agreed by rail systems and customers in service contracts.
- Service standards being "sold" to rail systems and customers where all parties agree to perform to the standard.

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- Transit times and other aspects of performance being available as real time information for management purposes.
 - Accumulated performance information being available on an agreed period basis for both management and customers.
 - Communication of all kinds of service deviations to customers, with action taken to minimise the impact of any delays.
 - Analysis of performance failures enabling identification and removal of performance blocks by all concerned, regardless of where problems occur in the total rail system. (Submission 64, p.31)

The Commission finds that rail must increase its commitment to a customer-oriented service which will require significantly increased cooperation between systems. The National Rail Corporation offers the prospect of major improvements in customer-oriented service.

11.4 Intersystem efficiency

Section 11.3 has demonstrated the scope for improvement in the efficiency of intersystem rail freight. In examining ways of improving the technical or operational efficiency of non-bulk rail freight, there are many possibilities for reducing the costs of service provision.

If Australian rail systems were operating with international best-practice costs, total interstate freight operating costs would be 56 per cent of their existing level.

The potential for reducing interstate operating costs, as found by Travers Morgan for the NFI (1990b), is noted in Table 11.4. In moving to world standard efficient costs, particularly large improvements appear possible in wagon maintenance and examination, train crew, signals and communications, locomotive capital and wagon capital costs.

Travers Morgan has undertaken further work for the Commission, reported as Appendix K, which indicates the possibility of an even greater reduction in operating costs for interstate freight of 44 per cent under international best-practice costs. Applied to the existing network, this would imply an annual saving of about \$270 million.

Table 3.2 of Appendix K shows that of all freight traffic types, the greatest possible reduction is for interstate freight. Although the emphasis is on intersystem operations, many of the improvements would be of benefit to LCL and other intrastate operations. Most of the linehaul and terminal issues raised in this section are being addressed as part of the establishment of the National Rail Corporation. Some of these improvements require major capital expenditure which needs to be considered when evaluating the cost of achieving operational benefits.

Table 11.4: Potential operating costs using world standard efficient costs

<i>Cost area</i>	<i>Index using 'world standard efficient costs' (1988-89 Australian costs = 100)</i>	<i>Comments</i>
Locomotive maintenance	71	Assumes all 3000hp fleet
Wagon maintenance and examination	54	
Fuel and energy	92	Newer fuel-efficient locomotives; improved train control procedures and driving techniques
Train crew	60	All trains with one-person operation
Terminals	67	Based on mainly block trains and United States freight handling productivities
Signals and communications	49	Assumes ATCS technology and longer loops (less trains)
Track maintenance and capital	79	Based on United States best practice
Locomotive capital	48	Average life 22 years; 7 per cent real interest
Wagon capital	44	Average life 20 - 30 years
Corporate overheads	69	United States and Australian best practice
TOTAL	65	

Source: NFI (1990b).

11.4.1 Harmonisation of standards

The need for harmonisation of standards such as rollingstock, locomotives, train control, and consignment tracking is, as already noted, particularly relevant for intersystem freight. A cautious approach is needed, as outlined by AN:

... it would be necessary to ensure that the adopted standard is set at the highest common demonstrator rather than the lowest common denominator. This would not be a simple matter given the different business priorities and the consequent differing levels of technical sophistication amongst the rail systems.

Standardisation must be achieved without constraining innovation within rail systems if dynamic response to business demand is to be maintained. This is an advantage of the present arrangement of system-specific standards. Innovations can be adopted in the area where the most benefit can be obtained without being constrained by the demands and requirements of other, possibly non-commercial, areas. In North America innovative response to changing demands is often delayed due to the long and often high cost process of modifying standards to achieve harmonisation. (Submission 64, p.50)

Australian National Industries Limited (ANI) addressed issues of standardisation in its submission. It considered that:

... while a lack of standardization exists throughout the various railway systems and between the three classes of passenger transport, freight transport and locomotives, the greatest, most immediate benefits would be gained if any effort to standardize commenced with interstate freight transport. Improved efficiencies in this sector of the rail system would also provide support for the objectives of the National Freight Initiative. (Submission 76, p.4)

Many of the locomotives and some of the rollingstock on order or being built by the individual systems are the same. ROA is overseeing the establishment of rollingstock standards although, to quote AN, 'parochial prejudices continue to confound the process' (Submission 64, p.51).

The same point was made by the Australian Railways Union (Submission 63), with reference also being made to the effect of different shunting methods. The development of a 'National Shunting Code of Practice' is apparently not progressing due to little practical support from railways other than the PTC. The ARU has also been involved in establishing standard inspection procedures for new or modified rail freight wagons, a standard method for handling defective rail freight wagons and the development of standard design principles for rail freight wagons.

Compatible and inter-connected communications systems are important to efficient operations of interstate trains. Tentative steps are being taken including the adoption of common radio frequencies, but practical measures remain to be taken.

The Commission finds that efforts to harmonise standards have generally been ineffective. There is an urgent need to encourage greater harmonisation where operational efficiency will be most enhanced.

This issue is addressed further in Sections 12.4.2 and 12.5.1.

11.4.2 Wagons and locomotives

The operation of block and unit trains improves efficiency because of the need for less shunting. Many interstate services now operate on this basis, but there are gains to be made by introducing the same approach on smaller consists used for intrastate services. In hearings, Westrail stated that the thrust of its current strategic planning is to get out of less-than-train-load traffic (Initial hearings, p.983).

Chapter 3 of Appendix K notes the gains obtainable from international best-practice with respect to locomotive and wagon maintenance and capital. Obsolete rollingstock needs to be replaced by new wagons with lower tare weights and higher drawbar strength (Booz.Allen & Hamilton 1989b). AN stated that its 5-Pack articulated container wagons and 5-unit well-sets are cheaper than container flats and save 3.5 tonnes tare weight per 12.2 metre container carried. AN estimates that the cost

saving of running a high speed container train to Perth and back twice a week using 5-Packs is \$600 000 per year (Submission 64, p.39).

There is also a need to improve the availability of suitable wagons. Particular concern was expressed regarding the problems of carrying overseas shipping containers. BHP Transport Limited drew a contrast between modernisation of the intermodal fleet and the little attention being given to non-intermodal wagons for which ‘There is an urgent need for development of a wagon replacement plan to improve engineering standards and reduce costs of moving steel, and for implementation of such a plan’ (Submission 111, p.5). In hearings, BHPT admitted that there is a trade-off between the high capital costs of new wagons and the lower operating and maintenance costs of such equipment (Draft report hearings, pp.43-9).

AN has the exclusive licence for RoadRailers in Australia. This new technology comprises road trailers which can form a train with the only rail equipment required being one bogie per trailer. Although they have operated for many years overseas, RoadRailers are only just being introduced to Australia. They offer cost savings because they need less terminal space, cheaper paving and no expensive terminal equipment such as piggypackers. Because units are very close together, streamlining gives increased fuel efficiency and lower train operating costs, and there is less opportunity for theft. Technical problems with their operation in NSW east of Lithgow have been largely overcome. AN states that in its view the remaining problem of height clearance would require only moderate expenditure to rectify (Submission 115, p.7).

As noted in Section 10.5.1, Australian rail systems use locomotives for mainline traffic which are around twenty years old on average. Major operating cost savings can be made by using newer units with longer service maintenance cycles, lower maintenance demands and much lower fuel consumption. Of course these operating savings must be traded against the capital cost of new equipment. A consistent program of scheduled locomotive overhaul, replacement and retirement is a prerequisite to the attainment of operational efficiency; such was advocated by Booz.Allen & Hamilton (1989b) and now is being implemented by the SRA.

11.4.3 Permanent way

Changes to the permanent way also offer scope for cost savings. Intersystem and other freight operations are often limited by the maximum train length and weight permitted by crossing loop lengths, gradients, heights and widths on particular routes. These have been documented for intersystem routes by the Inter-State Commission (1990, vol 2). For instance, the otherwise very cost-effective double stacking of containers can only be undertaken in the Adelaide-Perth and Adelaide-Alice Springs corridors due to height restrictions (tunnels and electrification) in the eastern states. Track alignment could be improved, track structure upgraded and old bridges replaced to allow faster operations and less wheel wear.

There is scope for improved operational efficiency on the various existing intersystem corridors, a factor which strongly motivated the National Freight Initiative. It is the north-south corridors on the east coast where the greatest potential exists. The National Freight Initiative considered a capital program of infrastructure renewal, commercial projects and strategic projects including major upgrades of permanent way. These include NSW North Coast upgrading on the Sydney-Brisbane corridor, Adelaide-Melbourne Standard Gauge (via Geelong or Ballarat) and the Sydney-Melbourne Fast Freight Train (FFT) proposal. A subsequent study has been made into the eastern rail network, identifying specific network structure and investment priorities for the National Rail Corporation's Sydney, Melbourne and Adelaide corridors. The Commission is aware of the draft recommendation that the line west of Sydney, through Broken Hill, should not become part of the NRC network. Any final decision on this and other routes should be made in the commercial framework of the NRC. Such decisions will have a major effect on investment decisions elsewhere in rail networks.

The Northern Territory and South Australian Governments and others argue that there is also value in extending the Adelaide-Alice Springs railway to Darwin. A rail link from Darwin to Adelaide has been talked about for more than eighty years with many assessments made of the proposed railway. Between 1945 and 1983 there were four major studies, a consistent theme of which was that construction of a line from Alice Springs to Darwin would not be warranted, on economic grounds. Commonwealth Government commitment to complete the line, required as part of the agreement by which South Australia surrendered the Northern Territory to the Commonwealth, has waned following the Independent Economic Inquiry into Transport Services to the Northern Territory (Hill Inquiry 1984). That inquiry assessed the railway (and accelerated road projects) and concluded that investment in the railway could not be justified on the basis of a straight investment analysis or by using a social audit approach.

Subsequent to this the Northern Territory Government commissioned a number of feasibility studies. As stated by the Northern Territory Government, 'Without exception, these studies conclude that the rail link is not a financially viable investment proposition without Government funding' (Submission 83, p.4). Debate continues regarding the link's viability in economic terms once broader economic and social considerations are evaluated. A crucial issue is the tonnage likely to be carried on the line which would depend on the establishment of a major port development in Darwin and the feasibility of a competitive service from there to major cities. As noted by the Northern Territory Treasury, 'A complete north/south rail link combined with an efficient port interface in Darwin has the potential to drastically alter existing freight flows' (Submission 145, p.1).

11.4.4 Train priorities

In several systems, interstate freight trains currently receive lower running priority than passenger trains which, particularly in urban areas, generally have top - even if not absolute - priority. In Sydney, for example, there are major problems as highlighted by Booz.Allen & Hamilton (1989b). All four major freight routes into Sydney have high density passenger operations and yet none has adequate passing loops to allow passenger trains to overtake large freight trains. The consequent total freight curfews are very restrictive. If freight services are to run commercially - as are other services - there needs to be a commercial determination of priorities (such as by differential pricing for train paths). The NSW Treasury stated that internal pricing reflects the priority status of urban passenger services in the Sydney metropolitan area: Freight Rail is charged on a long-run avoidable basis only (Submission 130, p.26).

The Commission finds that freight services are disadvantaged by the practice of scheduling preference being given to passenger services and that appropriate pricing of all services is essential for proper ranking of priorities.

11.4.5 Terminals

Operations

In most circumstances, there is no need for rail authorities to undertake every part of the total rail freight transport chain. For example, pickup and delivery is performed by road regardless of the linehaul mode (unless there is a private siding direct to the customer), and consolidation/deconsolidation and loading/unloading occur in private and/or rail terminals. Thus, although linehaul operations are the only tasks necessarily specific to rail, terminals generally play a critical part in the rail transport chain and are frequently identified as a major stumbling block to rail's operational efficiency. As already noted, the principal factor determining rail freight demand is reliability. This makes terminal performance critical. Given that customers are concerned with door-to-door times rather than linehaul times per se, the efficiency of terminal operations plays a major role in influencing demand.

For example, the NFI Final Report stated that 'customers accurately perceive that terminal congestion and low productivity are major contributors to unsatisfactory interstate rail service' (NFI 1990a, p.54). It concluded that 'many existing terminal facilities are not coping well with the current task, let alone future growth' (NFI 1990a, p.25), noting the generally low productivity of Australian terminals, congestion at Acacia Ridge (Brisbane), Chullora (Sydney) and Dynon (Melbourne) and the scheduling of trains which do not take into account terminal capacity limitations. The report noted that together with train delays, terminal congestion delays container availability, adding between 5 and 7 per cent to customers' PUD costs. Mayne Nickless Limited

stated: 'Rail will only become competitive when the loading and unloading function at each end of a route becomes efficient' (Submission 51, p.5).

The trend to handling full-car-load (FCL) freight has had an influence on terminal operations with more consolidation/deconsolidation occurring away from the rail area - even if in forwarders' terminals within or adjacent to the rail terminal site where loading/unloading of trains occurs. Australian National has advanced the most in this direction with its Islington terminal in Adelaide being used only for loading and unloading trains. Consolidation/deconsolidation is a distinct activity which is performed separately, but in the vicinity of the terminal area.

AN has defined the principal requirements for a (loading/unloading) terminal as:

first, to provide a large train holding capacity with associated paved area for efficient movement of materials handling equipment (container lifters, forklifts, etc) and clients vehicles; and second, to provide a quick train turnaround and quick service turnaround of the trucking fleet. Multiple daily despatches to the economic limits of each corridor, rather than the costly 'peak hour' nature of current freight movements, would provide the most efficient and competitive service. (Submission 64, p.67)

On the basis of this definition, it is apparent that improvements in operational efficiency have already occurred in many systems. Appropriate technology such as Piggypackers, straddlecranes (on tyres), forklifts and other container lifters to complement and replace gantry cranes (which are constrained to rails) has been or is being adopted. Other examples of change include computerisation to reduce the paperwork associated with consignments, and improved facilities for block trains. Future or pending changes which may improve the efficiency of terminal operations include the use of control towers for management of terminal traffic and container transfer, and RoadRailers.

V/Line is implementing a strategy for the redevelopment of its South Dynon terminal, as part of its rationalisation of container handling terminals to handle forecast container traffic growth. The SRA is to redevelop its site at Enfield as the sole Sydney intermodal terminal, replacing the currently overloaded Chullora terminal, Cooks River, Clyde and other minor areas. QR is spending \$3 million expanding its interstate container facilities at Acacia Ridge where it also is spending \$26 million trebling the capacity of its existing goods shed and making other improvements to meet long-term country freight demand due to the transfer of all activity from its inner-city terminal at Roma Street.

Location

In all systems, the number of freight terminals has been or is being rationalised. There is still scope for rationalisation of the number of major city terminals and their location. There are two related major aspects: whether terminals be dispersed (sited on or towards the outskirts of metropolitan centres) or consolidated into one central facility; and whether single or multiple terminal sites are used. Important factors include:

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- Train operational constraints such as availability, priority and timing of paths through metropolitan areas, clearance and shunting requirements. Dispersed or smaller terminals and sidings require much expensive ‘milk run’ shunting to make up a single train for the linehaul trip. Booz.Allen & Hamilton (1989b) noted that ‘Within the Sydney metropolitan area, State Rail serves a multitude of container handling facilities. This dispersion of activity raises costs and reduces service levels.’ As earlier noted, the SRA has chosen to consolidate at Enfield.
 - Intermodal access to ports. For instance, in redeveloping South Dynon Container Terminal, V/Line is integrating the terminal with port facilities - in the long term this will involve constructing a direct dedicated road link between South Dynon and Swanson/Appleton Docks to enable road movements of preassembled shiploads of containers from the rail terminal to docks. This is consistent with AN's arguments for directing port containers into an economic unit train size which can be dealt with at a single container terminal with road connections to and from wharves (Submission 64, p.48).
 - Access to freight origins and destinations, that is close to customers.
 - Customer service when traffic is not concentrated at a single location.
 - Opportunity cost of terminal land. To receive a commercial rate of return on expensive city land, the charge for terminal costs needs to rise (see Section 6.2.4).
 - Varying social effects associated with any arrangements such as terminal noise and road congestion and safety issues. For example, the Transport Action Council of New South Wales referred to ‘The sufferings of the people of Bexley because of the failure of the Government to develop efficient rail haulage to and from Port Botany’ (Submission 127, p.13).

Overall, these factors support the current rationalisation of terminals.

Ownership and control

Non-bulk terminals are in the main owned by the railways. Freight forwarders and other private businesses do own/lease sidings and/or terminal space in or adjacent to railway sites for both consolidation/deconsolidation and loading/unloading activities. An example of private freight forwarder terminal operation is TNT-Contrans which first leased terminal sites in Melbourne (South Dynon) and Sydney (Cooks River) in 1968, since which time operations have been extended to Adelaide and Brisbane, with investment in major handling equipment such as gantry cranes. An example of a single customer involvement is BHP Transport with terminals operated by itself or a contractor in South Dynon (Melbourne), Acacia Ridge (Brisbane), Islington (Adelaide), Rozelle and Sandown (Sydney) and Kwinana (Perth). Another example is TNT's operation of a container terminal at Parkes (NSW), the ‘Inland Port’ with road and/or rail access to all major trading ports, many industries, local, national and international markets.

The future ownership of terminals, specifically for interstate freight, is being reviewed as part of the establishment of the National Rail Corporation. Indeed the National Freight Initiative arose from the concern of major users to improve terminal operation. The NFI Final Report noted the concerns of all rail users about having access to rail services only through competitor-managed terminals, and concerns of smaller customers about using major competitors' terminals individually or in consortium.

In April 1991 the National Rail Freight Corporation (NRFC) Task Force expressed the view that the NRFC (now the NRC) should operate and control (as a result of either ownership or lease arrangements) its own terminals in Sydney, Melbourne, Brisbane, Adelaide, Perth and Alice Springs. It appears that its preference is to not allow private sector operation of terminals, at least in loading/unloading activity. This would not be inconsistent with the position of the Australian Railways Union, stated as:

... the NRFC should own and operate intermodal terminals in each major city, and operate (or contract) road pick-up and delivery services from these terminals. We are opposed to the NRFC or Governments encouraging private freight forwarders to set up their own terminals which would operate in direct competition with NRFC terminals. This practice would lead to wasteful duplication of expensive terminal and track facilities, and preclude achievement of the economies of throughput that are essential to boost terminal productivity and so achieve real microeconomic reform. (Submission 63, Appendix 1)

Private involvement in loading/unloading might encourage competition as well as take advantage of the apparent greater efficiency of present private terminal operations. The National Farmers' Federation declared in its submission that rail terminals operated by TNT are more efficient than those operated by V/Line, noting that

- the TNT terminals use about half the number of men per crane,
- these men are remunerated about \$100 per week less than those employed in V/Line terminals, and
- TNT enjoy much more flexible working arrangements, such as the use of part time employees in peak periods. (Submission 77, p.11)

There seem good reasons why individual or consortia of freight forwarders should be able to own and operate their own terminals, so long as other shippers have access to competitive facilities. This access could be provided by common-user terminals which are effectively what railways already provide. Private sector participation in common-user terminals would also be appropriate, provided the terminal management is responsible to the railway for performance standards and operating demands. This would take account of concern that private sector control of common-user terminals would prevent integrated terminal and linehaul operations (and adversely affect customer service) (AN, Submission 64, p.68).

There has been concern expressed about the monopoly powers of exclusive private sector ownership of loading/unloading facilities. Abuses could be mitigated if provision is made for at

least one common user loading/unloading facility in each major city. There may still be a need for a regulatory function (see Section 12.5).

RECOMMENDATION 11.2

The Commission recommends that there should be no restrictions on private ownership and operation of freight terminals, including common-user loading/unloading facilities.

Recommendation 11.2 received in-principle support from most participants. The Commonwealth Department of Transport and Communications agreed in principle, provided that issues of terminal ownership and operation are resolved commercially (Submission 128, p.7). The Queensland Government suggested it is a matter for commercial resolution (Submission 135, p.4). The NSW Treasury agreed, observing that railways' principal business is the linehaul task and therefore the number and type of terminals must not interfere with efficient train operation (Submission 130, p.9). The Western Australian Government expressed concern that there be sufficient safeguards in place to prevent abuse of any market powers in common-user terminals (Submission 131, p.5). The Commission notes that such concerns could be handled under Trade Practices legislation (see Chapter 12).

11.5 National Rail Corporation

The history of the National Freight Initiative culminating in the formal establishment of the National Rail Corporation (NRC), is outlined in Appendix D. The establishment of such a corporation was overwhelmingly endorsed by inquiry participants.

In October 1990 Commonwealth, State and Territory leaders unanimously supported the creation of a National Rail Freight Corporation (NRFC) and signed a 'heads of agreement' in which they agreed that the proposed NRFC:

- a. will involve Commonwealth, State and Territory equity participation in a company incorporated under the Companies Code;
- b. shall encompass all the railways' existing interstate freight business; and
- c. shall have a corporate goal to earn a commercial rate of return on its assets without reliance on government guarantees.

The Shareholders' Agreement for the National Rail Corporation which was signed on 30 July 1991 will result in a single, commercially operating company responsible for interstate rail freight in Australia. The NRC is being established to be a commercial venture, expected to break even within three years and become totally self-supporting after five years. It is to operate commercially, with

revised work practices and anticipated average productivity gains of at least 35 per cent compared with current railway operations.

It is envisaged that by early 1992 the NRC will be the sole contact between intersystem freight customers and the railways. The Corporation will have full marketing and linehaul operational responsibility for all inter-capital trains and all interstate block trains originating or terminating outside capital cities. The Corporation will, to a large extent, make use of existing infrastructure and rollingstock, but these would be controlled and utilised differently. The NRC will assemble an asset base comprising terminals, track, signalling systems and rollingstock sufficient to ensure its commercial viability. Leasing or other arrangements will be entered into where ownership is not a commercial proposition.

Preconditions for success identified by the National Freight Initiative Committee include cost reductions (achieved through work force reductions, increased private sector involvement in the provision of rollingstock, locomotives, terminals and infrastructure), adequate start-up financial resources, and the development of a productive relationship with its workforce. Key success factors were identified by the NFI as follows:

- A large improvement in productivity of resources.
- Major capital expenditure involving more rapid investment in high priority upgrading projects, continued annual capital renewal programs and the catching up of a backlog of infrastructure renewals and perhaps strategic projects. Various capital expenditure programs have been identified. The preferred option of the NRFC Task Force involves about \$1.7 billion investment between 1991-92 and 2000-01.
- Increased reliability through changed attitudes, changed operating procedures, and more reliable equipment. The importance of bonus and penalty arrangements in contracts between the Corporation and customers is stressed.
- An increased role for the private sector.

The NRC should help to increase efficiency through an integrated approach to the freight task, large productivity improvements and the possibility of competition.

To quote Mayne Nickless, the NRFC

... should offer the *opportunity* for private enterprise *throughout* (e.g., terminals or parts thereof; rolling stock; equipment; gantries; tracks; maintenance; etc). The aim should be that all such activities operate on a commercial basis. For example, while it is unlikely that many companies would have enough volume to fill a whole train, the option to operate private trains should exist as one of the principles of competition espoused by the NFI. The same applies to rolling stock: users should have the option of investing in more efficient, purpose-designed wagons and related equipment. Of course, it may be more commercially feasible to lease such equipment from the major carrier, but it is important that the option for private enterprise be an integral feature of the proposed scheme. (Submission 51, p.5)

The Commission is concerned that the NRC does in fact lead to more efficient interstate rail (and road) freight operations - and intrastate freight operations which will benefit from flow-on effects. As stated by the Australian Mining Industry Council:

the potential for significant benefits does exist provided that the equity stakeholders in the National Rail Freight Corporation introduce a commercial orientation which has not existed within a number of the individual rail authorities to date. (Submission 140, p.9)

The Commission is of the view that the NRC must not merely transform the current several inefficient monopolies into a single efficient monopoly; the NRC should not be given a sole licence to operate interstate freight. Contestability in interstate freight services must exist. The Commission is concerned that the NRC not be allowed to restrict access by other operators to the rail infrastructure or interstate freight market.

To be truly national and overcome the inefficiencies of the current five-system arrangements, the NRC must have satisfactory access to track, signalling and communications. The existing rail systems must not be allowed to frustrate the proper commercial establishment of the NRC. There are many unresolved issues. For example, various rail systems are concerned about handing over tracks to the NRC - be it for reasons relating to land ownership, track control or scheduling. The SRA is opposed to handing over to the NRC responsibility for any lines close to Sydney. Another consideration is that railways may not want to relinquish ownership of the right-of-way because it can be used for other income-producing purposes such as laying fibre-optic cables which could be leased commercially.

Perhaps the only workable solution is for ownership of the right-of-way and track to remain with the existing owners. But long-term right of access does seem to be a reasonable proposition, either as a lease or as a shareholder contribution.

Scheduling of trains is clearly a problem when several users want to use the same track at the same time (for example, interstate freight and passenger, urban passenger, coal and wheat trains in Sydney). Appropriate pricing, on the basis of what users are prepared to pay for access to the track, could be used to resolve such conflicts. The pricing process would relay indications as to whether additional lines should be built or terminals relocated.

Other unresolved issues relate to satisfactory asset valuation, sufficient start-up capital, legal and taxation matters, and the gains and losses for each system. For instance, almost all AN's current activity will be taken over by the NRC and there will be little significant freight traffic remaining for the PTC.

The Commission believes that every effort should be made to resolve satisfactorily all the above issues and so ensure the NRC realises its full potential.

The NRC offers the hope of major reform in interstate rail freight. This one national body ought to be able to achieve improvements which have not been forthcoming from cooperation between systems thus far. It also offers the hope of positive effects flowing on to other rail freight (and passenger) operations. In the absence of the NRC, open access (as discussed in Chapter 12) would allow one or more existing or new rail corporations to merge to provide a seamless service for interstate freight.

12 OPTIONS FOR STRUCTURAL REFORM

The administrative and regulatory reforms recommended in the preceding chapters have the prospect of providing substantial efficiency benefits. Yet structural reform is required and holds prospects for providing further substantial efficiency gains. Ownership and use of most railways is at present confined to public rail authorities. Although railways have natural monopoly characteristics, especially in rail infrastructure, there is potential to increase competition within the industry by making rail authority tracks accessible to other train operators (from both the public and private sectors). In addition, it is necessary to have a means to resolve disputes about charging, scheduling and access to tracks, including where access is inappropriately denied on the basis of alleged inadequacies in standards or staff skills. The Trade Practices Commission could fulfil this role after appropriate amendments to the Trade Practices Act. Other groups would assume responsibility for national railway standards and skill recognition. There is also scope for further improvement through private sector participation in the ownership and operation of railways.

12.1 Introduction

A program for administrative reform of the railways has been described in the preceding chapters. In order to achieve improvements in productive or technical efficiency and a better allocation of resources across industries, the Commission recommends that:

- government railways be corporatised, including incorporation under the corporations law;
- financial relationships between governments and railways be specified in contracts;
- railway costs be reduced significantly, to best international practice;
- rail passenger fares be restructured and generally increased;
- rail services be retained only if they have revenues which at least cover short-run marginal costs - continuation in the longer term depends on the ability to cover the cost of replacing rollingstock and tracks where relevant;
- arrangements be introduced to ensure that road transport bears the costs it imposes;
- regulations which restrict carriage of certain goods to rail be removed; and
- monopoly rents not be obtained via railway freight rates.

As a result of these changes all components of government railways would be required to operate commercially, on essentially the same footing as private sector companies. Railways would be further removed from political or non-commercial influence, in general, and ministerial day-to-day intervention, in particular. Commercial pressures would compel railways to consider improvements in productive efficiency, changes in fare structures (and freight charges where appropriate) leading

to a substantial overall increase in revenue, rationalisation of resources and improvements in the quality of service.

There is scope for further efficiency gains through increased competition within the rail sector. This implies a departure from the current industry structures which are dominated by individual government railways. One major problem such increased competition faces is access to railway infrastructure on fair terms. Another issue is the ability of interested parties to build and operate new lines for special tasks.

As is the case elsewhere in this report, comments are confined to advising on the efficient organisation and operation of railways.

12.2 The case for increased competition within the railway industry

As a general rule, competitive markets will result in the most efficient outcomes, maximising both productive and allocative efficiency. Competition encourages high levels of service and production at minimum cost and redistributes resources so as to maximise returns to the whole community.

For some railway tasks effective competition is provided by other modes of transport. For those tasks where there is no intermodal competition it is desirable to have competition within the railway industry. However, the industry is dominated by public ownership, supported in many instances by regulated monopoly provisions. There are thus opportunities to increase competition through deregulation and by allowing greater private participation in the provision of railway services. In addition, parts of the industry, and especially the provision of infrastructure, are characterised by natural monopoly. In these cases the challenge is to create conditions which will generate results approximating those of competition.

Competition, in the context of the railway industry, is usually understood to mean allowing the private sector to compete with a government railway; but it can also be a case of one government railway competing with another, or even private sector competition in which the government railway withdraws from the market.

Competition depends on access or entry to the market being available on fair terms and conditions.

There is an urgent need for structural reform which will allow greater competition to emerge. The past deficiencies have persisted for too long and it is important the reform process begin as soon as possible. While it is important that significant change occurs quickly, it need not necessarily all occur in one step. It might be achieved by a series of graduated adjustments over a fixed period. Some changes of the kinds advocated in the following sections are already occurring on a small scale, which suggests that there is a base on which to build further changes. Furthermore, where attainment of an ultimate objective requires complementary reforms in several railway systems, the reform process should not be held up because of difficulties in reaching agreement by all relevant systems: cooperation between two adjacent systems would be an appropriate first step.

12.2.1 Contracting out the provision of rail services or parts of rail services

One method of achieving some benefits from competition is by contracting out the supply of a good or service by calling for tenders. This is the procedure normally used for the purchase of railway rollingstock and equipment, and the provision of coach and truck services which complement rail services.

Contracting out, in the context of railways, has for the most part been applied to the provision of inputs to railway services. In this regard there is now increased contracting out for provision of maintenance services, for both rollingstock and track, and for ancillary services such as cleaning of carriages and maintenance of railway facilities (see Section 7.3.1). For example, some SRA and Westrail workshops no longer have a monopoly on railway maintenance work but have to compete with outside workshops. In this way tendering produces a benchmark for internal costs. AN contracts out where this is efficient (Submission 64, p.67). QR also employs contractors for various maintenance tasks, where appropriate, but intends to continue providing other maintenance services internally using world best-practice methods (Queensland Government, Submission 135, p.17).

But the concept of contracting out can be extended beyond maintenance and ancillary services to the provision of outputs of railway services themselves such as the provision and maintenance of locomotives, wagons or complete trains, the running of trains, or even to the provision of a complete rail service. For example a railway might call for tenders to supply and operate a country passenger service with a specified number of seats and with specified departure and arrival times. Alternatively, the supplier might provide the train at a specified time and have the rail authority operate it. In all these cases the contract would require the supplier to satisfy safety, technical and operating standards.

In April 1991, the SRA called for tenders for either the purchase or hire of locomotives. In the second option, which is known as power by the hour, the supplier is to provide properly maintained locomotives of specified power for specified tasks at specified times.

The tendering process has not yet been applied to contracts for the running of trains. However, the October 1990 special Premiers' Conference communiqué (1990a) indicated that the NRFC (now the NRC) would not be restricted to interstate services but would be able to tender for intrastate freight services. The NSW Government has recently called for expressions of interest to upgrade and extend existing tracks and operate a passenger service from central Sydney to the airport at Mascot. However ownership is to revert to the government eventually.

Tendering for the provision of passenger services would appear, *prima facie*, to be unlikely because these services do not at present recover costs, let alone make a return on assets. However, more flexible fare policies, together with explicit government contracts for the provision of specified non-commercial services, could change this. Although it is implied in current proposals that such community service contracts would be between a government and its railway, a more efficient approach could be to call for tenders. However, such a process may not be practical for urban rail passenger services.

Although tendering is usually seen as a means of obtaining a good or service at minimum cost, it could also be applied to having a non-commercial service supplied at minimum subsidy. Tendering for the provision of subsidised services has not occurred in Australian railways although such a practice is common for coach and bus services. Indeed, all of the SRA's coach services for country passengers are now contracted out. One fundamental difference at present between railways and buses in this regard is that private buses have ready access to roads but the private sector does not have access to railway tracks. The Commission's proposals would, if accepted, require railway authorities to specify the terms which another party would need to meet in order to use the authorities' infrastructure. Governments could then specify the level of service being tendered and offer the service to the entity which offers to provide it at the least subsidy.

The Commission finds that railway authorities, in exploring opportunities for maximising efficiency, should give greater consideration to tender for outputs (that is, supplies of railway services) and to contract for inputs.

12.2.2 Train operator access to tracks

As noted above, access to rail authority tracks is currently restricted to rail authorities' trains, although there are exceptions for railway historical society trains, and authorities do haul rollingstock owned by private firms and other rail authorities. In fact, although most of the trains which run on an authority's tracks consist of locomotives and wagons which belong to that authority, interstate trains typically consist of mixes of locomotives and wagons belonging to different systems. It is then difficult to say who 'owns' the train. Notwithstanding this, when a train crosses from one railway jurisdiction to another, there is normally a change of cabin crew, and sometimes locomotives, at the system boundary.

There are many international precedents where trains belonging to one railway have access to another's tracks, with or without explicit payment. The Canadian long-distance passenger service, VIA, owns no track and pays owners for access to their tracks. In the US, the arrangements for Amtrak to use others' tracks usually involve payment.

In a competitive environment, access to the railway track to run entire trains would be available to all train operators who could satisfy safety, technical and operating standards, subject to spare track capacity being available. Users and authorities would negotiate times of access and corresponding charges, presumably with charges varying according to demand, that is, higher charges for ‘peak’ services and lower charges for ‘off-peak’ services.

Access differs from contracting out in that the train operator determines the type of service rather than this being specified by the rail authority or government. Similarly, the train operator seeks to determine the time at which the service operates, possibly leading to negotiation of different access prices for different times. There would have to be contractual agreements to ensure that the track and signalling were maintained adequately to carry specified loads at agreed speeds safely, while trains would have to be in good working order, available on time, capable of performing the task, and operated safely. In the case of accident or damage, or delays which inconvenienced others, the party at fault would be responsible for subsequent losses incurred by itself and others, within the bounds of any contractual arrangement and statutory limitation of liability applying for example to common carriage of passengers.

There are safety reasons for restricting cabin crew to those who are competent and accredited to work the appropriate sections of track, but there is no need to restrict crew to those provided by the rail authority. Given this freedom, independent operators should have little difficulty in supplying crew competent to operate coal trains, for example, which keep plying the same routes. For intersystem trains there is no need to restrict crew rigidly to work only within their own authority; there can be greater flexibility in the arrangements for crew changes. Crew changes should be organised according to the circumstances of the task, not according to the boundaries of authority jurisdictions. For example, Sydney-Melbourne trains might have crew changes at Junee or Albury, but not at both.

Access is of great importance to the National Rail Corporation. It appears that it will be seeking access to rail authority tracks, although it is conceivable that the NRC itself could own or control some tracks. Because the NRC is to be owned by the rail systems, NRC access to rail authority tracks and rail authority access to NRC tracks may be easier to achieve than private user access to authority tracks. The separation of train operations and track management, which seems inherent in the NRC concept, provides an example (although limited to one operator) of the open access provision recommended at the end of this sub-section. Similarly, any parts of the track which might be controlled by the NRC should be made available to other authorities and train operators.

The discussion so far has centred on rail authorities providing track access to other train operators, whether from the NRC, other authorities or the private sector. The Commission recommends that the same open access requirement apply to tracks owned by private entities. This view is based primarily on considerations of equal treatment for private and public railways, but there are precedents in other countries. For example, in the US the Interstate Commerce Commission

requires that each railroad, most of which are privately owned, allow access to its tracks by trains owned by other railroads.

Potential train operators

Although there is always the possibility that an outsider would enter the train operating business, it is more likely that any new operator would arise from among existing users. In practice, the only customers which might be interested in operating dedicated trains for their own purpose would be those who had a very large and steady flow of traffic, as in the Pilbara. The large tonnage is necessary in order to avoid the diseconomies of managing a small fleet, while the steady flow is desirable in maximising the capacity utilisation of the rollingstock.

These conditions are fulfilled for some Queensland coal operations which have high tonnages and where there is no pressure to run special trains because of the large stockpiles at the ports. Similarly, large quantities of steel are moved between BHP's various centres on a regular basis.

On the other hand there is much peaking in the demand to transport coal in NSW because each ship is contracted to load a particular blend of grades of coal, and the stockpiles at port are not large enough to store large quantities of all the many different grades. Because individual mines do not have steady loads, it would be very expensive for each company to have a fleet large enough to cater for its peak demands. In these circumstances an alternative to the SRA as the supplier of train services might be a consortium of coal companies which could obtain system benefits from the flexible use of capital assets, and not perhaps provide a basis for trade-offs between stockpile size and rail service provision.

A similar situation applies in interstate general rail freight. Although one or two large operators might be able to justify owning and operating a few dedicated trains, freight forwarders as a whole would prefer to have access to a shared linehaul service which would offer a wider schedule of services than would otherwise be available.

BHP Transport has indicated that it 'would be interested in exploring the opportunities available' for private enterprise investment in rail systems, including 'train path leasing between major city distribution centres allowing a more reliable customer driven operations', but only 'after radical structural change in the rail organisation that lifts the service package to acceptable standards' (Submission 32, p.16). In other words, BHPT would be interested when there had been significant improvements in the organisation, infrastructure and scheduling which would ensure a much more reliable service. At the draft report hearings, however, BHPT appeared less likely to be a train operator when it said:

We do not see ourselves being an investor or an operator of rollingstock. We are a resource company not a transport company, in that context. (p.39)

In the context of providing a total door-to-door service, Mayne Nickless stated:

This may also require privately-operated line haul. If the conditions were right and proper feasibility studies supported it, then Mayne Nickless would be interested in greater involvement in rail linehaul. (Submission 51, p.5)

As described above, access might also be of interest to coal producers, either individually or in a consortium, and other bulk users, and also to a possible national rail passenger organisation. However, although many rail users have indicated their approval of the access recommendation, as would be expected at this stage none has indicated any firm intention to be a train operator.

Even though the Commission expects that there would be few new train operators, it considers it highly desirable that there be open access to railway tracks. The threat of intra-industry competition would alone place pressure on rail authorities to improve their efficiency and performance.

Setting aside those cases where freight forwarders load and unload freight wagons and pay rail authorities to haul the train, there are a few situations where rail operators are already paying for access to public tracks. For example, BHP pays the SRA a fee to run BHP trains a short distance on tracks near Port Kembla (Draft report hearing, p.215). The Commission wishes to remove any impediments which might prevent such practices from becoming more widespread.

Associated regulations

Because the rail authority would be both using the track and selling track access to competitors, some form of regulation would be necessary to ensure that access was available and at a fair price. This is discussed further in Section 12.5.

The Commission recognises that an appropriate price does not mean just the marginal cost of the additional traffic, but also a contribution to fixed costs. Conditions for access would include the owner having some prior rights of access, adherence to the owner's operating requirements (for example, technical and operating standards), any other requirements such as safety standards, and guarantees that track of agreed quality would be available at appropriate times. While normal commercial agreements would be negotiated in most cases, there should be recourse to the equivalent of an arbitrator in cases of disagreement.

Freight customers have expressed support, in principle, for there being access to tracks, but point out that the track owner would still be in a monopoly position. Hence there is a need for a regulator to guarantee access on fair terms.

The Commission accepts that it may not be practicable to allow others to have access to urban tracks, especially in peak hours.

Government responses to the track access recommendation

In response to the draft report recommendation on access to tracks by other operators, either public or private, the NSW Treasury stated:

There is no objection to providing access as long as an appropriate commercial arrangement can be reached and users comply with State Rail's strict operating requirements. (Submission 130, p.10)

AN made a similar response but emphasised that an appropriate pricing policy would have to be established, including a reasonable contribution to the fixed costs of the rail infrastructure (Draft report hearings, p.418).

The Western Australian Government supported the joint use of railway tracks under commercially structured arrangements (Submission 131, p.7).

The new Queensland rail legislation permits other organisations' trains (for example, NRC trains) to run on QR tracks. However, the Queensland Government points out that such permission would be granted only under certain conditions (which are not specified) (Submission 135, p.21).

The Victorian Government has not formed a view on access to its tracks by other operators, but would probably have no objections, in principle. It drew attention to the link between operator access to tracks and the separate control of tracks and trains, which is being investigated by the PTC at present in relation to both urban and non-urban rail services.

There is general support for the recommendation from governments. They are already implicitly agreeing to access by another organisation, in the form of the NRC. Such disagreements as were expressed on the draft report recommendations have been addressed by the requirement that access terms be negotiated and agreed by the relevant parties. Corresponding arrangements for access to tracks are at present being made within the European Community (see Section 12.3.1).

The Commission is concerned about the wording of the July 1991 special Premiers' Conference communiqué (SPC 1991c, p.22) which describes the NRC as the 'sole marketer' of interstate freight. Although these words are probably intended to mean that the NRC will take the place of individual rail systems in the marketing of interstate services, they can also be interpreted as preventing any other train operator from entering the interstate market.

RECOMMENDATION 12.1

The Commission recommends that owners of railway tracks (whether they be governments, rail authorities or private owners) be required to allow access by other organisations (whether public or private) to operate on their tracks, subject only to capacity being available and negotiation of a commercial agreement which sets the prices and conditions for access. The Commonwealth Government should require open access on lines controlled by AN and the NRC and, if necessary, should contemplate using its powers (over interstate trade and international trade) to achieve open access elsewhere.

There was in-principle support for the proposal from mining interests (AMIC, BHP-Utah, NSW Coal Association, Pasminco and Queensland Mining Council) and others (AWB and BHPT), but many expressed reservations and qualifications. BHP-Utah considered it unlikely that any companies would be interested in existing projects (Submission 120, p.1). Pasminco was not interested itself because it believed that there would still be monopoly pricing, for access to tracks (Submission 132, p.9), while the AWB did not see much relevance for grain (Submission 129, p.5). The NSW Coal Association would really prefer privatisation of rollingstock and purchase of the principal lease of the track (Submission 133, p.2).

12.2.3 Ownership of tracks

Several participants have expressed the opinion that the government monopoly on ownership and/or control of railway tracks should be broken.

The permanent way should become a normal tradeable asset, the same as a farm or office building, with a limited use provision restricting its use for the purpose of rail services.

On establishment of a new rail line, the developer (presumably the dominant user directly or via contracts) should have the right to own and control the asset. (AMIC, Submission 88, p.8)

When the rail line is predominantly used for coal haulage, the State should divest its control over the permanent way and associated infrastructure to the private sector. (NSW Coal Association, Submission 97, p.1)

Empirical studies suggest that private ownership is preferable to public ownership where there is competition, but there is no clear-cut preference when there is no competition (see Section 4.2.4). For coal companies in particular, which are competing in international markets, there may be a strong case for integrating rail transport and mining operations, as in the iron ore industry. In a closely related example, a consortium of coal companies has recently taken over operation of the

Port Kembla Coal Loader from the public sector on the basis that this would achieve improved efficiency in operations (Initial hearings, p.129).

Construction and operation of a private railway usually depends on a government exercising discretionary powers and also requires government cooperation, especially for obtaining access to land. Permission has been granted in some cases such as the iron ore lines in the Pilbara, the Emu Bay railway in Tasmania and the Ski tube in the Snowy Mountains. In each case the service is dedicated to a particular task and is isolated from the government railway system. It appears that the Queensland Government would currently not approve construction of a private coal line, even if it could be built to operate independently of QR lines, because this would prevent collection of super-normal profits through coal charges. For similar reasons the Queensland Government may be hesitant about allowing open access.

Traffic on many railway lines is dominated by a single purpose. In the current public rail systems, even where lines have a dominant or sole transport task, they are designed to form part of a network, whether or not they are often used as such. Networking might be seen as a justification for government to retain control of all tracks which connect to other tracks. However, provided that the Commission's recommendation on access is implemented, there might be advantage in having private sector ownership of a track, especially where the traffic is dominated by one user or a group of users. The Commission suggests that any such proposals from the private sector be assessed by governments and rail authorities in terms of financial and social benefits and costs, rather than in terms of attempting to preserve intact the government-owned railway.

The sale of a railway track by the public authority to the dominant user can have benefits for both parties in terms of increased efficiency. Where the dominant user is involved in a competitive market (such as coal exports) it would likely have a stronger incentive to minimise costs than the public owner. For the same reason a buyer will tend to pay more for assets than the economic value to the current owner, thereby providing benefits to the buyer, the current public owner and hence the wider community. The injection of funds into the authority as a result of the sale could be used to retire debt or finance investments elsewhere. Finally, under the Commission's recommendations, the authority could still have access to the track for other purposes.

Several options for private sector ownership are available. For a new line there could be private development, as is the case in the Pilbara, or a joint venture between the rail authority and the private sector. For an existing line the State could provide a long-term lease, or it could choose to sell the line, that is, privatisation, or enter into a joint partnership. Possible candidates for private sector involvement are some of the coal lines in Central Queensland, the line from Townsville to Mt Isa, and perhaps the coal lines to Newcastle. Relative costs and benefits - rather than any philosophical predisposition - should determine which owner would offer the most advantages for the Australian economy.

The SRA indicated that it had no disagreement with private companies establishing their own railways. It also said that it would contemplate the joint ownership of lines or selling of lines, if it was in its commercial interest (Draft report hearings, pp.215, 216).

New special purpose lines

Where there is a need for a new or duplicated railway line for a special purpose, such as a coal mine, the question arises as to whether this be provided by public or private rail. Private rail seems already to be accepted in a remote area, such as the Pilbara, where there is no immediate possibility of connection to an existing government railway. However, in many cases it is likely that a government railway already exists in the area where an extension is proposed.

One argument for preferring extension of a government railway to construction of a private railway rests on the premise that the extension would constitute part of a larger single natural monopoly. While this argument has merit, it is not always clear whether a proposed rail line is part of a State-wide network or merely a geographically self-contained line with only occasional links to a wider network.

A second argument is that the community is better off where all natural monopolies are owned by governments, so that potential users of the infrastructure do not have to face a private monopoly. There are, however, many Australian (and overseas) examples of natural monopolies being owned by the private sector. A relevant example here is the private ownership and/or private operation of a number of export coal loading facilities. Moreover, as discussed in Chapter 10, there is evidence that a need already exists to reduce the ability of government rail authorities to extract monopoly rent via profits or to dissipate monopoly rents in inefficiencies. Such mechanisms could be equally applied to private rail monopolies. What is required, whether natural monopolies are owned by governments or private interests, is a regulatory regime to help ensure that monopoly powers are not abused.

Thirdly, the argument - that it would be inefficient for a new entrant to duplicate or extend a rail network - itself suggests that no legislated (additional) barrier to entry is required. A new entrant would be unlikely to establish expensive infrastructure except where there were good reasons for so doing. For example, the new entrant may be seeking to avoid monopoly prices for the use of, or restricted access to, the railway line. Even then, it is unlikely that a duplicated line would be built before other avenues had been exhausted, including recourse to anti-monopoly authorities.

NSW Coal Association proposal for existing special purpose lines

The NSW Coal Association has proposed separation of the ownership and control of rollingstock and train operations from the ownership and control of rail infrastructure, for existing lines which are used predominantly for coal traffic. Its motivation is to test the SRA's 'monopoly control over the provision of rail services and, therefore, the setting of rail freight charges' (Submission 97, p.1). Whereas separation schemes usually have rail infrastructure remaining under government control,

this proposal requires the State to divest its control of both tracks and trains. The permanent way and associated infrastructure would be leased by a consortium of major rail users, similar to the arrangement for the Port Kembla Coal Terminal which is owned by coal shippers. Under the Association's proposal, rollingstock would be owned or leased by a different entity or entities.

The Commission supports that part of the proposal which gives the private sector access to tracks in order to operate trains, and it commends consideration by the SRA, as one of the first tasks after it is incorporated, of the proposal to lease the tracks. Such a lease ought not remove the requirement on the lessee to provide open access; the Commission's recommendation would require that the SRA had access. Any decision to sell should be made by the SRA on commercial grounds - the Commission is not convinced that there is a need to remove the control of coal rail infrastructure from railway authorities or to prevent them from operating trains. In particular, provided that there is open access to rail infrastructure, the necessary efficiency gains may be achieved without a change of ownership of infrastructure. However, there may be a need for an appropriate regulatory regime to prevent abuses of monopoly power (see Section 12.5).

Lines under threat of closure

The Commission is recommending that lines and services be discontinued if revenues do not meet short-run marginal costs (see Recommendations 9.1 and 11.1). Where revenue exceeds short-run marginal costs, the service should be continued until such time that rollingstock and/or track have to be replaced and this cost cannot be covered by revenues.

In the past decade, US railroads have disposed of some hundreds of branch lines as unprofitable. Many of these have been acquired by small companies which have managed to maintain regional services using second hand rollingstock. It is not clear that these companies will be able to replace track when the time comes.

The Lachlan Valley Railway Society, in NSW, is negotiating with the SRA to operate over a grain line from which rail services have been withdrawn. The Society will be tendering to haul grain commercially in SRA wagons from grain silos on this section of track to the main line.

These examples are relevant to the consideration to close unprofitable lines, as discussed in Section 10.3.

12.3 A national rail network corporation

12.3.1 Separate management of rail infrastructure and trains

Throughout the world, organisations which own and manage rail infrastructure generally also operate trains. An alternative arrangement is to have an organisation whose sole activity is provision of rail infrastructure, with train operators paying for access to its tracks.

The case for separate management of tracks and trains rests primarily on the premise that provision of rail services is less a natural monopoly than the provision of rail infrastructure, so that separation holds the promise of supporting competition. It creates the opportunity for competition/contestability within the train operations part of the rail industry, and hence goes some way towards reducing abuses of natural monopoly power, so long as the natural monopoly power of rail infrastructure is controlled. Separate management of tracks and trains is also a natural extension of separate costing and profit centre accountability for train operations.

Sweden (see below) saw another reason for separation of track and train management, which was that it would make it easier to compare the financial and economic performance of road and rail services, and thus adjust charges and funding so as to improve both competition and the allocation of resources between the modes. This would overcome some of the difficulties which arise when road infrastructure is managed by a road authority and road vehicles are operated by users, while both rail infrastructure and train services are managed by the same government authority.

Separation of rail infrastructure and rail services has been considered for several countries (see Appendix I). Its application to Canadian railways in terms of 'below-wheel' ownership and 'above-rail' operations is described by Cubukgil (1987). In the UK it was concluded that practical benefits would be small because of the difficulty of attracting new entrants. In a more localised application, however, arrangements are being drawn up to allow the British and French public railway authorities to operate services over the Euro-tunnel tracks through the Channel Tunnel.

The Swedish experiment

In Sweden rail infrastructure and train functions have been separated: the government railway operations were divided in 1988. A national infrastructure authority (Banverket or BV) has responsibility for the track, structures, signalling, large freight marshalling yards, station platforms, train scheduling and provision of electricity for motive power; the rail operating authority, Swedish State Railways (SJ), has responsibility for rollingstock, train operations and station buildings. The operating authority pays the infrastructure authority for use of the track. There can be private operators, although for the moment SJ retains a monopoly on intercity passenger services and has a first option on providing rail freight services. The motivation for the separation was primarily to

reduce the financial burden of the railway on taxpayers by improving efficiency. It also enables the environmental costs of transport to be addressed equitably by charging and taxing road and rail use in a similar manner but at different rates according to their assessed social costs and benefits. While SJ operates commercially at a profit, BV is supported by grants to carry out maintenance and implement investment plans, some of which are influenced by political decisions. Jansson and Cardebring (1989) found that there was no significant change in total rail financial results after one year. It is, however, too early to assess the full effect of the scheme. Europe and the rest of the world are watching the Swedish experiment with great interest. Some further details are provided below and in Appendix I.

European Community railways

The European Community (EC) decided in June 1991 that, commencing in 1993, (a) European railway companies would keep separate accounts for their rail infrastructure and train operations and (b) train operators would have right of access to all tracks, opening the way for free competition between European railways. (While this is not a complete separation of train operations and rail infrastructure along Swedish lines it is a move in this direction which goes beyond the requirement that train operators be given access to tracks.) All present and future Community railway companies, including private companies with a majority share held by Community residents, will be entitled to use the railway networks of all EC countries on the payment of an infrastructure utilisation fee. The EC Commission is working on an all-European harmonisation of the infrastructure, so that free and unimpeded access to all the networks will be physically possible, with priority on tunnel profiles, bridge clearances and container dimensions. There is an intention to harmonise user charges. Continued supervision by independent EC agencies will be necessary to ensure that national railway companies cannot obtain an unfair advantage over other railway companies (EC 1991; Daily Commercial News 1991).

12.3.2 Functions of a national rail network corporation

Separation of rail infrastructure and train services in Australia could be achieved by the establishment of a number of regional authorities or a national rail infrastructure authority. This latter option would create a national rail system which extended across State and system boundaries. It would thus be an institution which - in theory - had an incentive to keep on addressing and overcoming many interstate and intersystem difficulties, and might ultimately lead to elimination of inefficient differences in engineering standards between existing systems (including, but not only, break of gauge) if that were economic. It might be expected to make rail infrastructure investment and disinvestment decisions from a national perspective.

A railway infrastructure authority could be given responsibility for the construction, ownership and maintenance of track and associated structures such as embankments, bridges and tunnels, and it would provide signalling. It could also have responsibility for the scheduling of all train movements on its tracks and might assume responsibility for common user loading and unloading facilities at rail freight terminals.

However, unless such a body had control of those tracks within cities which provide access to freight terminals and long-distance passenger stations, much of its advantage would be lost. On the other hand, urban passenger authorities, especially in the larger Australian cities, are not prepared to relinquish their control of urban tracks because of operating constraints. One solution would be to separate urban passenger services from all other services, so far as is possible, by the construction of some dedicated tracks. For example, the National Freight Task Force has considered the possibility of a freight-only link between Enfield and Campbelltown, but has given it a low priority relative to other investments. Another solution would be relocation of freight terminals and non-urban passenger stations to less congested parts of the urban rail system (with connection to the CBD by priority urban passenger trains). A more efficient solution might be to charge all users of tracks according to demands for track access.

Another model is that of a rail network corporation which would be responsible for rail infrastructure used by railway authorities for intersystem and interstate purposes. Such a single network could be extended to include 'important' lines (for example coal), or to all lines outside urban areas. Investments and disinvestments in rail track (for example, re-alignment, new signalling, longer passing loops, line closures) would be made according to priorities determined by the railway infrastructure corporation, on advice from customers, and adopting a national perspective.

To avoid any conflict of interest, such a corporation would not be a user or potential user or in any way connected to or in competition with users. This would avert the need for further regulatory control over the provision of access to the permanent way, although some regulatory control to reduce the potential for monopoly profit making would likely still be needed.

12.3.3 Evaluation of a national rail infrastructure corporation

Benefits from the establishment of a national rail infrastructure corporation derive from the opportunities for increased competition and increased efficiency which it would generate. While it is generally accepted that increased efficiency follows from increased competition, it can also be argued, especially in the case of Australian railways, that efficiency could be improved by standardisation, amalgamation and coordination. These reasons underlie the establishment of the National Freight Initiative and Whitlam's advocacy of Commonwealth acquisition of State railways (Submission 103).

Although there might be some benefits if the existing rail authorities ran trains on tracks controlled by a national infrastructure authority, important benefits would arise from the competition created between them and by entry or potential entry of new rail operators. The issue of new operators has been discussed earlier in relation to open access to tracks. Government and existing rail authorities appear prepared to allow open access, but the Commission has received little evidence that there would be new entrants in the immediate future.

While open access to the tracks would create opportunities for competition within the rail sector, there must be doubts that new train operators would indeed enter all or even many of the markets currently met by rail authorities. Sweden hoped that its new arrangements would attract new entrants. Only one has appeared to date. A small company bid successfully against SJ for the supply of regional passenger services to three of the 24 counties and commenced operations in May 1990 (Rail Gazette International 1991, p.57). As noted above, British rail dismissed the idea of separate management of tracks because of doubts that there would be new entrants and concern that the assessed net costs involved in separation (including transaction costs in giving access to the track by the rail authority) would thus be high.

In Australia, on many lines there is currently only sufficient traffic to warrant there being one train operator which can provide the kind of service frequency required by customers.

It has been pointed out that track and train design, performance and operation are integrally related (Railway Project Engineering, Submission 33, p.2). However, under certain conditions the benefits of open access can be greater than the additional cost of maintaining an adequate technical and operational relationship between separately controlled track and train organisations.

The Commission has given careful consideration to the possibility of establishing a rail infrastructure authority. Separation of responsibility for the track would create an additional authority or authorities, and lead to increased transaction and administrative costs which could only be justified if considerable benefits were available. Benefits of sufficient magnitude are not yet evident.

The case against separation of rail infrastructure from train operations in Australia at the present time depends on traffic densities. In urban areas traffic density may be too high for separation to be practical, while for most non-urban services traffic density is probably too low for the benefits of separation to overcome the additional costs. Traffic densities on coal lines and some other bulk freight lines may, however, be sufficient to support separation. The lack of potential new entrants to the train operating business is related to the relatively large economies of traffic density. At some higher traffic density than at present there may be net benefits in separation. Australia should maintain an interest in the Swedish experiment because separation of tracks and trains may one day be appropriate for Australia.

In the short term at least, any of the perceived benefits of an infrastructure corporation could be achieved by the acceptance of the Commission's recommendation concerning open access to tracks and by separation of the accounts of track and train operations, and by acceptance of the need for a regulatory agency to ensure that access is on fair terms.

12.4 Overcoming impediments to competition

12.4.1 Separation of accounts

Separation of costs and revenues according to profit centres, activities and major cost components is an essential ingredient of sound financial management. It also provides important information for the quest for increased efficiency.

Assessment of the potential benefits and costs of competition cannot be made unless adequate accounts are kept of the relevant parts of railway authority operations. In a situation where open access is allowed, it is necessary to know the separate costs of rail infrastructure and train operations so that potential users can assess the advantages and disadvantages of seeking access to tracks (in order to run their own trains). Infrastructure costs would establish a minimum charge for track access, while authority revenues and costs would be the basis of the authority's assessment of the desirability of continuing to provide a train service in the face of competition.

In deciding to call for tenders for the provision of railway services or parts of services, the authority itself needs to know the costs of existing services. For example, the authority cannot assess the potential benefits of contracting out, say wagon maintenance, unless it knows what it costs to perform this function in its own workshops at present.

Overall, each railway authority needs to have an accounting system which provides the revenues and costs of individual traffics on individual tracks, and the separate costs of providing rail infrastructure and running trains. In most cases, adequate authoritative information is not yet available. Actual costs should be used as far as possible, rather than relying on divisions of aggregate costs according to models or formulae. In particular, while the RailCost model (which is used by all Australian rail authorities) is a useful theoretical tool for allocating shared costs between lines and traffics, direct measurements of cost components should be used wherever possible. Such accounting information is necessary for assessing the potential costs and benefits of competition which might be achieved (through tendering, open access or different ownership arrangements).

The Commission strongly encourages rail authorities to treat their major traffics (for example, coal, grain, urban passenger) as separate business centres, keeping separate accounts and aiming to make an adequate capital return for each. The rail infrastructure network should be treated similarly as a business centre, selling its services to the various traffics. Correspondingly, each traffic would be able to identify the costs of its use of infrastructure. Indeed, a case can be made for the publication of separate accounts, given the sizes of deficits, the uncertainty and arbitrariness of cost allocations in the past, and the way in which inefficiencies for some railway activities have been hidden within aggregated accounts.

Some have interpreted the separation of infrastructure and train operations as a throwback to the days when railway decisions were made on the basis of civil engineering (track) and mechanical engineering (train) criteria, with little consideration of commercial factors. Now, however, with the emphasis on commercially run business centres, the emphasis on infrastructure is needed to draw attention to the costs to each centre of use of tracks.

It is recognised that some authorities are already seeking to establish business centres for major activities.

It is expected that the separation of traffics and accounts as described above would help identify inefficiencies and hence scope for improvements. In addition, separation of accounts, with sufficient detail to enable costs and revenues to be measured for different types of passengers and journeys, is necessary for determining community service contracts.

Indeed there may be benefits in going further by separately corporatising some major activities within existing rail authorities such as Hunter Valley coal and Central Queensland coal. While any need to have separate organisations is reduced if accounts are kept properly, division into separate corporate entities would eliminate the possibility of cross-subsidisation from profitable to unprofitable activities, in public perception as well as in actuality.

While companies and authorities in general are not required to publish separate accounts for their different activities, the Commission considers that an exception should be made in the case of railway infrastructure. This would provide some information to potential train operators about the conditions applying for infrastructure use.

RECOMMENDATION 12.2

The Commission recommends that each rail authority be required to operate its infrastructure network as a separate business centre, and to publish separate accounts concerning it.

In any further review of railways, the success of open access to tracks, the separation of rail infrastructure accounts from those of other rail business centres, and the separation of rail infrastructure control and train operations should be examined, taking account of developments within Australia and overseas.

12.4.2 Uniformity of standards

Some of the factors which have contributed to the relatively poor performance of the interstate rail system, and which would be a hindrance to achieving competition within railways, are the differences between the systems in technical specifications and operating practices. This is not just a matter of differences in gauge. There are many other differences which have evolved over the years as the State railways developed separately. They include, for example, differences in maximum dimensions (which restrict movements through tunnels, across bridges and beneath overhead wires), braking systems and locations of handrails. In addition, there are differences in radio communications systems and locomotive cabin layouts (AFULE, draft report hearings, p.102), and power systems for electric trains (25 000 volts AC and 1 500 volts DC) - Whitlam (Submission 103, p.2).

Few, if any, of these standards and practices are contained in legislation; they have become the accepted way of doing things. Many are related to safety or perceived safety issues. Technical requirements may vary within a system for different types of track and for rollingstock which are used for different purposes, and may even vary along one track.

RIC (1990b, Recommendation 4(a)) has recommended that governments, systems and unions increase standardisation of equipment and operational rules and procedures.

The efficiency of interstate services would be improved if it were possible for locomotives and rollingstock which are used for interstate purposes to move freely on the lines required for this purpose. This could be achieved by introducing national standards. Initially, these specified standards need not apply to all lines, just those used for interstate purposes. However, as discussed below, the Commission considers that a program of standardisation would likely impede the early introduction of efficiency gains which are available and needed in the railway industry.

Mutual recognition of standards

Because standardisation involves either premature redundancy of some equipment or delays in the reform process while existing equipment is phased out, it would not only reduce benefits but could also lead to higher costs compared to the alternative of mutual recognition. Mutual recognition of other systems' standards would allow individual railway operators to weigh the economies of scale resulting from standardisation against other cost/performance factors, without accruing an undue penalty because of unessential non-uniformity.

While there are undoubtedly some areas where greater uniformity in infrastructure and rollingstock specifications would involve gross efficiency gains - an obvious example is track gauge - there are also areas, particularly in rollingstock specification, where the mutual recognition of each system's standards by the other systems would not only be easier to achieve, but which would ensure a more efficient outcome.

Mutual recognition would allow rollingstock of one system to operate equally freely in another system, physical and safety restrictions permitting. Uniformity and minimum standards would be required in some areas, for example in relation to maximum dimensions. Beyond that each system would grade its own track and rollingstock into several classifications to support a convention which would allow rollingstock to be operated in other systems on the same conditions that it operates in its home system, taking the relevant track and rollingstock classifications into account.

A paper on regulatory reform which was prepared for the October 1990 special Premiers' Conference (1990b, pp.3-4) described this process as 'harmonization of essential requirements and mutual recognition of regulation'. It describes the advantages of mutual recognition as including:

- a lower cost efficient regulatory regime by utilising rules, regulation and certification made elsewhere;
- less likelihood that rigid technical standards would be a barrier to technological change;
- acknowledgement that negotiated uniformity can be difficult, time-consuming and costly to achieve; and
- the likelihood of eventual regulatory harmonisation as a result of competitive pressure.

Differences in operating practices between systems could also be approached on the basis of mutual recognition.

The July 1991 special Premiers' Conference communiqué (SPC 1991c, pp.9-12) reports that agreement was reached in principle on models for mutual recognition of both goods and occupations, where uniform national standards are not essential. A Discussion Paper was released for public discussion with the aim of reaching formal agreement at the November 1991 Conference.

Finally, in spite of the advantages of mutual recognition, it may be necessary to give a regulatory authority formal responsibility in standards issues, to the extent that they are inappropriately applied to deny open access.

12.4.3 Removal of financial inequalities

Differences between government railways and their private sector competitors in financial responsibilities and liability for payment of taxes are an impediment to structural reform of the railways. The private sector in this context includes potential competitors within railways, and also road transport. A favoured tax treatment for government railways reduces the incentive for private sector participation in railways.

By removing deficit funding, requiring payment of market interest rates on borrowings, striving for a reasonable rate of return, and encouraging the closure of non-economic activities, the Commission's recommendations would put government railways on a more equal footing with the private sector. The recommendations do, however, exclude a rate of return requirement for passenger services. Where there are prospects of private sector involvement in railways, it would be important that government rail authorities not distort investment patterns by having no rate of return on investments or an inappropriately low rate of return.

Railways do pay some taxes on inputs, namely State payroll taxes (which are not, however, paid by many of their small road transport competitors) and Commonwealth excise on fuel (this is discussed in Chapter 6 in terms of the relationship between fuel excise and the funding of roads and rail infrastructure). Railways generally do not pay Commonwealth sales tax, State stamp duty, State motor vehicle registration fees, or State franchise fees. These exemptions disadvantage the road transport industry by giving government railways an unfair advantage (see Section 3.3.1).

Government railways do not pay corporate taxes, although AN expects to do so soon. While government railways collectively make an annual loss of around \$4 billion, corporate tax does not appear to be of much relevance. Profits in a few business sectors are more than offset by losses elsewhere. The Commission's recommendations are intended to eliminate the losses, leading to a profitable outcome which, on the basis of the above discussion, would need to be taxed by State governments on a basis equivalent to a Commonwealth tax liability.

12.5 Regulations to facilitate competitive conditions

The preceding sections have examined means of increasing competition within the railway industry. Nearly every case examined required a regulatory mechanism to ensure that the benefits of competition can be achieved and maintained. While regulation is in some cases not needed because of competition from other modes of transport, there are still many situations where other modes do not provide a sufficient discipline to help ensure efficient costs and prices. The need for regulation arises mainly because of the existence of natural monopoly, particularly in the provision of rail infrastructure. As seen elsewhere in this report, government ownership is no guarantee that rail authorities would refrain from monopoly pricing when charging for services.

In monopoly situations, whether natural or conferred by regulation, government railways have demonstrated their desire to charge 'what the market will bear' (see Section 10.3). This is a reasonable strategy from the point of view of maximising railway revenue, and is encouraged by the current emphasis on commercialisation, but it is not necessarily in the community's best interest.

The Commission has examined four conditions which together should be applied to the pricing of monopoly rail services - a normal rate of return requirement, prices less than stand-alone costs, prices greater than marginal costs, and efficient (that is, least-cost) inputs (see Section 4.2.5). It has also explained that Ramsey pricing, which can result in different prices for different customers, offers an efficient set of prices consistent with the requirement of a normal rate of return from the operations of the enterprise.

The Commission considers that some new arrangements are required in order to prevent abuses of monopoly power, especially in relation to freight rates, and to resolve conflicts between rail authorities and others concerning open access to rail tracks and the appropriate terms and conditions. Access is of particular concern because rail authorities would become suppliers of track services to train operators with which they are competing. Pro-competitive regulation can be achieved by two means which can be described as general and specific. By general regulation is meant making use of existing bodies such as the Trade Practices Commission (TPC). This option has the advantage of avoiding the additional costs of a new body; but the disadvantage is that existing bodies may not have the technical knowledge that is required. In some countries, the perception that a regulator should have specialised knowledge has led to the creation of a regulatory body whose sole responsibility is rail transport. This has two disadvantages. There would be the additional costs of having one more authority. There is also the danger of regulatory capture, that is, the authority becoming aligned with the industry as a result of frequent interaction.

Because of these disadvantages the Commission is reluctant to recommend the establishment of a specific rail regulatory body. It would prefer such matters to be dealt with under existing legislation such as the Trade Practices Act. While the TPC is concerned with anti-competitive behaviour, it has no powers to regulate monopoly pricing. Although the TPC has some jurisdiction over AN, there are doubts as to whether or not the activities of the State railways currently come under the jurisdiction of the Trade Practices Act. There is also some concern that the TPC does not have the resources to undertake regular monitoring or to handle the likely number of complaints.

At the July 1991 special Premiers' Conference it was agreed that the November Conference would address the possibility of extending the application of the Trade Practices Act to GBEs, and whether alternative approaches within the scope of a national framework of competition policy and law might be more effective.

In the absence of agreement, the constitution gives the Commonwealth powers in relation to interstate trade and international trade. These powers could be reflected in those of a regulatory authority, thus giving it powers in relation to all interstate rail freight and all internationally traded goods which are transported by rail. Those powers might also enable the Commonwealth to ensure that individuals could build and operate their own railway lines where that was warranted. It is noted that refusals by authorities and/or unions to allow locomotives and drivers to cross State boundaries is analogous to not allowing an out-of-state truck with an out-of-state driver to travel on a State's roads. A decision in favour of interstate movements of trucks was decided by the High Court in 1955.

12.5.1 Responses to the rail regulatory authority proposal

The Commission in its draft report indicated that it was considering to recommend that an independent National Rail Regulatory Authority be established. The Authority would have responsibility for

- resolving disputes about charging, scheduling and access to tracks and terminals; and
- ensuring that monopoly powers were not abused.

In addition it would undertake oversight of

- national safety, technical and operational standards for railways; and
- the national recognition of railway skills.

The last two items were included because lack of standards and lack of recognition of skills by other rail systems were seen as being potential hindrances to the introduction of open access to railway infrastructure.

The Commission has received many responses which support the establishment of a regulatory body and many which oppose it. Given that the body would have several different functions, responses have not been directed at the proposal as a whole, but at the individual parts. Accordingly, support for and opposition to the individual functions will be discussed separately.

Although there is, understandably, strong opposition to the creation of another regulatory authority, there is considerable support in principle for its proposed functions. This became apparent at the draft report hearings where many who opposed the recommendation as such were found to be in favour of the responsibilities being exercised by some means.

Monitoring of monopolistic behaviour

The strongest government and railway authority opposition to regulation of monopolistic behaviour came from the NSW Treasury and AN.

The monitoring of monopolistic behaviour by such a body would require access to sensitive information on cost and revenues which could prejudice commercial negotiations. In addition, there are many instances where charging what the market will bear and discriminatory pricing are justified. (NSW Treasury, Submission 130, p.10)

At the draft report hearings, however, the SRA acknowledged that its greatest opposition was to the establishment of a new regulatory body, and that it might be prepared to be subject to the TPC and PSA, depending on the specifics (p.220).

AN argued that ‘any degree of regulation for any purpose at all is going to constrain our responsiveness to the market place’ (Draft report hearings, p.420). It also sought to make the point that it did not have monopoly power in its major market which is general freight.

The Commission is sceptical of all such arguments in favour of excluding government monopolies from legal requirements which have to be met by private sector corporations.

The Queensland Government saw no need for a new, specialised regulatory body if rail is to be fully commercialised and subject to trade practice laws and the corporations law (Submission 135, p.21), although Queensland has not yet expressed full support for Recommendation 3.1 which covers these matters. The Western Australian Government made no criticism of the draft recommendation except to oppose the creation of an additional regulatory body. The Victorian Government has not formed an opinion, but found merit in much of the proposal (Draft report hearings, p.569).

Some rail customers (Pasminco, AWB, Rail Freight Forwarders) and others (ARTF) expressed the need for a regulator, although the AWB was concerned that one might endorse too high a freight rate.

A number of rail users are not in favour of a regulatory presence, even if the responsibilities were undertaken by an existing body such as the TPC. BHPT would be opposed to there being a rail regulatory body in addition to there being a NRC (Draft report hearings, p.38). It admits that the NRC would be a monopoly, but it would be satisfied to deal with a single (national) efficient monopoly rather than several (State) monopolies, because this would avoid the current protracted discussions with the different systems in order to obtain decisions on intersystem matters.

The NSW Coal Association preferred that competition were introduced into the market in the way it proposed (that is, one private consortium controlling the rail infrastructure and another running the trains), in which case it claimed that there would be no need for a regulatory body (Submission 132, p.4). It went on to say that:

However, in the event that monopoly powers remain, the NSWCA would see some justification in an independent body, perhaps along the lines of the Interstate Commerce Commission (ICC) in the United States being formed to ensure that such powers are not abused.

The Queensland Mining Council did not believe that railway corporations should be subject to the scrutiny and directions of a Commonwealth [rail] regulatory authority.

Should measures other than trade practice constraints and the threat of private and intermodal competition be required, these should be a matter for the railways, state governments and rail users, whether individually or collectively. (Submission 148, p.2)

Oversight of standards

Railway systems are opposed to the regulation of standards by a national body. Some do not wish to have standards imposed on them from outside, while AN is concerned that a regulatory body might hinder rather than facilitate technical innovation (Draft report hearings, p.421). The railway systems have for long had a preference for sorting things out cooperatively between themselves. Unfortunately, this long-held preference has to date achieved very little, very slowly. Rail authorities now look to the establishment and operation of the NRC to accelerate the process of standardisation, because uniformity of standards across that part of the network used by the NRC will give it greater efficiency.

On the other hand, the ARU saw a need for an authority with responsibility for standards, but with its responsibilities confined to operational standards and independent safety investigations (Submission 141, p.12). Similarly, the AFULE supported the concept of an authority as a means of obtaining consistent engineering and operational standards in the industry and, in particular, independent investigations of accidents and incidents (Submission 125, p.6). The Commonwealth Department of Transport and Communications considered that there may be a case for an authority to look after safety matters (Submission 128, p.8).

Allen suggested that there should also be national railway standards for keeping accounts (he advocated accrual accounting consistent with the corporations law), costing, and the collection and computerised documentation of data (Submission 105, p.3). The Consumer Transport Council went further in suggesting that a competent railway or transport body (for example, BTCE) be made responsible for the national collection and dissemination of railway data on a consistent basis (Submission 119, p.6).

It was agreed at the July 1991 special Premiers' Conference that a framework for national performance monitoring be established for GTEs (or GBEs). Rail and urban public transport were mentioned specifically, and the focus initially is to be on accounting and non-financial measures of performance. Oversight of standards could come within this framework.

National recognition of railway skills

DEET supported the establishment of nationally consistent standards for both skills and training. This would help overcome barriers to the transfer of skills across systems (Submission 101, p.2).

The ARU is strongly in favour of national standards of training but opposed a regulatory authority having any role in this process (Submission 141, p.12). It pointed out that national standards of training are being instituted under the auspices of the National Training Board (see also Section 7.3.4).

12.5.2 Responsibilities for rail regulatory functions

The Commission is convinced that there should be a means of resolving (notified) disputes between railway authorities and customers, particularly in relation to charging matters and anti-competitive behaviour. The existing arrangements, supported by what are effectively restrictions on competition, are one-sided in favour of the railways. Disclosure of costs to the regulator would have to be part of the process.

Evidence from participants indicated that existing or planned bodies would be able to undertake standards and skill recognition responsibilities. On that basis the Commission sees less need for a new specialised rail regulatory authority. However, it also does not consider that the TPC with its current powers is able to undertake the range of regulatory activities which the Commission believes is essential for the introduction and retention of competition in the railway sector. The Commission therefore proposes that the relevant Commonwealth and State legislation be amended so as to allow the TPC to:

- oversee trade practices aspects of railway authorities, regardless of their ownership and regardless of whether or not they are incorporated under the corporations law (see Recommendation 3.1);
- investigate disputes and facilitate their settlement where there is evidence of anti-competitive behaviour, possibly in the form of monopoly pricing and/or exclusion from access to rail infrastructure; and
- allow (but not require) discriminatory pricing, such as Ramsey pricing, by natural monopolies, but to make mis-use of their pricing power an offence under the law.

The possibility of extending TPC powers to cover GBEs will be considered at the November 1991 special Premiers' Conference. The TPC has indicated that it would welcome some of the above changes (Submission 168 to this inquiry; and Submission 162 to the Industry Commission's inquiry into energy generation and distribution).

The TPC notes that implementation of the draft report recommendations would introduce competition and contestability into most areas of the rail transport sector leaving only limited areas

that might be considered to retain natural monopoly characteristics. Appropriate changes to the Act, to prevent monopoly abuse of market power in hindering access and changing excessive prices, would include:

- changing the ‘purpose’ test in section 46 (misuse of market power) to an ‘effects’ test so as to reduce the currently high burden of proof placed on potential plaintiffs;
- extending the coverage of section 49 (price discrimination) to cover services - railway operations would currently be excluded as not being ‘goods’;
- extending the authorisation process (whereby the TPC has the power to grant immunity from court action, if it finds net public benefits, for certain practices that would otherwise be in breach of the Act) in order to provide the TPC with flexibility to allow certain pricing arrangements such as Ramsey pricing; and
- providing the TPC with the scope over access and price matters to facilitate the settlement of disputes where there is clear evidence of abuse of monopoly power such as in preventing or hindering access or in monopoly pricing.

The major benefits of this course of action are that the required regulatory function would be introduced without the need to establish a new regulatory authority, and that trade practices regulation would be undertaken in a way which was consistent across industries. The TPC would require adequate staffing and other resources to undertake these additional responsibilities.

While the pursuit of national standards for railways through cooperation between the rail systems has been a slow and tedious process in the past, the Commission has been told that there is now a new wave of cooperation. Single management of interstate operations by the NRC is expected to accelerate the process because it is in its own interests to have uniform minimum standards for its rollingstock and the tracks it uses. Given these expectations, it would be inappropriate at this time to recommend the creation of a regulatory body for standards while the NRC is being established.

National recognition and accreditation of railway skills is covered by Recommendation 7.4.

The Commission is not fully confident that the mechanisms described above will achieve the desired results in a timely manner, but they should be tried and there are indications that they would have a reasonable chance of success. Nevertheless, the Commission recommends that governments review these processes within five years.

RECOMMENDATION 12.3

The Commission recommends that Commonwealth and State legislation be changed so that the coverage of the Trade Practices Act extends to railway authorities, whether incorporated under the corporations law or not. The Act should also provide the power to facilitate the settlement of disputes concerning monopoly pricing and anti-competitive behaviour (including access to track).

12.6 Amalgamation of government railways

It is sometimes said (eg Whitlam) that it is much easier to move freight and passengers between countries of Europe than between States of Australia. One solution to the interstate problem is to amalgamate government railways.

In 1975, the Commonwealth Government offered to take over State railways under the powers of section 51(xxxiii) of the Constitution (see Chapter 3 and Appendix F). Only South Australia (for its non-urban rail) and Tasmania accepted, leading to the formation of AN. The Hon. Gough Whitlam, the then Prime Minister, has suggested that this offer again be made by the Commonwealth Government (Submission 93, p.5). Given the conditions of the South Australia takeover, presumably he is referring to non-urban services. Whitlam argued that amalgamation would reverse the trend of increasing rail deficits. He strongly advocated taking over the whole NSW and Victorian systems, presumably because they are perceived as the least efficient and account for a large proportion of the total railway deficit. Amalgamation has also been suggested by Viney (Submission 15, p.1).

For interstate traffic, the major gains envisaged by amalgamation of State railways could be achieved by the NRC, especially as the economics of non-urban passenger rail services are questionable. Moreover, as Chapter 10 illustrates, there is significant value in inducing competition in those parts of the railway system which have natural monopoly advantages. Finally, the 'open access' to the permanent way, recommended in this chapter, has the potential to offer further gains. These moves could offer larger net gains than might be achieved by aggregating State railways into a single, national sole supplier of rail services.

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Rail Transport

Volume II: Appendices

Report No. 13

21 August 1991

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- 2** The scope for and benefits of rail reform
- 3** Relationships between governments and railways
- 4** The case for government intervention in railways
- 5** Competitive, environmental and social aspects of rail and road transport
- 6** Rail financing and capital investment
- 7** Management and labour productivity
- 8** Urban passenger services
- 9** Non-urban passenger services
- 10** Bulk commodity freight
- 11** Non-bulk freight
- 12** Options for structural reform

References

ABBREVIATIONS USED IN VOLUME 11

..	negligible
-	not applicable
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AGPS	Australian Government Publishing Service
Amtrak	trading name of the National Railroad Passenger Corporation (US)
AN	Australian National Railways Commission
ANI	Australian National Industries Limited
ANZEC	Australian New Zealand Environment Council
ARIAC	Australian Rail Industry Advisory Council
ARRDO	Australian Railway Research and Development Organisation
ARU	Australian Railways Union
ASCO	Australian Standard Classification of Occupations
ATAC	Australian Transport Advisory Council
AWU	Australian Workers Union
BHP	Broken Hill Proprietary Company Limited
BTCE	Bureau of Transport and Communications Economics
BTE	Bureau of Transport Economics
BR	British Railways
BRB	British Railways Board
CAPM	Capital Asset Pricing Model
CBD	central business district
CGC	Commonwealth Grants Commission
CN	Canadian National Railways, a division of Canadian National
CP	Canadian Pacific, a department of Canadian Pacific Limited
CSO	community service obligation
dB	decibel
DoTC	Commonwealth Department of Transport and Communications
EC	European Community
EPAC	Economic Planning Advisory Council
FORS	Federal Office of Road Safety
GBE	Government Business Enterprise
GDP	gross domestic product
IAC	Industries Assistance Commission
IC	Industry Commission
ICC	Interstate Commerce Commission (United States)
ISC	Inter-State Commission
km	kilometres
LCL	less-than-car-load
Met	trading name for the urban activities of the PTC
mt	million-tonnes
na	not available
NAROC	Northern Area Regional Organization of Councils
NFI	National Freight Initiative

NRC	National Rail Corporation
NRFC	National Rail Freight Corporation
NSW	New South Wales
NT	Northern Territory
NTA	National Transportation Agency (Canada)
ntk	net tonne-kilometres
NZ	New Zealand
NZR	New Zealand Rail Limited
NZRC	New Zealand Railways Corporation
OECD	Organization of Economic Co-operation and Development
PSO	public service obligation
PTC	Public Transport Corporation (Victoria)
PUD	pickup and delivery
QLD	Queensland
QR	Queensland Railways
RIC	Railway Industry Council
ROA	Railways of Australia Committee
SA	South Australia
SJ	Swedish Railways
SOC	Social Opportunity Cost of Capital
SPC	special Premiers' Conference
SRA	State Rail Authority of New South Wales
SRTP	Social Rate of Time Preference
STA	State Transit Authority of New South Wales
STAP	State Transport Authority Plan (Victoria)
SULC	Save the Upfield Line Campaign
Tasrail	Tasmanian operations of AN
TFP	total factor productivity
Transperth	trading name of the Metropolitan (Perth) Passenger Transport Trust
UIC	Association of International Railways
UK	United Kingdom
US	United States
VIA	VIA Rail Canada Inc.
VicRail	Victorian Railways (a former name)
V/Line	trading name for the non-urban activities of the PTC
VFT	Very Fast Train
VKT	vehicle-kilometres travelled
WA	Western Australia
Westrail	Western Australian Government Railways Commission

APPENDIX A: LIST OF PARTICIPANTS

Participant	Submission number
ACT Government	71
Action for Public Transport (NSW)	40, 95, 139
Albury-Wodonga Development Corporation	79
Alcoa of Australia Limited	19
Allen, Dr J. A.	105
Arkland Pty Limited	67
Australia Post	59
Australian Automobile Association	10, 146
Australian Bureau of Agricultural and Resource Economics	73
Australian Bus and Coach Association	102
Australian Cement Limited	28
Australian Chamber of Manufactures	99
Australian Chamber of Shipping Ltd	53
Australian Conservation Foundation	34
Australian Consumers' Association	55
Australian Federated Union of Locomotive Enginemen	125
Australian Federation of Construction Contractors	44
Australian Federation of Consumer Organizations	87
Australian Local Government Association	81
Australian Mining Industry Council	88, 140
Australian National Industries Limited	76
Australian National Railways Commission	64, 115
Australian Railways Union	63, 141
Australian Road Transport Federation	69, 124
Australian Wheat Board	61, 129
Austrroads	24
Barker Federal Electorate Council (ALP)	96
Bathurst City Council	118
BHP Transport	
BHP-Utah Coal Limited	52, 120
Bomford, Mary	
Brown, Mrs M.	89
Bulk Grains Queensland	
Business Council of Australia	57
Cameron-Stewart, Mr John	49
Canberra/Queanbeyan Regional Transport Action Group	42, 116
Cockburn Cement	7
Combined Pensioners Association of NSW Inc	143
Commuter Council of NSW	144
Consumers Transport Council	6, 94, 119
CRA	72, 92

Participant	Submission number
Dalrymple Bay Coal Terminal Pty Ltd	8
Department of Employment, Education and Training	101
Department of Industrial Relations	136
Department of Transport and Communications	128
Director General of Transport of South Australia	74
Easton, Mr E. W.	104
Esler, Mr Kevin	48
Exxon Coal and Minerals Australia Limited	11, 84, 91, 138
Fast Train-Polis Action Group	56
Freebairn, Professor John	1
Greenpeace	
Grocery Manufacturers of Australia Ltd	12
Healy, Mrs Mary	80
Howlett, Mr Murray	27
Jerilderie Shire Council	62, 112
Koerner, Mr Richard J.	13
Lachlan Regional Transport Committee	39
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Laird, Dr Philip	4, 114
Local Government Association of South Australia	30
Mayne Nickless Limited	51
Michael, Mr Ewen	
Miller, Mr Richard	
MIM Holdings Limited	
Municipal Association of Tasmania	9
Murray Regional Development Board	3
National Farmers' Federation	77, 159
New South Wales Coal Association	31, 97, 133
New South Wales Farmers' Association	82
New South Wales Government	75, 86
New South Wales Treasury	130
Newman, Peter and Kenworthy, Jeff	54
Nissan Motor Manufacturing Company (Australia) Ltd	37
Northern Area Regional Organisation of Councils	41
Northern Territory Government	83, 145

Participant	Submission number
Oakbridge Limited	47, 117
Pasminco Mining Limited	66, 132
Port of Brisbane Authority	85
Queensland Coal Association (see Queensland Mining Council)	
Queensland Government	50, 135
Queensland Mining Council	60, 148
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Shell Company of Australia	90, 100, 142
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Shire of Carnamah	162
Shire of Dalwallinu	167
Shire of Donnybrook	155
Shire of Gnowangerup	149
Shire of Goomalling	164
Shire of Jerramungup	156
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Shire of Murchison	153
Shire of Murray	163
Shire of Nannup	150
Shire of Narembeen	166
Shire of Nungarin	152
Shire of Parkes	18
Shire of Perenjori	158
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State Rail Authority of NSW	98
State Transport Authority of South Australia	123
Tasmanian Government	35
Taylor, Dr Colin J	26, 108
Town and Country Town Planning Association (Victoria)	45, 110
Town of Narrogin	154
Trade Practices Commission	168
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Participant	Submission number
United Farmers and Stockowners of South Australia Incorporated	70
United Farmers and Stockowners of South Australia Incorporated - Grain Section	121
VFT Consortium	46
VFT Progress Group	22
Victorian Government	58, 134
Viney, Mr Allan	15
Watson, Mr Mark	14
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West Australian Locomotive Engine Drivers', Firemen's and Cleaners' Union	20
Western Australian Government	43, 131
Western Australian Municipal Association	147
Whitlam, Hon Gough	93, 103
Wilson, Mr Geoffrey P.	65, 137

APPENDIX B: RAIL SYSTEM MAPS

APPENDIX B: RAIL SYSTEM MAPS

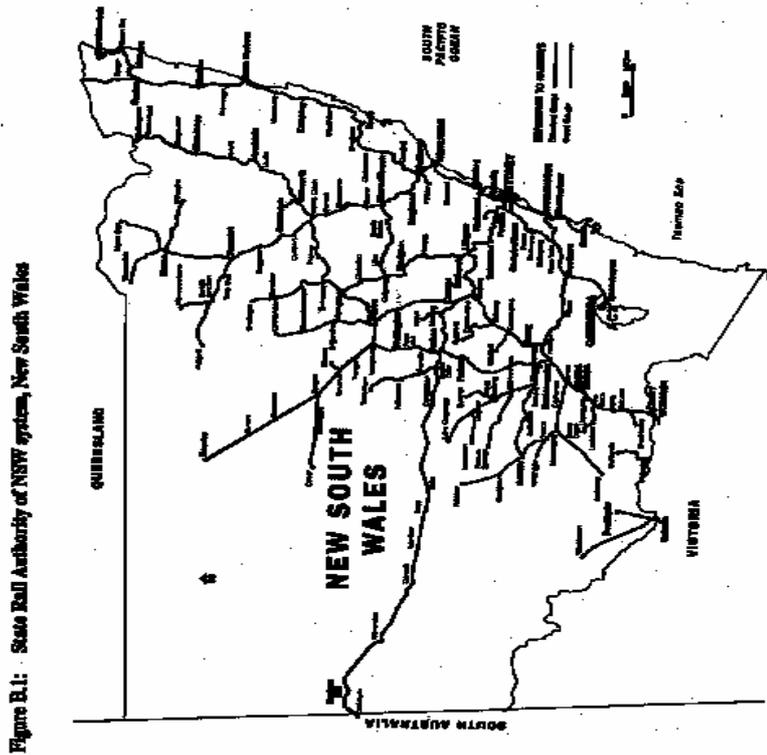


Figure B.2: Public Transport Corporation (Victoria) system, Victoria

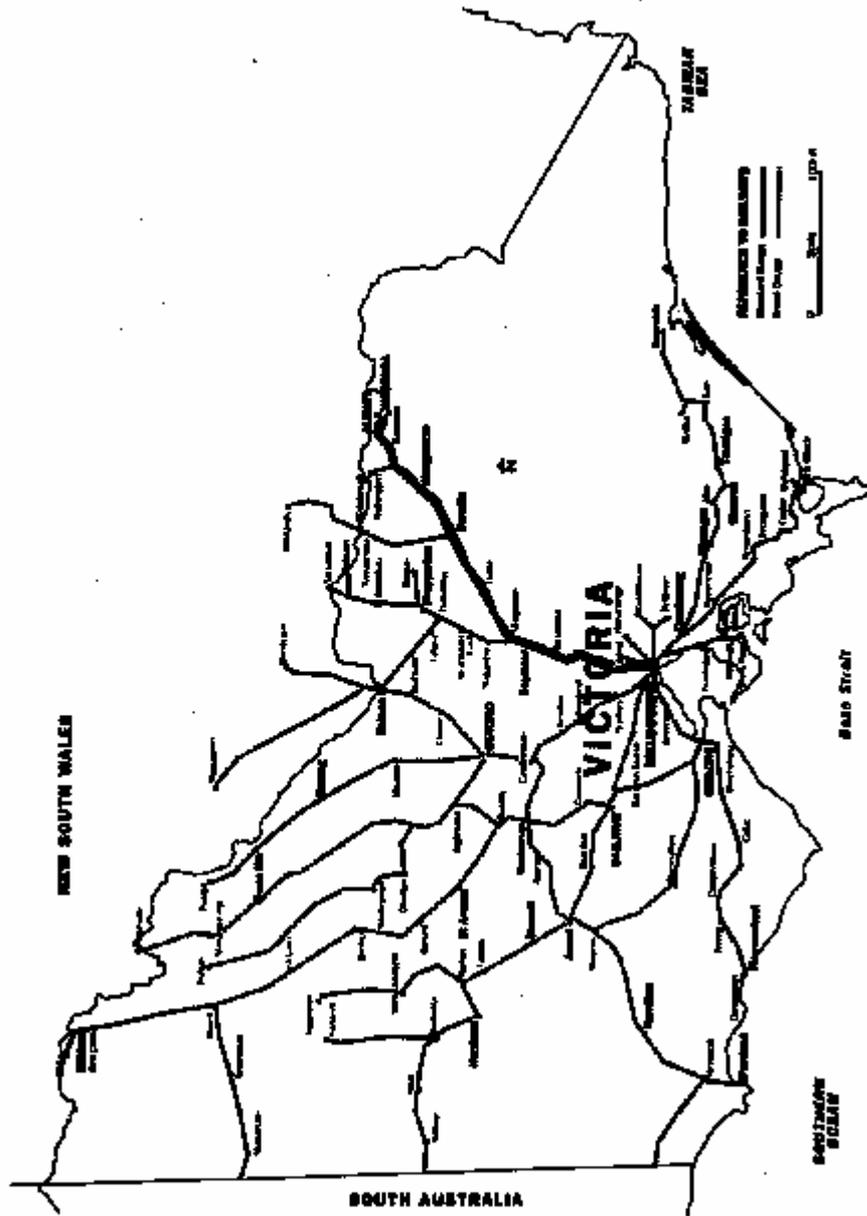


Figure B.3: Queensland Railways system, Queensland

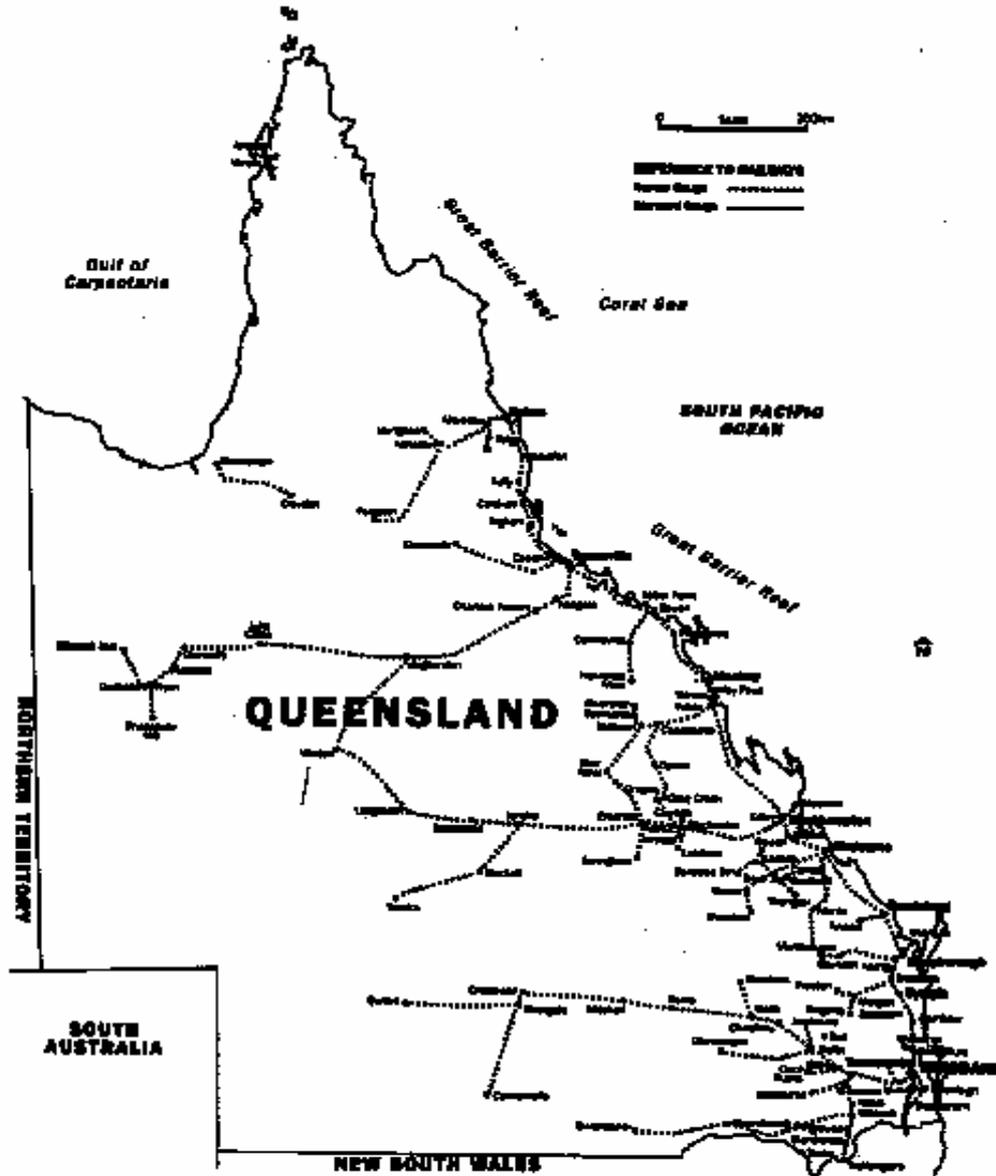


Figure B.4: Westrail system, Western Australia

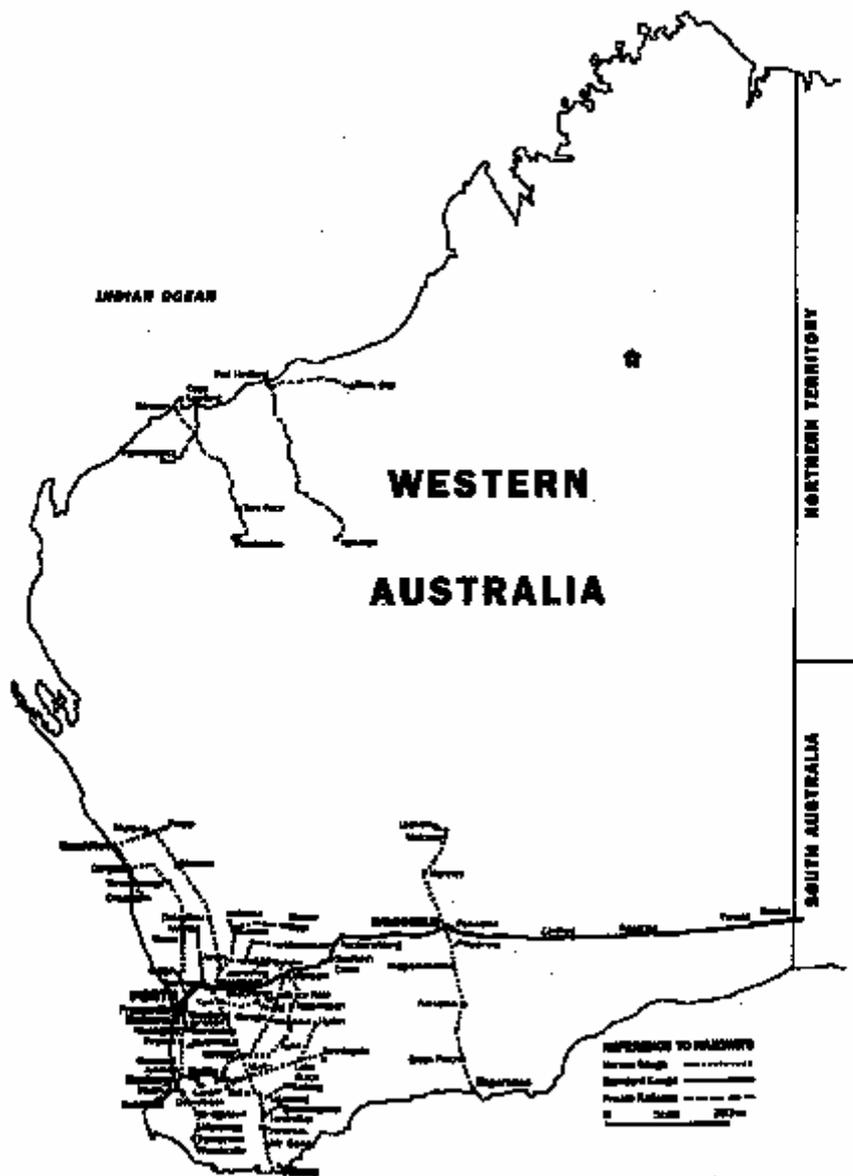


Figure B.5: Australian National system, South Australia, Northern Territory and Tasmania

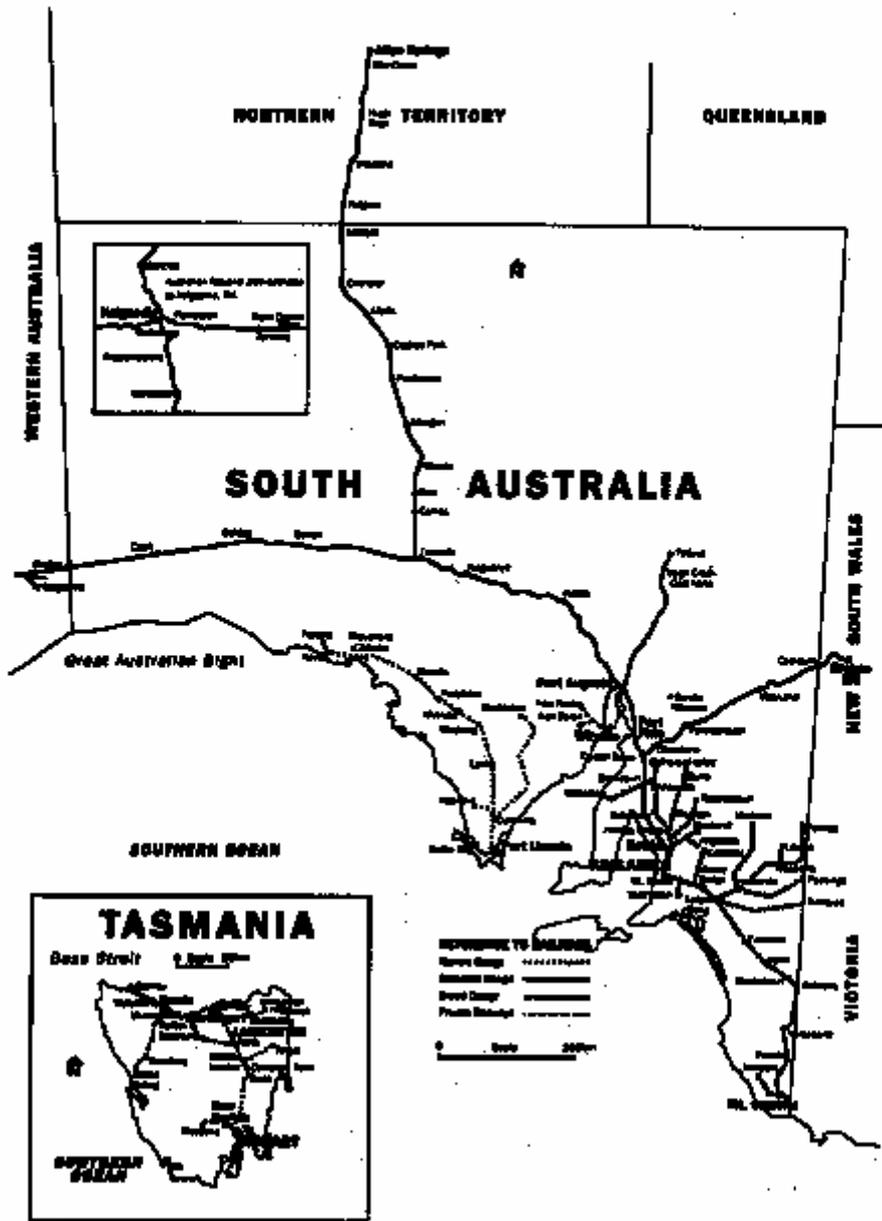


Figure B.6: Sydney urban system

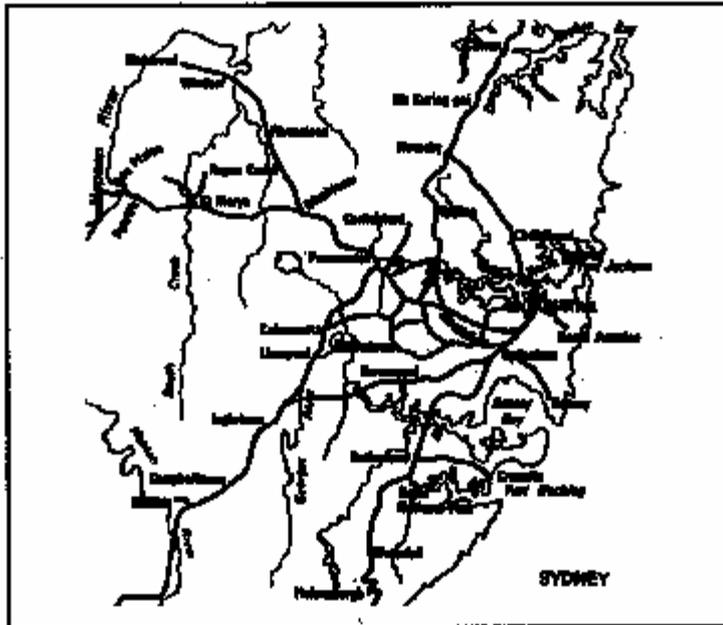


Figure B.7: Melbourne urban system

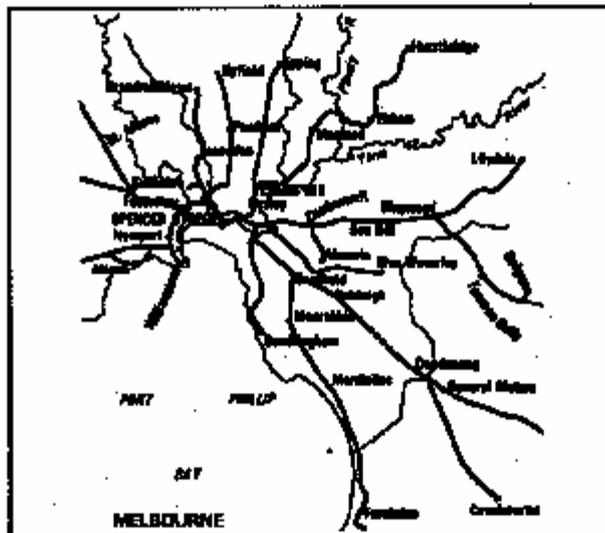


Figure B.8: Brisbane urban system

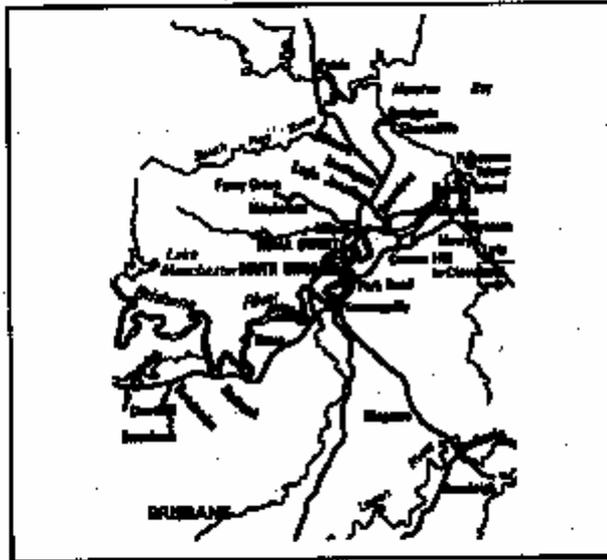


Figure B.9: Perth urban system

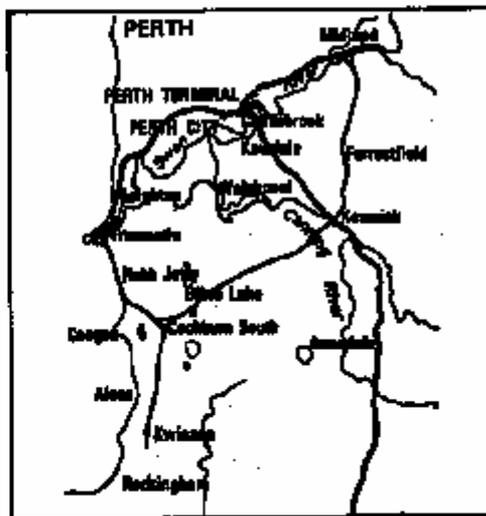
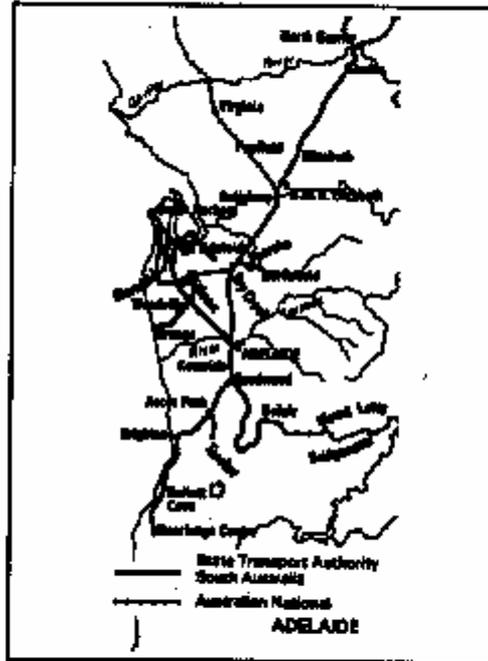


Figure B.10: Adelaide urban system



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Table C.1: Road and rail transport tasks, 1968-69, 1978-79, 1988-89

<i>Task</i>	<i>1968-69</i>	<i>1978-79</i>	<i>1988-89</i>
Road^a			
Truck			
Tonnes (million)	na	912.6	990.2
Tonne-kilometres (billion)	na	48.1	85.5 ^a
Bus			
Government passenger journeys (million)	437.0 ^b	357.6 ^c	na
Passenger journeys (million)	na	na	973.7
Rail			
Government			
Tonnes (million)	77.0	111.1	178.8 ^d
Tonne-kilometres (billion)	21.5	32.1	50.7
Passenger journeys (million)	447.4	375.0 ^e	416.7
Private			
Tonnes (million)	53.4	117.7	137.3
Tonne-kilometres (billion)	5.5	25.6	31.0

- a Years ending 30 September 1979 and 1988.
b includes trolley bus in Tasmania.
c excludes Western Australia.
d includes some double counting for intersystem traffic.
e excludes South Australia.
Source: ABS unpublished statistics, ABS (1990a, 1990b).

Table C.2: Summary of operations by rail system, 1988-89

	<i>PTC</i>		<i>PTC</i>		<i>QR</i>	<i>Westrail</i>	<i>Transperth</i>	<i>STA</i>	<i>AN</i>	<i>AN</i>	<i>Total</i>
	<i>SRA</i>	<i>Met</i>	<i>V/Line</i>	(<i>SA</i>)				<i>Mainland</i>	<i>Tasrail</i>		
All operations											
Gross revenue (\$m) ^a	1 072	206	257	1 107	269	7	18	302	29	3 267	
Employment (persons) ^b	33 113	5 585	11 629	21 741	5 621	506	1 073	5 823	825	85 916	
Route kilometres	7 755	330	5 047	10 094	5 553	63	128	6 218	840	36 028	
Locomotives	625	95	285	622	150	-	-	204	50	2 031	
Freight operations											
Freight revenue (\$m) ^a	619	-	161	1 021	253	-	-	257	27	2 338	
Revenue/net tonne-kilometres (cents)	4.6	-	4.7	4.9	5.2	-	-	3.4	5.8	4.6	
Net tonne-kilometres (billion)	13.6	-	3.4	20.9	4.9	-	-	.6	0.5	50.9	
Net tonnes (million)	50.2	-	10.0	80.5	24.3	-	-	12.0	2.3	179.3	
Average haul (km) ^c	271	-	340	259	202	-	-	633	217	284	
Average haul (tonnes) ^d	na	-	586	901	517	-	-	851	483	na	
Wagons	9 209	-	4 236	17 167	5 848	-	-	5 028	847	42 335	
Passenger operations											
Metropolitan journeys (million)	246.1	93.5	3.2	49.0	-	9.4	9.0	-	-	410.2	
Country journeys (million)	3.2	-	2.6	1.5	0.3	-	-	0.4	-	8	

a Excludes government supplements and subsidies.

b At 30 June 1989.

c Derived by dividing net tonne-kilometres by tonnes carried.

d Derived by dividing net tonne-kilometres by freight train-kilometres.

Sources: Rail authority Annual Reports 1988-89, ROA (1990), CGC unpublished statistics.

Table C.3: Urban rail systems, principal features, 1988-89

<i>Features</i>	<i>SRA</i> <i>CityRail</i>	<i>PTC</i> <i>Met</i>	<i>PTC</i> <i>V/line^a</i>	<i>QR</i>	<i>Transperth</i>	<i>STA</i> <i>(SA)</i>	<i>Total</i>
Track-kilometres	730	391	na	202	64	128	na
Train-kilometres ('000)	32 473	13 800	2 866	6 746	2 333	2 500	60 718
Carriages	2 068	919	191	306	102	131	3 717
Passenger-kilometres (m)	3 243	1 418	na	858	111	193	na
Fare revenue (\$m)	237.3	100.7	11.5	46.4	5.5	9.5	411.8
Fare-kilometres (c/km)	9	7	8b	5	5	5	7
Expenditure (\$m)	na	na	na	147.7	37.6	66.7	na
Total revenue (\$m)	na	na	11.5	49.0	7.0	17.6	na
Operating deficit (\$m)	na	na	na	98.8	30.6	49.1	na
Cost recovery (per cent)	na	32	29 ^b	33	19	26	na

a V/Line commuter services.

b Includes V/Line country services.

Sources: Rail authority Annual Reports 1988-89, CGC unpublished statistics.

Table C.4: Urban rail use, 1986 Census data

	<i>Sydney</i>	<i>Melbourne</i>	<i>Brisbane</i>	<i>Perth</i>	<i>Adelaide</i>	<i>Total</i>
Number travelling to work	1 327 551	1 224 592	353 342	395 405	453 121	3 757 011
Number travelling to work by train	185 928	101 093	25 850	6 906	13 232	333 009
Train travellers as per cent of total workers	14	8	7	2	3	9
Number travelling to work in CBD	135 686	105 461	53 665	107 392	88 135	490 339
Number travelling by train to work in CBD	65 035	35 185	12 158	2 611	7 336	122 325
Per cent of workers travelling to CBD, who travel by train	48	33	23	2	8	25
Per cent of workers travelling by train, who travel to CBD	35	35	47	57	55	37

Source: ABS, 1986 Census (microfiche).

Table C.5: Household expenditure (\$ per week) on rail fares and other transport by household income level, capital city households, 1989

<i>Income group</i>	<i>Rail fares ^a</i>	<i>All public transport</i>	<i>Motor vehicle costs</i>
Lowest quintile	0.59	1.80	24.73
Second quintile	1.00	2.63	47.50
Third quintile	1.39	4.15	67.21
Fourth quintile	2.09	4.34	90.38
Highest quintile	2.72	6.09	118.33
All capital city households	1.64	3.94	72.81
Per cent change 1984 to 1989	40	52	33

a These are dollar expenditures. There are no substantial differences between quintiles in dollar expenditures on rail expressed as proportions of all household expenditure.

Source: ABS unpublished statistics.

Table C.6: **Household expenditure (\$ per week) on rail fares by State and capital city, 1984 and 1988**

<i>State and Capital City</i>	<i>Rail fares</i>		
	<i>1984</i>	<i>1988</i>	<i>Change</i>
	<i>\$</i>	<i>\$</i>	<i>%</i>
NSW	1.23	1.96	59
Victoria	1.03	1.18	15
Queensland	0.52	0.84	62
Western Australia	0.15	0.26	73
South Australia	0.15	0.33	120
Tasmania	0.01	0.03	200
Northern Territory	-	-	-
ACT	0.15	0.28	87
Australia	0.81	1.17	44 ^a
Sydney	1.78	2.85	60
Melbourne	1.34	1.44	7
Brisbane	0.87	1.64	89
Perth	0.19	0.25	32
Adelaide	0.19	0.43	126
Hobart	-	0.01	-
Darwin	-	-	-
Canberra	-	0.28	-
All capital cities	1.17	1.64	40 ^b

a Over the same period motor vehicle costs increased by 27 per cent for Australia.

b Over the same period motor vehicle costs increased by 33 per cent for all capital cities.

Source: ABS unpublished statistics.

Table C.7: Country and interstate passenger services, 1989-90

	<i>SRA</i>		<i>PTC</i>			<i>Total</i>
	<i>Countrylink</i>	<i>V/line^a</i>	<i>QR</i>	<i>Westrail</i>	<i>AN</i>	
Track-kilometres (m)	6.5 ^b	7.1	2.5	na	2.3	na
Passenger-kilometres(m)	1 030.0	862.6	331.0	135.4	356.3	2 715.3
Passenger-journeys (m)	2.7	2.2 ^c	0.7 ^c	0.2 ^c	0.4	6.1
		0.6 ^d	0.2 ^d	0.1 ^d		0.9
Fare-kilometres (c/km)	7	8	6	5	9	7
Expenditure (\$m)	105.1	na	72.6 ^e	29.1	67.2	na
Revenue (\$m)	72.0	22.7 ^c	19.7 ^c	4.9 ^c	33.8	153.1
		19.3 ^d	1.5 ^d	7.9 ^d		28.7
Operating deficit (\$m)	na	na	52.9 ^e	16.3	33.5	na
Cost recovery (per cent)	31 ^b	29 ^f	27	44	50	na

a includes trains and road coaches.

b 1988-89

c regional

d intersystem

e regional only

f includes V/Line commuter services

Source: Rail authority Annual Reports 1989-90; Commission estimates

Table C.8: Household expenditure (\$ per week) on rail fares and other transport by household income level, households outside capital cities, 1989

<i>Income group</i>	<i>Rail fares^a</i>	<i>All public transport</i>	<i>Motor vehicle costs</i>
Lowest quintile	0.29	0.79	28.14
Second quintile	0.19	0.82	47.73
Third quintile	0.34	0.96	75.05
Fourth quintile	0.43	1.01	84.91
Highest quintile	0.54	1.10	139.04
All households outside capital cities	0.34	0.92	68.61
Per cent change 1984 to 1989	70	26	17

a These are dollar expenditures. A measure of rail expenditure on a proportion of total expenditure for each quintile shows a slightly higher proportion in the first quintile but no substantial difference between higher quintiles.

Source: ABS unpublished statistics.

Table C.9: Household expenditure (\$ per week) on holiday rail fares in Australia by household income level, 1989

<i>Income group</i>	<i>Holiday rail fares</i>
Lowest quintile	0.16
Second quintile	0.12
Third quintile	0.10
Fourth quintile	0.13
Highest quintile	0.20
All households	0.14

Source: ABS unpublished statistics.

Table C.10: Financial results (\$ million) of government railways, State and Commonwealth, 1980-81 to 1989-90

	NSW	Vic	Qld	WA	SA	All States	Commonwealth	Australia
<i>Operating expenditure^a</i>								
1980-81	897	473	501	179	65	2 115	284	2 399
1981-82	1 126	531	611	201	78	2 546	317	2 864
1982-83	1 281	581	704	224	127	2 917	366	3 283
1983-84	1 402	1 306	769	237	137	3 851	406	4 257
1984-85	1 525	1 598	831	247	172	4 373	395	4 768
1985-86	1 712	1 416	912	238	168	4 446	405	4 851
1986-87	1 803	1 399	952	241	155	4 550	417	4 968
1987-88	1 953	1 282	975	241	163	4 614	460	5 074
1988-89	2 322	1 431	1 088	267	180	5 287	497	5 783
1989-90	2 409 ^c	1 524	1 155	306	192	5 586	494	6 080
<i>Operating revenue^b</i>								
1980-81	546	237	408	166	69	1 426	205	1 631
1981-82	649	258	491	198	85	1 681	228	1 909
1982-83	695	231	561	213	132	1 832	238	2 070
1983-84	804	601	690	195	139	2 429	280	2 709
1984-85	916	644	872	237	170	2 840	311	3 150
1985-86	1 052	392	963	229	166	2 802	340	3 143
1986-87	1 106	372	1 005	228	155	2 866	360	3 226
1987-88	1 150	463	1 023	237	163	3 036	384	3 419
1988-89	1 135	470	1 094	267	181	3 146	415	3 560
1989-90	1 414	495	1 159	278	192	3 539	450	3 989
<i>Operating deficits</i>								
1980-81	-351	-236	-93	-14	4	-689	-79	-768
1981-82	-477	-273	-120	-3	8	-865	-89	-955
1982-83	-586	-350	-143	-11	6	-1 085	-128	-1 213
1983-84	-598	-705	-79	-42	2	-1 422	-126	-1 548
1984-85	-609	-953	41	-10	-2	-1 534	-84	-1 618
1985-86	-661	-1 024	52	-9	-1	-1 644	-65	-1 708
1986-87	-696	-1 028	52	-13	0	-1 684	-58	-1 742
1987-88	-802	-819	47	-5	1	-1 578	-77	-1 655
1988-89	-1 187	-961	6	0	1	-2 141	-82	-2 223
1989-90	-995 ^c	-1 029	5	-29	0	-2 047	-44	-2 091 ^c

a Includes depreciation charges, interest payments.

b Excludes government subsidies, includes interest receipts.

c Adjusted by the Commission in order to remove the impact of debt reconstruction which eliminated the SRA's interest payments in 1989-90.

Source: ABS unpublished statistics.

Table C.11: Total capital expenditure (\$ million) by government railways, State and Commonwealth, 1980-81 to 1988-89

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>All States</i>	<i>Commonwealth</i>	<i>Australia</i>
1980-81	246	121	89	44	3	503	57	560
1981-82	326	130	178	38	-	671	63	734
1982-83	270	218	319	52	3	862	55	917
1983-84	439	394	301	15	5	1 154	52	1 206
1984-85	429	312	217	22	11	991	26	1 017
1985-86	528	266	355	22	12	1 183	54	1 237
1986-87	419	270	400	31	5	1 125	60	1 185
1987-88	412	207	303	29	1	952	95	1 047
1988-89	349	209	181	67	14	820	81	901

Source: ABS unpublished statistics.

Table C.12: Interest payments (\$ million) by government railways, State and Commonwealth, 1980-81 to 1988-89

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>WA</i>	<i>SA</i>	<i>All States</i>	<i>Commonwealth</i>	<i>Australia</i>
1980-81	21	59	6	5	6	96	35	131
1981-82	42	67	8	3	5	125	41	166
1982-83	119	51	24	8	6	207	48	256
1983-84	132	63	23	21	7	246	56	301
1984-85	176	161	55	21	7	420	61	481
1985-86	244	237	62	23	8	573	60	634
1986-87	308	166a	49	26	8	558	62	620
1987-88	351	50a	84	27	7	519	63	582
1988-89	498	43a	152	26	6	725	68	793

a Debt 'reconstruction' reduced interest payments in Victoria.

Source: ABS unpublished statistics.

REFERENCES FOR APPENDIX C

ABS (Australian Bureau of Statistics) 1990a and previous issues, *Year Book Australia*, Cat. no. 1301.0.

_____ 1990b and previous issues, *Survey of Motor Vehicle Use*, Australia, 30 September 1988, Cat. no. 9208.0.

ROA (Railways of Australia) 1990, *1990 Year Book and Personnel Directory*, Melbourne.

APPENDIX D: RECENT DEVELOPMENTS IN RAIL REFORM IN AUSTRALIA

The Commission acknowledges the major efforts to reform rail transport made by government, unions, private industry and the rail systems, particularly in the last few years. Symptomatic of the problems facing rail, much of this reform has not been consistent within or across systems. The various developments summarised in this appendix deal with organisational and structural reform of a fundamental nature more than with the numerous technical improvements introduced in recent years. Developments in rail reform are examined for each system individually; attention is also given to wider initiatives presently underway. Appendix E looks at railways' total factor productivity which is affected, in part, by those developments.

D.1 State Rail Authority of New South Wales (SRA)

Previously considered as a system lagging in reform, the State Rail Authority has recently commenced major reform activity. A change of government followed closely by two major inquiries in 1988, the New South Wales Commission of Audit (1988) Report on the State's Finances (the Curran Report) and PA Consulting Group's (1988) Report on the State Rail Authority started the process. Reform was given a practical boost with the passing of the Transport Administration Act 1988 and reviews of the SRA by Booz.Allen & Hamilton and implementation of recommendations in its two reports (Booz.Allen & Hamilton 1989a, 1989b).

Substantial changes were made to the SRA's strategic direction in 1988-89, and 1990-91 was the second year of the SRA's 'Turnaround Program'. For 1990-91, the SRA quotes increased freight tonnage (up by 2.2 million tonnes), increased commuter travel (passenger trips up by 5 million or 2 per cent), reduced cash operating costs (down by \$80 million or 5 per cent), reduced government cash contribution (down by \$14 million or 3 per cent), reduced employee numbers (down by 1800 or 6 per cent), and increased employee productivity.

The new legislation requires the SRA to operate in accordance with sound commercial practice, with an independent commercially-oriented board appointed to oversee the new charter. The Act intends clearly to delineate the SRA's managerial responsibility for commercial decisions and ministerial responsibility for social policy decisions. Losses resulting from Ministerial directions which are contrary to the Board's commercial objectives will be reimbursed through community

service contracts between the NSW Government and the SRA. In 1991 agreement was reached between the SRA and the NSW Government on the wording of contracts anticipated to commence in July 1991. Although this agreement is expected to define community services broadly, it is anticipated that, with further development of the SRA's accounting systems, detailed costs which are specific to location and function would enable more detailed contracts to be specified.

The NSW Government currently provides funding for country passenger services and suburban services. Under a financial restructuring agreement between the government and the SRA, the government makes a grant for all the operational and capital funding requirements of CityRail and Countrylink, but commercial freight must service all its capital investments. Options for corporatising Freight Rail and freight workshops are being considered by the NSW Government in recognition of the need to ensure Freight Rail has a commercial structure.

Management has been streamlined with the former fifteen levels of management being replaced by six new levels. Business units have replaced the old branch-based functional management structure. For units in the Freight and Countrylink division (Coal, Minerals and Grain, Express Rail, Trackfast and Countrylink), business managers are responsible for fixed assets and rollingstock, and in the case of commercial services, for earning a return on investment. There are also four regional divisions with responsibility for operations of services, track and rollingstock maintenance and management of human resources, and four support divisions with responsibility for group support, engineering, workshops and internal business. The regions act as cost centres. In the CityRail division, general line managers are responsible for the efficient operation and financial performance of their particular line.

The new Act requires preparation of an annual corporate plan. The SRA's 1988-89 corporate plan contained five-year strategies for the CityRail business and the Freight and Countrylink businesses. Monitoring systems for measuring progress against corporate performance indicators are being established. Full accrual accounting practices are being adopted together with depreciation allowances and the provision for superannuation, leave, workers' compensation and interest charges.

Over the past few years a number of traditional rail activities have been put out to competitive tender or sold. They include: printing; legal; medical; station retail businesses; outdoor advertising; some cleaning and station maintenance; most Trackfast road operations and most road motor vehicle maintenance. In 1990-91 Freight Rail workshops competed for 20 per cent of its work with outside suppliers. It has also recently gone to tender for the supply of locomotive services. This supply will be either purchased or fully maintained locomotives to be hired on a per kilometre basis. Recently the NSW Government has sought expressions of interest from the private sector for development, ownership and operation of a rail link between central Sydney and the airport at Mascot.

The SRA is undertaking a \$2.6 billion program of infrastructure renewal, of which \$2 billion is for the Sydney suburban system. The SRA is giving consideration to maintenance leasing

(maintenance by supplier) and operating leasing ('power by the hour') of locomotives. The SRA is consolidating terminal activity at Enfield, reducing the size of the rollingstock fleet, and rationalising workshops and maintenance depots by fleet consolidation. Countrylink road coach services have been successfully tendered out.

D.2 Public Transport Corporation (PTC) - Victoria

The establishment in July 1989 of the Public Transport Corporation, amalgamating the former State Transport Authority (trading as V/Line) and the Metropolitan Transit Authority is the most recent of many administrative rearrangements of government railways in Victoria. The government objective in integrating the two transport bodies is to obtain improved planning, management and delivery of transport services. The Victorian Transport Act sets down a very detailed set of functions and objectives for the Corporation.

Major changes have been made in the handling and transport of grain, with investment to reduce the number of receival points and to use larger and fewer wagons and locomotives, the closure of lightly trafficked lines and the use of integrated road operations. While grain freight services are to be managed and operated at a profit, there is a legislative requirement that only above-wheel costs be taken into account, effectively ignoring substantial infrastructure capital costs and track maintenance costs. Other changes in V/Line have included rationalisation of intermodal freight facilities in Melbourne, scrapping of old four-wheel wagons, reductions in train crew numbers by improving their management, implementation of a rollingstock control system, fare initiatives in country passenger travel to encourage off-peak usage, and a shift from mandatory training of labour to specific needs-based training.

For the period 1985-86 to 1989-90, the PTC reports that, while all tonnage carried remained constant at about 10.5 million tonnes, freight train tonnes per kilometre of track increased by 39 per cent; wagon fleet reduced by 49 per cent; and locomotive fleet reduced by 23 per cent. In the country passenger area, the number of passengers carried per carriage increased by 31 per cent. Actions taken to improve productivity included investment in workshops of approximately \$15 million to achieve productivity savings of some \$20 million per annum, introduction of two-person crewing on freight trains and the amalgamation of roles of guards and conductors on non-urban passenger trains. The PTC aims to reduce staff by at least 1500 (mostly management) and its deficit by 20 per cent in 1991-92.

Large government subsidies continue to be expended on operating suburban rail services, yet the PTC has been struggling to pay its bills resulting in Treasury intervention in its operation during 1990-91. The Metropolitan Public Transport Industry Plan (MetPlan) (State Transport Authority of Victoria 1988b), released in September 1988, provided a framework for decision-making on the

future development, operation, staffing and financing of public (rail and other) transport in Melbourne over the next 15 years.

MetPlan required major capital funding but such has not been forthcoming. Various initiatives in encouraging patronage growth and more efficient fare collection and revenue control have been attempted, the latter with adverse union and community group reaction. An inability to redeploy effectively PTC staff has added to a poor public image.

A draft final report of the State Transport Authority Plan (STAP) (State Transport Authority of Victoria 1988a) was released in April 1988 for community comment. STAP focussed on development needed to meet the country and interstate transport needs to the year 2002 by examining five different scenarios. As yet no final report has been published.

Of all the major railway systems, the urban rail sector of the Public Transport Corporation shows least evidence of achieved reform. V/Line, on the other hand, has undertaken worthwhile reform, although more is warranted.

D.3 Queensland Railways (QR)

In the last decade QR has undertaken major capital investments in coal line construction and suburban and mainline electrification. For the past six years QR has reported operating profits (before interest and redemption charges) but only because monopoly rents are extracted from the rail transport of coal. As QR stated in its submission:

Coal and mineral rail freight rates are more than simply a charge for carrying out a transport service, they are also a means of deriving an additional royalty from the development of the State's coal and mineral resources. (Submission 50, p.27)

Coal freight revenue more than covered the very substantial losses of other rail sectors, including the large losses of general freight. The extent of this cross-subsidisation is now being openly acknowledged (Queensland Department of Transport 1990, p.72). A review of the coal rail freight policies commenced in 1990 but was still not complete at the time of finalising this report.

Typical of most rail systems, QR is able to point to some gradual reforms. After a change of government in 1989, there appears to have been a concerted attempt to reform rail across the board and these developments are particularly worth reporting. The reforms adopted focus specifically on improving commercial performance, efficiency, accountability and the introduction of efficient pricing principles.

The Queensland Government has stated that it accepts QR's role as a provider of transport services within a competitive environment. This is reflected in QR's change in direction towards commercially-driven strategies. A new Transport Infrastructure (Railways) Act, as an interim measure, establishes Queensland Railways as a statutory authority under control of a commercial board. The longer term objective is for corporatisation. Various possibilities for Queensland's

government owned enterprises such as QR are canvassed in the Queensland Government's (1990) Green Paper. It is proposed that community services be identified, negotiated, explicitly funded and reported. It is interesting to note Queensland Railways' definition:

"the term CSO refers to a contractual arrangement between Government and the Railways for the provision of specifically identified and funded non-commercial services to specified service and efficiency levels".
(Submission 135, p.11)

A QR Trust Fund was established on 1 July 1990 (while QR was part of a department of State) to retain all receipts, as a first step to moving away from the traditional approach of using the Consolidated Revenue Fund for operational funding and the State Loan Fund for capital financing. Full accrual accounting is to be introduced in 1991.

An extensive organisational review of QR was finalised in September 1990. In line with the recommendations from this review QR's organisational structure was altered with the formation of three core business units (Coal and Minerals, Freight, and Passengers) along with three head office service groups (Financial Services, Corporate Services, and Human Resources). Each is responsible and accountable for a specific business area.

The workforce has been reduced as a result of the introduction of two-person and one-person crewing, rationalisation of freight terminals and workshops and changes in work practices (for example, crew shift lengths) and operating procedures. There has been a 16 per cent staff reduction over a recent five-year period. At the same time there has been a 27 per cent reduction in the rollingstock fleet with a concurrent 27 per cent increase in tonnage hauled. Introduction of technology has included the Main Line Electrification project over more than five years, and continued introduction of a Centralised Train Control system.

Government policy on restricting goods to rail has been revised. Ten major commodities have been deregulated since 1984 and common carrier obligations on QR have been removed. Volume discount freight rates have been introduced. All freight operations have been relocated from the inner-city Roma Street freight terminal to suburban Acacia Ridge where interstate freight services terminate. The number of freight terminals is to be reduced from 312 to a minimum of 23, with retained terminals being refurbished and modernised.

Major service improvement and operating cost reduction has been achieved on the Brisbane suburban network, accompanying a 100 per cent increase in patronage since electrification of the network commenced in 1978.

D.4 Westrail

Reform has been evident in Western Australia for many years. Westrail's system includes its metropolitan rail services which it operates under contract for Transperth. Westrail has developed

specific corporate objectives which guide its operations. A range of quantitative performance measures is monitored.

Detailed arrangements for the commercial orientation of Westrail were developed by a Government Inter-Departmental Committee established in 1984. The Western Australian government is soon to release a Policy Discussion Paper on the Corporatisation of GTEs which will almost certainly make clear that it will not corporatise its agencies using Australia's corporations law but constitute them under only State law, drawing as necessary on those parts of the corporations law considered relevant.

The business organisation of Westrail is structured around various business units serving internal and external customers. For the last five years, Westrail has included a statement of its commercial results in its annual report, to allow consideration of its financial performance in a commercial environment.

Rate of return reporting has been implemented for Westrail, and annual performance agreements between heads of Westrail and Transperth and the relevant Ministers have been introduced. Transperth, for instance, has identified the net socioeconomic return on written-down current cost of assets as an appropriate corporate target against which performance can be measured.

Thus far community services provided through rail have not been well defined with their cost being implicitly funded through consolidated revenue funding of the Westrail deficit. The WA Government appears to be unwilling to move away from the current deficit funding of community services (see Submission 131, p.4).

Over the last decade the Westrail workforce has been reduced by about 43 per cent although there has been relatively little decrease in recent years.

Major capital investment in the rail system is underway, concentrating on the urban rail electrification project and the northern suburbs rail link. The electrification has been accompanied by developments such as Centralised Train Control, reduced train crew size, automatic fare collection and automatic train protection. Consideration is being given to using value capture mechanisms for funding new rail infrastructure.

Although general freight traffics were deregulated in the early 1980s, several high volume traffics remained regulated to rail. Since 1985 progressive review have been undertaken of these remaining traffics. The Government argues that where regulation to rail is deemed to be necessary for economic or social reasons, rail freight rates should be adjusted to reflect the full costs of the road alternative.

D.5 State Transport Authority of South Australia

There is generally little evidence of reform in the rail operations of the State Transport Authority which operates urban rail and bus services in South Australia (all other intrastate rail services being the responsibility of AN). The State Government is still responsible for determining fare and service levels, setting cost recovery levels (which it has never done) and approving investment.

There has been some attempt to contain increasing costs, as reported by PA Consulting Group's (1987) 'Review of Performance - State Transport Authority'. This has included the cautious introduction of various employment initiatives, for example, split shifts and fewer awards.

The State Transport Authority has recently re-established its corporate planning process. This has taken into account some of the recommendations contained in the Fielding Report (1988) on Adelaide's public transport system. The State Transport Authority Corporate Plan for 1990-1994 targets major cost savings in all operations. The Transit Link concept is expected to introduce greater emphasis on utilising the rail system for high volume commuter passenger movements, supported by a feeder bus network comprising State Transport Authority and community services.

D.6 Australian National (AN)

Australian National has demonstrated a resolute, practical and steady commitment to reform, basically ever since it gained full control in 1978 following the merger of the Commonwealth Railways, the non-urban part of South Australian Railways and the Tasmanian Government Railways.

As a result of decisions announced in the May 1988 Commonwealth Government Business Enterprise (GBE) Reform Package, AN has received explicit funding for non-commercial operations - which requires scrutiny to help ensure that there is no cross-subsidisation of commercial operations by the explicitly funded non-commercial activities.

Some strategic controls (for example, over wage and employment conditions) and certain day-to-day controls (for example, approval to enter into contracts) were relaxed or removed in 1989, giving AN greater real commercial autonomy than any other government-owned rail system - although lack of access to additional equity finance is perceived by AN as a remaining constraint. In return, AN is held more accountable than previously, which has prompted the revaluation of assets on a replacement-cost basis. This will see depreciation provisions increase substantially.

AN is currently undergoing a major internal reorganisation by grouping within one division, the rail transport division, all of those functions which are necessary to operate trains.

Two other divisions, AN Freight and AN Passenger, will contain all those functions which interface with the customer. Each division will operate on a profit centre basis.

AN has had explicit detailed objectives for several years, as contained in legislation and its annual corporate plans (with ten-year planning horizons). These plans have been segmented into separate plans for each principal business sector; a resume of the plan is published. As an adjunct to corporate planning, extensive performance monitoring is undertaken and the results are widely published.

AN has defined its business as being to provide for high volume point-to-point linehaul transport of freight and for passengers. This has required it to reshape its business to cater only for tasks for which rail has a unique or strong competitive advantage over road freight, and, where possible, to vacate activities where resources are underutilised and losses are not supported by government revenue supplements (activities including less-than-car load (LCL), pickup and delivery (PUD) and South Australian regional passenger services). AN's train and terminal operations and all support functions have been reoriented to cater efficiently for the linehaul business, including the use of much longer unit trains, requiring significant investment in infrastructure. The AN Islington freight terminal in Adelaide is particularly appropriate to the task and has recently been expanded.

Refurbishment of AN's Ghan passenger train and an associated marketing program have demonstrated some potential for improving patronage, revenue and cost recovery on long-distance passenger services, although discounted air fares have recently affected those factors.

The major issue successfully addressed by AN has been improvement in the productivity of human and capital resources. This has included activities such as: a substantial reduction in workforce numbers achieved by natural attrition and by voluntary redundancy schemes; staff training; substantial reduction in rollingstock, maintenance plant, buildings, stores stock, debtors, overdraft financing and liabilities for annual leave; and development of management information systems to enable better control of finance, operations and marketing. Innovative rollingstock such as the 5-pack articulated container wagon and the 5-pack well-set have been brought into service, and currently AN is introducing RoadRailers. Work by the Bureau of Transport and Communication Economics reported by Brunker and Gallagher (1989) indicates an average annual total factor productivity growth rate of between 3.8 per cent and 6.0 per cent (depending on the assumptions made) for AN in the 1980s. This is more than double that for Australian industry overall; Australian manufacturing had an average annual total factor productivity growth rate of 1.7 per cent.

During its first twelve years of operation (1978 to 1990), AN has reduced its staff by 45 per cent, locomotive fleet by 23 per cent and wagon fleet by 54 per cent while increasing its traffic task by 79 per cent. Over the same period, expenditure on freight reduced by 28 per cent while revenue increased by 4 per cent in constant 1990 dollars.

AN has endeavoured to improve intersystem operations by negotiation for single management of interstate passenger trains. Despite coming close to agreement with Westrail on several occasions, such arrangements have never been finalised. Arrangements with the SRA look more promising at present. A House of Representatives Standing Committee on Transport, Communications and Infrastructure (1989) report recognised that rationalisation of east-west services is necessary to meet future needs, arguing that AN was in the best position to control interstate rail freight and passenger services.

AN has steadily improved its financial performance during the 1980s. For example, AN Tasrail which replaced the financially troubled Tasmanian Government Railways has required and received decreasing revenue supplements from the Commonwealth Government. AN has made major technical improvements in Tasmania for what is now a freight-only railway. A report prepared by the then Bureau of Transport Economics (BTE 1987) assessed the economic, financial and social consequences of closing the Tasrail network in 1988-89, concluding there was not a strong case for so doing.

D.7 Railway Industry Council (RIC)

The Railway Industry Council was established by the Australian Transport Advisory Council in 1986, having been proposed for some years. The primary objective of RIC - which comprised representatives of Commonwealth and State governments, rail managements, rail unions and the Australian Council of Trade Unions (ACTU) - was to develop a strategy for the medium and long term to improve the viability and competitiveness of the rail industry. Some three years later, in May 1990, RIC published a discussion paper (RIC 1990a) to enable public consultation and the development of recommendations. RIC's Conclusions and Recommendations were released on 19 October 1990 (RIC 1990b), the recommendations having been endorsed in principle by the Australian Transport Advisory Council on 7 September 1990.

The RIC process attracted much public comment with widely differing reactions, although RIC concluded that there was 'clear, broadly-based support for revitalisation of the industry' and 'a broadly-based consensus about the need for change in rail'. The process was perhaps understandably slow given the broad composition of the Council, though the fact that it achieved any consensus probably reflects the generally more conducive climate for rail reform. In the event, as acknowledged by RIC, the pace of change has been faster in some areas than the RIC analysis anticipated (for example, the National Freight Initiative proposal which is discussed below).

RIC's work was very much driven from the supply side of rail. It examined several options for rail's future, evaluating three non-urban scenarios (commercial traffics only; commercial traffics and community services; integrated transport services) and two urban scenarios (improved cost recovery; expanded role for urban rail). In the end it did not support any option, choosing only to endorse some general principles. Its six detailed recommendations, comprising the 'elements of a broadly-based reform package', relate to the future essential role of rail, investment in rail and potential sources of funding, technological development, measures to improve efficiency (in relation to rail's potential, labour market reform, commercial operation of freight services, contracted community services, uniformity of standards and railway workshops), improvement of the scope for revitalisation of the rail industry, and measures to promote appropriate freight and passenger transport services.

As the final step of the RIC process, the Commonwealth Minister for Land Transport has established an Australian Rail Industry Advisory Council (ARIAC) to advise him on rail reform issues, including the implementation of RIC's recommendations, especially those not included in the National Freight Initiative. Among other things, ARIAC will look at the future of passenger services, including the possible establishment of a single rail passenger authority for interstate services.

D.8 National Freight Initiative (NFI)

The National Freight Initiative Committee was established on 7 September 1989 by individual rail systems, freight forwarders and BHP, ACTU, Railways of Australia and the Commonwealth Government, motivated by a desire to revive intersystem rail freight activity. Consultants to the NFI, Booz.Allen & Hamilton and Travers Morgan, produced a final report dated 30 March 1990 (NFI 1990a). In addressing the issue of whether there is a commercially feasible option for providing interstate rail freight services, they concluded that by establishing a national rail freight organisation, improving infrastructure and changing work practices, a potential profit could be achieved by 1993-94. That report - which did not address many of the substantial institutional issues - effectively encouraged the NFI to continue working, and to propose to Commonwealth and State governments that a single organisation be given responsibility for national freight and that a package of supporting measures be put in place. This proposal was contained in a Report of the Committee on Establishment of a National Rail Freight Corporation (NRFC), dated 20 July 1990 (NFI 1990b).

The proposal for establishing a NRFC was based on Commonwealth and State equity participation in a body incorporated under the corporations law, commencing business from 1 July 1991, encompassing all of the railways' existing interstate business, the separate funding and organisation of community services, having a corporate goal of earning a rate of return sufficient to fund all investment from non-government sources without reliance on government guarantees.

After rapidly gathering momentum, NFI progress was slowed when Transport Ministers of Commonwealth, State and Territory governments failed to agree to the establishment of an 'Interim Board', due to various State concerns. They did agree, at the Australian Transport Advisory Council (ATAC) meeting on 7 September 1990, to establish an independent task force to develop detailed proposals and recommendations.

In October 1990, the ATAC delays were circumvented when Commonwealth, State and Territory leaders unanimously supported the creation of a National Rail Freight Corporation and signed a 'heads of agreement' at a special Premiers' Conference (the first of a series of such conferences aimed at reforming intergovernmental relations). Government leaders noted the need for the proposed Corporation to operate at world standard efficient costs which would require considerable upgrading of track and related rail infrastructure, and significant labour reform involving improvements in work practices and reductions in numbers employed, and the need for a substantial injection of equity funds to finance infrastructure upgrading.

At a special Premiers' Conference on 30 July 1991, the Commonwealth and State governments agreed to establish a National Rail Corporation (NRC). The corporation is expected to start operating in early 1992 becoming the sole provider of interstate rail freight services. The Commonwealth Government, with the NSW, Victoria and WA governments, will provide the initial equity estimated to be more than \$400 million over the next five years. Queensland signed the agreement and contributed assets to the corporation, but did not agree to any initial equity share due to its small interstate business. South Australia supported the corporation and proposed to sign the agreement after a range of issues under its Railways Transfer Agreements with the Commonwealth are resolved through bilateral negotiation.

The initial equity will be used to upgrade the track, terminals and other freight handling facilities. The corporation will run on a commercial basis and is expected to break even within three years, compared to the current deficits incurred by interstate rail freight of around \$375 million a year. It is expected that average productivity gains of at least 35 per cent can be achieved through revised work practices and new investment.

D.9 July 1991 special Premiers' Conference

As well as the agreement on the establishment of the NRC noted above, the special Premiers' Conference of July 1991 considered other aspects of microeconomic reform which have some bearing on reform of rail. As well as decisions on the need for a fundamental review of Commonwealth/State financial arrangements (intended to be dealt with at the next special Premiers' Conference in November 1991) and reform of regulatory differences between States that inhibit interstate mobility of goods and labour, government leaders, with the exception of the Northern Territory, agreed to the creation of a new National Road Transport Commission by September

1991 to regulate heavy vehicles on a national uniform basis and develop a new system of road user charges for heavy vehicles. This agreement is a development of proposals contained in the Inter-State Commission report on a national scheme for road use charges and vehicle registration (ISC 1990).

National registration procedures are expected to be developed by July 1992 for application from 1 January 1993. The national heavy vehicle standards will include vehicle dimension and weight limits, emission standards, traffic codes, vehicle and driver licensing, and consistent penalties for breaches of regulations. The new system will allow the operation of B-Doubles and road trains under national uniform conditions.

The new charging system will include the amount of tax that heavy vehicle operators pay on diesel fuel purchases, and a registration charge based upon the vehicle's weight and average distance travelled, in an attempt to reflect the real costs of heavy vehicle damage on roads. To take into account the heavier reliance on truck transport in remote areas, Australia will be divided into low-cost and high-cost zones for truck operations. Queensland, WA and SA will make up the low-cost zone but heavy vehicles from those States entering the high-cost zone (that is NSW, Victoria, Tasmania or the ACT) will have to pay the higher mass-distance charge.

Under the agreement, the National Road Transport Commission will phase in full cost recovery before July 1995 for all heavy vehicles except road trains where the date is set for July 2000. The inclusion of light vehicles in the scheme will be considered at the next special Premiers' Conference in November 1991.

The above developments in road transport, which competes with and complements rail transport, should enhance rail reform.

D.10 Very Fast Train (VFT)

The Very Fast Train is a proposal for a new high-speed rail system between Sydney, Canberra and Melbourne, first announced in 1984. Although it would use electrically-powered locomotion running with steel wheels on steel rails, the operational speed of 350 km/h means it would be significantly different from existing rail technology operating in Australia; practically, the VFT represents a new transport mode. It primarily would be marketed to passengers (including those currently travelling by air), but also to freight.

With a projected cost of \$6.5 billion (1990 dollars), the VFT proposal is the largest investment project currently under consideration in Australia. It is planned to be funded, built and operated by private enterprise. The project is dependent, amongst other things, upon a favourable feasibility study and government support/cooperation to facilitate acquisition of both public and private land for the route. At one stage the VFT Joint Venture (comprising four companies of which only one,

BHP, still was financially supporting the feasibility study) was also keen to have governments permit development along the route in such a way as to contribute to the financing of the VFT.

The investment proposal has been subject to a long evaluation process commencing with the preparation of a Concept Report and most recently a Project Evaluation Report by the VFT Joint Venture. There have been inquiries or reviews by the Victorian Government, the Senate Standing Committee on Transport, Communications and Infrastructure and the ACT Government. A VFT government Task Force was established to coordinate the involvement of the Commonwealth, New South Wales, Victorian and ACT governments in responding to the VFT Project Evaluation Report (VFT 1990) and the VFT Joint Venture's tax and finance proposals to the four governments.

Arguing that the present tax system discriminates against major long-term infrastructure projects financed by the private sector, the Joint Venture proposed a new tax regime to assist in financing the project. In August 1991 the Commonwealth Government acknowledged the potential commercial benefits of the project, but stated there was no case for special taxation treatment for the Very Fast Train and that the implications of allowing wider access to tax losses for all taxpayers ruled out such a policy. With this announcement all work on the VFT proposal was suspended indefinitely. However, the issue of tax treatment for such major long-term infrastructure projects is on the agenda for the November 1991 special Premiers' Conference.

D.11 Royal Commission into Grain Storage, Handling and Transport

The joint Commonwealth/State Royal Commission of inquiry into the storage, handling and transport of grain announced in April 1986, reported in February 1988 (Royal Commission into Grain Storage, Handling and Transport 1988). It found that the then current arrangements for the storage, handling and transport of grain effectively prevented significant competitive influences for most of the organisations involved. As part of its preferred reform option, the Royal Commission recommended that restrictions on the transport of grain by road be removed and rail freight services be commercialised.

The Commonwealth Government accepted and implemented the recommendations that were within the Commonwealth's power and urged the States to implement the remaining recommendations. The Wheat Marketing Act passed by Commonwealth Parliament in June 1989 included provisions to override restrictive State transport regulation.

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APPENDIX E: TOTAL FACTOR PRODUCTIVITY AND RATES OF RETURN IN AUSTRALIAN RAILWAYS

Australia's major railway systems have long been recognised as being relatively inefficient. The IAC (1989) found that 'overmanning, low productivity and poor performance compared to some private railways in Australia and some railways in other developed countries point to inefficient production practices'. Pricing practices were also found to bear little resemblance in many cases to the costs of providing the service. These production and pricing inefficiencies were found to impose significant costs on using industries and to reduce the competitiveness of the Australian economy.

Since the IAC's initial review of Australian railways, many important reforms have been initiated to improve railway performance. To monitor progress towards improved railway efficiency, it is necessary to measure comprehensively the performance of the various railway systems. Two indicators which form the core of any government business enterprise (GBE) performance measurement system are total factor productivity and the real rate of return.

Total factor productivity (TFP) is an index of the ratio of total output quantity to total input quantity and is an important indicator of economic efficiency. Comparing TFP indices for different railways provides information on their technical efficiency (the extent to which the maximum output possible, given existing technology, is realised from the inputs used). Technical efficiency and allocative efficiency (the extent to which inputs are combined in cost minimising proportions) are the determinants of economic efficiency. This, along with the extent to which costs are being fully recovered, is the major determinant of economic performance. TFP indices also reflect scale effects and gains resulting from improved management practices.

Real rates of return provide a means of assessing whether the community is getting a reasonable return on the assets it has tied up in railways and the extent of cost recovery. They also provide the most accurate way of comparing GBE performance with that of the private sector.

The IAC (1989) carried out one of the first studies of Australian railway productivity. The State Rail Authority (SRA) of New South Wales was found to have the lowest TFP growth rate for the period 1978-79 to 1986-87 of 3 per cent while V/Line, Australian National (AN) and Queensland Railways (QR) were all found to have TFP growth rates of around 7 per cent. Bruncker and

Gallagher (1989) undertook a detailed study for AN covering the period 1979-80 to 1987-88 and found that AN's TFP grew at an average rate of 6 per cent over this period. While these studies provided useful information on TFP growth rates, the methodology used did not permit absolute levels of TFP to be compared between rail systems. Information on productivity levels is critical in assessing comparative performance since a railway system can take little comfort from a similar productivity growth rate to those of other systems if it still has a lot of catching up to do. The methodology used in this paper is based on that of Lawrence, Swan and Zeitsch (1990) which enables comparisons of TFP levels to be made between railway systems as well as growth rates over time.

Little work has been done examining real rates of return for Australian railway systems. EPAC (1990) provided estimates ranging from a high of minus 6 per cent for QR to a low of minus 24 per cent for State Transport Victoria. However, these calculations were based on book values of railway capital assets and hence may bear little, if any, resemblance to economic values. One of the main problems in undertaking productivity and rate of return studies is obtaining accurate estimates of capital inputs. Being durable, capital inputs are consumed in production over many years rather than just the year in which they are purchased. Book value information on investment and capital stocks is, however, available in historical cost terms. This information needs to be corrected for the effects of inflation, the difference between economic and accounting depreciation, the effects of technological obsolescence, etc. Ideally, a thorough valuation of all the railway's assets at current market prices is required for an accurate estimate of the railway's total economic costs.

The approach adopted in this paper is to apply the methodology of Zeitsch et al. (1990) to update point estimates of railways capital stocks for 1978-79 made by the Australian Railway Research and Development Organisation (ARRDO 1981). A more comprehensive (albeit still preliminary) data set is used compared with that used by the IAC (1989). Results are presented for the period 1980-81 to 1989-90 for the five major rail systems: the SRA, the Public Transport Corporation (PTC) of Victoria (including the Melbourne suburban railways), QR, Westrail (including the Perth suburban railways) and AN.

The material presented in this appendix differs from that of the Draft Report in three ways. First, the analysis has been updated to include results for the year 1989-90 and revised data supplied by the PTC. Secondly, as discussed in Section E.2, explicit payments from governments for community services have been excluded from the analysis presented in this appendix compared to that of the Draft Report. Finally, additional work has been carried out examining the effects of scale of operations and composition of output on TFP. The effects of these characteristics are netted out to form adjusted TFP indices.

E.1 Methodology

In forming an index of TFP it is necessary to aggregate together many diverse outputs and inputs into a single measure. A means of aggregating together a range of different output quantities and

labour, capital and other input quantities is thus required which is consistent with the underlying production technology. The TFP index which has been widely applied recently is the Tornqvist (1936) procedure;

$$(1) \quad \log (TFP_m/TFP_n) = \sum_i \frac{1}{2}(R_{im}+R_{in}) \log(Y_{im}/Y_{in}) \\ - \sum_j \frac{1}{2}(S_{jm}+S_{jn}) \log(X_{jm}/X_{jn})$$

where m and n are adjacent observations, there are i outputs, (Y), j inputs, (X), the Rs are output revenue shares and the Ss are input cost shares. Diewert (1976) has shown that the Tornqvist index (1) has a number of desirable properties in that it corresponds exactly to a homogeneous translog transformation function. This means that it imposes a minimal number of constraints on the technology being modelled and can approximate an arbitrary production technology up to the second order.

The IAC (1989) used the Tornqvist procedure to form TFP indices for each of the five major rail systems for the period 1978-79 to 1986-87 and compared productivity growth rates. The Tornqvist procedure could equally well be used to compare the productivity levels of the five railways for any one year. However, the Tornqvist procedure cannot be applied to time-series, cross-section or panel data to reliably compare both TFP levels and growth rates over time. It does not satisfy the important technical property of transitivity whereby:

$$(2) \quad I_{mn} = I_{mk}/I_{nk}.$$

This property states that direct comparisons between observations m and n should be the same as indirect comparisons of m and n via the intermediate observation k. Thus, comparisons of, say, QR's TFP in 1984-85 and the SRA's TFP in 1978-79 should be the same regardless of whether they are compared directly or via any third observation such as AN in 1981-82.

To overcome these problems requires an indexing procedure which satisfies transitivity while retaining a high degree of characteristicity. It should also correspond to a flexible underlying production technology. The index used in this study is the multilateral procedure proposed by Caves, Christensen and Diewert (1982) and applied by Freeman et al. (1985) to Canadian railways and by Lawrence, Swan and Zeitsch (1990, 1991) to Australian State electricity supply systems;

$$(3) \quad \log (TFP_m/TFP_n) = \sum_i \frac{1}{2} (R_{im}+R_i^*) (\log Y_{im} - \log Y_i^*) \\ - \sum_i \frac{1}{2} (R_{in}+R_i^*) (\log Y_{in} - \log Y_i^*) \\ - \sum_j \frac{1}{2} (S_{jm}+S_j^*) (\log X_{jm} - \log X_j^*) \\ + \sum_j \frac{1}{2} (S_{jn}+S_j^*) (\log X_{jn} - \log X_j^*)$$

where R_i^* (S_j^*) is the revenue (cost) share averaged over all railways and time periods and $\log Y_i^*$ ($\log X_j^*$) is the average of the log of output i (input j). Using equation (3) comparisons between any two observations m and n will be both base-railway and base-year independent.

Transitivity is satisfied since comparisons between two railways for 1988-89 will be the same regardless of whether they are compared directly or via, say, AN in 1981-82. An alternative interpretation of this index is that it compares each observation to a hypothetical railway with output vector $\log Y_i^*$, input vector $\log X_j^*$, revenue shares R_i^* and cost shares S_j^* .

Equation (3) can also be derived directly from a translog transformation structure and has been named the translog multilateral index. The procedure thus satisfies all the properties required to be able to accurately compare TFP levels over time. The translog multilateral index is used in this study to compare TFP levels and growth rates for the five major railway systems for the period 1980-81 to 1989-90.

To calculate railway system real rates of return the methodology of Zeitsch et al. (1990) has been adopted. The nominal, net of depreciation, pre-tax, earnings on capital is defined as:

$$(4) \quad R_t^n = Y_t^n - E_t^n - D_t^n$$

where

$R_{t,n}$ is the nominal earnings on invested capital in year t;

$Y_{t,n}$ is the nominal economic income in year t, defined as total income less interest income and revenue from sales of assets;

$E_{t,n}$ is the nominal economic expenses in year t, defined as total expenses, less interest expenses and the book depreciation charge; and

$D_{t,n}$ is the nominal declining balance depreciation expense on the estimated capital stock in year t.

Earnings on capital before depreciation, $Y_{t,n} - E_{t,n}$, can also be interpreted as a measure of economic profit. Pure profit can be interpreted as economic profit less the annual user cost of capital (AUC). Thus, $\pi = (Y_{t,n} - E_{t,n}) - AUC$, where π is pure profit.

The real rate of return can now be defined as:

$$(5) \quad r_t = R_t^n / (P_t K_t) * 100$$

where

r_t is the real rate of return on invested capital in year t;

P_t is a price index of a unit of capital at time t; and

K_t is the value, at constant prices, of capital at time t.

The term $(P_t K_t)$, therefore, measures the nominal value of capital.

A critical part of the exercise in estimating total factor productivity and rates of return is deriving estimates for the value of the capital stock of the enterprise concerned. Time series estimates of the economic value of railways fixed assets were derived from the ARRDO point estimates for 1978-79 and investment information supplied by the Australian Bureau of Statistics, using the following model:

$$(6) \quad K_{jt} = K_{jt-1} (1 - d_j) + I_{jt}$$

where

K_{jt} is the value at constant prices of asset class j in period t ;

d_j is the declining balance rate of depreciation on asset class j ; and

I_{jt} is net investment at constant prices in asset class j in period t .

For the productivity study the annual user cost of capital assets was calculated as:

$$(7) \quad AUC_{jt} = (i_t + d_j - dP_{jt} / P_{jt}) P_{jt} K_{jt}$$

where i_t is the net cost of financing one dollar's worth of capital in period t , approximated in this case by the ten year government bond rate for simplicity.

E.2 Data sources

To calculate a time-series of real rates of return, information on railway revenues, operating and maintenance costs, economic depreciation and current value of railway capital stocks is required. Calculation of multilateral TFP indices is more data intensive requiring price and quantity series for each output and input.

The principal data sources used in this study for outputs and non-capital inputs are annual reports of the various railway authorities. The information presented in these reports has been prepared according to a variety of accounting rather than economic conventions and often lacks the degree of detail required, particularly for calculation of the TFP indices.

A further complication arises from a series of amalgamations and separation of various railway functions within some States over the course of the last decade. In Victoria, for instance, VicRail's Melbourne suburban railway operations were transferred to the Met in 1983. As well as running trains, the Met also runs Melbourne's trams and buses and in its annual reports costs for these various operations are not reported separately. In recent years revenue is also not reported separately for each transport mode. Additional data supplied by the PTC has helped isolate some of the information required for rail operations.

In those cases where adequate information is not available in published reports, the Commission has had to draw on supplementary sources and make a range of assumptions to form estimates of the variables required. The Commission has requested additional information from the various

railways involved. Until this information can be supplied directly or the assumptions made by the Commission can be verified for all systems, the results of the analysis presented in this paper should be regarded as being strictly preliminary.

Railway output has been divided into two categories, freight and passengers. The quantity of freight output is measured in net tonne-kilometres while the quantity of passenger output is measured in passenger-kilometres. Where passenger-kilometre figures are unavailable they have been approximated by multiplying the number of urban and country passenger journeys by the respective average journey distances obtained from the Commonwealth Grants Commission (CGC 1988).

In the analysis reported in the Draft Report, explicit payments from government to make up the short-fall from concessional fares or in compensation for fulfilling community services were included as railway revenue in addition to customer revenue. General payments from Consolidated Revenue to cover operating losses were excluded. A number of railways complained that this procedure did not necessarily provide an accurate basis for comparison since a system could improve its 'performance' simply by relabelling its deficit as a community service, regardless of whether or not this was justified. Explicit community service payments are relatively small in any case and their inclusion or exclusion has only a marginal impact on the results obtained. To ensure that the five systems are being compared on a like basis, only direct customer revenue is included in this analysis.

At this stage, three input categories have been used: labour, capital and other inputs (fuel, materials and services). The quantity of labour inputs has been approximated by the number of staff employed in each system. For QR, AN and Westrail wages and salaries series are available. In the absence of reliable series for the SRA and the PTC, the number of staff employed in those systems has been multiplied by the average wage rate for QR to form an estimated wages and salaries series. Wages and salaries data has been supplied by the PTC for part of the time period of this study and this information has been used to rescale the QR wage rate series for the entire period.

As indicated in the preceding section, 1978-79 point estimates of the current value of the capital stock derived by ARRDO (1981) have been combined with investment data supplied by the ABS and the PTC to form a capital stock series. A declining balance depreciation rate of 6 per cent was employed as a proxy for economic depreciation. The value of the annual user cost of capital inputs used in the productivity analysis was derived using equation (7). The capital price index used was the ABS series for public enterprises.

The value of the other inputs category was derived by subtracting the wages and salaries series from the railway system's total operating costs (excluding accounting depreciation and interest costs). This was then deflated by the ABS price index for public enterprise transport equipment to derive an estimated quantity of other inputs. In the absence of separate operating cost data for Melbourne's trains after 1983, the PTC's operating costs have been prorated on the basis of revenue shares for trains, trams and buses.

E.3 The total factor productivity of Australian railways

Multilateral TFP indices for the five major railway systems are presented in Figure E.1 for the ten year period 1980-81 to 1989-90. The indices have been normalised around the SRA value for 1980-81. No adjustments have been made for differing sizes of the systems or differing output characteristics. Two features of the graph stand out: the ranking of the indices bears little resemblance to the size of the respective systems and there has been an increase in the spread of TFP levels over the last decade.

To help provide some perspective for subsequent discussion, key statistics for each system are presented in Table E.1.

Figure E.1: Railway system multilateral TFP, 1980-81 to 1989-90

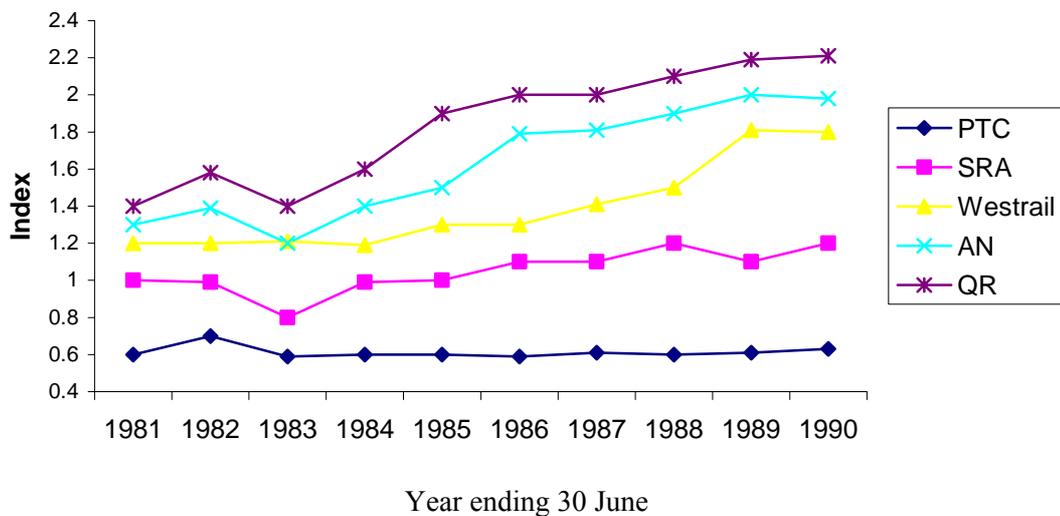


Table E.1: Railway system key statistics, 1989-90

<i>Variable</i>	<i>Unit</i>	<i>SRA</i>	<i>PTC</i>	<i>QR</i>	<i>Westrail</i>	<i>AN</i>
Freight carried	ntk(m)	14100	3581	22579	4871	8112
Passengers carried	pkm(m)	4309	2316	945	291	326
Personnel	no.	28842	16095	20821	5504	6526
Freight revenue	\$m	667	162	1063	236	284
Passenger revenue	\$m	314	151	61	19	39
Wages & salaries	\$m	838	431	605	175	167
Capital services	\$m	791	483	523	156	206
Other inputs	\$m	842	633	370	102	207

Source: Rail authority Annual Reports and Commission estimates.

The ordering of TFP levels remained the same over the ten year period with QR achieving the highest TFP levels. The rankings reflect the amount of freight carried relative to passengers with those systems concentrating on freight output tending to have a better TFP performance. QR's freight output almost doubled over the period due largely to increased coal transportation. By 1988-89 transporting export coal made up nearly 70 per cent of QR's total freight net tonne-kilometres. Much of the coal traffic is on dedicated lines constructed from the mines to ports which are operated relatively efficiently. Passenger output increased by up to one quarter while staff numbers fell by one sixth.

QR has been followed closely by AN whose TFP has followed a similar pattern to that of QR up to 1989-90 when QR widened the gap relative to AN. AN has made considerable progress over the period in improving its efficiency with a reduction in its workforce of over one third while freight output has increased by 40 per cent. Passenger output has fallen by around one quarter. AN has moved to concentrate on those transport tasks where rail has a comparative advantage.

Westrail attained mid-ranking for most of the period with rapid productivity growth between 1985-86 and 1988-89 after a period of relatively constant TFP levels. Westrail's freight and passenger outputs have only increased marginally while staff numbers have been reduced by around 40 per cent.

The NSW system has maintained relatively constant TFP levels over the period at levels substantially below those of the most efficient systems. The gap between NSW and QR has widened from nearly 40 per cent in 1980-81 to over 85 per cent in 1989-90. NSW's TFP level exceeds only that of Victoria whose level has remained largely unchanged over the period.

The TFP levels of all the systems declined during the recession of 1982-83 due to reduced output but whereas the TFP levels of the other systems quickly recovered, Victoria's has remained at this reduced level. Unlike the most efficient systems which have increased their concentration on freight activities, Victoria's freight output has fallen by around 10 per cent while its passenger output has increased by 25 per cent. Some of the poor reported performance for Victoria may be due to difficulties in obtaining rail operating cost data for 1983 onwards because costs for Melbourne's trains, trams and buses have not been reported separately.

In 1989-90 to reach the TFP level of Queensland Rail, AN would have had to increase its TFP level by 18 per cent, Westrail by 25 per cent, the SRA by a large 87 per cent and the PTC by a massive 240 per cent. These increases in TFP could be achieved by reducing input use while leaving outputs unchanged or by getting more output from existing inputs. Changing the composition of railway output to place more emphasis on freight operations and less on passenger operations would be an important means of achieving the available productivity improvements.

It should be noted that TFP indices can be calculated using either revenue or cost shares to aggregate the various output components together. In a competitive market where revenues and total (economic) costs will be approximately equal the use of either revenue or cost shares will make little difference. This will also be the case where there is under-recovery of costs to an equal extent between outputs. However, if levels of cost recovery differ between outputs (as is the case with rail freight and passengers), the use of cost shares instead of revenue shares may produce a different pattern of TFP results. In this analysis revenue shares have been used because a reliable allocation of total costs between freight and passenger operations is not available. An attempt to approximate the ratio of unit freight to unit passenger costs indicated a similar pattern of TFP results to Figure E.1 although the systems with the highest concentration on passenger operations (the PTC and the SRA) improved their positions relative to the other three systems. An alternative method of adjusting for differences in output mix is presented in Section E.5.

Table E.2: Multilateral TFP compound growth rates: 1980-81 to 1988-89

<i>System</i>	<i>Annual growth rate (%)</i>
SRA	2.9
PTC	-0.3
QR	5.4
Westrail	4.8
AN	5.7

Compound growth rates for multilateral TFP are presented in Table E.2. Over the ten year period, AN has had the strongest TFP growth performance, followed closely by QR. The growth rate of 5.7 per cent for AN is very similar to the figure obtained by Brunker and Gallagher (1989) for almost the same period. Victoria's TFP growth has actually been negative for the period as a whole. This highlights the importance of considering TFP levels as well as growth rates because Victoria not only has the lowest growth rate by a wide margin but also the lowest TFP level. Its performance is thus falling behind at an increasing rate.

E.4 Partial productivity performance

To gain a better understanding of why differences in TFP levels exist, further analysis was undertaken to examine how input use differs between the States. The effects of differences in input usage between the States will be reflected in measures of partial productivity. Partial productivity indices measure the ratio of output quantity to the quantity of a particular input. In this study partial productivity indices were calculated using the multilateral index procedure of equation (3). This enables direct comparisons to be made of partial productivity levels between the States.

Partial productivities for labour inputs are presented in Figure E.2 in index form relative to a value set at 1.0 for the SRA in 1980-81. The pattern of labour partial productivities is generally similar to that of the TFP indices except that AN now generally achieves higher levels than QR, reflecting the large cuts AN has made to its workforce. The gap between the best and worst labour productivity performers has widened dramatically over the period. Victoria's labour productivity is now less than 40 per cent that of AN's.

Figure E.2: Multilateral labour partial productivity, 1980-81 to 1989-90

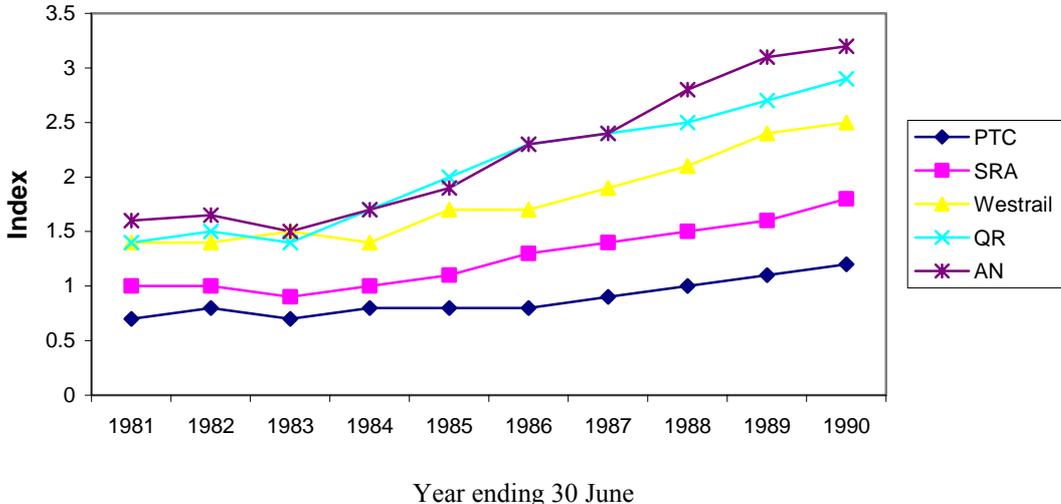


Figure E.3: **Multilateral capital partial productivity, 1980-81 to 1989-90**

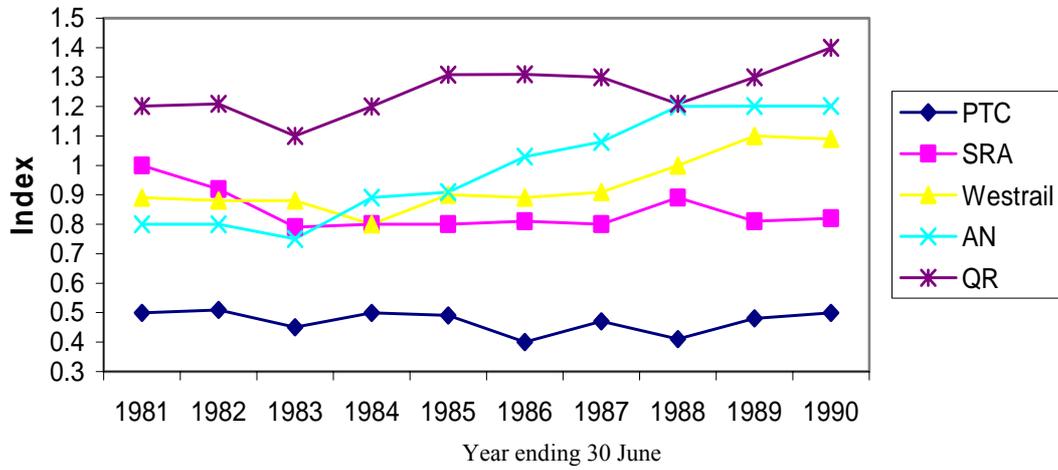
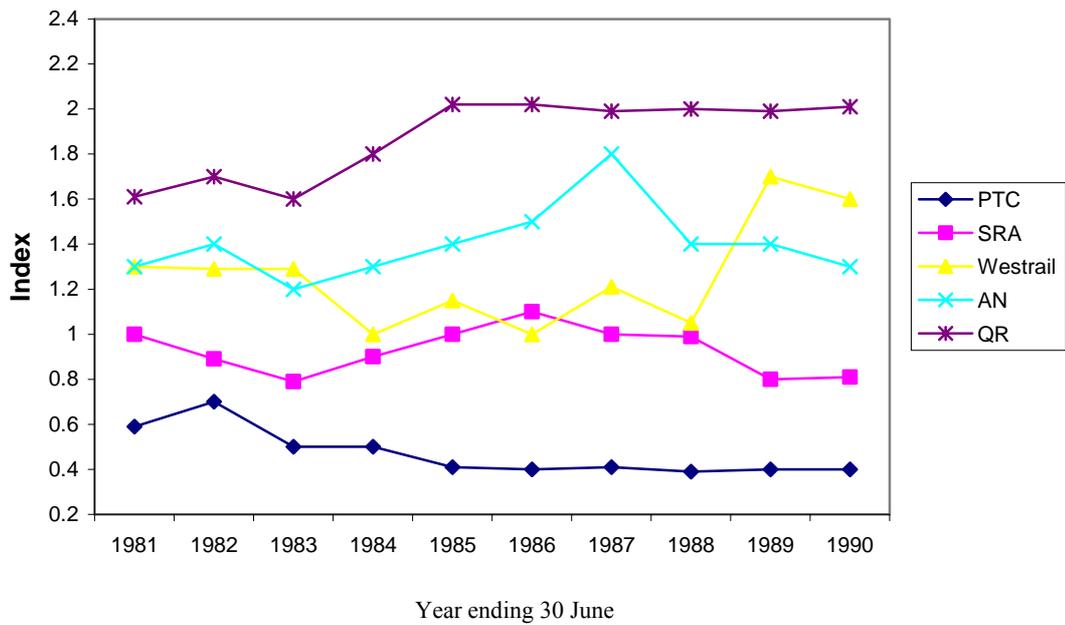


Figure E.4: **Multilateral other inputs partial productivity, 1980-81 to 1989-90**



By contrast, the spread of capital partial productivity levels presented in Figure E.3 has remained wide throughout the period. QR has been consistently the best performer in terms of levels, although AN caught up rapidly between 1982-83 and 1988-89. Victoria is again the worst performer by a wide margin. The reduction in productivity levels due to reduced output during the 1982-83 recession is quite noticeable in this graph.

The same basic pattern is again reflected in the other inputs partial productivities presented in Figure E.4. QR has consistently achieved the highest productivity levels followed by AN and Westrail which have changed positions a number of times during the decade. The SRA and the PTC have been the worst performers with productivity levels actually declining over the course of the 1980s.

E.5 Adjusting TFP for output effects

The examination of partial productivities has helped to explain TFP performance by considering differences in input usage. However, differences in scale and output composition of each system may have an important influence on TFP performance. Indeed, it was observed earlier that the multilateral TFP rankings are closely related to the relative importance of freight output in each system's operations. Ideally, the multilateral TFP indexing procedure would be carried out separately for freight and passenger operations as the two railway outputs have quite different characteristics. Other things being equal, passenger operations can be expected to be more labour and input intensive and hence systems which have a large focus on passenger operations will perform worse in an aggregate level TFP analysis than systems concentrating on freight operations, irrespective of efficiency differences. However, insufficient information is currently available to enable an accurate allocation of overall system inputs between freight and passenger operations and, hence, separate analyses for freight and passenger operations are not possible.

With the information that is currently available, one means of allowing for these factors is to regress the multilateral TFP index on a range of variables representing the specific output characteristics of each system. This enables the adjustment of TFP indices for these output characteristics and consideration of technical efficiency differences if all five systems were operating under the same conditions, following Lawrence, Swan and Zeitsch (1990).

A log-linear regression was run regressing the multilateral TFP index against the following variables:

- Scale: multilateral output index used to aggregate freight and passenger outputs.
- Output composition: ratio of freight net-tonne-kilometres to passenger-kilometres.

- Time trend: system-specific trends.

Preliminary analysis indicated that there was no high degree of correlation among the variables.

In performing regressions of this nature it should be explicitly recognised that pooled data are being used. Consequently, there may be not only serial correlation of the disturbances over time but also non-constant variances between systems. To allow for this a generalised least squares (GLS) estimator was used which allows for autocorrelations within each system's series, heteroskedasticity and contemporaneous covariance of errors between systems. The GLS procedure is based on Kmenta (1986, pp.616-625) and implemented using White et al. (1990).

Table E.3: TFP regression (log-linear form)

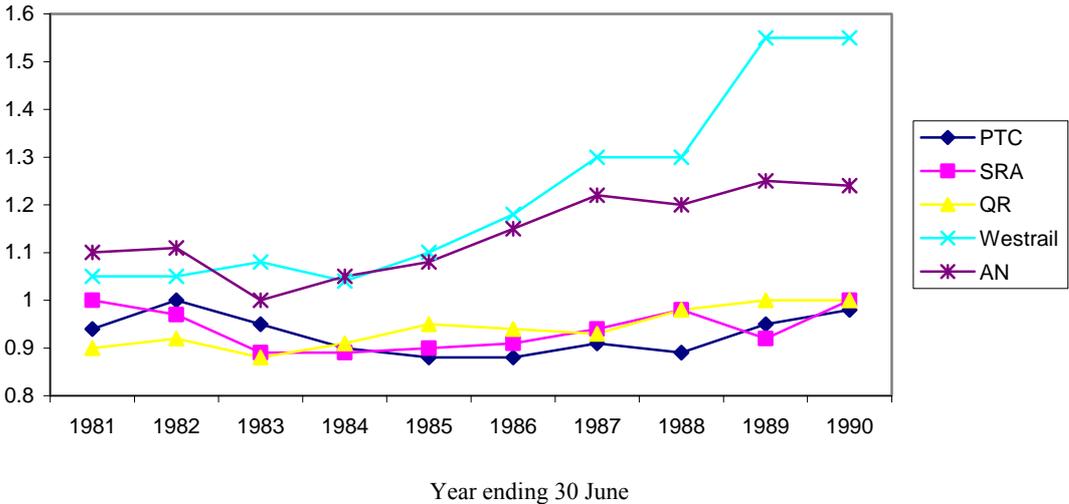
<i>Variable</i>	<i>Estimated Coefficient</i>	<i>t- statistic</i>
Constant	-0.320	-6.880
Scale	0.364	9.374
Output composition	0.285	14.005
SRA time	0.003	0.433
QR time	0.006	0.879
PTC time	0.000	0.030
AN time	0.033	5.122
Westrail time	0.048	7.937
Buse R- square	0.98	

The results of the GLS regression are reported in Table E.3. The scale variable can be seen to be significantly positively related to multilateral TFP indicating the presence of significant economies of scale (Freeman et al. 1985) although the scale variable used does not distinguish between size of the system and traffic density. Similarly, the ratio of freight to passenger output is strongly positively related to multilateral TFP confirming that freight-oriented systems will have higher levels of multilateral TFP than passenger-oriented systems, all other factors being held constant. The system specific time trends give information on growth rates of adjusted TFP for each system after the scale and output composition variables have been corrected for. Westrail and AN retain relatively high adjusted TFP growth rates of 4.8 and 3.3 per cent, respectively. Adjusted TFP growth rates for QR and the SRA are significantly lower than the unadjusted figures reported in Table E.2. The PTC's adjusted TFP exhibits no growth compared to the negative growth of its unadjusted series.

The adjusted multilateral TFP index is constructed by subtracting from the log of the unadjusted index the product of the logs of the scale and output composition variables and their respective estimated coefficients. The adjusted series is again normalised around the SRA figure for 1980-81 for convenience of presentation. The adjusted indices are presented in Figure E.5. Adjusting for scale and output composition produces a very different picture of the relative efficiency of the five

systems. QR, the PTC and the SRA now all have similar multilateral TFP levels and have achieved very little, if anything, in terms of TFP growth over the last decade other than that arising from increased scale and changes in the ratio of freight to passenger tasks. Most of QR's impressive unadjusted TFP performance has consequently arisen from its rapidly increasing scale and growth in freight tasks as a result of increased black coal exports. Conversely, much of the PTC's poor unadjusted performance is accounted for by its small scale and increasing concentration on passenger services. Westrail and AN perform significantly better than the other systems in the adjusted TFP series. They started off in 1980-81 at TFP levels marginally above those of the other systems but their higher adjusted TFP growth rates have considerably widened the gap since. AN's adjusted TFP level was around 25 per cent higher than that of QR, the PTC and the SRA in 1989-90 while Westrail's was around 50 per cent higher.

Figure E.5: **Output-adjusted multilateral TFP, 1980-81 to 1989-90**



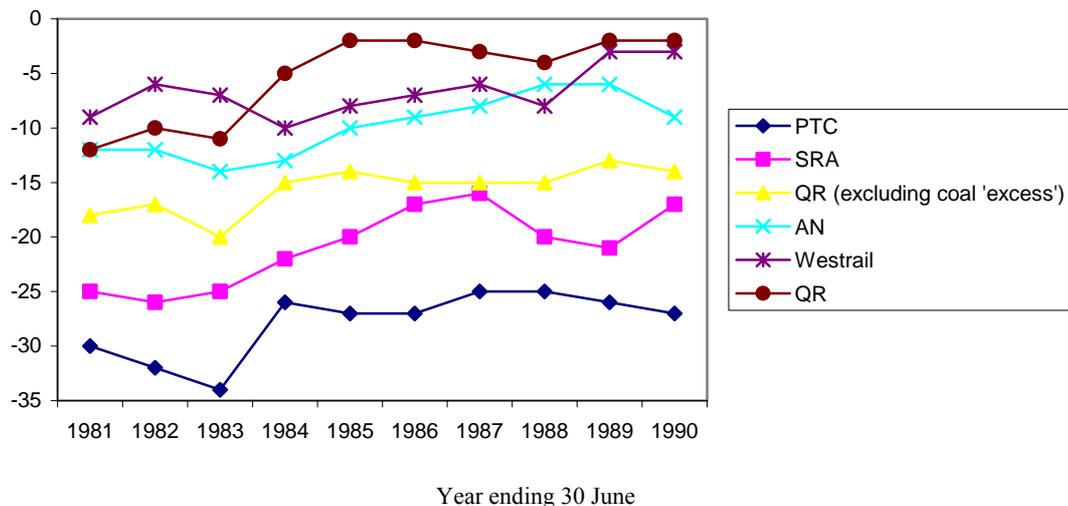
The adjusted TFP series highlight the urgency of moves for railway reform and increases in efficiency. With the exception of Westrail and, to a lesser extent, AN, Australian railways have made very little progress over the last decade in improving their performance other than through changing the scale and output focus of their operations.

E.6 Railway real rates of return

The real rate of return earned on capital shows how efficiently an enterprise, or in this case a rail authority, is using the capital it employs or owns. The real rate of return is defined as the ratio of economic income to the value of capital stock. Economic income is estimated as the difference between operating revenues and expenses and as such excludes interest received and paid and book value depreciation expenses which have been replaced by the estimated value of economic depreciation based on written down replacement cost. The external benefits and costs of railway operation are excluded from the real rate of return indicator.

The real rates of return earned by each of the five rail systems over the period 1980-81 to 1989-90 are presented in Figure E.6. It is clear that the rail systems have been performing badly over the entire study period.

Figure E.6: **Railway system real rates of return, 1980-81 to 1989-90**



In 1980-81 all the rail systems had large negative real rates of return. These negative returns persisted right through the 1980s, although by 1989-90 QR and Westrail were close to earning positive rates of return. All the rail systems, with the exception of Westrail, realised their lowest rates of return during the recession of 1982-83. For Westrail there was a lagged effect resulting in low returns in 1983-84 while the other systems appeared to be recovering from the recession. For most rail systems there has generally been a slow but steady improvement in rate of return performance since the 1982-83 recession. Rates of return for the PTC have been relatively constant

since 1984-85 at -25 per cent. The PTC's performance stabilised in this analysis compared to that presented in the Draft Report due to use of the revised investment series which implies a larger capital stock in recent years than does the ABS investment series.

The real rate of return performance of the railway systems has corresponded closely to relative TFP performance since 1983-84 with the exception that Westrail has performed better than AN. QR has had the lowest deficits of the five rail systems in relative terms for most of the period. At the beginning of the period QR was earning low returns in the order of -11 per cent. By 1988-89 QR's rate of return had improved to -1.4 per cent. This improvement in rates of return has been aided by large increases in coal traffic and associated 'excess' rail freight charges. It might be noted that if the 'excess' component of these charges based on extrapolation of estimates presented in IAC (1988) is excluded, QR's rate of return would have been between 7 and 11 percentage points lower over the last decade. Similar but less dramatic adjustments for monopoly pricing might be applied to other systems.

While the rates of return analysis indicates that modest progress has been made in improving the performance of some of the rail systems, much remains to be done before the community receives a reasonable rate of return on the assets it has invested in railways. The problems appear to be greatest in the PTC in Victoria.

E.7 Conclusions

The economic performance of Australia's five major railway systems has varied widely over the last decade. QR, AN and, more recently, Westrail have all achieved relatively high total factor productivity levels and impressive TFP growth rates. This contrasts markedly with the less impressive growth performance of the SRA and the very low TFP levels and negative TFP growth of the PTC. As a result of the very poor performance of these systems, the gap between the TFP levels of the best performer (QR) and the worst performer (the PTC) has increased substantially over the period. In 1989-90 Victoria's TFP level was only 30 per cent that of QR's. A similar pattern is repeated in the three partial productivity measures calculated.

The real rates of return calculated for the five systems indicate that the community has not been getting a reasonable rate of return on the assets it has tied up in railways. In fact, all five systems have earned negative rates of return over the last decade. In 1989-90 Westrail was close to achieving a positive rate of return, followed closely by AN. The systems of NSW and Victoria, however, were still far from achieving positive returns. Indeed, the Victorian system's rate of return was still around -25 per cent.

The importance of scale and output composition on railway efficiency is highlighted by adjusting the multilateral TFP indices for these effects. This adjustment shows that most of QR's good

performance and the PTC's poor performance in the unadjusted series can be accounted for by changes in scale and differences in concentration between freight and passenger tasks. It also indicated that abstracting from scale and output composition effects, QR, the PTC and the SRA have made virtually no progress in improving TFP levels over the last decade although the SRA shows recent signs of improvement. Substantial cost savings would have been made if the other four systems had produced freight and passenger outputs as efficiently as Westrail in 1989-90 and in the same proportions. For instance, if all inputs were reduced in equal proportions, the SRA could achieve cost savings of around \$880 million, the PTC savings of around \$565 million, QR savings of around \$520 million and AN savings of around \$110 million. The total savings which Australia would achieve simply by the other four major rail systems moving to Westrail's adjusted TFP level are around \$2.1 billion. This result serves to highlight the importance of microeconomic reform and does not include the additional savings possible by all State systems moving closer to international best practice.

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APPENDIX F: CONSTITUTIONAL BACKGROUND

Presented in this appendix are details of the Constitutional provisions that relate specifically to railways. The following interpretation of the provisions is based on advice to the Commission from the Attorney-General's Department. Under the Constitution the Commonwealth Parliament has powers to make laws with respect to:

s.51(xxxii) The control of railways with respect to transport for the naval and military purposes of the Commonwealth:

s.51(xxxiii) The acquisition, with the consent of a State, of any railways of the State on terms arranged between the Commonwealth and the State:

Section 51(xxxiii) is regarded as probably qualifying the general power provided in s.51(xxxi) for the acquisition of property on just terms from any State or person for any purpose in respect of which the Parliament has power to make laws.

s.51(xxxiv) Railway construction and extension in any State with the consent of that State:

The Commonwealth has used this power to construct the trans-continental railway and under arrangement with the States to construct standard gauge track. Section 51(xxxiv) probably restricts the Commonwealth's power to create corporations to construct and operate interstate railways without State consent.

s.98 The power of the Parliament to make laws with respect to trade and commerce extends to navigation and shipping, and to railways the property of any State:

This provision is regarded as indicating that the meaning of trade and commerce in s.51(i) extends to transport.

s.102 The Parliament may by any law with respect to trade or commerce forbid, as to railways, any preference or discrimination by any State, or by any authority constituted under a State, if such preference or discrimination is undue and unreasonable, or unjust to any State; due regard being had to the financial responsibilities incurred by any State in connexion with the construction and maintenance of its railways. But no preference or discrimination shall, within the meaning of this section, be taken to be undue or unreasonable, or unjust to any State, unless so adjudged by the Inter-State Commission.

Under s.51(i) the Commonwealth Parliament has power to legislate on interstate trade and commerce within the restrictions of s.92, s.99 and implied constitutional immunities of the States and State authorities. In s.102 this power is specified as extending to railway preferences or

discriminatory practices and stipulates that it is for the Inter-State Commission and not Parliament to determine what constitutes undue and unreasonable practices or what is unjust to any State. However, as a result of the recent repeal of much of the Inter-State Commission Act 1975 and the resignation of the members there is no presently constituted Inter-State Commission.

s.104 Nothing in this Constitution shall render unlawful any rate for the carriage of goods upon a railway, the property of a State, if the rate is deemed by the Inter-State Commission to be necessary for the development of the territory of the State, and if the rate applies equally to goods within the State and to goods passing into the State from other States.

Amongst other things, this provision limits the power of the Commonwealth to fix railway rates in the circumstances envisaged by the provision. However, as stated in relation to s.102 above, there is no presently constituted Inter-State Commission.

Constitutional issues have arisen recently in relation to the establishment of the National Rail Corporation that are also relevant to some of the options for structural and institutional change canvassed in Chapter 12. These are discussed here in order to provide an understanding of how the Commonwealth might exercise its constitutional powers.

In view of the decision of the High Court in *Bourke v. State Bank of New South Wales* (1990) 170 CLR 276 there is some doubt whether the Commonwealth could establish and operate an interstate rail freight organisation under the interstate and overseas trade and commerce power in s.51(i) (and s.98) *without the consent of the States*. There is some doubt, for example, whether in the light of s.51(xxxiii) and s.51(xxxiv) set out above, the Commonwealth could compulsorily acquire a State railway (compared with a privately owned railway) under the general ‘acquisition of property’ power in s.51(xxxi) or could carry out railway construction or extension in a State, for the purposes of interstate transport, without the consent of that State.

It would be possible for the Commonwealth and the States by complementary legislation to establish a *statutory authority* to undertake both interstate and intrastate railway operations and to exempt the transfer of assets from taxation. In relation to any Commonwealth-State *company*, there is no constitutional difficulty with the Commonwealth taking up shares in a company which is limited to interstate operations (the interstate and overseas trade and commerce power). However, if it is intended that the company also engage generally in intrastate operations, a constitutionally firm basis for the Commonwealth's involvement could be provided either (a) by a reference of the relevant matter by the States for the purposes of s.51(xxxvii) of the Constitution, or (b) by ensuring that the proportion of Commonwealth shares to the total did not exceed the proportion of interstate operations to the total operations (so that it could be reasonably maintained that the Commonwealth shareholding was acquired for the purposes of the interstate operations: *Kathleen Investments (Australia) Ltd v. Australian Atomic Energy Commission* (1976) 139 CLR 117).

APPENDIX G: SOCIAL COST CONSIDERATIONS

This appendix provides information in support of the material presented in Chapter 5 on competitive, environmental and social aspects of rail and road transport. Section G.1 focuses on the extent to which different types of road users pay for the costs they incur. Then follow four sections on key environmental issues for rail and road transport: energy efficiencies (G.2), atmospheric pollution and greenhouse gases (G.3), noise pollution (G.4) and congestion (G.5). The final section (G.6) presents information on road and rail accident costs.

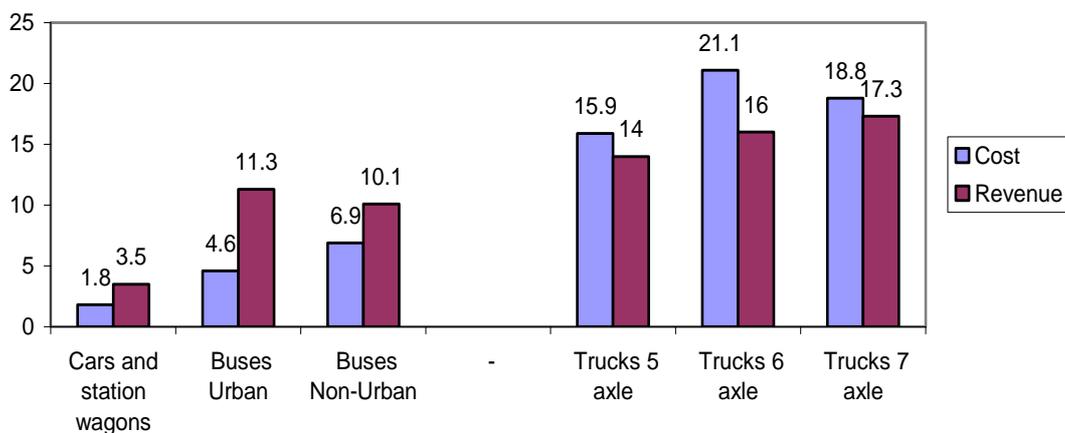
G.1 Cost recovery

Achieving an efficient pricing policy for rail depends to some extent on the appropriate prices being in place for road use. This section considers the costs of building and maintaining the road infrastructure, and the extent to which these costs are recovered.

The Inter-State Commission (ISC) report 'Road User Charges and Vehicle Registration: A National Scheme' (1990) analyses whether each class of road vehicle pays its share of the costs of building and maintaining roads.

Figure G.1 depicts the ISC estimates of varying levels of cost recovery for the classes of road transport which are most likely to compete with rail transport.

Figure G.1: Road transport cost recovery, 1989-90.



Source: Inter-State Commission (1990).

Costs, measured in cents per kilometre, include government expenditure on construction and maintenance but do not include external costs such as pollution, greenhouse emissions and road accidents. Revenue, also measured in cents per kilometre is the combination of fuel taxes and registration charges.

The ISC concluded that while overall road transport more than covers its costs, this is not the case for all road users. At a disaggregated level some users, namely cars and buses, are found to be subsidising others such as trucks, which do not meet their full costs.

The revenue per kilometre obtained from cars is low relative to that obtained from other road users. Cars, however, inflict little damage on roads so that their costs are nearly twice recovered through revenue.

There is competition between rail and buses for both urban and non-urban passenger services. At present urban buses are responsible for costs of 4.6 cents per kilometre, yet pay 11.3 cents per kilometre. For non-urban buses the figures are 6.9 and 10.1 respectively; if charges were reduced to reflect more accurately the cost of buses on roads, their ability to compete with rail for passenger services would increase further.

Five, six and seven-axle articulated trucks are those in competition with rail for interstate freight. On average these trucks fall short of full cost recovery by three cents per kilometre, but by as much as five cents per kilometre for six-axle trucks. Measures to increase the cost recovery for large trucks would provide an incentive for increased use of rail in interstate freight transport. Other trucks, such as rigid trucks with up to five axles, are paying fully for the costs they impose on roads, while small trucks pay significantly more than those costs for which they are responsible.

The ISC has recommended that road user charges be imposed on the vehicles directly responsible for the pavement damage. For example, heavy trucks do more damage to the pavement than light trucks or cars. Therefore, heavy trucks are charged a higher proportion of the costs of road repairs than light trucks. This approach is consistent with that of the Industry Commission.

The ISC also aimed at achieving full cost recovery by charging all non-pavement costs to road users, according to the type of roads and the vehicle-kilometres travelled. This approach has a number of shortcomings.

- Full cost recovery is not justified when there is over-investment in roads. Similarly, where there is substantial investment in new road infrastructure it may take several years for traffic to reach a level sufficient to recover costs. In the intervening time, cost recovery should be substantially less than 100 per cent, while still ensuring road users were covering the capital costs of road in the long run.
- It may not be legitimate to allocate cost on the basis of kilometres travelled. For rail transport the Industry Commission has adopted the principle that the traffic for which the rail line is primarily provided should be responsible for meeting the costs of that line. Most

roads are built primarily for cars; however, pavements are made much thicker and wider to accommodate trucks. Therefore, cars should be responsible for the basic cost of the right of way and laying a standard strength road. Trucks should be responsible for the additional capital costs of strengthening and widening the road.

The Industries Assistance Commission has noted deficiencies in relying on fuel taxes as a means of collecting road user charges (IAC 1986). Fuel taxes cannot be varied to directly reflect the use of different types of roads or the time of day the roads are used. Therefore, they do not accurately charge for road use. Where possible more direct charging mechanisms should be adopted.

G.2 Energy efficiency

G.2.1 Non-urban freight

Aggregate energy efficiency comparisons between road and rail transport show that rail is the more energy efficient mode. Several submissions cited evidence to support this conclusion. For example:

The subject of the amount of fuel used in transport operations in Australia has received attention from a number of writers over the last 20 years ... A common theme of much of this work when touching on freight transport, is that sea and rail transport are generally more energy efficient than road transport. (Dr Philip Laird, Submission 114, p.1)

Greenpeace, citing the Australian Railway Research and Development Organisation, said that:

rail is 3.5 times less energy intensive per passenger km than a car and 8 times less energy intensive during peak times. (Submission 36, p.4)

Similarly, a 1988 consultant report for the Department of Primary Industries and Energy reported rail freight as being four times more energy efficient than road freight (Nelson, English, Loxton & Andrews Pty Ltd 1988, p.121).

An important aspect when comparing energy efficiency between modes are the load factors involved. The greater the freight or passenger load, the more energy efficient the task will become.

This is important because rail's energy efficiency advantages may be diminished by less-than-capacity loading. A good example of this is non-urban passenger rail services where low occupancy rates result in high energy consumption per passenger-kilometre (see Figure G.4).

Fuel efficiency also varies with the wagons and locomotives used, speed, the type of terrain traversed and the quality of the infrastructure. For example, fuel use increases if trains need to decelerate and accelerate to take corners. The Commission estimates, from data received from the

rail authorities¹, that from Sydney to Melbourne trains transport freight at an energy rate of 1.5 to 2 ntk/MJ of fuel, while trains travelling between Sydney and Adelaide achieve nearly 3 ntk/MJ of fuel. In 1981 the BTE estimated that westbound rail freight from Adelaide to Kalgoorlie achieved 3.54 ntk/MJ. Philip Laird (Submission 114, p.6) argued that developments since 1981 would have probably raised this to 4 ntk/MJ.

The Australian Road Transport Federation (ARTF) noted that:

... this concept of common wisdom that rail is so much more energy efficient - is so much more greenhouse friendly - is not really a proper concept. It is a concept that is common as the result of over-aggregation of the data. If we take out the urban distribution aspects of truck energy consumption and look at line haul comparisons, we can see that it is horses for courses. If we are going to go from Sydney to Perth, then I am sure that rail will always show better. If we are going for the short haul or the medium haul, it depends on the commodity and it depends on the task that is being put up for the transport. We suggest that the data is there to be considered on a case-by-case basis. (Initial hearings, p.840)

The ARTF presents four freight scenarios to illustrate its case: mine to port, farm to port, general freight from capital city to capital city, and general freight from capital city to country. The estimates, summarised in Table G.1, are not based on empirical results but attempt to reflect the energy use of typical trains and trucks undertaking different transport tasks.

Table G.1: Road energy consumption relative to rail energy consumption

Scenario	Road distance ^a km	Rail	Road		
			Articulated	B-Double	Road train
Mine to port	400	1.0	2.9	2.5	1.9
Farm to port	400	1.0	1.7	1.4	1.1
General Freight	400	1.0	0.7	0.6	0.5
General Freight ^b	870	1.0	0.9	0.8	0.6
General Freight ^{b c}	870	1.0	1.3	na	na
General Freight	150	1.0	0.6	0.5	0.5

a It is assumed that the rail distance is 15 per cent longer (a typical consequence of lesser grades on rail tracks).

b Commission estimates.

c Calculated using a road fuel efficiency of 1.04ntk/MJ instead of the 1.4ntk/MJ used by ARTF.

Source: Australian Road Transport Federation (Submission 69).

¹ Fuel efficiencies are for the linehaul only. They do not include the pickup and delivery of freight at the terminal.

The ARTF has assumed that trains and trucks used for bulk traffics are fully laden one-way and empty for the return journey. For general freight, it is assumed that trucks are fully laden for 88 per cent of the trip (that is, 75 per cent of journeys have full two-way loading, and 25 per cent of journeys have full loading one-way and are empty the other). Trains use to transport general freight are assumed to be fully laden one-way and 67 per cent laden the other way.

From Table G.1 the ARTF concludes that rail is three times more energy efficient than a typical articulated truck for bulk movements between mines and ports. However, for transporting goods by rail between farms and ports there is a trucking component from farm to the rail collection facility; this component is less energy efficient than is rail linehaul and its inclusion reduces rail's energy advantage for the total task. Nevertheless, rail transport from farm to port remains more energy efficient than even the most efficient method of trucking (road train).

The fourth scenario typifies general freight movements over shorter distances for which the relatively energy efficient linehaul component of rail is quite small. For such tasks, trucks are assessed as being about two times more energy efficient than railways.

The third scenario is intended to represent general freight movements between capital cities. Rail loses some of its energy efficiency advantage in such tasks because trains typically carry smaller tonnages than for bulk movements. For the rail task an allowance is made for truck delivery to and from the rail terminal. The table indicates that all three types of trucks are more energy efficient than rail for such general freight tasks.

The tabulated results for general freight between capital cities require some qualification. The ARTF results are based on a 400 km road trip which is unrealistic for Australian capital cities.

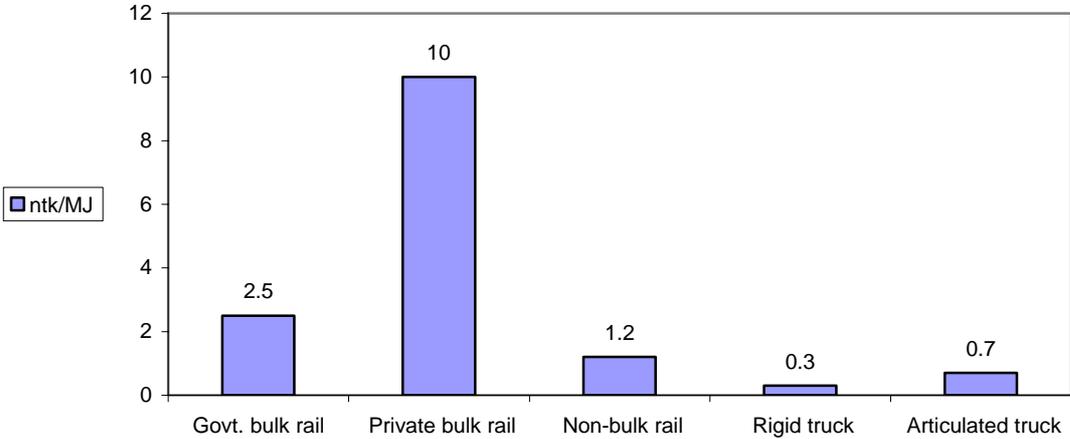
Community groups were also critical of the fuel efficiencies the ARTF used for its intercity freight comparison. Philip Laird, for example cited estimates of fuel efficiency for road and rail from various sources. For rail the 1.67ntk/MJ used by the ARTF appears to be consistent with other estimates of current fuel use between Sydney and Melbourne. In contrast, the 1.4nkt/MJ the ARTF used for articulated trucks appears high compared to most other estimates. Philip Laird considered that an energy efficient truck travelling between Sydney and Melbourne would achieve 1.04ntk/MJ (Submission 114, p.9). The BTCE has estimated the average energy efficiency of an articulated truck carrying non-urban freight to be 0.75ntk/MJ (see Figure G.2).

The Commission has recalculated energy efficiency using the distance between Sydney and Melbourne of 960km for rail and 870km for road. Estimates taking the increased distances into account, but using ARTF fuel efficiency reduce the difference in energy efficiency between road and rail. For articulated trucks energy consumption relative to trains increases from 0.7 to 0.9, and for B-Doubles and road trains estimates increase to 0.8 and 0.6 respectively.

Estimates including the revised distances and an energy efficiency for trucks of 1.04ntk/MJ indicate that trains use slightly less fuel than articulated trucks when transporting freight from Sydney to Melbourne. The energy consumption of road relative to rail increased to 1.3. Rail's advantage would be even greater for other intercapital hauls, except perhaps Sydney to Brisbane.

BTCE (1991) estimates of energy efficiencies for non-urban freight show that rail has an advantage for bulk freight over non-bulk by a factor of two (see Figure G.2). The long distances and high load factors, which typify bulk rail freight, would account for the superior energy efficiency of rail on bulk tasks. The BTCE also concludes that rail is less energy intensive than road, even for non-bulk freight where rail is least fuel efficient. This conclusion is reached because the analysis does not isolate that part of rail freight carried on low volume branch lines where road has the greatest advantage. If the analysis were also to include the energy involved in the construction of trains and trucks the relative fuel efficiency of the two modes may change.

Figure G.2: Non-urban freight energy consumption, 1987-88



Source: BTCE (1991).

G.2.2 Passengers

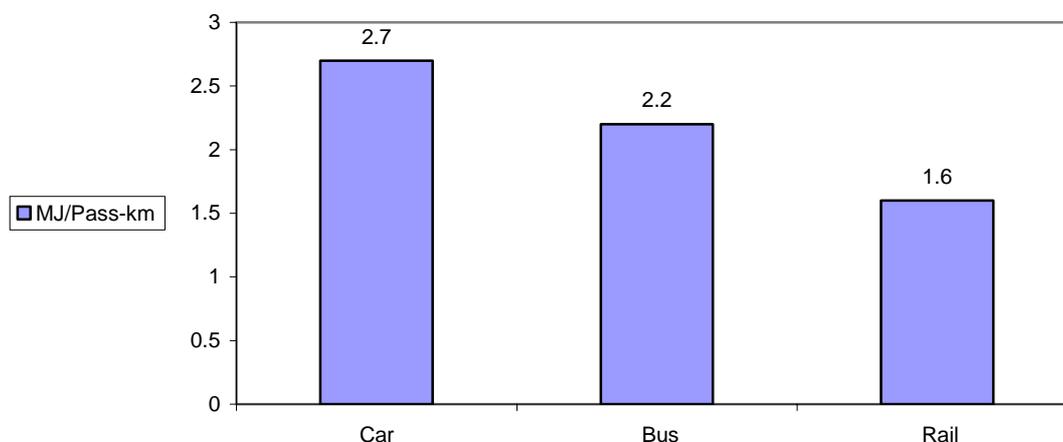
The evidence on energy efficiency on passenger tasks is also subject to debate. For instance, Greenpeace (Submission 36) cited rail as 3.5 times less energy intensive per passenger-km than car. A more complete picture was provided by the Society for Social Responsibility in Engineering (Submission 5, p.5) with the following energy efficiency comparisons (measured in megajoules per passenger-kilometre) for Melbourne.

- Train 2.12
- Car 3.50
- Tram 1.52
- Bus 1.80

The energy efficiency difference between trains and cars is clearly less than that reported by Greenpeace. This points to the danger of drawing conclusions from aggregate comparisons. In fact the results from the Society for Social Responsibility in Engineering indicate that a transfer from rail to buses could yield improved energy efficiency.

Figures G.3 and G.4 illustrate BTCE estimates of energy efficiencies for urban and non-urban passenger travel. Urban rail uses only 60 per cent of the energy needed per passenger-kilometre for car travel and 70 per cent of that for bus travel. These estimates change for non-urban journeys where rail loses some of its advantage to road. This is due to the different passenger occupancy rates between urban and non-urban transport. For country trips car occupancy almost doubles, while rail passenger occupancy falls significantly. Given their relatively high occupancy rates, non-urban buses use 44 per cent of the energy used by trains and one third of that used by cars.

Figure G.3: **Urban passenger transport, energy consumption, 1987-88**

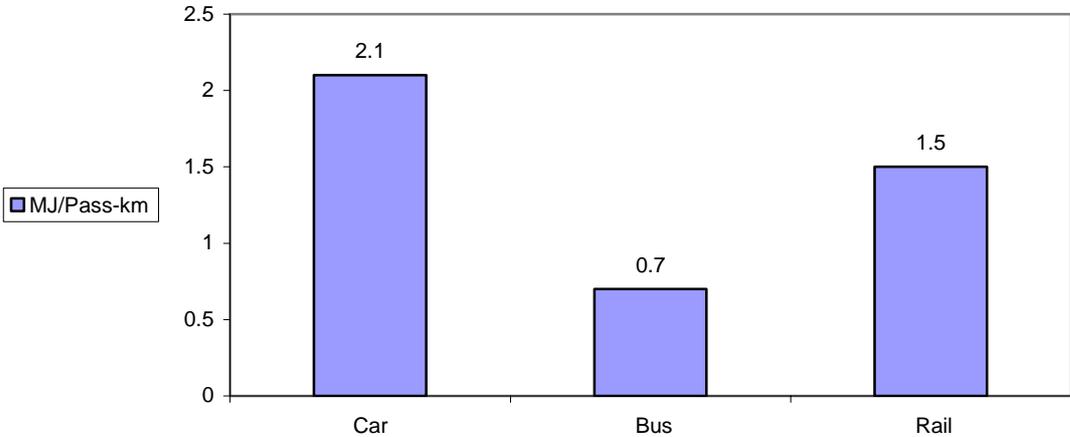


Source: BTCE (1991).

Clearly, energy efficiency aggregates do not hold where the passenger task is disaggregated into urban and non-urban tasks. They disguise the greater efficiency of buses over long distances and overstate the energy advantage of trains for non-urban travel.

The BTCE estimates are averages over all journeys and should not imply that coaches are intrinsically more fuel efficient. They do, however, reflect the less intensive load factor of rail compared to coach. If rail load factors were to increase significantly rail would be more fuel efficient.

Figure G.4: **Non-urban passenger transport, energy consumption, 1987-88.**



Source: BTCE (1991).

G.2.3 Improving energy use

The discussion of fuel efficiency so far has concentrated on what is currently achieved. Both road and rail have the potential to reduce the fuel they use. Extending the use of B-Doubles, improving roads and driver training would all reduce the fuel used by trucks. Similarly, increasing loads (passengers or freight), purchasing new locomotives, realigning and upgrading track and improving driving techniques would reduce the fuel used by trains.

Participants have argued that because rail has been slow to adopt new technology, the potential for gains in fuel efficiency is much greater for rail than for road transport. Philip Laird has estimated that upgrading the track alignment and increasing clearances between Sydney and Melbourne would increase the energy efficiency of rail from 1.6ntk/MJ to 3ntk/MJ (Submission 114, p.5).

G.3 Atmospheric pollution and greenhouse gases

Fossil fuels are the primary energy source for the major forms of transport in Australia. Diesel and petrol are the major fuels used by road transport. Electricity - generated by burning coal or gas - and diesel are used by railways. Some waste products generated by burning fossil fuels have adverse consequences for the environment. There are two problems associated with exhaust emissions from vehicles or power stations:

- atmospheric pollution; and
- the release of greenhouse gases.

While both problems emanate from the same sources they differ in that:

- atmospheric pollution can generally be localised to specific regions; and
- greenhouse gases are a global problem.

The economic problem arises because users of transport do not take into account the damage that exhaust emissions cause to others.

G.3.1 Atmospheric pollution

Atmospheric pollution costs include deterioration of health, material damage to property, visual intrusion, and annoyance and discomfort. The costs arise from the effects of exhaust emissions, for example carbon monoxide, lead, nitrous oxides, and secondary pollutants formed on their release into the atmosphere.²

While it is possible to measure the levels of atmospheric pollution, it is difficult to specify its external costs. Causality between pollution levels and health deterioration is also difficult to establish. Moreover, the impact of pollutants in the atmosphere depends on climatic factors, traffic flows and proximity to people. Therefore the costs vary spatially and through time.

The Inter-State Commission (1990) provides the most recent estimate of the atmospheric pollution costs of road transport in Australia. Its estimates, presented in Tables G.2 and G.3, are based on United States estimates of emission damage costs together with Australian vehicle use data.

² Secondary pollutants include photochemical smogs and ozone. They are formed by the action of sunlight on hydrocarbons and oxides of nitrogen.

Table G.2: **Estimates of road transport atmospheric pollution costs, Australia, 1989-90**
(cents per kilometre)

	<i>Automobiles</i>		<i>Heavy duty petrol engined vehicles</i>		<i>Diesel engined vehicles</i>	
	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urbana</i>	<i>Rural</i>	<i>Urban</i>
Carbon monoxide		0.10543		0.36700		0.05698
Hydrocarbons	0.00394	0.19530	0.01630	0.80980	0.00239	0.11853
Oxides of nitrogen	0.00236	0.31820	0.00757	1.01700	0.01315	1.76615
Oxides of sulphur	0.00001	0.01340	0.00002	0.03539	0.00012	0.29178
Particulates		0.04480		0.03808		0.12406

a Only includes five axle trucks.

Source: Inter-State Commission 1990, Vol. 2, p.203.

Table G.2 indicates that the major cost contributors are hydrocarbons and oxides of nitrogen that produce photochemical smogs and ozone. The total annual costs, derived from Table G.3, are \$787 million. These estimates are only for the road transport sector. All other modes, including rail, release pollutants into the atmosphere but no estimates were identified by that inquiry. The two fuel sources used by railways are electricity and diesel. Both of these result in atmospheric pollution. The Australian Automobile Association made this point in its submission.

In addition, it is now well recognised that diesel fuel consumption is not as environmentally benign as it was once thought to be. Increased electricity usage could be disadvantageous if generated from coal supplies. (Submission 10, p.15)

While the Inter-State Commission (1990) pointed out that a diesel engine will emit more nitrous oxides than a petrol engine of the same size and more than ten times as many particulates, passenger rail is not a significant source of pollution in urban areas. This is because few urban trains are fuelled by diesel. They are powered mainly by electricity that is not generated in urban areas and therefore does not emit exhaust products into the urban atmosphere.

Table G.3: **Estimates of road transport aggregate atmospheric pollution costs, Australia, 1989-90**

	<i>Automobiles</i>		<i>Heavy duty petrol engined vehicles</i>		<i>Diesel engined vehicles</i>	
	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>
Interstate and rural	0.006	3.1	0.024	0.2	0.014	0.7
Urban	0.677	670.5	2.269	28.1	1.625a	84.0
Total		673.6		28.3		84.7

a Includes all heavy vehicles.

Source: Inter-State Commission 1990, Vol. 2, p.204.

Table G.3 shows that most of the costs of atmospheric pollution are attributable to urban car use so that if it were possible to transfer significant numbers of motorists to the urban rail system there would be a reduction in such pollution.

G.3.2 Greenhouse gases

The core greenhouse effect involves the warming of the earth's surface, brought about by gases in the atmosphere. These gases absorb longwave radiation emitted from the earth's surface, and re-radiate this energy downwards.

While there is much uncertainty concerning scientific aspects of the greenhouse effect, it is widely believed that human activity is responsible for much of the emissions that contribute to the warming effect. This has inspired international efforts to evaluate the effect and respond to it by limiting greenhouse gases.

The five greenhouse gases of most concern are carbon dioxide (CO₂), methane, nitrous oxide, ozone and chlorofluorocarbons. Australia's contribution to the increase in greenhouse emissions, was reported by ANZEC (1990) as being between 1 and 2 per cent of the global total.

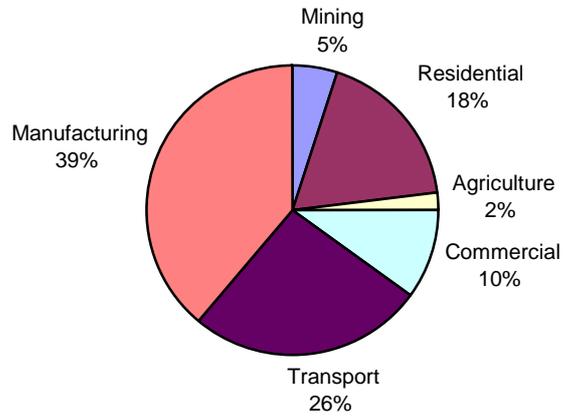
The greenhouse gas of most concern in transport issues is CO₂. Carbon dioxide emissions account for just over 40 per cent of Australian greenhouse gas emissions (Greene 1990). The transport sector accounted for just over a quarter of the CO₂ emissions in 1988, as seen Figure G.5.

Transport emissions also comprise other greenhouse gases. This point was made in the submission from the Society for Social Responsibility in Engineering.

The importance of vehicle transport for greenhouse warming goes well beyond its contribution to CO₂ emissions. In addition to CO₂, motor vehicles emit carbon monoxide (CO), various nitrogen oxides (NO_x) and a range of hydrocarbons (HC). (Submission 5, Appendix 2, p.3)

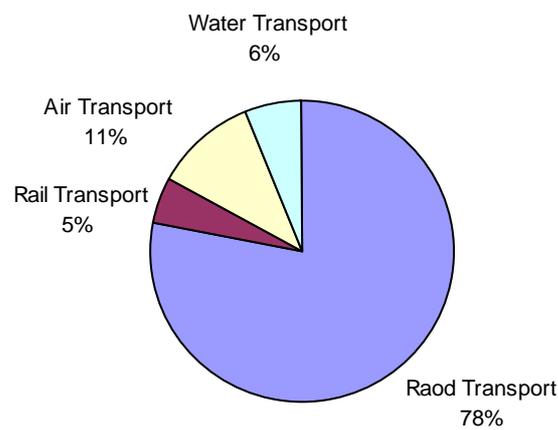
Figure G.6 shows the relative modal emissions of CO₂. Road transport emissions dominate those from other modes, particularly rail. Road transport undertakes 32 per cent of the land freight task in Australia and comparisons of modal CO₂ emissions need to be weighted by their share of the transport task.

Figure G.5: **Relative sectoral carbon dioxide emissions, 1988**



Source: Greene (1990).

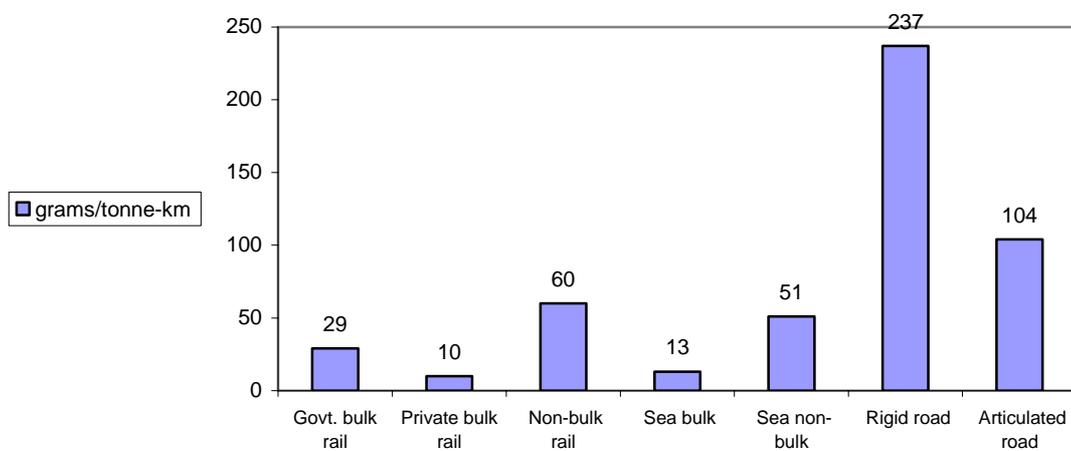
Figure G.6: **Relative modal carbon dioxide emissions, 1987**



Source: Greene (1990).

Figure G.7 indicates that rails' CO₂ emissions per net tonne-kilometre are considerably less than those of road transport.

Figure G.7: **Rate of CO₂ emissions in non-urban freight transport, 1987-88**

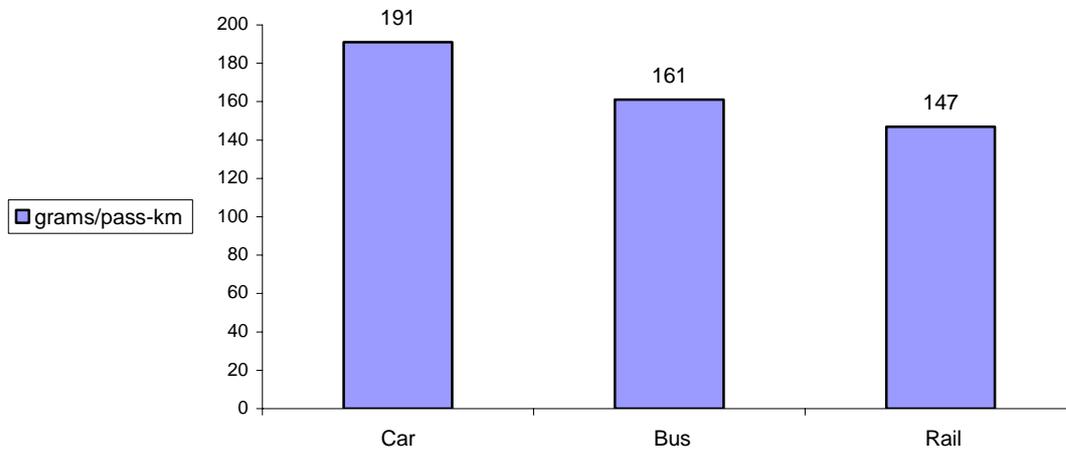


Source: BTCE (1991).

The principal transport greenhouse issue raised in submissions (including Greenpeace, Newman and Kenworthy, the Town and Country Planning Association, Society for Social Responsibility in Engineering) was the reduction in CO₂ that may result if less reliance was placed on the motor car for urban transport tasks. The reason for this is clearly demonstrated by Figure G.8.

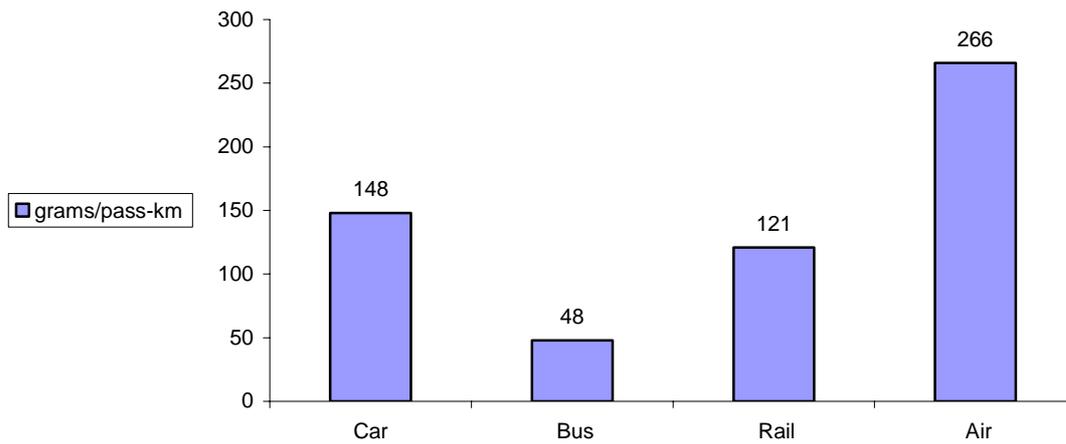
For non-urban passenger transport (see Figure G.9) rail has an advantage over cars but is not superior to bus. Low levels of emission per passenger-kilometre for buses is primarily a result of the greater number of passengers that buses carry relative to trains for non-urban journeys.

Figure G.8: Urban passenger travel, CO2 emissions, 1987-88



Source: BTCE (1991).

Figure G.9: Non-urban passenger travel, CO2 emissions, 1987-88



Source: BTCE (1991).

G.4 Noise pollution

Noise pollution is a problem for those people living in proximity to noisy activities. Transport is a necessary but noisy activity of daily life.

A unit of measure of noise is the decibel (dB). Several indexes are available to assess the impact of noise. One favoured in many countries, including Australia, is dB(A). It can be used to assess the impact of noise from most sources.

Noise exposure can be expressed by different standards using the dB(A) scale. For instance, in NSW there are two standards for noise from planned railway operations: a maximum average level over a 24 hour period of 55 dB(A), and a maximum level for any emission of 80 dB(A).

All traffic modes generate noise. Some examples are provided in Table G.4. A modal shift from road to rail does not unambiguously reduce noise levels. Traffic noise levels fall for those people near heavily trafficked roads but the noise level in railway corridors will increase.

Table G.4: **Noise levels resulting from differing sources**

<i>Source</i>	<i>Noise Level [dB(A)]</i>
Passenger car @ 60 km/h, 7 metre distance	75
Heavy truck @ 40 km/h, 7 metre distance	90
Lorry, motorcycle, or older type of bus accelerating, 7 metre distance	90
Outdoor noise level near a motorway	74
Older type of underground train	90

Source: Inter-State Commission (1990).

Action for Public Transport argued that noise from rail affects fewer people than noise from road.

rails ... probably have fewer route kilometres than main roads. Railways are quite often fronted by roads, factories, etcetera rather than houses ... (Draft report hearings, p.129)

Unlike the level of noise, costs of noise are more difficult to measure. Costs include speech interference, loss of sleep, annoyance, dissatisfaction, and interference with other activities. The value that an individual attaches to each of these depends on their perception of the noise. Thus the cost of noise will vary for different noise sources, and for different persons, even if their measured level is equal.

People react differently to noise. Some people would find the noise from trucks more intrusive than the noise from trains, while others would be more disturbed by train noise.

Estimates of the cost of noise are not available for all modes. Where they are available their magnitudes suggest that the problems of noise are significant.

More noise is generated in (the more populated) urban areas than in rural areas. Also, because cities are densely populated more people are located close to the source of the noise. Therefore, noise levels are a greater problem in urban areas than in rural areas. Estimates of the aggregate noise cost for vehicles in Australia were prepared by the Inter-State Commission (1990). Table G.5 shows the urban and non-urban costs for three vehicle categories. The costs in urban areas are much higher than in rural areas. The total cost of aggregate noise from vehicles in Australia is estimated at slightly over \$500 million.

No similar estimate is available for the cost of noise generated by rail operations. The OECD (1988, p.44) reports rail to be a less significant source of transport noise than road. It ranks rail noise, in terms of population exposure, behind road and air noise in all member countries, except Germany and Switzerland. If population noise exposure and costs are correlated, Australian rail noise costs are likely to be less than the costs for road.

Table G.5: **Estimates of aggregate noise costs for vehicles, Australia, 1989-90**

	<i>Automobiles</i>		<i>Medium trucks</i>		<i>Heavy trucks</i>	
	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>	<i>Cost per km (cents)</i>	<i>Annual cost (\$m)</i>
Interstate and rural	0.065	31.8	0.795	12.5	2.170	100.7
Urban	0.130	128.9	1.845	68.6	7.055	191.5
Total		160.7		81.1		292.2

Source: Inter-State Commission (1990).

G.5 Accident costs

Accident fatalities and injuries occur on all modes of transport. Table G.6 lists road and rail fatalities for the period 1986 to 1989.

In Table G.6 the figures for rail require some qualification. The majority of fatalities are of urban incidence, which include fatalities associated with rail such as misadventure in boarding and unboarding carriages and a number of suicides (also included in road deaths). On the other hand, the figures exclude level crossing accidents which mostly take place in non-urban areas. These are generally included in road fatality statistics and thus understate the rail fatality rate.

Table G.6: **Australian road and rail fatalities, 1986-1989**

<i>Year</i>	<i>Mode</i>	
	<i>Rail^a</i>	<i>Road</i>
1986	65	2888
1987	60	2772
1988	60	2888
1989	68	2799

a Excludes level crossing accidents which are included in road accident statistics.

Sources: ABS mortality tabulations table RG3; Federal Office of Road Safety.

All studies which the Commission looked at concluded that each truck is more likely to be involved in a fatal accident than each car. The South Australian Injury Surveillance Control Unit concluded that each semi-trailer is 10 to 20 times more likely than a car to be involved in a fatal accident. On average semi-trailers travel 5 times further than cars. After adjusting for this greater distance, a semi-trailer is 2 to 4 times more likely than a car to be involved in a fatal accident.

A more disaggregated study of South Australian statistics by White (1990) provided the following findings. Taking the distance each vehicle travels into account:

- in urban areas an articulated vehicle was 8.5 times more likely than a car to be involved in a fatal crash;
- in rural areas the likelihood decreased to 1.7 times that of a car; and
- over the whole State an articulated vehicle was 2.8 times more likely than a car to be involved in a fatal crash.

The same study gives some indication of the involvement of articulated vehicles in serious-injury and minor crashes:

- in urban areas an articulated vehicle was 1.7 times more likely than a car to be involved in serious injury crash and equally likely for a minor crash;
- in rural areas these ratios decreased to 0.7 and 0.5 respectively; and
- over the whole State an articulated vehicle was 0.7 times more likely than a car to be involved in a serious injury crash and 0.3 times for a minor crash.

The Federal Office of Road Safety (FORS) also has analysed fatal accidents. It looked at the vehicle type and the distance different types of vehicles travel. Its results for 1988 are presented in Table G.7. These results indicate that, depending on the measure used, an articulated truck is 2 to 6 times more likely than a car to be involved in a fatal accident. These data are for one year only and

in that year there was a substantial increase in articulated truck fatalities relative to previous years. Prior to this (1982-1987) fatality rates had been falling.³

Table G.7: **Fatalities, selected vehicle types, Australia, 1988**

	<i>Crashes</i>	<i>Fatalities</i>	<i>Fatal crashes per 100 million VKT^a</i>	<i>Fatalities per 100 million VKT</i>
Articulated trucks	268	332	6.99	3.21
Rigid trucks	165	179	2.10	2.28
Cars	1 709	1 989	1.23	1.43

a Vehicle-kilometres travelled.

Source: FORS, unpublished data.

Accidents involving both cars and trucks are included in the figure for cars in Table G.7. This suggests a reduction in truck accidents would also reduce the number of crashes and fatalities for cars.

Studies presented so far have compared the involvement of trucks and cars in fatal accidents. The analysis needs to compare vehicles which carry out similar transport tasks and consider the extent to which accidents can be reduced by transferring the transport task between modes.

FORS was able to provide fatalities data for passengers for selected years, taking into account the distances the different vehicles travel. In 1984-85 the fatality rate (fatalities per 100 million passenger-km) was 1.3 for cars and 0.06 for coaches. The fatality rate for rail in 1982-83 was 0.2. Even in 1989, the year of the Kempsey and Grafton bus crashes, the coach fatality rate was 0.2. Thus, in terms of passenger fatalities, rail cannot be said to be safer than road coaches.

All of the studies discussed indicate that less use of trucks in freight and more use of rail will result in lower numbers of fatalities. It should be recognised, however, that measures to shift freight from road to rail would not provide large gains in road safety. Although the number of trucks involved in fatal crashes relative to their tonne-kilometre task is significant, trucking accidents are not a large proportion of total road accidents. Table G.7 indicates that articulated trucks are responsible for a small proportion of total road fatalities. Significant gains in road safety would require a focus on car accidents.

The costs of road fatalities were estimated by the BTCE (Steadman and Bryan 1988) to be \$6.2 billion. Community concern for the level of road accident costs is apparent by the number of references to them in submissions to the inquiry. However, concern appears to focus on total costs which include both the costs which affect road users and costs which are borne by others.

³ For example, in NSW this trend was expected to continue through 1988 with a predicted value of 57 fatalities. The realised value of 120 fatalities, which was mainly observed in the second half of 1988, clearly disturbs this declining trend. The decrease in fatalities resumed in the second half of 1989, when there was a slight fall.

Injuries and property damage borne directly by road users involved in road accidents are already taken into account in decisions on whether to use road or another transport mode. It is the costs borne by others (external costs) which are important for this discussion. External costs do not influence peoples' decision to use the roads or the level of care they exercise on roads. If the cost of road use was increased by the amount of these external costs the option of using other modes, including rail, would become more attractive.

Table G.8 provides a disaggregation of the \$6.2 billion estimate by cost category and accident severity. Overseas studies indicate that the methodology used to derive this estimate results in an underestimate of road accident costs.⁴

Table G.8: **Accident costs, Australia, 1988 (\$million)**

<i>Cost category</i>	<i>Fatal</i>	<i>Critical</i>	<i>Severe</i>	<i>Serious</i>	<i>Moderate</i>	<i>Minor</i>	<i>Property Damage only</i>	<i>Total</i>
Loss of victim								
Forgone income	739.5	68.8	150.7	15.5	51.4	11.1	-	1 037.1
Family and community losses	580.3	54.0	118.3	17.2	57.0	12.3	-	839.0
Accident generated activities								
Hospital) Medical) Rehabilitation)	6.7	14.1	24.8	58.0	103.5	32.0	-	239.2
Legal and court proceedings	8.0	1.9	9.6	29.4	73.6	62.7	0.0	185.2
Insurance administration	4.9	0.8	4.0	13.8	70.0	55.2	197.2	345.9
Accident investigation	6.6	0.4	1.8	6.4	34.2	50.2	30.1	129.6
Losses to others	12.8	2.5	5.4	3.2	10.4	4.5	0.0	38.8
Vehicle damage	23.2	4.6	22.6	82.7	351.1	595.3	751.4	1 831.0
Pain and suffering of victim	0.0	53.8	134.4	300.8	665.5	104.5	0.0	1 259.0
Total	1 382.3	201.0	472.3	529.7	1 432.8	973.3	1 187.8	6 179.1

Source: BTCE, Costs of Road Crashes in Australia, Information Sheet 2.

⁴ The rationale of the methodology used is that society would be willing to pay at least the level of costs it incurs to avoid the current level of accidents. The main objection to the methodology is that it measures concern to preserve current levels of output rather than peoples' preference for safety. The 'willingness-to-pay' approach is conceptually better for measuring safety preference. Overseas estimates using the 'willingness-to-pay' methodology have produced estimates more than double those using a similar methodology to the BTCE's.

The estimate represents the savings from measures that reduce road accidents. Given that accidents will never be eliminated, Steadman and Bryan (1988, p.xvii) acknowledge that,

cost estimates such as these should not be regarded in total as potential savings. There is a possible large proportion of the estimated costs which cannot be saved because people are not prepared to suffer what they see as the inconveniences of the measures which might be required to produce a substantial reduction in road accidents.

Table G.8 presents an estimate of the total costs, which comprises both direct and external costs. The estimates were not derived with the separation of direct and external costs in mind. Some costs such as accident investigation and losses to others are clearly borne by people not involved in the accident. The separation in other categories is not so clear. For instance it is often argued that loss of income is internalised to the road user. However, in some cases the loss is clearly borne by others. Where an accident victim is employed his or her employer may be obliged to make a sick leave payment. In this example the cost is incurred by the employer and is therefore an external cost. Arbitrary divisions of the estimates are not likely to result in an accurate specification of external costs.

Presently the amount of the externalities cannot be determined exactly. All that can be said is that they are substantially less than the total accident costs. The insurance market is one mechanism which internalises the costs of road accidents. Drivers pay an insurance premium that covers them for the risk of them being involved in an accident. The ISC (1990) estimated total insurance premiums in 1987-88 to be \$4.4 billion. This suggests that the external cost of road accidents is less than \$1.8 billion.

More work in this area is required to determine the amount of external costs more precisely. With such information the community would be able to determine whether external crash costs are a significant issue in road transport. If a problem is identified then policy responses to increase charges by the amount of the external costs should be considered. Further action, including a greater possible use of rail may then follow.

One further issue that needs to be discussed is the argument that crash externalities are internalised by insurance. The Inter-State Commission argued this way in *Road Use Charges and Vehicle Registration: A National Scheme*. Its conclusions were made on the basis of one observation, 1987-88 insurance data and 1985 accident costs. Results in other years may lead to contrary results. This emphasises the need for further work on the level of externalities, particularly as the ISC approach involved an arbitrary division of total cost estimates.

G.6 Congestion

Congestion is a problem principally for urban road users. It can occur on non-urban roads, for example traffic delays associated with vehicle crashes, but its magnitude there is dwarfed by congestion delays experienced in cities.

Railways are not recognised as having significant congestion costs. By not having to share their track with a multitude of other users they enjoy a greater degree of certainty in travel times. Rail congestion does occur in some cities, for instance in Sydney.

Congestion costs increase with the number of vehicles using the road. Each additional road trip may impose costs on other road users if journey times increase, fuel consumption rates increase and exposure to atmospheric pollutants increases as a consequence of the trip.

Congestion costs are internalised to road users as a group because at an aggregate level the costs are generated and faced by road users collectively. However, an individual may not bear the same costs imposed on others (Luck and Martin 1988, p.186). For example, a motorist whose journey is for business purposes may have a higher premium on time than a motorist travelling for leisure purposes, and will thus experience higher costs from the delays of congestion. For the congestion costs faced by each individual to equal those they impose on others, road users must be equally inconvenienced by congestion. However, like noise costs, congestion costs depend on the perceptions of each individual. Several factors are likely to have a weighting in individual assessments of congestion costs including:

- income of the traveller;
- purpose of the journey;
- length of the journey; and
- tolerance or sensitivity to traffic delays.

These are likely to vary widely among road users.

Congestion costs in rail are mostly internalised to the operating authority. This is because access and volume on the system are controlled by the operating authority. The costs of delays will ultimately be incurred by the authority through declining patronage.

The BTCE (Luck and Martin 1988) estimated the total road congestion costs to be of the order of \$2000 million per annum. The estimate is based on the assumption that the main benefit from new capital expenditure on urban arterial roads is reduced travel times. The estimate is derived by multiplying total urban arterial road expenditure by the average cost benefit ratio of these projects.

The use of rail to carry a greater proportion of urban commuters may not be the long-term solution to the congestion problems in cities. Less congestion on arterial roads lowers the cost of road use and can reasonably be expected to result in additional road use. The real problem is work location and land use in cities and the pricing of road use. The solution to the congestion problem probably lies more in changing these arrangements than relying on rail to alleviate congestion levels.

REFERENCES FOR APPENDIX G

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APPENDIX H: RAILWAY LABOUR MARKET CHARACTERISTICS

H. 1 Employment

A significant decline in employment has occurred in the rail industry over the past decade. The pace and size of reductions varied across the individual authorities.

Table H.1: **Railway employment at 30 June, 1981 to 1994, actual and projected**

<i>Year</i>	<i>SRA</i>	<i>V/Line^a</i>	<i>Met</i>	<i>QR^b</i>	<i>Westrail</i>	<i>STA (SA)</i>	<i>AN</i>	<i>Total</i>
1981	42 087	15 080	7 014	24 963	9 304	1 158	10 481	110 087
1982	41 302	14 410	6 701	25 243	8 937	1 377	9 941	107 911
1983	40 367	14 326	6 663	25 943	8 391	1 209	9 575	106 474
1984	40 751	14 238	6 621	25 915	7 777	1 178	9 252	105 732
1985	41 427	14 279	7 294	25 750	7 101	1 050	8 799	105 700
1986	41 062	13 416	7 255	25 746	6 500	1 007	8 127	103 113
1987	38 585	11 704	7 179	24 770	5 900	1 116	7 838	97 092
1988	36 717	10 749	6 631	23 070	5 567	1 102	7 198	91 034
1989	33 113	10 083	6 608	21 465	5 621	1 013	6 648	84 551
1990	28 842	9 552	6 500 ^c	20 821	5 504	994	6 432	78 645
1991 ^d	26 900	na	na	na	5 300	na	5 986	na
1992	24 800	na	na	na	na	na	5 521	na
1993	20 300	na	na	na	na	na	5 195	na
1994	18 500	na	na	na	na	na	5 001	na

a Prior to 1984 all Victorian rail employees were employed by VicRail. The V/Line and Met employment totals for the period 1981 to 1983 are PTC estimates based on the proportion of staff employed in metropolitan and country activities during 1984.

b Average for years ended 30 June.

c PTC estimate; separate rail employment data not available for 1990.

d From 1991 the figures are projected levels.

Sources: Rail authorities, ARU (Submission 63, Appendix 3).

Table H.1 shows that:

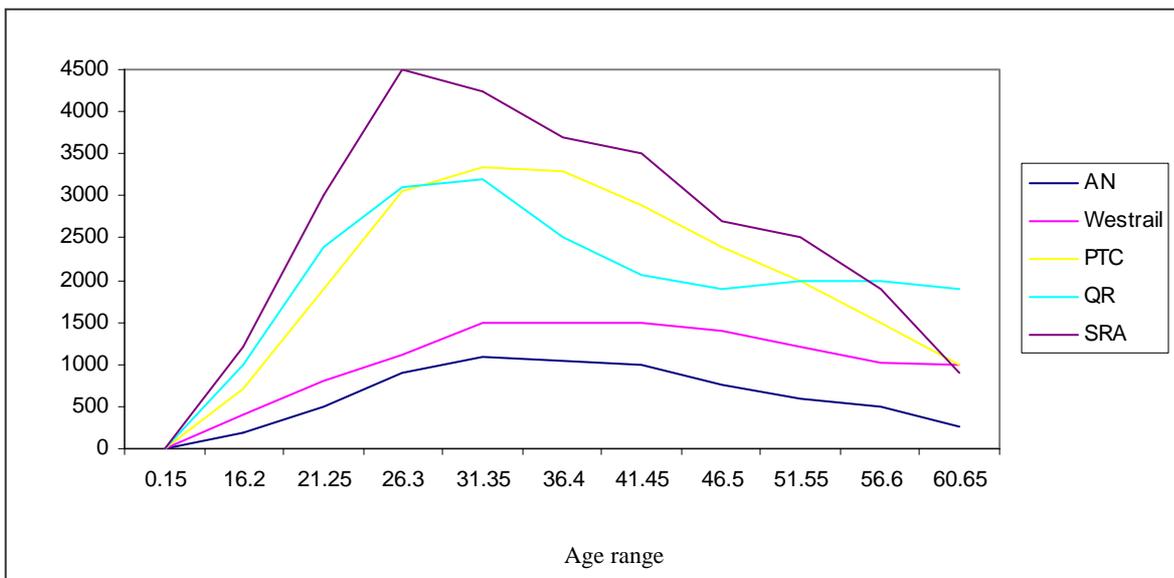
- Westrail and AN have undertaken a program of gradual reductions. Current employment levels are around 40 per cent lower than in June 1981.
- The SRA has reduced its workforce by more than 20 per cent in the last two years. A 45 per cent reduction is planned between 1989 and 1994.

- Employment reductions in Victoria are faltering. Within the Met employment has remained almost constant. V/Line made significant reductions between 1985 and 1988 but the decline has since slowed. This change in policy is evidenced by the replacement of the Transfer, Redeployment and Redundancy Scheme with the Transfer, Redeployment and Retraining Scheme in 1988-89.
- QR started to reduce its workforce in 1986. Its progress has been gradual: a 20 per cent decrease in four years.

Some authorities formally project future employment levels to be around 50 per cent or less of the 1980-81 levels. Others generally suggest that employment levels will need to decline in the future.

H.2 Age distribution

Figure H.1: **Railway employee age distribution, 1990^a**



a Westrail data were provided in ten year intervals.

Source: Rail authorities.

Figure H.1 graphs the age distribution of the rail workforce. The shape of the distribution indicates the extent to which rail authorities can reduce staff levels with early retirement schemes as compared to redundancies. When this information is normalised to obtain the percentage of employees in each age range the results are similar for all systems except QR, which has a relatively higher proportion of its employees over the age of 50. On this basis, early retirement schemes are, for example, more feasible for QR than for the other authorities.

H.3 Awards

The awards that apply to each rail authority are listed below. Federal awards are italicised.

Most authorities are covered by more than one main award. QR effectively has a single enterprise award; a second award, the Railway Catering Services Award - State, applies to a very small number of its employees. The SRA is covered by 16 awards, although 95 per cent of its employees are covered by 8 federal awards. Some authorities expressed a preference for single award coverage (AN, Submission 64, p.38). The SRA is currently negotiating for single award coverage for its employees.

SRA

Government Railways (Building Trades Construction Staff) Award
Government Railways (Building Trades - Maintenance Staff) Award
Government Railways (Tarpaulin Repairers and First Class Canvas Workers) Award
Public Transport Commission of New South Wales (Clerks on Construction) Award
Public Transport Commission of New South Wales - Clerks, Supervisory Officers and
Gangers on Construction etc. Works (Permanent Way Wages Staff) Award
Public Transport Commission of New South Wales (Construction) Award
Public Transport Commission of New South Wales Superintending Officers' Award
Public Transport Commission of New South Wales (Trading and Catering Services
Wages Staff) Award
Salaried Officers Award 1955, Department of Railways N.S.W.
Senior Officers Award 1977 Public Transport Commission of NSW
Railways Traffic, Permanent Way & Signalling Staff Award 1960
Railways Professional Officers Award 1974
Railways Miscellaneous Grades Award 1960
Railways Metal Trades Award 1953
Public Transport Commission of NSW Carpenters & Joiners Award 1976
Locomotive Enginemen's Award 1966

PTC

Railways Traffic, Permanent Way & Signalling Wages Staff Award
Locomotive Operating Grades (State Transport Authority Victoria) Award 1987
Graphic Arts Award 1977
Plumbing Industry (Victorian Government Departments, Instrumentalities &
Public Hospitals) Award 1983
Railways Metal Trades Grades Award
Railways Miscellaneous Grades Awards
Railways Professional Officers Award 1974
Railways Salaried Officers Award

QR

Railway Award-State
Railway Catering Services Award-State

Westrail

Railway Employees Award 1969

Railway Officers Award 1985

AWU Construction, Maintenance and Services (W.A. Govt) Award 1987

AWU Government Foremen Construction and Maintenance Award 1985

Government Railways Locomotive Enginemen's Award 1973

Railway Salaried Officers Award 1960

Railways Professional Officers Award 1974

State Transport Authority of South Australia

STA of South Australia Traffic Operating, Permanent Way, Workshop and Miscellaneous Grades Award - 1988

STA Salaried Officers Award – 1979

AN

The Traffic Operating, Workshops & Miscellaneous Grades (ANR) Award, 1978

The Locomotive Enginemen's (ANR) Award, 1978

The Professional & Technical Officers' (ANR) Award, 1978

The Salaried Officers' (ANR) Award, 1978

The Construction Workers' (ANR) Award, 1978

The Camping Out (ANR) Award, 1985

H.4 Skill distribution

Skill levels are discussed using the Australian Standard Classification of Occupations (ASCO). Table H.2 shows the education and training standards associated with each group.

Table H.2: **The skill level of Australian Standard Classification of Occupations (ASCO) major groups**

<i>ASCO major group</i>	<i>Secondary education</i>	<i>Tertiary education</i>	<i>On-the-job training</i>	<i>Relevant experience</i>
Managers and administrators	Year 12	Degree/diploma		7 years
Professionals	Year 12	Degree/diploma		
Para-professionals	Year 12	Associate diploma	6 months	
Tradesperson	Year 10	Apprenticeship		
Clerks	Year 11		6 months	
Salespersons and personal service workers	Year 10		3 months	
Plant and machine operators and drivers			1 year	
Labourers and related workers			3 months	

Source: Lubulwa and Jones (1989, p.192).

Table H.3 shows that the majority of rail employees are employed in semi and low skilled occupations. The proportions are broadly in line with those of an earlier study (Lubulwa and Jones 1989, p.193).

Table H.3: **Skill distribution of rail employees, 1990 a (per cent)**

<i>ASCO major group</i>	<i>SRA</i>	<i>PTC</i>	<i>QR</i>	<i>AN</i>
Managers and administrators	2	6	4	3
Professionals	3	5	3	1
Para-professionals	0	3	3	5
Tradespersons	17	21	18	21
Clerks	33	12	11	10
Salespersons and personal service workers	2	3	1	2
Plant and machine operators and drivers	15	13	19	27
Labourers and related workers	28	37	41	32

a Information not available from Westrail.

Source: Rail authorities.

H.5 Labour productivity

Tables H.4 and H.5 list employee productivity growth for two fundamentally different traffic types, freight and passenger.

The average productivity growth rates for freight employees, calculated from 1984-85, are as follows:

- SRA, 10 per cent;
- V/Line, 9.5 per cent;
- QR, 8 per cent;
- Westrail, 9 per cent; and
- AN, 12.5 per cent.

Table H.4: **Freight employee productivity 1978-79 to 1989-90 (thousand net tonne-kilometres per employee)**

<i>Year</i>	<i>SRA</i>	<i>PTC</i>	<i>QR</i>	<i>Westrail^a</i>	<i>AN</i>
1978-79	na	na	na	441	508
1979-80	na	na	na	508	599
1980-81	508	na	na	506	637
1981-82	525	na	na	515	653
1982-83	458	na	na	546	625
1983-84	553	397	na	527	716
1984-85	604	450	902	637	792
1985-86	677	422	981	648	957
1986-87	704	520	1 017	724	986
1987-88	784	551	1 093	796	1 166
1988-89	829	579	1 203	917	1 342
1989-90	1 045	689	1 359	937	1 418

a Westrail's productivity is measured in 'task units'. A task unit is defined by the following equation: task units = net tonne-kilometres + 1.5 passenger-kilometres.

Source: Rail authorities.

Table H.5: **Passenger employee productivity 1983-84 to 1989-90 (thousand passenger journeys/employee)**

<i>Year</i>	<i>SRA</i>		<i>Met^a</i>	<i>V/line</i>	<i>QR</i>		<i>AN</i>	
	<i>CityRail</i>	<i>Countrylink</i>			<i>Suburban</i>	<i>Country</i>		
1983-84	12.2	0.7	12.7	0.8	na	na	0.3	12.2
1984-85	11.9	0.7	11.8	0.8	14.7	na	0.3	11.9
1985-86	13.1	0.8	12.3	0.9	15.1	na	0.3	13.1
1986-87	14.3	0.8	12.9	1.1	16.9	na	0.3	14.3
1987-88	16.6	0.9	13.3	1.2	18.6	0.7	0.4	16.6
1988-89	18.6	0.8	14.1	1.3	20.2	0.6	0.4	18.6
1989-90	20.7	0.9	14.6	1.4	17.1 ^b	0.7	0.5	20.7

a Based on the number of boardings.

b From July 1989 the suburban passenger boundary was extended and reclassified as SouthEast Regional Passenger.

Source: Rail authorities.

REFERENCE FOR APPENDIX H

Lubulwa, A.S.G. and Jones, K. 1989, 'Railway Restructuring and Labour market consequences', Australasian Transport Research Forum, *Forum Papers*, Vol. 1. Perth, pp.181-204.

APPENDIX I: RAILWAYS IN OTHER COUNTRIES

The varied roles and characteristics of railways in other countries are influenced by a range of historical, geographical, institutional and other factors. This is reflected in the range of values contained in Table I.1. The table provides indicators of the freight and passenger tasks performed by railways in Australia and a selection of other countries which are discussed in this appendix.

Table I.1: Railway task in Australia and other countries

<i>Country</i>	<i>Freight net tonne-kilometres^a (billion)</i>	<i>Average freight haul tonnage^a</i>	<i>Average freight haul length^a km</i>	<i>Passenger Km^a (billion)</i>	<i>Freight revenue as per cent of total non-urban revenue^b</i>	<i>Operating cost recovery for non-urban rail^b</i>
Australia (non-metropolitan)	50	736	286	6	93	77
New Zealand	3	399	328	na	35	62
Japan	22	333	235	198	7	69
United States	1 329	2 378	1 093	19	97	109
Canada (Canadian Pacific)	108	2 521	1 189	na	97	87
Europe ^c						
- maximum	120	681	392	60	na	na
- median	17	304	232	12	na	na
- minimum	2	190	114	1	na	na
Sweden	17	431	339	6	na	na
Great Britain	17	347	121	33	33	73

a 1987 data.

b 1985 data.

c Entries along each line mostly refer to different railway systems.

Sources: BTCE (1988); IAC (1989, Volume 4, p.80); International Union of Railways (1988); 1987-88 Annual Reports for Australian and New Zealand railways.

It must be stressed that due to difficulties in isolating non-urban rail activity, all the data in Table I.1 should be treated cautiously. Nonetheless Table I.1 provides indicative information and shows a great diversity in the nature of the tasks undertaken by overseas railways. Australia's average haul in terms of tonnes is less than only the United States and Canada (and considerably so), but in terms of kilometres is smaller than many countries. In terms of revenue, freight activity comprises more than 90 per cent of rail activity in Australia, the United States and Canada (due to the large bulk task), whereas everywhere else it is much less important.

Operating cost recovery varies from country to country. Further comparison of non-urban public railways in various countries is reported in an Information Paper of the Bureau of Transport and Communications Economics (BTCE 1988).

There are other differences between Australian and overseas railways. For example, rail's share of the interstate freight market is very high in Australian corridors (ranging from 25 to 80 per cent) compared to Europe and the United States (where it ranges from 5 to 20 per cent), yet in terms of actual freight volumes, Australian railways are relatively small.

Due to the varying importance and nature of different overseas railways, there are limitations to any comparison with Australian railways. Nonetheless, the consideration of railways in particular countries is relevant because of the lessons to be learnt regarding alternative organisational and structural arrangements. The following coverage therefore does not seek to give a complete description, not even in summary form, of each country discussed. Rather, particular aspects which are considered relevant to this report are noted. The discussion varies depending on country, but overall, it is apparent that most changes to Australian rail arrangements proposed in this report have been contemplated and/or implemented sometime, somewhere overseas.

I.1 New Zealand

Background

New Zealand Rail Limited (NZR) provides freight and passenger rail services in the North and South Islands of New Zealand and the inter-island ferry service. NZR is responsible for its own financial and commercial performance. It also provides urban transport services in several cities, under yearly contract to, and with service conditions determined by, local government.

Regulatory environment

The transport sector has undergone extensive regulatory changes in recent years with a general move towards fewer restrictions on entry and pricing. Road freight transport was tightly regulated from 1933 on the basis of quantitative licensing (restricting the number of operators in the industry) and from 1936 by restrictions on length of haul (to limit competition with rail). Following the passage of the Road User Charges Act 1977 and the Transport Amendment Act (No. 2) 1983, regulatory control over entry was replaced with a system of 'quality' licensing. This change has been combined with a user-pays philosophy whereby heavy vehicles are charged according to the avoidable costs associated with their road use. A phased withdrawal of the restriction on length of haul was begun with the sale of permits for individual trucks to compete against rail. These permits were charged on the basis of a 'per tonne day', but were phased out by the end of 1986.

Following deregulation, rail charges were reduced to maintain market share. However, the number of trucks increased dramatically and rail lost considerable market share (though not much absolute traffic) to road transport.

Corporate identity

Until 1982 the rail system was generally run as a government department. The New Zealand Government Railways Department had the requirement to provide New Zealand with an effective freight and passenger system at minimum economic cost. It started losing money during the 1970s. Performance fell sharply as government policies, including a price freeze and a Prime Ministerial direction to the railways to increase employment, were implemented during a period in which the rail task was declining.

In 1981, the Railways Department was made into a statutory corporation, New Zealand Railways Corporation (NZRC), with responsibility for establishing, maintaining and operating safe and efficient rail, road and ferry services. The Corporation could contract and be paid for continuing unprofitable social services. This represented a step towards commercialisation, although government participation in strategic decisions and basic operations remained quite extensive until 1986.

NZRC became a state owned enterprise under the State Owned Enterprises Act of 1987, and entered the so-called corporatisation phase. Corporatisation had the aim of improving the operating efficiency of government business organisations through administrative means and, where possible, by injecting competition into the markets of the organisations concerned. Such measures are designed to replicate as far as possible a private sector operating environment. The NZRC operated as a single statutory entity with a variety of different businesses (rail, bus services, ferries, management of extensive property holdings). Particularly important was that it was then able to adopt significant changes in its industrial relations and employment regimes (negotiating its own arrangements). For instance, just eight months before a general election, a major workshop (employing 2000), which was the biggest employer in a big town in a marginal electorate, was closed without interference from government.

In 1990, legislation established New Zealand Rail Limited, the shares of which are presently 100 per cent owned by the government through the Ministry of Finance and the Ministry of State-owned Enterprises. NZR took over the railway and ferry activities of the NZRC. The NZRC, which still exists as a government entity under the Ministry of Railways, now owns only country road passenger services, a parcel service, the railway right-of-way (rented to NZR for \$NZ1 per annum) and surplus property.

Reform

With the establishment of the NZRC, considerable reform has occurred since the early 1980s. Efforts to reduce costs included improved management of property and capital stock involving a significant rationalisation of the land and non-land capital base. The Corporation sought to realign its cost structures in other areas with those corresponding to a commercial system based on cost/resource comparisons against various commercial US rail systems.

The Government insisted that community services such as uneconomic branch line operation and uneconomic long-distance passenger services should not be met by cross-subsidies but from the government's budget. After some time the Government decided to withdraw its subsidies and NZRC was allowed to choose whether to continue affected services. By that time cost reductions were so great that most of the branch lines were kept open because they were no longer making losses.

unlike many overseas systems there was no core traffic or core network. All our lines of business contributed to our financial performance, as did all parts of the network. Indeed the principal routes depended on traffic from the provincial and branch lines for their viability. We found, in fact, that some of the conventional wisdom, for example to close branch lines and get out of LCL, did not apply to our situation. In fact to maintain overall viability we had to maintain the existing traffic base. (Small 1991, p.126)

The resulting strategy included the rationalisation of station and freight terminals, the adoption of a hub and spoke network, and the closure of more than 300 smaller terminals.

Between 1983 and 1990 staff numbers fell from more than 21 000 to about 6500. The staff reductions were achieved with the cooperation of staff who appreciated the urgency of change, and because of the willingness of unions to accept change:

Initial resistance to change gave way to a responsible and cooperative attitude once it was made clear that the rail system's survival was at stake. They accepted this once it was clear that the government would not continue to fund Railways, and they had seen sufficient financial data to show the consequences of the various options, including doing nothing. (Small 1991, p.127)

A study by Booz.Allen & Hamilton in 1983 recommended a 17 per cent reduction in real costs, including a reduction of 4500 in staff in order to make NZRC competitive with road. In reality, the railways have reduced real costs by 48 per cent, considerably more than the 17 per cent suggested reduction, and employment has fallen by a factor of three times the recommended reduction. In the process the railways have only maintained their competitive position. Total net tonne-kilometres performed by rail have remained fairly constant with road taking all the growth in the total freight task. Road has lost some bulk freights to rail, but taken more of the higher value traffic. Since significantly reducing its costs, rail is now attempting to build its share of all freight markets.

An example is the railways capturing 30 per cent of the market for delivering new motor vehicles after having lost this business in the past due to delivery unreliability and pilfering.

Other factors cited by Small (1991, p.127) as important in the reform process commenced in the NZRC, and continuing in NZR, are:

- government help by reforming the structure in which collective bargaining occurs;
- change in organisational structure, within both NZRC and NZR, to stand-alone business groups;
- determination of management; and
- communication to staff and clients of the need for change.

In January 1990 the government took over NZ\$1 billion of railway debt, including \$300 million for electrification of the main northern line. This will be repaid by the sale of rail property (worth about \$1 billion) owned by NZRC and which is surplus to railway needs now that fewer yards and workshops are required. This leaves NZR preparing to become a viable commercial business. In adverse economic conditions, NZR expected to end the 1990-91 financial year with a taxable profit.

1.2 Japan

Until 1987 Japan's railway system comprised a public national railway system and a number of private regional railways. The national system, Japanese National Railways (JNR), operated passenger and freight services across the country, and by the mid 1980s held a significant but declining share of passenger traffic and a minimal share of freight.

Government railways

In the mid 1960s JNR's finances began to deteriorate and despite some government measures aimed at restructuring the rail system the trend was not arrested. In the early 1980s it became clear that any turnaround required addressing the issues of excessive government involvement, unclear management responsibility and limitations on what business activities railways could or could not undertake.

After a number of reports into the operations of JNR (the most influential prepared by the 2nd Ad Hoc Commission on Administrative Reform), a Bill was passed in 1986 to privatise and divide JNR, taking effect on 1 April 1987.

JNR was transferred to private ownership. While some areas such as budgeting, fund planning and involvement in non-rail activities have been left unrestricted, railways in Japan still face government restrictions. The issuing of bonds, long-term borrowings, appointment and dismissal of

representative directors, employment levels, fares and charges, train schedules, termination of services, construction of railway facilities and land sales are subject to ministerial approval.

JNR was divided into six passenger railway companies, one freight company, a telecommunications company, a technical research institute and a property corporation which together formed the new JR Group. Each of these companies has a private corporation status. JNR operated 245 lines totalling 23 320 km of which 83 lines totalling 3160 km were closed under the JR Group railway system. The Japan Freight Railway company has abandoned freight operations on minor lines and consolidated major freight operations. It also terminated the assembly of freight cars into block trains at marshalling yards and ceased handling freight at more than 100 stations.

When JNR was divested, it had 276 000 employees. Of these 215 000 were hired by the JR Group while the remaining 61 000 were asked either to take early retirement or to seek employment elsewhere. Of the 215 000 continuing in the JR Group, 32 000 were considered surplus but were retained to prevent increased unemployment. Even so, shedding the 61 000 workers was a big achievement made possible only after abolishing the strong National Railways Workers Union.

The new laws allowed JR Group corporations to enter into businesses other than transportation. This has seen them diversify into businesses such as hotels, fish hatcheries and restaurants. In April 1989 five subsidiaries of the JR Group began to operate buses.

The privatisation and division of JNR has had a favourable effect on the finances of the Japanese rail system. Since the new arrangements took effect a modest operating profit has been achieved. Although the operating revenue includes subsidies paid by the government which may vary from year to year, it seems that reductions on the expenditure side of the account are responsible for the positive results since privatisation. Freight operations, once viewed as the greatest burden of the JNR system, recorded a profit.

Japan is a very densely populated country, giving the railways a large pool of passengers to carry over relatively short distances. In 1988 the three passenger operation corporations (JR East, JR Central and JR West) that are based on the main island of Honshu reported an operating profit, while the other three located on Hokkaido, Kyushu and Shikoku islands reported losses. The better performing rail companies have large population pools from which to attract customers - such as the Tokyo district with a population of 30 million, the Osaka district with 18 million and the Nagoya district with eight million. Also, fares for commuting passengers in Japan are subsidised by their companies.

Private rail operations

Private rail operations have been the model that the JR Group has attempted to follow. All the major private railways are located at or around major metropolitan regions and all are engaged in business ventures other than rail but mostly closely related to the railway industry. By establishing various enterprises a short distance from the railway's right-of-way, they generate passenger demand and in turn the provision of rail services brings customers to these enterprises.

A good example of how a Japanese private rail company operates is the Shibuya-Sakuragicho line connecting two major activity centres of Tokyo and Yokohama. Tokyu, who operates the line, bought vast parcels of land adjacent to it before the railway attracted various developments. It developed a residential area, encouraged the construction of a university campus and other schools along the line and built large department stores in terminals at each end. These bases drew more business and Tokyu further developed housing along the line.

As noted above, the Japanese Government applies restrictions to the fares charged by private railways. Proposed fare increases are reviewed by the ministry of transport and are usually granted only when a railway's financial records show a loss in operations. Most private railways were making profits in 1987.

I.3 United States

The distinction between freight, intercity (country) and urban passenger railways in the US has long been more pronounced than in Australia. Freight services are provided by private railroads, intercity and country passenger services are run by a federal government owned and operated corporation (Amtrak), while local councils provide urban passenger services sometimes in association with Amtrak.

Freight

Since the introduction of the Interstate Commerce Act of 1887, freight services in the US have been predominantly provided by private interests. A regulatory body covering the operation of private railways was set up - the Interstate Commerce Commission (ICC) - which had and has jurisdiction over tariffs, the level of service and the discontinuation of services by abandoning lines. The current environment under which US railways operate is largely a result of the 1976 Railroad Revitalisation and Regulatory Reform (4R) Act and the 1980 Staggers Rail Act. Both Acts were a response to the worsening financial state of private railways.

Pricing

Before the 4R Act, the ICC had regulatory jurisdiction over virtually all rail rates, regardless of whether there was competition (either intermodal or intramodal) for the traffic involved. Under the 4R Act, the ICC was given jurisdiction over rail rates only where the railroads involved could be shown to possess market dominance over the traffic. The ICC defined market dominance fairly broadly after the 4R Act. Following the Staggers Rail Act, a stipulation was added that a carrier does not have market dominance unless its rates exceed the variable cost of providing the service in question by a specified percentage. For 1980 the figure was set at 60 per cent and increased to 80 per cent by 1984. This means that railways have freedom from ICC regulation over rail rates so long as those rates do not exceed variable costs by the specified proportion.

In addition, ICC regulation over rates is not necessary applicable unless the railroad is earning an adequate return on capital employed. In 1987 the ICC decided that the standard for determining revenue adequacy should be a rate of return equal to the current cost of capital. Thus, even when the carrier dominates freight traffic and where the freight rate in question exceeds the trigger point set out in the Act, the rate can be found reasonable if the carrier is earning inadequate revenues. Conversely, increases in the rates will not be allowed if the railroad involved is earning an adequate return on capital, even if the increase would keep it below the trigger point.

Along with this new pricing freedom came some additional duties and responsibilities. Prior to the Staggers Act railways were allowed to price cooperatively through rate bureaus. Even though price fixing is a violation of the antitrust law, the railways were granted immunity to engage in this type of activity. The Staggers Act removed the immunity so that railroads now have to set rates for particular single line movements independently. Any discussions held with competing railroads could very well result in prosecution for violation of the antitrust laws.

Contracts

Prior to the Staggers Act, individual contracts between railroads and shippers were illegal. The Act allowed, for the first time, railways to enter into contracts with purchasers of rail services and to provide a specified service under specified rates and conditions, subject to ICC approval. Approval is granted if the contract does not unduly impair the ability of a railroad to meet its common carrier obligations to a particular shipper.

Competition

Inducing competition between railways was an important objective behind the Staggers Act. Previously one railway could prevent another railway from serving a shipper by simply refusing to allow the second to cross its property. After the Staggers Act, the ICC was given the statutory power to require that, when a shipper is served exclusively by only the line of one particular railway, other railways in the vicinity also have right of access. The ICC also may authorise an

extension of a railway line, following which no rail operator is able to block the extension by refusing permission to cross its property.

Line closures

The Staggers Act also liberalised procedures for abandoning rail lines and gave the ICC discretion not to award redundancy packages to affected workers. Previously, government regulation of line closures and labour protection policies created incentives for abandonment by slow death. Having to prove beyond question the unprofitability of a line before closure was approved, railways instead would run the service down, stop track maintenance and cut back employment before seeking approval.

Effects

The above changes had a substantial effect on the structure and financial performance of the rail industry. A series of mergers saw the industry change from one where dozens of major railways covered limited geographical areas to one where railway's routes started covering over 20 states. By 1986 the four largest railways collectively accounted for around half of Class I railway revenues, which in turn accounted for around 94 per cent of total industry revenues.

Greater freedom in abandoning uneconomical rail lines brought about a shedding of surplus and unproductive resources in the Class I system. Over the period 1980-86, track ownership was reduced from 435 432 to 375 226 km (around 10 000 km per year), while the locomotive and freight car fleets were reduced by 26 and 32 per cent respectively. The effect on employment was even more pronounced, it fell from 447 000 to 274 000 or by 38.7 per cent in the first 6 years after passage of the Staggers Act.

Around 28 000 km of the 60 200 km of track shed by the Class I railroads was taken up by the establishment of nearly 200 short line and regional railways which act mainly as feeders to the mainline. The success of these operations is generally based upon the use of non-unionised labour who are employed on a lower wage package than Class I employees and who may be more flexibly deployed than their unionised counterparts.

Although the total rail system shrunk after the Staggers Act, investment in railroad bed and structures tripled in the 1980-86 period. This increased investment was due to the greater certainty that was introduced when railways were permitted to enter into contracts with users.

In 1985, a 5 per cent return on investment was generated by the railroad industry. This represented a considerable increase from the average of 1 per cent of the 1970s. Federal government assistance to freight railroads fell gradually from US\$1990 million in 1978 to US\$60 million in 1985.

The average rates charged by railways after 1980 indicate that their improved financial results did not come at the expense of rail users in general. During the five years preceding the Staggers Act, rail rates rose by an average of 10.6 per cent per annum while in the first five years after the Staggers Act the annual rate of increase was only 4.6 per cent. This was mainly due to increased competition in a less regulated market.

Although rail users in general may be better off after the reforms, captive users claim that they had to bear the brunt of rate deregulation, implying that greater pricing freedom gave railways more room to use their monopoly power in extracting monopoly rents. The way of determining market dominance by the ICC may be open to criticism and would suggest that it might be necessary to address complaints from captive users on a case-by-case basis.

Amtrak

Amtrak (officially known as the National Railroad Passenger Corporation) was created under law in 1970 to provide US intercity rail passenger services.

In 1988-89 Amtrak operated an average of 220 trains per day, serving 504 stations over a system of approximately 24 000 route miles. Of this route system, Amtrak owns a right-of-way on all track miles in the Northeast Corridor (Washington-New York-Boston; New Haven-Springfield; Philadelphia-Pittsburg) where it provides all station and on-board service staffs, as well as train and engine operating crews. Outside the Northeast Corridor, Amtrak owns the right-of-way in several small track segments in the East, while in other parts of the country it contracts with 21 privately owned railroads for the right to operate over their track.

Since 1980-81 Amtrak has steadily improved its financial performance. Revenue has been increasing at a higher rate than expenditure (which fell in constant dollars over the period 1980-81 to 1988-89) with a consequent rise in Amtrak's cost recovery ratio from 48 per cent in 1980-81 to 72 per cent by 1988-89. The improvement came about primarily from improved labour agreements, improved quantity and quality of services offered and the imposed discipline of decreasing government subsidies.

Labour agreements

In 1981 Amtrak secured an agreement with its non-operating unions to hold down future wage increases until they were 12 per cent below the railway industry average. A number of work-rule changes were also introduced which included split shifts, flexible start time, reduced guaranteed pay and lower entry pay rates. These changes were fully implemented by 1985 and, according to Amtrak estimates, produced annual savings of approximately US\$165 million.

Amtrak's labour costs thus were kept well below those of the US railroad industry as a whole. Between 1980 and 1988 Amtrak recorded a cumulative wage increase of 34 per cent compared to a 48 per cent increase in the railway industry.

Improved quantity and quality

As seen in Table I.2, government subsidies have decreased since 1981. Prior to that year substantial capital grants were provided which enabled Amtrak to construct new facilities and modernise existing ones, to acquire modern diesel and electric locomotives, to introduce 640 new passenger cars in the east and 280 double-decker cars in the west, to electrify and rebuild many older passenger cars, and to introduce new ticketing arrangements and upgrade the track. The new equipment and facilities improved both the quantity and quality of the service provided by Amtrak, leading to increased patronage and revenues which was a major contributor to the turnaround in Amtrak's fortunes. From 1982-83 to 1988-89 revenues increased by 91 per cent while expenses increased by only 31.6 per cent.

Table I.2: Federal appropriations to Amtrak (US\$ million)

<i>Financial year</i>	<i>Operating grant</i>		<i>Capital grant</i>		<i>Total grant</i>	
	<i>Current</i>	<i>Constant^a</i>	<i>Current</i>	<i>Constant^a</i>	<i>Current</i>	<i>Constant^a</i>
1981	675.8	675.8	220.5	220.5	896.3	896.3
1982	558.4	526.8	176.6	166.5	753.0	693.3
1983	605.5	553.0	94.3	86.1	699.8	639.1
1984	618.1	540.7	98.3	86.0	716.4	626.7
1985	627.7	530.1	52.3	44.2	680.0	574.3
1986	588.7	495.2	2.0	1.7	590.7	496.9
1987	580.5	462.8	26.5	21.0	607.0	483.8
1988	534.6	402.0	46.2	34.7	580.8	436.7
1989	584.0	418.9	80.0	57.4	664.0	476.3

a 1981 US\$.

Sources: Amtrak 1989 Annual Report; United States Senate (1989).

Government operating subsidies have been decreasing steadily since 1980-81 while capital grants followed suit up to 1986, after which they gradually increased. Combined with the threat of subsidies being cut altogether, decreasing federal grants put enormous pressure on Amtrak to produce an efficient operation and to find new ways of financing its capital needs.

There was an increase in both the quantity and quality of the service provided. While it is clear that some lines lose more than others and that some will never be able to operate anywhere near full cost recovery, a cut in a service will trigger labour protection benefits which are imposed under federal law and entitle employees to redundancy payments of up to as much as six years of salary. These payments vitiate potential savings which could otherwise be realised by eliminating individual routes. For example, the redundancy payments associated with the closure of three long-

distance trains which are among the largest loss makers amount to US\$70 million. The gross savings of closure amount to about \$80 million.

New ways of financing Amtrak capital needs mainly involved co-financing of projects, which are primarily local in nature, and new commercial activities outside the traditional provision of rail travel. In 1987-88 around US\$28 million in local station, equipment and track upgrading projects were jointly undertaken by Amtrak and local and state governments with Amtrak contributing \$6 million to the total.

New commercial activities ranged from the lease of rights-of-way for commercial communications use; mail and express delivery; rail car engineering and testing; rail welding and track renewal for commuter agencies; electrical co-generation; and the commercial development of train stations and other real estate holdings. These projects come under what Amtrak calls its Revenue Enhancement Program which generated a net income of US\$104.9 million during the 5-year period from 1983-84 to 1987-88. Revenues are applied predominantly towards capital requirements and covered nearly 40 per cent of Amtrak's capital funding during those five years.

I.4 Canada

Background

Canadian railways are grouped into three classes. Some 90 per cent of the total Canadian rail task is performed by Class I Railways: Canadian National Railways (CN), Canadian Pacific Railways (CP Rail) and VIA Rail Canada Inc. (VIA). Class II and III Railways comprise smaller operators such as BC Rail which is operated by the British Columbia provincial government. Only Class I Railways are considered here.

Compared with Australian railways, Canadian urban and non-urban railways undertake a much smaller proportion of the passenger-kilometres travelled by all modes, but a considerably greater share of the total freight tonne-kilometres performed. In absolute terms, Canadian Class I Railways perform more than five times as many freight tonne-kilometres as Australian railways over almost double the track length (of Class I Railways) using more locomotives, more freight wagons, but fewer rail employees.

The historical importance of railways in opening up the expanses of Canada may be compared to the corresponding influence of railways in Australia. In both countries, federation was agreed to upon the promise of construction of a transcontinental railway line. Canada, though, managed to build hundreds of railways all using standard gauge. The ratio of population to area is similar. Urban centres are similarly spaced, a full steam locomotive water tank's distance apart. However, with only a few major ports (situated at the extremes of the system), location in Canada is not determined by proximity to the ocean; rather, by proximity to United States and its transport

network. US railroads effectively have competitive access to Canada with the ability to connect with major Canadian cities from their extensive network south of the border.

The range of traffics in Canada and Australia is similar: bulk minerals, bulk grain, general freight, non-urban passenger (for which intercity coach competition is highly regulated) and urban passenger (which is not considered here). LCL traffic is not carried by Class I Railways. Train lengths are considerably longer, although both CN and CP have cut lengths in recent years to improve their on-time performance. The (freight) railways return profits (after receiving various external subsidies); passenger services which in aggregate make big losses, are accounted for separately.

There is far greater user organisation and lobbying in Canada than in Australia. For example, the Coalition of Concerned Shippers had a major influence on the pro-competitive nature of measures in the 1987 National Transportation Act. Also, shippers have recourse to appeals provisions.

The principal contrast with Australia is that the publicly-owned CN competes against the privately-owned CP for freight services on separate networks of tracks across Canada, and long-distance passenger services are provided by the government-owned national operator VIA. Railways in Canada are thus much more a national matter, and regulated as such; though, overall, there is much less government intervention in their operations than in Australia.

Regulation

All regulation is at the national level. The railways are basically free to set freight rates and to pursue commercial objectives under certain general guidelines. They have the freedom to practise selective service design and pricing. The only significant national regulation of traffics to rail involves certain grains for which rates are regulated.

The Federal Minister for Transport receives advice on transport objectives, strategies and policies from Transport Canada's Policy and Co-ordination Group. Under the National Transportation Act 1987, the National Transportation Agency (NTA) acts as the administrator of transport regulation, directed by policy instructions from the Minister for Transport, which are also laid before both Houses of Parliament. The NTA conducts investigations upon Ministerial request and supervises and arbitrates on disputes between carriers and shippers. The Government may revise or revoke any NTA decision. Shippers and carriers may appeal against any NTA decision or regulation.

The National Transportation Act 1987 is distinguished by its explicit concern for safety standards, its emphasis on intramodal competition, its consideration of regulation as a last resort, and its identification of transportation as a key to regional economic development.

Specific provisions of this Act which relate to greater intramodal competition for railways include:

- freight rates can no longer be jointly set by CN and CP;
- confidential contracts may be negotiated with shippers and must be filed with the NTA;
- minimum rate regulation exists whereby rates must be compensatory, that is the price for the service must exceed the variable costs of the particular movement of traffic concerned;
- no maximum rate regulation exists, although there are dispute resolution mechanisms (including final offer arbitration);
- provision for running rights, joint track usage and interswitching;
- provision is made for competitive access to railways through Competitive Line Rates which may be requested by any shipper who is captive to one railway at the point of freight origin or destination, and which involve setting a rate to or from the point served by the local railway and the nearest interchange with another railway;
- railways may sell lines to independent operators who run short lines services (as in the US);
- rationalisation is restricted such that railways may abandon no more than 4 per cent of trackage annually until 1992, although successful shipper objections and government directions can - and do - keep lines open;
- safety is monitored by a section of the NTA; and
- annual reviews are carried out by the NTA.

Currently, there is apparently no strong federal philosophical commitment to privatisation of railways (that is, of Canadian National), though there is a view that introduction of intramodal competition applies pressure for the removal of the Crown from ownership.

Subsidisation

The railways receive direct subsidisation rather than rely on internal cross-subsidisation. The Federal Government pays large direct transport subsidies: for grain handling (under the Western Grain Transportation Act 1983); for uneconomic services operated as an imposed public duty such as branch lines (under the Railway Act); for shipping to eastern ports; and for VIA operating expenditure and capital funding. VIA subsidies are currently being reduced considerably; this should affect CN and CP only if thus far they have been receiving more compensation than the marginal costs imposed by VIA services.

Ownership

Canadian National Railways

CN is the major division of Canadian National, a (Federal) Crown Corporation, created out of a large number of public and private lines which had faced bankruptcy. Canadian National also has interests in consultancy, rollingstock manufacture, real estate, steamships and ferries, and US railroads. In recent years CN has sold its hotels to CP, and has divested itself of its trucking and telecommunications businesses. It is current government policy to sell all non-rail assets of CN. The CN rail task is virtually entirely freight, with its track length, employment and task each comprising more than half the Canadian total.

CN is not subject to particular government interference, although it must report annually to government and cannot borrow money without Federal Government approval. Since its inception, CN has always pursued its mandate to operate 'as one united system, on a commercial basis under its own politically undisturbed management for benefit of Canada ... competition and commercialism have repeatedly taken precedence over political rhetoric and campaign promises' (Gratwick 1982, p.238).

Nonetheless, by virtue of its infrastructure, CN has been vulnerable to government direction regarding the provision of particular services to meet regional development objectives.

Canadian Pacific Railways

CP Rail is a small department of Canadian Pacific Limited, a private company, which is also involved in trucking, consultancy, real estate, timber, mining and oil, ocean shipping, telecommunications, steel and US railroads. The CP Rail task is entirely freight, accounting for over 30 per cent of the Canadian trackage, employment and task.

VIA Rail Canada

VIA is a Crown Corporation which assumed full responsibility in 1979 for managing and operating all railway passenger services (excluding urban and a very limited number of provincial passenger services), taking over the passenger services of CN and CP Rail. Practically, VIA is a service broker between the Federal Government and the two railways, performing an overall management function for services whose need is defined on a very ad hoc basis. Massive subsidisation of passenger services is provided by the Federal Government. The basic principle behind VIA's creation was to retain direct control over service levels and to give responsibility for improving the performance and efficiency of the system to a separate operating authority. VIA is an example of the separation of 'below-wheel' infrastructure ownership and 'above-rail' service operation, as discussed by Cubukgil (1987).

VIA operates over both CN and CP tracks, but increasingly operates, services and staffs its own rollingstock. The majority of passenger carriages date from well before they were inherited from CN and CP, resulting in severe reliability and marketing problems.

The contractual arrangements for running rights have always been a matter of contention as were charges for train personnel, locomotive services and rollingstock maintenance before VIA provided its own. VIA has virtually no negotiating freedom in being required to reimburse CN and CP for the long run avoidable costs of service provision. There are difficulties auditing any charges by CN or CP, and these are billed ex post.

Since its establishment, cost recovery of passenger services has not improved, government (operating and other) funding has increased steadily (the subsidy costing about \$A100 per passenger in 1987), patronage has fallen and public dissatisfaction has risen. The VIA takeover of functions initially performed by railways has not improved operating cost performance in terms of either total or unit costs. Overhead costs have grown significantly.

At the end of 1989 the Federal Government announced that over the next three years government funding for non-urban rail passenger services was to be almost halved. The number of services has since been more than halved, the workforce is on the way to being almost halved and the number of passengers carried is expected to almost halve. Currently underway is a national passenger transportation inquiry which was announced in conjunction with the VIA cuts.

Performance

Lack of government political intervention is not the sole reason for both government (CN) and private (CP) railways returning profits. Of critical importance has been the removal from both railways of responsibility for passenger services and the relief of capital and interest charges under several recapitalisations of CN.

Both CN and CP are structured around business sectors. For both railways, labour costs represent almost half of their costs (including capital). There are fourteen unions with little likelihood of amalgamation. Industrial action is an inevitable part of efforts to introduce flexibility to employment contracts. There is a pattern of negotiation, strike, return-to-work legislation and (parliamentary appointed) arbitration for each new biennial labour agreement.

Total factor productivity

The Canadian railways were gradually deregulated in the late 1950s and the 1960s with the competitive pressures resulting in improved service and differential pricing. These changes are reflected in high average annual rates of total factor productivity (TFP) growth over the period 1962-71. During this period CN achieved an average annual growth rate of 6.4 per cent and CP 3.6 per cent. This TFP growth is exceptional, with average annual growth rates for CN and CP over the

period 1956-62 and over the period 1971-1979 less than 1.6 per cent in all cases according to Caves et al. (1982). Freeman et al. (1985) correct, refine, update and treat outputs differently to Caves et al. study, but reach the same conclusion. The higher growth rate for CN in the 1960s reflects CN's starting from a lower base (for example, simple labour productivity in CN was well below CP; CN faced a heavier burden of lower-traffic rail lines).

The evidence is that overall, CP's TFP growth exceeds CN's in unadjusted terms. If CN's TFP measure is adjusted for its lower average traffic density (greater route miles relative to traffic volume) and longer passenger hauls, the absolute level of productivity of the two railways are very close (that is, not significantly different in a statistical sense) (Freeman et al. 1985).

The TFP of Canadian railways is often compared favourably with that of US railroads to conclude that the heavier regulation of US railroads impeded performance, and that ownership status is not an issue (Caves et al. 1982 and Freeman et al. 1985). The conclusion is that it is the competitive environment rather than the form of ownership that has the larger impact on firm productivity.

1.5 Europe

Railway systems in Europe present a range of operational, financial and technical differences and in so doing highlight one of the basic problems of European rail, that of railways being organised on a national rather than international basis. Planning for railways stops at national borders with governments using their railways primarily for domestic policy purposes and giving little attention to facilitating intra-European flows. Relationships between European national railways have similarities with the relationships between Australian State railway systems.

Although there has been some degree of cooperation between the rail systems a lot of rigidities remain. There is cooperation of sorts through the Association of International Railways (UIC) which involves all European rail authorities except the USSR. For example, railway carriages and wagons can be used throughout the European Community (EC) if they satisfy UIC standards. The EC has attempted to implement a common transport policy, but has been impeded by regulation and intervention at the national level. In June 1991, however, the member states agreed to implement important new railway policies throughout the EC. These are described below.

Passenger services on many of the routes are unable to offer the speed required to be competitive with other modes of transport. In freight transport there is a service problem in that many routes do not possess sufficient height or width clearances to accept freight trains that run elsewhere. Technical differences which include different track gauges and the lack of a common approach to the introduction of new technology (for example, the electrification of lines at different voltages) further impede intra-European flows.

About 65 million tonnes per annum are shipped by rail among the twelve members of the EC, a level which has remained more or less constant since 1975. As a result, rail's relative share of the total freight task had dropped from 14 per cent in 1975 to around 10 per cent in 1987.

Private participation

A feature of the European international rail freight system is the private ownership of rollingstock which is around 40 to 50 per cent of the total fleet. While the benefits of private ownership of wagons are clear (it facilitates the improvement and development of rollingstock designed to suit the needs of clients), the benefits of private ownership of locomotives are less clear because of the very high costs associated with their acquisition. Although the possibility for private ownership of locomotives exists, it has not been taken up.

For all practical purposes the ownership of infrastructure (including terminals) is public, but EC proposals would allow private ownership. The EC proposes that there be a clear and distinct separation of infrastructure (such as permanent way and terminals) and rollingstock, and that charges for the use of infrastructure be transparent and on the basis of full cost recovery. While a regulatory authority to overlook charging for infrastructure is not envisaged, the national rail authorities would be obliged to report to the EC Commission on request as a means of providing some accountability.

Pricing

Prices charged for freight shipments are calculated on the basis of adding the various national prices en route rather than determining an international price. This leads to inconsistencies as the definitions for the various cost components are applied differently by the various rail authorities. More importantly, because of non-transparency in pricing, national rail authorities have been known to discriminate in favour of internal traffic.

Other developments

As in other countries, the major concerns of rail users in Europe are reliability and quality of service. With respect to reliability, under the previous system (which has not been totally replaced) no guarantee was given that shipments would reach their destinations within the agreed time, although a minimum standard of 300 km per day plus one day for departure and one day for customs clearance was in place. The UIC in recent times introduced a new system called Euro-rail Cargo which offers guarantees of improved reliability on designated routes (those identified as either existing high volume or offering potential); for example, for journeys of between 1000 and 1500 km with departure on the evening of day one and delivery on the morning of day three. If there is a delay of more than one hour, the shipper is entitled to a 10 per cent rebate and retains the right to seek further compensation if losses can be proven.

Quality of service has improved markedly after major infrastructure investments were undertaken across Europe in the early 1980s.

June 1991 railway policy

For the past few years the EC has been examining proposals to improve the efficiency and competitiveness of the European railway network through the separation of rail infrastructure and train operation activities, and the harmonisation and/or standardisation of railways in different countries. In June 1991 the EC's 12 transport ministers decided that, commencing in 1993, there would be a partial separation in that separate accounts would be kept for rail infrastructure and train operations, and that train operators would have access to all tracks, thus opening the way for free competition between European railways (EC 1991).

Access to rail infrastructure will be available not only to existing railway companies but to future ones too, including private companies provided that they have a majority shareholding from within the Community.

Governments will continue to have responsibility for urban, suburban and regional transport. At the same time, obligations on railways to provide public services will be replaced by an optional system of public service contracts between governments and railways.

The EC is also working on an all-European harmonisation of the infrastructure so that free and unimpeded access to all the networks will be physically possible (Daily Commercial News 1991). Priority is being given to tunnel profiles, bridge clearances and container dimensions. There is an intention to harmonise user charges. Continued supervision by independent EC agencies will be necessary to ensure that national railway companies cannot obtain an unfair advantage over private companies or those from other countries.

I.6 Sweden

In the 1970s the government-owned railway, Swedish Railways (SJ) was considered a problem due to its declining market share in both passenger and freight transport and the need for the government to step in from time to time to restore its financial position by debt remissions. Nevertheless, SJ consistently outperformed its counterparts in Europe in terms of labour productivity and degree of self-financing.

By the end of the 1970s a view had emerged that something radical had to be done to ensure the survival of the railways without burdening taxpayers. In the ten-year period 1979-88 three major policy initiatives were taken with important implications for SJ: the New Transport Policy of 1979; the Guidelines for Railway Policy of 1985; and the New Transport Policy of 1988. The 1988 policy has shaped the structure of the rail industry in Sweden as it exists today.

SJ was divided into a railway authority responsible just for the railway infrastructure (Banverket) and a rail transport enterprise (Affars-SJ) with the objective of running trains in the most business-like manner possible on Banverket's rail tracks, for which Affars-SJ is charged. As well as the track system, signalling and the provision of electricity for traction belong to Banverket, while station buildings belong to Affars-SJ.

The system of railway transport services was divided into four categories:

- The major national or inter-regional routes which are run by Affars-SJ as a commercial enterprise.
- The regional routes in which Affars-SJ runs the freight trains while county councils have responsibility for regional passenger train services. If a county decides on having regional train services, it can get Affars-SJ or any other train operator to provide the required level of service by paying for any losses the service makes - assuming it is unprofitable.
- A few remaining commercially unviable interregional lines, which are considered to be essential for some regions. Affars-SJ is paid by the central government what is required to maintain passenger services on these lines.
- The iron ore transport by rail from Kinura to Lulea and Narvik (in Norway) which is provided by a separate division of SJ which enjoys a natural monopoly.

The rationale for establishing the Banverket was that economic efficiency would increase if train operations and investment in rollingstock were carried out in accordance with purely commercial criteria, while track maintenance and investment decisions were made according to social benefit-cost analysis, as is the case for the road transport infrastructure.

There is no direct connection between the rail track investments or the total costs of Banverket, and the revenue from rail user charges, just as there is little direct connection between road investments and road user charges in Sweden. Total revenue from rail infrastructure user charges was estimated to be around 900m Cr for 1989, divided equally between allegedly marginal-cost related variable charges and fixed (engine- and wagon-kilometre independent) charges. This revenue covered only half the operating costs of Banverket in 1989, and hence was not sufficient to make any

contribution towards investment expenditure. This compares with roads where revenue from fuel and motor vehicle taxes far exceeds the total expenditure devoted to roads.

Although the mounting financial problems of SJ were the main concern and the most pressing reason for a new transport policy, environmental issues were also important. It was considered that the transport sector must not continue adversely to influence the environment to the extent that it had. To this end, an energy tax, levied on all transport modes, was introduced. As rail transport was perceived to be more 'environmentally friendly' than road, the energy tax was set so that, other things being equal, there should be a shift towards rail transport as road becomes relatively more expensive.

Although it is too early to judge the full effect of these initiatives, it seems that they have not been too successful. Financially, even though Affars-SJ reported a profit for the first time in 1988-89, it was able to do so only after paying around half price for its use of the infrastructure. Had Affars-SJ paid Banverket the full cost of providing the infrastructure, its financial results would not have looked much better than those of previous years.

It was hoped that the separation of infrastructure from running trains would attract new entrants into the industry. Affars-SJ at present has a monopoly on urban and intercity passenger services and has first option on the provision of freight services. This means that other operators are confined to regional passenger services and perhaps some freight services. So far there has been only one new entrant. BK-Tag, a private operator, bid successfully against Affars-SJ in three counties for provision of local passenger train services commencing in May 1990. This is a small operation which uses only 20 diesel railcars and 48 staff (including 34 drivers). In the first six months, patronage increased 45 per cent, revenue increased and costs were cut (Rail Gazette International 1991).

I.7 Great Britain

Background

British Railways (BR) is the national railway in Great Britain, running all rail services in England, Scotland and Wales excepting the London Underground. BR is formally operated by the British Railways Board (BRB) whose members are appointed by the central government. Unlike in Australia, the passenger task dominates freight in what is a much smaller and very much more densely populated country. For instance, Network SouthEast and the London Underground together carry 77 per cent of all London commuters, compared with rail's 48 per cent share of Sydney commuters to the CBD.

After nationalisation in 1948 (before which time there were many large private railway companies) BR operated with a geographic structure of five regions. Changes in government policy since the late 1970s have enabled/forced BR to become much more commercially oriented. A new structure

based on five main business types was created in 1982: Network SouthEast (London commuter and some provincial lines), Provincial, InterCity, Freight, and Parcels. This has hastened a change of culture within BR from a production/engineering orientation to a market/commercial orientation.

Other business activities of the BRB include:

- British Rail International which markets BR travel overseas;
- the Research Division;
- British Rail Maintenance Limited which is responsible for the overhaul and repair of BR's locomotives and rollingstock;
- Transmark which consulted on 190 projects in 25 countries and states in 1989-90;
- British Rail Property Board with gross income from letting of 120.9 million pounds sterling in 1989-90 and property sales of 319.2 million pounds sterling (profits from one-off property sales enabled BR to show an overall surplus in 1989-90 despite a rail operating loss); and
- British Transport Police.

BR faces varying degrees of competition from other modes in its five business sectors. It holds a 40 per cent market share of Network SouthEast shorter distance trips and 75 per cent of longer distance trips, whereas its InterCity business faces much greater competition from cars and coaches, carrying a maximum of 40 per cent on some routes. Freight and Parcels each face strong competition while some parts of the Provincial network face no competition.

Relationship with government

BR in the past has been completely subject to government direction. The 1977 Transport White Paper included a general statement that commercial services provided by BR should not continue to be subsidised. The present government has applied this principle through the publishing of objectives every three years by the Secretary of State for Transport, based on, and implemented through, BR's annual corporate plans. These objectives (detailed below) relate to financial performance, quality, safety, 'obligation to serve' and other aspects. In return for allowing BR's management greater freedom from bureaucratic and Ministerial interference, the Government expects BR to meet various targets, including the steady reduction of subsidies.

In theory, BR's relationship with government thus is now more clearly defined with BR having considerable autonomy. In practice, politically-sensitive matters such as fare levels, line and station closures and service reductions continue to be subject to government influence. Government approval is needed for large investments.

The Government currently makes Public Service Obligation (PSO) grants for the Network SouthEast and Provincial sectors. PSOs are required to conform with European Economic Community regulations that allow compensation necessary to ensure the adequate provision of transport services. The Public Transport Executives of local governments also contribute to PSO grants, subject to conditions such as the maintenance of certain fare levels.

In 1989-90, six grants totalling 4 million pounds sterling and involving two million tonnes of traffic were awarded to customers under Section 8 of the Railways Act 1974 to support the movement of freight by rail rather than by road on environmental grounds.

Objectives

The Government has set certain statutory and financial duties for the BRB including the requirement:

that the combined revenues of the authority and of its subsidiaries taken together are not less than sufficient to meet their combined charges properly chargeable to revenue account, taking one year with another.
(Transport Act, 1968)

The annual corporate plan of the BRB provides a framework for the direction and control of its business during the next five years. Such plans are used in reaching an agreed view of what should be achieved, as announced in the Government's three-year cycle of objectives. The annual plan, together with the BRB's Annual Report and Accounts, is used to report progress on the objectives. The interactive process potentially and (apparently) actually brings a stability and sense of direction to the railways. This might not be so if the plans and goals were not so specific and demanding.

Objectives for the period 1990-91 to 1992-93 'are aimed at producing a safe, efficient and high quality railway which is responsive to the needs of its customers' (BRB 1990). Particular emphasis for this period is given to safety, quality (punctuality, reliability and overcrowding) and productivity. The government states that the implementation of safety-related projects flowing from the inquiry into a major accident near Clapham Junction in 1988 should not be impeded by finance, noting that 'non-commercial projects intended specifically to improve safety are not expected to earn a direct financial return' (BRB 1990).

The passenger service quality objectives set by the Secretary of State for Transport (and reported annually by the BRB) comprise punctuality, service provision (reliability), load factors, telephone enquiry bureaux response times, ticket office queuing times, and interior and exterior cleanliness of trains.

Financial performance

BR had an objective for 1989-90 of reducing total Public Service Obligation grants to 665 million pounds sterling (Network SouthEast 94 million, Provincial 422 million, contingency 149 million), but in fact needed support of only 574 million pounds sterling. Total operating expenditure for 1989-90 was 3511 million pounds sterling. Financial results for the business sectors are summarised in Table I.3.

Table I.3: British Rail selected results, 1989-90, pounds sterling (million)

<i>Business sector</i>	<i>Gross income^a</i>	<i>Operating Surplus^a</i>
InterCity	833.0	46.4
Network SouthEast	930.0	-138.1
Provincial	276.4	-509.4
Freight	693.9	59.4
Parcels	119.8	-15.9

a Excluding grants of 87.4 million pounds sterling for Network SouthEast and 499.4 million pounds sterling for Provincial.
Sources: BRB (1989, 1990).

Investment decisions

Internally, the head of each business sector has the delegation to approve investment projects within financial limits. The BRB becomes involved for higher amounts, and the approval of the Secretary of State for Transport is required for any investment in excess of four million pounds sterling. The BRB has an investment committee (made up of senior BR officials) which assesses proposals made by the business sectors and commissions independent appraisals of certain projects. BR sets a target rate of return of a real 8 per cent for investment projects.

Investment is financed by a combination of internal funds and borrowings. External funding (borrowings plus PSOs) is negotiated between the BRB and the Department of Transport, and the Department of Transport and the Treasury. Rail investment proposals are assessed using financial analysis which does not take account of all external benefits. In contrast, the government does take account of all external benefits by using benefit-cost studies to justify road investment.

Employment

Total employment in British Rail is fairly steady at 130 000.

The government is still liable to interfere in pay negotiations so as to preserve the 'incomes policy' of limiting public sector pay rises.

For example, the serious industrial troubles in the summer of 1989 resulted from the Department of Transport forcing BR to make a pay offer to manual workers which BR had warned would be unacceptably low.

A long period during which managers were poorly paid and publicly ridiculed has considerably weakened BR's ability to recruit able staff. Commentators contend that BR suffers morale and motivation problems.

Private sector participation

The Government's policy of greater private sector participation has four particular facets. The first is greater commercial exploitation of BR assets in partnership with private interests. Examples are:

- privately-owned wagons account for 39 per cent of the total fleet in use in 1989-90;
- a private sector stake of around 2.7 billion pounds sterling in the Railfreight business through rollingstock and terminal investment; and
- joint property development of stations.

The second aspect is competitive procurement of rollingstock and catering. An example is the nine different companies providing trolley catering services on 24 Provincial and Network SouthEast routes. Third, there has been a review of services which traditionally have been provided internally with a view to their private provision, for example marketing services, computing and design services. Fourth, non-core railway operations have been sold to the private sector, for example British Transport Hotels, Sealink UK (ferries), British Rail Engineering Ltd (equipment building), Travellers Fare Ltd (station catering), Horwich Foundry, Vale of Rheidol Railway and Gold Star Holidays. There are now few non-core assets left to sell.

Privatisation

The 'commercialisation' of BR through the five business sectors has moved BR closer to the possibility of privatisation. The next step is by no means clear, especially as Government policy generally requires an enterprise to be reformed and demonstrably profitable before being privatised.

The option of leaving permanent way, train control, maintenance and stations and terminals in BR, and allowing private sector competitors to operate trains (including a government operator if appropriate) has been considered by the Government and BR. Apparently, the conclusion reached is that despite theoretical appeal, benefits practically would only be small because intramodal competition would be most valuable where it is most difficult to introduce. It is argued that there is too little business in the Provincial sector to interest a competitor. In Network SouthEast

congestion is so great already with little scope for new tracks, and no competitor could survive without interchangeable tickets (thus preventing price competition). It is argued that there would be no interest in private sector acquisition of InterCity.

Tendering for individual activities has already been noted, to which can be added the possibility of negative tendering for the provision of subsidised services, especially in the Provincial network. Infrastructure maintenance, notably of tunnels and bridges is being contracted out by tender. The Clapham Junction accident has slowed this process because of evidence that misunderstanding between BR staff and contractors may have been a contributory cause.

The entire sale of BR has difficulties because of the unknown financial state of the enterprise. Although BR meets Government requirements on return on assets, this is only possible because various assets such as bridges and tunnels are omitted from accounts. Learning from the problems which emerged in the sale of the Central Electricity Generating Board (when only at the last stage were the true costs of operating and decommissioning nuclear reactors revealed), there are hidden costs for which BR is responsible including the maintenance of more than 60 listed viaducts (no longer used). The vulnerability of BR's corporate plan to economic fluctuations is another concern.

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APPENDIX J: CHOOSING THE APPROPRIATE RATE OF RETURN FOR COAL RAIL INVESTMENT

J.1 Introduction

The Commission has been made acutely aware of the conflicts between rail authorities and mining companies, especially coal companies, about the appropriate levels of freight rates. Elsewhere (Chapter 10) the Commission argues that individual prices should not be set merely on the basis of meeting a target rate of return, although the target or hurdle rate of return ought to be one of the relevant factors. This appendix discusses the rate of return on capital, making extensive use of the State Rail Authority of NSW (SRA) policy paper on coal freight pricing (Submission 98).

The choice of the appropriate rate of return (or discount rate) for public investment projects is controversial both at the theoretical and empirical level. In the absence of uncertainty, income tax and other distortions, and in the presence of perfect capital markets, the rate at which individuals can transfer consumption from one period to another (known as the Social Rate of Time Preference, or SRTP) is equated to the rate of return required by the private sector from a marginal investment (known as the Social Opportunity cost of Capital, or SOC). At equilibrium, both rates will also be equal to the market rate of interest.

Complications giving rise to ‘second best’ problems arise once recognition is made of the existence of income tax, uncertainty and non-perfect capital markets (Swan 1983). Consider, for example, an economy where taxation is applied to household income at the single rate of 40 per cent and all investment is funded with equity capital. If individuals are assumed to have a rate of time preference of 9 per cent, they require a pre-tax rate of return of 15 per cent to induce them to invest. The marginal pre-tax rate of return on private investment, and hence to SOC of funds will be 15 per cent but the SRTP will be 9 per cent.

A policy often advocated is to use the higher SOC rate when private investment is displaced by a public investment; the lower SRTP rate when private consumption is displaced by public investment; and a weighted average of the SRTP and SOC rates when a combination of private investment and consumption is displaced.

In the case of publicly provided rail services for hauling coal and minerals, the case for using the lower SRTP rate, or even a rate below the SOC, appears to be very weak. Private rail operations in the haulage of coal and minerals exist both in Australia and overseas. Ultimately public investment in rail replaces private investment and for that reason the SOC rate should be used.

J.2 Risk and uncertainty

Differences in opinion also exist in the treatment of risk and uncertainty when calculating appropriate public vis a vis private sector discount rates. Samuelson (1964) argued that the public sector as a risk-taker differs from the private sector, because of the large number of projects it undertakes where the risks would offset one another. Uncertainties faced by the public sector in terms of changes in government policy and taxation arrangements were also seen to be less severe than those faced by the private sector. Finally the risks associated with default, bankruptcy and fraud are low or non-existent in the public sector. For these reasons Samuelson advocated that public sector projects should be assessed as if they were risk-free.

On the other hand Hirshleifer (1966) and Bailey and Jensen (1972), amongst others, argued strongly that risk should be discounted in the same way for public investment as it is for private investment. This is because both private capital markets and public ownership should eliminate the diversifiable risk leaving only systematic risk (due to links between individual projects and the performance of the economy or the market as a whole). Any preferential public sector treatment would result in the public sector crowding out more rewarding investment in the private sector.

The Commission believes that a government enterprise cannot avoid systematic risk any more or less efficiently than a private enterprise, in which case the public discount rate should be the same as the private rate for the same investment.

J.3 The Capital Asset Pricing Model (CAPM)

The CAPM model provides a useful means of computing the risk premium applicable to different kinds of projects and assets. In short, the CAPM compares the return on an individual asset, in excess of the risk-free rate of return, with the corresponding excess for the overall market rate of return on assets. The following exposition of the CAPM model is taken from the Treasury (1990, pp.103-110).

According to the CAPM, the required commercial return on an enterprise's total assets (funded by debt plus equity), r , can be expressed as:

$$(1) \quad r = r_f + B_a (r_m - r_f)$$

where

r_f is the risk-free rate of return;

B_a is the measure of systematic (non-diversified) risk associated with the return on the enterprise's total assets¹; and

r_m is the expected return on the market portfolio.

Equation (1) can be broken down to:

$$(2) \quad r_e = r_f + B_e (r_m - r_f)$$

$$(3) \quad r_d = r_f + B_d (r_m - r_f)$$

where

r_e and r_d are the required returns to the enterprise's equity and debt respectively; and

B_e and B_d are the enterprise's equity and debt betas respectively.

The weighted average of r_e and r_d is the enterprise's cost of capital:

$$(4) \quad r = r_e E/A + r_d D/A$$

where

E is the market value of equity;

D is the market value of debt; and

$A = E + D$.

r , when calculated by means of equation (4), is known as the weighted average cost of capital (WACC). It can be evaluated without knowing the B s, provided that estimates of r_e and r_d are available.

Equations (1) and (4) are different expressions for the same return on the enterprise's total assets. Equation (1) gives the return required by investors (of equity and debt) while equation (4) gives the cost of capital that a firm must pay.

Provided that the B_a is consistent with the B_e and B_d associated with the enterprise's debt/equity position, equations (1) and (4) should give the same estimate of the required commercial return.²

¹ The asset beta measures the sensitivity of a project's (or industry's) expected return to market-wide returns. Such risk is called 'systematic' risk. An investment with a beta value greater than 1 means that its return rises faster than the return on the market portfolio in a rising market but falls faster than the market portfolio in a falling market. Returns on investments with a beta of less than 1 vary less than the return on the market portfolio.

² If r_e (equation 2) and r_d (equation 3) are substituted into equation (4), equations (1) and (4) will be equivalent if $B_a = B_e E/A + B_d D/A$.

If, however, income earned and taxed at the company level is taxed again in the hands of shareholders, the enterprise's B_a will not be independent of the debt/equity position and equations (1) and (4) will differ. For this reason the WACC (that is, equation (4)) is often preferred in estimating the required rate of return.

So far, as specified, the CAPM model provides an estimate of the required return of an investment in post-tax terms and in respect of the equity (or shareholders' funds) invested rather than the total assets (debt plus equity) used.

Before introducing taxation into the CAPM framework, it should be noted that under Australia's full imputation arrangements for the taxation of company income, the situation will be broadly equivalent to the no-tax case where asset beta is independent of the debt/equity position.

J.4 The CAPM under income tax

Using upper case symbols to represent returns as they are received in the hands of investors (that is, after payment of company tax but before payment of personal tax) and returns on the company's debt in the hands of bondholders before the payment of personal income tax, equations (1), (2) (3) and (4) respectively are expressed as³:

$$(5) \quad R = R_f(1-t_c) + B [R_m - R_f(1-t_c)]$$

$$(6) \quad R_e = R_f(1-t_c) + B_e [R_m - R_f(1-t_c)]$$

$$(7) \quad R_d(1-t_c) = R_f(1-t_c) + B_d [R_m - R_f(1-t_c)]$$

$$(8) \quad R = R_e E/A + R_d(1-t_c) D/A$$

where

R_e is the required rate of return on equity in the enterprise before payment of personal income tax;

R_f is the minimal risk rate of return before personal income tax;

R_m is the expected rate of return on the market portfolio before payment of personal income tax but after payment of corporate tax;

t_c is the corporate tax rate;

R_d is the required rate of return on the company's debt in the hands of bondholders before personal income tax; and

R is the required rate of return on the enterprise's assets as a whole (that is, debt and equity) as assessed after corporate tax but before personal tax.

³ Note that equations (5) to (8) cannot be derived directly from equations (1) to (4). There are intermediate steps which take account of personal tax rates and tax imputation that are included in Treasury 1990 (pp.107-109).

Equation (5) provides a direct way of estimating the required rate of return on total assets, using the enterprise's asset beta, which under full imputation is broadly independent of the debt/equity position. Again, equations (5) and (8) are equivalent if

$$(9) \quad B_a = B_e E/A + B_d D/A.$$

The required pre-corporate tax rate of return on the enterprise's assets as a whole (A) can be calculated as $A=R/(1-t_c)$.

Using equation (5),

$$(10) \quad A = (1-B) R_f + B R_m/(1-t_c).$$

For the purposes of enumeration, R_m can be written as $(R_m-R_f) + R_f$, that is the market risk premium plus the bond rate.

J.5 Estimates of the essential parameters

The risk-free rate (R_f)

The assets which are closest to being risk-free are government bonds. As the term structure of interest rates is not flat, various government bonds will offer different interest rates depending on their term. Ideally what is required is the current yield on a government security whose term to maturity matches the life of the investment. Treasury (1990) estimated that over the 1950-89 period, annual nominal returns on 10-year government bonds averaged 7.4 per cent, while Swan (1983) estimated 7.8 per cent over the 1960-85 period. The Commission has used the current 10-year government bond rate of around 10.5 per cent principally because the current rate is the most relevant rate for investment purposes.

The expected rate of return on the market portfolio (r_m)

In practice it is impossible to calculate the rate of return on the market portfolio. For this reason a share price index is used as a proxy. As the rate of return on a share price index is highly variable from year to year, it is usual to calculate the average return on the index over a relatively long period. Officer (1981) found that the average rate of return on a share price index (Melbourne Stock Exchange, All Ordinaries) over the 1968-78 period was approximately 13.5 per cent per annum. Swan (1983), using a value-weighted stock market accumulation index for Australian shares, 1958-83, with dividends reinvested, estimated a compounded rate of return for the 25 year period of 9.9 per cent per annum.

Given that the effective corporate tax rate (t_c) is small (see below), it should be clear from equation (5) that it is not so much the return on the market portfolio (r_m) that is important in the calculation, but the risk premium, that is, the difference between R_m and the riskless rate of return, R_f .

Swan (1983) obtained a risk premium, $r_m - r_f$, of 2.1 per cent (9.9 - 7.8), but mentions that Officer, using slightly different data, obtained 6 to 7 per cent. According to the Australian Financial Review (19 May 1991, p.64), the generally accepted risk premium for Australia at present is 6 per cent. The Commission has used a risk premium of 6 per cent.

Systematic risk (B_a)

The most difficult variable to estimate in equation (5) is the project's systematic risk. Most railways in Australia are government-owned, while the major private rail operations are undertaken by mining companies which aim to achieve a rate of return over the whole mining investment, of which rail is just a part. For this reason there are no Australian share market data pertaining directly to the rail industry from which a beta value can be estimated. The SRA suggests (Submission 98) that the next best alternative source of data is perhaps private railways in the US. Taking a weighted average of risk in seven US-based railroad companies, the SRA estimated an asset risk coefficient of 0.9. On the other hand, the Commission understands that asset betas for some domestic coal companies are less than 0.5. SRA coal freight faces the same risks as the coal companies in their exposure to world coal markets, but less risk than an individual company because its services are spread over many customers.

The Commission has adopted a value of 0.5 for the asset beta.

Debt/equity ratio

An alternative approach is to derive the asset beta from the debt beta and equity beta using equation (9). It is very difficult to estimate the SRA's debt-equity position from its annual report accounts. Indeed, the distinction between debt and equity may not be a meaningful concept for SRA coal when it is considered how SRA projects have been funded in the past. A number of alternative approaches could be used:

- (a) Finance (1987) found that over the period 1976-77 to 1985-86 a typical firm financed 46 per cent of its capital requirements from equity, some 32 per cent from interest bearing debt and the balance of 22 per cent from non-interest bearing liabilities including trade credits.
- (b) In the context of an integrated firm in the exploration, extraction, transport and marketing of minerals, a convenient simplifying approximation is to assume that the debt/equity position of the firm is the same across all activities. MIM has currently a debt/equity ratio of 1.5 (that is, 60 per cent funded by debt), while CRA has a ratio of 1.

(c) Debt to equity ratios for similar activities overseas could be used. The Commission has no information on this.

Debt beta and equity beta

Referring to equations (6) and (7), the selected values of debt beta and equity beta reflect the fact that debt capital is usually cheaper than equity because investors take on less risk when buying it. In the case of SRA coal, B_d might be expected to be close to zero, but only because of the backing, or perceived backing, by the NSW Government. In the cost estimates for coal freight which were submitted to this inquiry - as estimated by Easton - it was assumed that since there is no explicit shareholding in publicly owned railways only the cost of borrowing should be included in the cost of capital. The Commission believes that, just as in a private sector project a large proportion of the risk is reflected in the returns to equity capital, the same is true for a public sector project where the taxpayer becomes the implicit equity shareholder. It is the taxpayer, not the bondholder (holder of a riskless asset) who will pay for projects that do not do as well as anticipated. When a rail authority gets into financial difficulties it is the taxpayer who foots the bill and meets the financial commitments to bondholders.

The main difference between a shareholder in public rail (that is, a taxpayer) and an equity shareholder in a private concern is that the formers' role is borne involuntarily.

Also note that it is unrealistic to assume that the cost of debt capital remains constant irrespective of the firm's debt/equity position. One would expect the risk of lending to an enterprise to rise once its debt/equity ratio rises above a certain value. Lenders will want to be compensated more for the risk of default. There are also indirect costs as some customers may choose not to deal with a vulnerable firm. In effect, if one assumes that all of the SRA's capital is financed by debt, the required rate of return for debt could be much higher than when a combination of debt and equity is used.

Corporate tax rate (t_c)

The corporate tax rate is currently 39 per cent of tax-based accounting profit. In reality the reported accounting profit can often be less than the economic income, particularly when deductions are allowed for items such as investment allowances and interest payments. The Commission has used an effective tax rate of 15 per cent.

Inflation

The discussion so far has implied that, by reference to nominal rates, the analysis must be conducted in nominal terms. The only rates in addition to the required rate of return are the bond rate and the market portfolio rate of return. The latter can be written as the bond rate plus the market risk premium, which has the same value whether it is expressed in real (inflation adjusted) or nominal terms. Thus it is only the bond rate for which the choice of real or nominal rate matters. It follows that the analysis can be conducted equally well in real terms. This has the advantage of reducing the fluctuations in the value of the required rate of return from year to year because the real bond rate fluctuates less than the nominal rate.

Although an expected rate of inflation should be used, it is convenient to use the current inflation rate.

Easton estimates of parameter values

As mentioned previously, Easton assumed that all SRA capital investment in hauling coal and minerals is funded by borrowings, the risk of which is zero due to the SRA's government backing. The required rate of return for the SRA then becomes the cost of borrowing with zero risk, that is, the government bond rate. The Commission points out that it is the taxpayer and not the bondholder who pays for rail investments that do not do as well as anticipated. For this reason taxpayers should be treated as implicit equity shareholders in rail investments and expect a comparable rate of return to a private sector project where most of the risk is reflected in the returns to equity capital. If the SRA is looked upon as a private enterprise, not only would it be impossible for it to fund all its capital through debt (simply because no one would be willing to lend it the funds, and in any case it would be declared bankrupt before it reached such a point) but after exceeding a certain debt to equity ratio the risk associated with debt would increase.

A further consideration is whether it is appropriate for the SRA to aim for a commercial rate of return on capital employed when it is in a monopoly position. It would pay the SRA to over-invest in capital if it could extract a return on it from users. Alternatively, the SRA would feel no pressure to seek to use capital more efficiently if it was not restricted in what it could charge. Note that while these observations are true for the SRA they would also be true for a privately operated monopoly.

J.6 Estimate of required rate of return

The required pre-corporate tax rate of return, A , for rail investment in coal freight was calculated in nominal terms using equation (10). The preferred values of the variables in that equation are shown in column 2 of Table J.1. Table J.1 also shows the effect on A of changes in the values of variables and parameters.

Table J.1: Calculation of required pre-corporate tax hurdle rate of return and effects of changing preferred parameter values

<i>Variable or parameter</i>	<i>Preferred value</i>	<i>Change in value</i>	<i>Effect on A (% points)</i>
R_f 10-year bond rate	10.5%	+2%	+2.2
$R_M - R_f$ market risk premium	6%	+2%	+1.2
B_a asset beta for coal freight	0.5	+0.3	+2.7
t_c effective corporate tax rate	15%	+5%	+0.6
A required rate of return	15.0%		

Under the assumptions made above, the required pre-corporate tax rate of return is 15 per cent which, for an inflation rate of about 5 per cent, corresponds to a real rate of 10 per cent.

The results are not particularly sensitive to realistic changes in the values of the market risk premium or the corporate tax rate. But, a given percentage point change in the nominal bond rate will produce an almost identical change in the required rate of return. Assuming that the real bond rate changes little, there would be little change in the required rate of return expressed in real terms. A critical parameter is the asset beta; for every increase of 0.1 in its value the required rate of return increases by about 1 percentage point. Thus the required rate of return would be 18 per cent nominal if the asset beta were increased to 0.8.

The SRA has supplied the Commission with two preliminary estimates (Submission 98; and revisions for the draft report) and its final estimate (reported in Chapter 10, Section 10.4.3) of its pre-corporate tax target rate of return for 1989-90. These are compared with the Commission's target or hurdle rate for 1991 in Table J.2. The SRA final values account for differences from the Commission's estimated rate of return of 2.6, 1.2, 2.9 and -0.5 percentage points respectively. The SRA bond rate differs because it is for 1989-90. The Commission disagrees with the SRA on the choices of market risk premium and asset beta.

Table J.2 Commission and SRA estimates of pre-corporate tax hurdle rate of return for coal freight

<i>Variable or parameter</i>	<i>Industry Commission</i>	<i>SRA Preliminary Submission 98</i>	<i>SRA Preliminary Revised</i>	<i>SRA Final</i>
Year to which results apply	1991	1989-90	1989-90	1989-90
10-year bond rate (%)	10.5	13.0	11.5	12.9
Market risk premium (%)	6	7	5	8
Asset beta for coal	0.5	0.9	0.9	0.82
Effective corporate tax rate (%)	15	19.5	20	11.7
Hurdle rate of return:				
nominal (%)	15	24	19.5	21.7
real (%)	10	15	12.7	12.4

J.7 Conclusion

In the Commission's view the appropriate pre-corporate tax rate of return for SRA coal is approximately 10 per cent (real). Expressing this in a form which is more suitable for use on an ongoing basis, the long-run target rate of return for the SRA is the real government bond rate plus about 4 percentage points.

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APPENDIX K:

THE EFFECTS OF ADOPTING INTERNATIONAL BEST PRACTICE IN AUSTRALIA'S RAIL SYSTEMS

A report prepared by Travers Morgan Pty Ltd
for the Industry Commission inquiry into Rail Transport

INDUSTRY COMMISSION
CANBERRA
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1 INTRODUCTION

In February 1991, Travers Morgan Pty Ltd was appointed by the Industry Commission to compare productivity in Australia's rail systems with comparable overseas systems and to estimate the effects on rail costs and activity levels of the introduction of international best practices. The terms of reference are attached as Attachment A.

Although there are a number of different ways in which rail costs can be analysed and presented, all Australian systems now follow the same general principles for costing freight and passenger railways. This is known as the NFG2 Convention, after the National Freight Group (of Railways of Australia) which was instrumental in its development. This report follows the NFG2 Convention, which is summarised in Chapter 2. Chapter 2 also outlines the background to the approach used to estimate the 'best-practice' costs and discusses the various factors that need to be taken into account when making comparisons between different systems.

Government rail services in Australia are organised in different ways in each State. Attachment B therefore summarises the various authorities and responsibilities. The analysis in this report has been undertaken for each of the main sectors of rail activity, as detailed in the terms of reference. These are:

- (i) Freight services, subdivided into:
 - (a) coal and other minerals (for the SRA and QR combined);
 - (b) grain (for each of the SRA, V/Line, QR, Westrail and AN);
 - (c) interstate rail traffic (as defined for the NRFC); and
 - (d) other intrastate freight (for each of the SRA, V/Line, QR, Westrail and AN).

This analysis is discussed in Chapter 3.

- (ii) Non-urban passengers, subdivided into:
 - (a) country passengers carried by each of the SRA, V/Line, Westrail and QR; and
 - (b) interstate passengers for the whole of Australia.

This analysis is discussed in Chapter 4;

- (iii) Urban rail passengers in each of Sydney, Melbourne, Brisbane, Perth and Adelaide. This analysis is discussed in Chapter 5;

All the above analyses assume a constant traffic task. However, many of the services currently operated are unfinancial and an analysis has therefore also been undertaken to assess the financial impact of eliminating those freight services and associated sections of the network which do not

cover costs, even after the introduction of international best practice. This analysis is described in Chapter 6.

The terms of reference specify all analyses are to be undertaken for the 1988-89 financial year. In practice, it has proved much easier to undertake the analysis for the 1989-90 financial year and all the results presented in this report are based on the costs, revenues and traffic patterns for that year.

2 BACKGROUND AND PRINCIPLES

The NFG2 costing convention (outlined in Attachment C) is used as the general framework for the analysis in this report. This convention discusses some general principles common to all aspects of railway costing and then considers each of the main cost areas in turn. Table 2.1 summarises the NFG2 convention and is used as the basis for reporting the cost of railway traffics, services or business segments in this report.

The principles outlined in Attachment C are applicable to any scale of traffic task. They are in general use in Australia and New Zealand for traffic costing for business and strategic planning purposes, and are broadly consistent with the methods used in North America and Britain.

Train running and terminal costs, including the capital costs of wagons and locomotives, generally represent about two thirds of total costs. These costs represent the long-run avoidable costs of a traffic or service and can be **attributed** to specific traffics on the basis of the **causal** relationships described in Attachment C. The remaining costs (that is, signalling and communications, the fixed component of track costs, other infrastructure maintenance, other corridor costs not allocated to traffics, and an allowance for business and corporate overheads) are generally not attributable to specific traffics. However, when an overview is being taken of a total corridor or business segment (such as interstate freight or coal and minerals), these costs are allocated as described earlier. The sum of these allocated costs and the long run costs attributable to individual traffics are the fully-distributed cost and represent the break-even level of revenues for the corridor as a whole.

The remainder of this chapter concentrates on the factors which influence the actual level of costs in different systems, particularly the interaction of investment and operating costs, and summarises the process by which the 'best-performance' costs have been arrived at.

Inter-system comparisons

There are four main factors which need to be considered when comparing costs within and between systems:

- (i) differences in cost classification and definition;
- (ii) differences in the physical environment (such as terrain, climate);
- (iii) differences in the level of investment in infrastructure and rollingstock; and
- (iv) differences in the age and technology of the equipment used.

Cost classification and definition

Whilst all systems follow NFG2 principles when calculating the costs of particular services or business units, there are inevitably differences between them in the manner in which costs are recorded, and particularly in the way in which some cost items are treated by some railways as operating costs (and then expensed in railway accounts) and by other railways as capital (and then treated through depreciation/interest provisions). In general, these differences reflect the different institutional environments in which the various railways operate. The rules which are used are often dictated by State treasuries rather than by the railways themselves and, at the margin, the availability of a particular source of funds has as much influence as the exact nature of the work undertaken.

The major difficulties arise with the correct classification of rollingstock and infrastructure maintenance costs into operating and capital expenditure. In the case of rollingstock, wagon modifications and prototype conversions are often treated as operating expenditure when such work is more correctly of a capital nature. Definitional problems also often arise with the mid-life overhauls of locomotives and with the provision of new bogies for wagons.

However, the greatest problems arise with infrastructure maintenance, and particularly with track-related expenditure. The sums involved are large; whilst routine track maintenance might average \$5-10 000 per km per annum on a relatively busy main line, the cost of renewing the track when it is life-expired (which could occur every 20-30 years) is generally about \$350 000-\$400 000 per km (or \$15-20 000 per km per annum over its life). Reported track maintenance costs can thus easily vary by 200 per cent between systems which actually have the same level of input costs but different policies on the capitalisation of track renewals.

For the same reasons, care must be taken with historic track, locomotive and wagon maintenance cost data to avoid costs for particular lines or units which, in any one year, are abnormally high or low due to the periodicity of major maintenance and overhauls. Annual averages taken over longer periods should be used in these circumstances to derive unit cost rates.

The operating costs used in this analysis have been standardised to the best extent possible; the treatment of capital costs is described on pages 142 to 144.

Rollingstock costs:

- (i) **include** all mid-life overhauls;
- (ii) **include** new wheels and bogies for carriages and wagons;
- (iii) **exclude** locomotive rebuilds (that is, after 20 plus years life); and
- (iv) **exclude** all major carriage and wagon modifications, prototypes and conversions.

Table 2.1: Summary of NFG2 convention

<i>Item</i>		<i>Attachment C Reference</i>
Traffic	Net tonnes/passengers Net tonne-kilometres/passenger-km	
Revenue	Traffic Other	
Costs		
Train-running	Train crew Fuel Rollingstock maintenance Locomotives Self-propelled/Carriages/Wagons Variable track maintenance Rollingstock capital Subtotal	See C.1 See C.2 See C.3/C.4 See C.3/C.4 See C.7 See C.10
Terminal	Freight handling Passenger duties Shunting Train examiners Bogie exchange/transfer Subtotal	See C.6 See C.6 See C.5 See C.4 See C.5
Total Long-Run Avoidable		
Corridor Fixed	Track and structure maintenance Signal and communications maintenance Signalling, train-working and train control Non-renewable capital Subtotal	See C.7 See C.8 See C.9 See C.11
Business Overheads		See C.12
Corporate Overheads		See C.13
TOTAL		

Infrastructure costs:

- (i) **include** only routine activities such as caretaker maintenance, retamping, rail grinding and spot resleepering and rail renewals; and
- (ii) **exclude** face resleepering and track renewals.

Physical environment

The physical environment has a significant influence on the operating costs of a railway. Two particular factors with significant effects are the terrain and the climate.

The terrain affects railway operating costs in three ways:

- (i) hillier terrain generally leads to steeper grades. More locomotive power and fuel is therefore required to perform a particular task and this increases costs per unit of output.
- (ii) maintenance costs per unit of input are generally higher in hillier terrain. This is caused by the extra work that the locomotive is required to do and by the extra wear and tear on both track and rollingstock from operating over steeply graded and sharply curved rail track. As an example, tangent rail track (that is, track without any curves) will generally have a life in excess of 500 million gross tonnes whilst track on a sharp curve can be life-expired after just 20 million gross tonnes.
- (iii) hillier terrain is generally associated with a greater proportion of bridges and structures. These are generally significantly more expensive to maintain than plain track (particularly wooden structures).

In Australia, the main climatic impacts are the heat, which causes buckled track, and floods, particularly in inland areas. In the north of Australia the sub-tropical climate also increases maintenance costs in a more general manner; as an example, timber sleepers in Queensland generally only have 50-65 per cent of the life that they do in the southern States.

In this analysis, the various impacts of terrain have been allowed for as explicitly as possible. The greater power/load ratio needed in hilly terrain has been allowed for on a link-by-link basis. A 'terrain index' has also been calculated for each system and this has been used to allow for the impact of terrain on unit rollingstock and infrastructure maintenance costs. Bridge and structure maintenance costs have been specifically identified wherever possible. The main effects of terrain (heat and floods) are assumed to affect all systems more or less equally; however, the QR costs have been adjusted to reflect the general climatic difficulties experienced there.

Initial level of investment

The initial level of investment in track infrastructure clearly has a major impact on operating costs. The main impacts include:

- (i) Rail gauge. Although some 1067mm (3'6") railways are extremely efficient (for example, South African railways and the QR and Westrail minerals systems), narrow gauge

railways are generally built with lighter infrastructure and thus lack capacity, leading to higher unit costs per unit of output.

- (ii) Axleload. This has probably the greatest impact of any technical factor. Larger axleloads mean greater loads can be carried in each wagon more efficiently. Low axleloads require less investment but condemn a line to a lifetime of comparatively high operating costs per unit of output. There is the added impact in a system with varying axleloads that a wagon can only carry a load consistent with the smallest axleload over which it passes. Currently axleloads on the Australian government railways vary from 10 tonnes to 25 tonnes.
- (iii) Route grade and alignment. The impact of terrain was discussed in the previous section. Low initial investment is generally reflected in steep grades and sharp curves, leading to permanent cost penalties compared to more expensive and better-engineered lines. This is a particular problem on those main lines which have been created by converting and extending low-density branch lines; the North Coast line from Newcastle to Brisbane is the best example of this situation.
- (iv) Track structure. In many cases the original track construction was of a low standard, with a relatively weak track formation. The same problem has persisted in more recent times; the 1970 standardisation of the Broken Hill-Port Pirie line was done using unplated track, leading to relatively high maintenance costs in the intervening period.

These problems are not unique to Australia. They are common to all low-density railways built in the nineteenth and early twentieth centuries. The fundamental problem for such railways is that the traffic density at the time of construction, and for the foreseeable future, is not sufficient to justify the capital investment required to construct railways of a high standard at discount rates typically used for commercial investments. Rail track formation is a very long-term investment, difficult to pay back over a short-term time horizon. The average traffic density on Australian main lines is typically 5-10 million gross tonnes. Few branch lines carry over 1 million gross tonnes. By comparison, the **average** traffic density on US Class 1 railroads is about 15 million gross tonnes, and in China the average traffic density is about 50 million gross tonnes.

Where high traffic levels exist in Australia, and capital has been available to enable the railway to be designed so as to minimise overall lifetime cost, the result has been a series of technically efficient railways with low operating costs. However, the typical Australian railway is relatively low-capital and low-density by world standards and this has created a permanent legacy of high operating costs, no matter how efficient the input costs.

Equipment age and level of technology

Whilst the technical efficiency of rail operations is strongly influenced by the initial level of investment through infrastructure-related factors, it is also affected by subsequent levels of renewal expenditure, primarily associated with rollingstock. The two main impacts are:

- (i) Continuing to operate rollingstock and related equipment which is technologically obsolete. This generally applies to carriages and wagons, many of which can be maintained indefinitely. One example is the continued use of four-wheeled wagons in some systems, with generally poor loadability characteristics and high maintenance costs per unit of output.
- (ii) Incurring increased maintenance costs through operating equipment past the optimal age for replacement. Locomotive maintenance in particular increases with the age of the locomotive (particularly when spare parts have to be manufactured).

This problem has generally arisen because of political influence on investment decision-making. Much of the potential renewal investment required in the last thirty years has been in relatively unglamorous areas, such as track and wagons, for which re-investment and technological upgrading could be repeatedly postponed, albeit at the cost of increased operating costs, in favour of more politically high-profile projects. The chronic unprofitability of most government rail systems over this period has also hindered the systematic use by the systems of investment decision-making based on sound economic and commercial principles.

International ‘best-performance’

There are many difficulties in assessing the extent to which overseas operating costs and practices can be imported to Australia. Clearly adjustments need to be made for different labour costs; however, adjustments also need to be made because of the different costs of non-labour inputs, particularly locally-manufactured capital goods such as locomotives and wagons and the associated costs of spare parts. Adjustments also need to be made for the differing levels of initial investment and associated construction standards as well as the age and technology of the plant, equipment and rollingstock in use on the railway.

The first attempt to produce a comprehensive national set of ‘best-practice’ costs was undertaken as part of the Railway Industry Council (RIC) study in 1988-89. These costs were based on the then Corporate Plans of the various systems and represented the views of systems as to cost changes that could be expected in the medium to long-term (notionally represented by the year 2000), taking into account a series of planned and potential productivity improvements.

Some of these initiatives were related to technical factors (for example, more fuel-efficient locomotives being introduced) whilst others were the result of changed work practices (for example, single-manning of selected train and shunting services). Overall they represented a reduction of around 25 per cent over the period compared to 1986-87 cost levels. In spite of these reductions, the initiatives were nevertheless inevitably constrained by what was judged to be politically and industrially possible at that time and thus still retained a residual 'system-specific' element.

Subsequent to that study, a set of international 'best-practice' costs was developed in 1990 for the National Freight Initiative (NFI), based on experience in a number of countries adapted for Australian conditions. These costs assumed a 'green-fields' organisation which would contract in services from individual railways on an 'efficient-cost' basis. Such costs would reflect the technical operating conditions but would otherwise be system-independent. The costs used for freight and country passenger operations in this analysis are based on the NFI costs but have been discussed with each of the railways. In general, systems consider the NFI cost levels are achievable in the medium-term (say, three to five years) from a technical point of view, although some investment may be required.

There has not been a corresponding process for urban rail costs. However, the planning for the newly-electrified Perth suburban system included the estimation of operating costs on an 'international best-practice' basis. Again, these costs have been discussed with systems and are considered achievable, although significant capital expenditure may be required in the older systems.

3 EXISTING FREIGHT SERVICES

This chapter discusses the change in the cost of rail freight services that would result from the introduction of ‘international best-practice’ input costs. The first section discusses each cost area in turn and summarises the type of changes that are likely to arise. It should be stressed that many of these changes are currently either being implemented or under active consideration by systems, although not perhaps to the fullest extent possible from a technical point of view. The second section then considers the groups of freight services defined in the terms of reference and summarises the impact on their operating costs of the assumption of ‘international best-practice’.

‘International best-practice’

This section discusses the basis to ‘international best-practice’ input costs and describes in turn the cost components related to freight traffic. The system-independent costs have been estimated from Australian, New Zealand and North American operating costs for comparable railways, after taking account of differences in the price of labour, materials and other inputs. Factors have also been developed to take into account the terrain over which the railway operates; costs are thus higher per unit of input for track sections such as Sydney-Melbourne compared to Perth-Kalgoorlie.

Locomotive maintenance

Locomotive maintenance costs are based on an all-3000hp fleet. This should be achieved over the next 5-10 years in the normal course of re-investment.¹ US experience is that the maintenance cost of a 2000hp locomotive is the same as that of a 3000hp locomotive. Whilst there is insufficient evidence to prove or disprove this in Australia, there is no doubt that maintenance cost/hp decreases as locomotive size increases.

The costs include the cost of a mid-life overhaul but assume that locomotives do not continue to operate beyond their economic life (about 100 000 hours in traffic). The projected costs require the rationalisation of locomotive depots and workshops in some systems, together with some investment in support facilities, so that maintenance facilities are better aligned to actual requirements. Contestability between systems for the National Rail Freight Corporation (NRFC) maintenance work will flow through to total system working and this will help to promote efficiencies. Work practices will also need to be improved in some systems, with maintenance staff undertaking both electrical and mechanical work.

¹ Indeed, the first 4000hp diesel locomotives are now entering service.

Wagon maintenance and train examination

Wagon maintenance and train examination costs have been treated together because of the increasingly blurred distinction between light wagon repairs and train examination. Wagon maintenance costs are influenced by wagon technology and also by wagon utilisation.

Systems have made major strides in recent years in scrapping or converting technologically-obsolete wagons which had very high maintenance costs per unit of output (for example, four-wheeled timber wagons with plain bearings and non-automatic couplings) and concentrating on technically-efficient, high productivity wagons. Nevertheless, this process is not yet complete, particularly in Queensland, and full implementation will enable wagon maintenance costs to be substantially reduced. Some capital expenditure will be required to accelerate the process.

About 70 per cent of wagon maintenance expenditure is usage-related and 30 per cent is time-related. High-utilisation fleets thus have lower maintenance costs per unit of output as the fixed costs can be spread over a comparatively high kilometrage. Historically, few systems have accurately known individual wagon utilisations and maintenance has thus tended to be time-based, regardless of actual requirements. The now almost universal use of wagon-monitoring systems will both increase wagon utilisation and enable maintenance to be primarily usage-based.

As with locomotive maintenance, existing maintenance facilities will need to be restructured and re-equipped. In some cases, this means a re-appraisal of existing maintenance philosophies, with a combination of mobile maintenance crews and 'one-spot' depots at the major centres.

Maintenance costs differ significantly by wagon type. Costs were first calculated for the benchmark wagon, a container flat, and then calculated for other wagon types using standard relativities.

Locomotive fuel

The latest generation of locomotives are significantly more fuel-efficient than their predecessors and generally show an improvement of around 20 per cent. The full benefits, of course, will not be realised until the entire locomotive fleet has been upgraded. In addition, further improvements can be expected (of about 5 per cent) as systems pay more attention to fuel monitoring and improved train control and driving techniques.

Train crew

Train crew costs are a function of three factors:

- (i) the number of crew per train;
- (ii) the number of footplate hours per crew per annum; and

(iii) the level of overhead and administration costs.

Where adequate train-to-base communications exist, most point-to-point trains can be operated with a one-man crew, given some minor investment in crossing loop infrastructure. Two-man crews would, however, continue to be required for those services undertaking way-side shunting (for example, grain services collecting from two or three silos). Whilst the initial cost of upgrading the communications network is high, this has generally either been or planned to be completed. Some investment is required to modify cab layouts (for example, improving visibility and upgrading vigilance control). Shunting services are discussed under terminal costs.

Currently, train crew productivity is low, as measured by footplate hours per annum. This is partly a function of the awards, which have various distance limitations dating from pre-diesel days, and also a function of the as-yet incomplete transition in some systems from three-man to two-man crewing with consequent surplus staff. There are also a number of work practices limiting productivity such as that preventing crew from 'working through' depots but instead requiring a crew change at such points. The costs used in this analysis assume 1100 footplate hours per annum per crew member.

Traditionally, there are significant ancillary costs associated with train crew such as signing-on and signing-off as well as ferrying them to and from trains. These also are capable of reduction.

Terminal costs

Terminal costs cover the making and breaking of trains at their origin and destination, the shunting of wagons in and out of private sidings and freight terminals, and the physical loading and unloading of freight. For convenience, intermediate activities such as en-route marshalling, freight transshipment and bogie exchange are also considered here.

Terminal activities have traditionally been a high-cost area for railways. One of the most effective ways of reducing terminal costs is to reduce the quantum of terminal activities for a given throughput. Rail systems have therefore made concerted efforts in recent years to concentrate traffic in specialised terminals, with local distribution by road, as opposed to the traditional arrangement of shunting a series of private sidings. The most obvious example is the shift from vans to containers for handling general freight. However, the same principle has been applied to other traffics; two examples are the concentration of domestic grain at a single terminal in Melbourne and the roadbridging of containers from Melbourne Docks to the South Dynon freight terminal.

The costs used in this analysis assume:

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- (i) Bulk traffics are all handled in blocks rather than as single wagon-loads.
 - (ii) All container and steel traffic is handled in specialised terminals, requiring a minimum of train shunting and wagon placement.
 - (iii) Placement of forwarder and general traffic not unloaded in terminals is in rakes of vehicles rather than as single wagon-loads.
 - (iv) Shunt crews are typically one man in the locomotive and one or two men on the ground. This is a major reduction from current shunt crews. It will require minor investment in shunt locomotive cab modifications, radios for ground crews and, in some yards, upgrading of yard layouts and trackwork.
 - (v) Physical freight handling productivities similar to those in US terminals. These typically achieve about 100 lifts/shift with a two-man crew.

Track and structure maintenance

Track maintenance costs included in operating expenses include routine maintenance only, as defined in Chapter 2. The full cost of track, ballast and sleeper replacement has been treated as capital expenditure and included in renewable track expenditure.

The unit track maintenance costs were developed using Australian input costs, following field inspection and discussion with system engineers. The costs are a function of:

- (i) gross tonnage passing over the track section;
- (ii) operating speed;
- (iii) sleeper type and rail weight;
- (iv) axleload; and
- (v) terrain.

The costs assume all track maintenance is fully-mechanised, with a minimum of the traditional local caretaking and fettling gangs, who are tied to one, and only one, stretch of track. Instead, gangs are based at regional centres, and are thus able to be better matched to the potential workload as traffic levels fluctuate.

Structure maintenance costs fall into two groups; those associated with track structures (such as bridges, culverts) and those associated with buildings. Wooden bridges, which abound in Australia, are expensive to maintain and often are the critical factor limiting axleloads; where the line has a

long-term future the best approach is often to replace such bridges with concrete (which will reduce maintenance costs by up to 80 per cent), assuming sufficient capital is available.

Most railways have large numbers of buildings, many surplus to present-day requirements. One of the most effective ways of reducing overall building maintenance costs is therefore to reduce the volume of ancillary maintenance undertaken. Whilst some systems have already eliminated much non-essential maintenance, others still have the potential for large-scale reductions. In general, much of this work is poorly-suited to traditional railway works gangs and significant savings result when it is undertaken by local contract.

Signalling and train control

Traditional signalling systems were labour-intensive and time-consuming operationally. In recent years, systems have moved to simplify their signalling systems and, in the medium-term, signalling systems outside metropolitan areas are likely to be either train order or a variant of Centralised Train Control (CTC). The continuing moves towards larger, and hence fewer, trains, helps this process. Both operating and maintenance costs related to signalling are likely to reduce as signalling systems are simplified. Safeworking staff and signalmen will be replaced by central controllers. Overall, maintenance costs should reduce significantly as train order working becomes the norm on all but the busiest lines.

Corporate and business overheads

These costs are associated with corporate management at an overall level for example, finance and personnel. They do not include functions designed to support operational and maintenance activities (for example, workshops accountant), whose costs have been included in the appropriate direct cost.

These costs have been assessed as a percentage of operating expenses, excluding capital expenditure, based on typical proportions both in Australia and the US. A mark-up of 10 per cent has been adopted, in the middle of the range (8-11 per cent).

Locomotive capital

Locomotive capital costs are a function of the purchase price of locomotives, together with the expected utilisation. The price/hp generally declines as locomotive size increases; even so, Australian railways experience major cost penalties compared to North American railways. A new 3000hp locomotive costs about A\$2.5 million. The comparable locomotive in the US costs around \$US1.1 million, or 40 per cent less. A major factor in this difference is the economies of scale available in the US; in 1989 US railways purchased some 609 new locomotives (and rebuilt a further 128), more than the total fleet of any Australian railway.

The utilisation which can be achieved depends on the size of the system (and hence the opportunity for economies of scale), the type of traffic (round-the-clock operations involving bulk traffics or scheduled operations dictated by market requirements) and the length of haul.

Utilisation is best measured in terms of hours per annum. The highest utilisations are achieved by unit mineral workings, in which the locomotives are permanently assigned to a train for several days at one time. However, this does not necessarily translate into a high utilisation in terms of distance as much of the time is spent loading and unloading. Interstate workings achieve moderately high time utilisations, because of the length of haul, and very high distance utilisations, because of the comparatively high average speed. The lowest utilisations come from intrastate general freight operations, which are constrained as to when they can operate and only travel limited distances.

This analysis assumes that unit mineral workings achieve 5500 hours utilisation per annum (out of a possible 8760 hours). Interstate workings and intrastate general locomotives are assumed to achieve 4700 hours per annum and 3500 hours per annum respectively.

Wagon capital

Wagon utilisation is subject to the same general comments as locomotive utilisation. Historically, wagon utilisation has often been very low; many wagons would have been lucky to have travelled 10 000 km per annum. This means that the wagon would have been moving for only 5 per cent of the year. Systems are currently aiming for much improved utilisations from their more efficient wagons. Interstate superfreighter services, which use permanently coupled rakes of wagons, achieve well over 100 000 km per annum and this is projected to increase to 150 000-200 000 km per annum with the advent of the NRFC.

Wagon utilisation in intrastate traffic is necessarily rather less, as the same time is spent loading and unloading for a much smaller distance travelled. Intrastate utilisations are generally unlikely to exceed 75-100 000 km per annum and this will be rather less in traffics subject to seasonality or short-hauls where continuous operation is not possible.

As with locomotives, the cost of purchasing wagons in Australia, whether manufactured in railway workshops or by third parties, is much higher than in the US. In 1989, the average price of new wagons introduced into the US fleet was about \$US50 000. Comparable Australian wagons cost upwards of A\$110 000, a cost penalty of about 40 per cent in favour of the US wagon. Again, scale is clearly a major contributing factor; 5885 new wagons were purchased in 1989 in the US, broadly equivalent to the entire current V/Line fleet.

Track capital

Track capital costs are based on reballasting, resleepering with concrete sleepers and rail replacement at a minimum of 50 kg/m. This has an estimated cost of A\$400 000 per km. The life of the track, assuming medium curved track (300 - 800 m radius) and regular grinding, is taken as 400 million gross tonnes. Capital costs of 'non-renewable' capital such as bridges, tunnels and earthworks have been excluded from the analysis.

Impact on freight service operating costs

The terms of reference divide freight services into:

- (a) coal and other minerals (for the SRA and QR combined);
- (b) grain;
- (c) interstate rail traffic (as defined for the NRFC); and
- (d) other intrastate freight (for each of SRA, V/Line, QR, Westrail and AN).

Each of these freight services has been analysed using each system's RAILCOST model, thus providing estimates of the resources (for example, locomotive-hours, gross tonne-kilometres) required for each of the individual traffic tasks. This enables consistent estimates to then be made of the cost of each of these services, using the causal cost relations defined in the NFG2 cost convention described in Chapter 2 and Attachment C.

Each cost area has been considered in turn, with estimates made of the 'best-practice' cost for each system, taking into account the operating conditions, infrastructure and type of traffic. Potential operating cost savings in particular systems and cost areas range from zero to 50 per cent. Table 3.1 summarises operating costs for all systems combined, together with the potential savings from the introduction of 'best-practice'. The operating cost estimates in Table 3.1 have been derived from systems' internal cost analyses.

Table 3.1 excludes capital costs of track, wagons and locomotives. These items have been costed for the 'best-practice' case on a replacement cost basis and incorporating interest charges at 7 per cent per annum real on their written down value. In the case of track the diverse accounting treatments in the current situation make it difficult reliably to provide direct comparisons with existing cost levels. For rollingstock and wagons, direct comparisons made on a replacement costing basis are also problematical as they depend upon average utilisation levels. The costing is based on one year and fluctuations in traffic levels make it difficult to validly compare one year's level of utilisation with a future efficient level. For example, in a good year the utilisation of grain or coal wagons can be at a very high standard already. By the same token, outside the bulk area,

railways typically have much larger wagon fleets than they need. Although it often makes sense to use the wagons available until they are life expired, railways do not intend to replace the fleet at its current level. So although average utilisation may be relatively low, a replacement costing of that fleet would overstate the cost levels ascribed to the existing system. Therefore, while we have identified a ‘world standard’ efficient cost level by traffic in the analysis, substantial additional analysis would be required to identify the pure efficiency component of any comparison with existing practice, particularly on a traffic by traffic basis.

Table 3.1: Operating cost components - freight services

<i>Cost Area</i>	<i>Total cost (89-90)</i>		<i>Potential saving</i>		
	<i>\$ m</i>	<i>% total</i>	<i>\$ m</i>	<i>% total saving</i>	<i>% reduction</i>
Train crew	294	14	112	17	38
Locomotive maintenance	209	10	45	7	22
Wagon maintenance / exam	201	9	74	11	37
Fuel	224	10	25	4	11
Terminal / marshalling	436	20	141	22	32
Signalling / control	80	4	30	5	37
Infrastructure maintenance	453	21	104	17	23
Corporate / business overheads	266	12	106	17	40
TOTAL	2 163	100	637	100	30

Impact by traffic

This section discusses the potential impact of ‘international best-practice’ on each of the traffics identified in the brief and highlights particular points specific to individual systems and traffics. Table 3.2 summarises estimates of best practice operating costs and capital costs, and current revenues and operating costs. No estimates are made of current capital costs, for the reasons given above.

Coal and other minerals (the SRA and QR)

The carriage of coal and minerals is a task for which rail is normally very competitive with alternative modes. It is also that part of rail operations which is normally the most capital-intensive. The two eastern seaboard railways, however, nevertheless illustrate some of the other factors which need to be taken into account when comparing railways. Queensland coal is largely hauled over purpose-built lines to and from modern terminals, with very little other traffic interfering with the operation. In NSW, coal and minerals are hauled over lines which were largely pre-existing and have been upgraded, and which carry large volumes of other services. Many NSW lines are also very steep and this also imposes operational limitations.

Because of these very different operating conditions, the introduction of international best-practice would affect different areas in the two systems. One of the most significant changes (as in all traffics) would be the introduction of driver-only operation (DOO), but this would be very difficult to implement on all routes in the coal system, particularly with respect to breakdown and emergency procedures where the trains are very large. However, current costs in some other areas, particularly on the purpose-built lines, are already very close to the best that could be achieved.

Table 3.2: Unit freight revenue and cost by traffic segment

	1989-90		Best-practice		Reduction in operating costs (per cent)
	Revenue	Operating cost (c/ntk)	Operating cost (c/ntk)	Ratio of LRAC ^a to operating cost	
Coal and other minerals					
SRA and QR	5.1	b	b	1.86	22
Interstate freight	3.1	4.1	2.3	1.43	44
Grain	5.0	5.7	4.1	1.83	28
Other intrastate					
SRA (excl coal, minerals)	5.8	b	b	1.23	32
V/Line	9.7	b	b	1.19	40
QR (excl coal, minerals)	3.8	b	b	1.37	39
Westrail	b	b	b	1.55	21
AN	b	b	b	1.45	27
Total other intrastate	b	9.5	6.2	1.35	35

a LRAC (long run avoidable cost) is defined for the purpose of this analysis as the sum of train running and terminal costs, including replacement capital costs for track and rollingstock. It does NOT include any capital charges associated with non-renewable capital, for example, initial construction, upgrading, electrification, etc.

b Confidential

Overall, operating costs would reduce by about 20 per cent with the introduction of 'best-practice'. When replacement capital for track, locomotives and wagons is included the cost almost doubles. This reflects the capital-intensity of the operation, which is accentuated by the 'best-practice' costs in the operating cost areas. This assessment does **NOT** include any allowance for the costs of non-renewable capital. These cover such items as the initial track construction, upgrading in which the standard of the track is increased, electrification works and signalling infrastructure. Capital charges related to these items are very substantial and add significantly to the continuing costs identified in the table.

Interstate freight

Interstate freight has been examined extensively in the last year as part of the work towards establishing the NRFC. As with the mineral operations, there are major differences between the different parts of the network, reflecting past investment and present traffic patterns. The most efficient sections of the network operationally run from Parkes and Adelaide west to Perth, together with the associated terminals. A large part of this has been rebuilt, initially around 1970 as part of the standardisation project and latterly as part of AN's concrete resleeper program. Large and long trains are run over these sections of the network and there is comparatively little interference from other traffics. Operating conditions in the eastern states are more difficult; the infrastructure was often never initially designed for high-volume operation and there are large volumes of local traffic. In addition, freight investment priorities have generally been given to minerals traffic in recent years.

The current plans for the establishment of the NRFC assume major improvements in both labour and capital productivity. The NRFC would contract with third parties, either existing railways or third parties, for a number of inputs and this will accelerate the introduction of many of the various productivity measures outlined previously. One of the success requirements of the NRFC, however, will be a quantum improvement in the utilisation of rollingstock, thus reducing unit capital charges, and this in practice will only be achieved by the proposed single management of interstate freight.

The major improvements in labour productivity arise in train crew, with the general introduction of DOO, and in wagon and, to a lesser extent, in locomotive maintenance. There are significant savings arising in marshalling. Benefits from reduced infrastructure costs are less marked but there are large savings in corporate and freight business overheads (revenue accounting, administration etc.).

Grain

Grain operations in each system are similarly diverse. V/line, which had substantial capital expenditure in both grain handling facilities and rail infrastructure in the early 1980s, is probably the most technically efficient. However, rail efficiency is heavily influenced both by the grain outloading facilities and by loading silo and discharge terminal operating hours (both of which are controlled by the grain handling authority), which can have a marked effect on capital utilisation. DOO is possible for most grain operations once the train is complete (typically trains attach at two or three locations unless serving a major sub-terminal); however, a two-man crew is generally required prior to this time, with one man effectively operating as a mobile shunter.

Overall, grain costs would decrease by nearly 30 per cent with the introduction of ‘best-practice’ costs. The gains arise almost equally from five areas: crew, from DOO; wagon and locomotive maintenance; terminal handling (and, to a minor extent, marshalling); infrastructure maintenance, reflecting the comparatively large part of the network primarily attributable to grain; and business and corporate overheads.

There are substantial, and generally similar, potential gains in efficiency in all systems, reflecting the system-wide impact of the assumed ‘best-practice’ in such areas as linehaul crew, terminal working and mechanical and infrastructure maintenance. The gains are rather smaller in Westrail and larger in V/Line, reflecting the general level of input costs in those two systems and the traffic density on the grain network in those two systems, with the other systems approximating the national average.

Grain is different to the other traffics considered in this report, as the volume carried can fluctuate sharply from year to year, depending on the harvest. In the case of V/Line, for example, 1989-90 was a poor year with only 2.4 million tonnes being carried, some 40 per cent below the design capacity of the system. Although this has been allowed for in assessing the potential for cost changes, the general level of costs per unit of output, both fixed and variable, is always artificially high in a year of low throughput, and the potential for improvement thus overstated.

Other intrastate

With the exception of Westrail and mainland AN, the potential improvements are rather larger in many of the residual intrastate traffics than for the bulk and semi-bulk traffics discussed above. This is because they are generally associated with relatively small train sizes, and with wagon-load and less-than-car-load (LCL) traffics which require marshalling, shunting and handling. These are all areas where ‘best-practice’ generates major savings through DOO, ‘one-plus-one’ shunting and through improved freight handling, particularly for small freight.

SRA

Over one-half of the potential savings in the SRA residual traffics are related to terminal operations and marshalling. Although the SRA have a substantial LCL operation, they also transport relatively large volumes of general industrial traffics such as cement and petroleum. The cost and revenue figures given in Table 3.2 are an average over a wide range of diverse traffics and the impact of ‘best-practice’ will differ markedly from traffic to traffic, depending on the precise mix of operations.

The SRA is currently implementing its 1994 Corporate Plan, which incorporates a large number of the productivity measures described above, and should then be within 10 per cent of the ‘best-practice’

V/Line

The residual V/line intrastate traffics are generally either labour-intensive (for example, LCL) or comparatively short-distance, with an average haul of under 200 km, and the high average costs, even under 'best-practice' reflect these two factors. Nevertheless, around one-half of the traffic is minerals of one sort or another, whose cost levels are significantly lower. As with the SRA, therefore, the figures in Table 3.2 are averages only and will vary markedly from one traffic to another.

V/Line implemented a wide-ranging series of productivity measures during the mid-1980s. Currently, their plans are less dramatic but nevertheless include an ongoing program of maintenance productivity improvements through the rationalisation and redevelopment of maintenance facilities in line with anticipated demands. An example is that wagon maintenance (currently a heavy maintenance cost) would in future be carried out either in a specially-equipped new facility (costing \$5-10 million) together with mobile gangs who would undertake light running repairs using specially-equipped road vehicles.

QR

QR has been the last system to retain a traditional general freight service, in which all traffics are carried wherever they may be consigned. QR is also the last of the systems to have its non-bulk operations restructured and its general freight services, operations and cost structure thus still reflect a philosophy which all other Australian railways moved away from some years ago. The financial results in this area also reflect the (government-determined) policy in recent years of holding down rates in these traffics well below the rate of inflation.

QR is burdened by infrastructure on the non-bulk network that is barely adequate for modern operations. The track is comparatively light-weight, with some sections being only 11 tonnes axleload, and there is still a substantial fleet of inefficient and expensive four-wheeled vehicles. The network is extensive and many sections are very lightly-trafficked. Even though the average haul is comparatively large, general freight in Queensland has been an intrinsically expensive operation under past operating and service policies.

QR is currently taking major steps towards rectifying this situation. It is in the process of implementing three major initiatives: DOO (the first system in Australia to do so for locomotive-hauled trains), consolidating and reorganising LCL into freight centres (as has long since been done by every other system) and rationalising the livestock traffic (which all other systems except AN have abandoned). The last two initiatives in particular will play a major role in enabling train services to be reorganised into a more efficient pattern and in raising the size of the average train load.

There are, however, a large number of other efficiency measures that can be introduced in QR, covering almost all facets of railway operations. Because of the relative lack of productivity-related investment in these areas in the past, capital (of between \$50-100 million) is required to enable these measures to be implemented but the amount is relatively small compared to the annual savings generated.

AN

The AN results cover both AN mainland and Tasmania. The benefits associated with DOO and improved shunting and marshalling operations mean that there are potential savings in both parts of the system; however, the generally smaller scale and nature of the Tasmania operations means that the relative savings are greater in that system.

AN has a well-established and formalised corporate planning process. Part of this process involves a continuing appraisal of operations and the introduction of more efficient procedures. There are therefore few measures assumed in this report that are not under active consideration by AN; their implementation timetable has not been finalised but could generally be taken as the next five years.

The Tasrail system in particular is planning major changes, with a restructuring and amalgamation of operating and engineering responsibilities (part of which has already occurred), concentration into selected major centres only and a comprehensive program of multiskilling. When this is complete, the Tasrail system will be operating at levels very close to those assumed in this report.

Westrail

Westrail has a large residual intrastate task, with major mineral movements, albeit over comparatively short distances. Westrail has no LCL traffic, relatively little marshalling and generally small terminal costs because of the type of traffic handled. Crew-related savings associated with DOO are still a major potential benefit, but their absolute impact is reduced because of the large size of many of the trains operated. Westrail achieved major productivity gains in the early and mid-1980s (being the first system to introduce two-man crewing). They are currently implementing a limited series of operational initiatives; however, the change which is likely to have the biggest impact on Westrail's costs (other than DOO) is the proposed separation of Midland Workshops from the railway proper. Midland probably has the greatest proportion of non-maintenance work (that is, construction, manufacture of spares and work for third parties) of any of the railway workshops and there is little doubt that its organisational separation, and consequential highlighting of maintenance charges, would bring these costs into sharper focus and encourage greater productivity.

Capital assets

Table 3.3 gives the estimated capital assets required to operate each traffic under ‘best practice’. These estimates have been derived using global averages for locomotive and wagon utilisation and more accurate figures would require detailed consideration of cycle times, loading and unloading constraints and freight marketing requirements for the timetabling of trains.

The locomotives are given as 3000hp equivalents, as many of the existing fleet of 1000hp and 2000hp locomotives will be replaced by at least this size of locomotive as they fall due. However, such locomotives cannot be operated on all parts of the system because of axleload constraints, and in other cases traffic demand would not warrant such large locomotives being used, so the actual fleet operated will generally be rather larger than that quoted below, but with a mixture of different sizes.

The wagons estimated are the typical size as used at present. These are generally 19 tonne axleload, except for coal, which averages around 23 tonnes, and Queensland, which averages about 15 tonnes.

Table 3.3: ‘Best-practice’ freight rollingstock by service group

	<i>Freight task Net tonne-km (m)</i>	<i>Locomotives</i>	<i>Wagons</i>
Coal and other minerals			
SRA and QR	24 208	280	8 200
Interstate freight	14 962	160	3 300
Grain	5 067	80	3 000
Other intrastate			
SRA (excl coal, minerals)	1 418	40	1 000
V/Line	590	16	600
QR (excl coal, minerals)	2 996	80	4 400
Westrail	2 316	30	1 250
AN	1 705	45	940

4 EXISTING NON-URBAN PASSENGER SERVICES

This chapter discusses the change in the cost of rail non-urban passenger services that would result from the introduction of ‘international best-practice’ input costs. Many of the cost components (for example, locomotive maintenance, track maintenance) are the same as for freight services and have been discussed in Chapter 3. The first section of this chapter discusses the cost areas that are specific to non-urban passengers and summarises the type of changes that are likely to arise. The second section then considers the groups of non-urban passenger services defined in the terms of reference and summarises the impact on their operating costs of the assumption of ‘international best-practice’.

‘International best-practice’

While freight services are reasonably homogeneous throughout Australia, with variations in train size but all basically consisting of a locomotive and wagons, country passenger services are operated by a wide variety of motive power. Interstate trains (other than Sydney-Brisbane) are locomotive-hauled, with both sleeper and sit-up passenger accommodation. The Westrail, the SRA and currently suspended AN intrastate services are operated by self-propelled railcars (ranging in size from one to seven vehicles). V/Line services are generally operated with locomotive-hauled carriages, although some railmotors and diesel railcars are used when available. Queensland has a mixture of locomotive-hauled trains (several of which are really mixed passenger and freight trains), electric multiple-unit (Brisbane-Rockhampton) and a diesel railcar (Normanton-Croydon, which last made a profit in 1907).

Many of the cost components of non-urban passenger services have been discussed in Chapter 3, and the comments are equally valid whether applied to passenger or freight operations. This section therefore restricts itself to those cost components that have not been previously discussed. This chapter assumes that ‘best-practice’ assumes the continuation of a rail service; it has been demonstrated several times, both in theory and in practice, that a substitute bus service can provide an equal or better level of service as most country trains at a substantially reduced cost.

Carriage maintenance and cleaning

Carriage maintenance and cleaning has traditionally been undertaken either in workshops or in dedicated facilities. However, this work has generally been labour-intensive as well as generally requiring the whole vehicle to be out of service whilst maintenance is undertaken. The principles successfully applied to wagon maintenance with the ‘One-Spot’ workshops, combining a multi-skilled workforce with modular replacement at a specially-equipped facility, can also be applied to carriages, with similar improvements in productivity. This will not only reduce maintenance costs

but also increase vehicle availability and thus reduce the capital charges associated with passenger trains.

The same comments apply to carriage cleaning. Recent experiences indicate the costs of internal cleaning as practised traditionally can be greatly reduced by contracting the work and this has been assumed as 'best-practice'.

Self-propelled maintenance

Self-propelled railcars have generally been expensive to maintain. This is often due to their age and general idiosyncrasies. A modern set, of the types recently proposed for NSW and Victoria, should cost around \$0.60/vehicle-km to maintain for long-distance operations with a power-trailer car combination; this is an order of magnitude less than the costs currently being incurred, but is of course balanced by the capital charges associated with such vehicles.

On-train crew

The efficiency of train driving crews has been addressed on pages 139 to 140. For non-urban passenger trains there are two additional kinds of crew costs:

- (i) crew required for the technical operation of the train. These are the guard (where still used) and on-board technicians (on long-distance trains to maintain the power supply); and
- (ii) passenger service crew, either conductors or catering staff.

The provision of technical crew is an operational matter. Many guards have now been multi-skilled to act as a train manager (combined guard/conductor) and there is no reason why this should not be universal. Indeed, on low-volume services, there is little requirement for such staff at all. However, the provision of passenger service staff is a function of the level of service judged necessary for a particular fare class. This judgment has at times shown large variations between systems. The financial results of the various services indicate the need for a re-appraisal of the type and quality of on-board services provided; there seems little reason why, for example, catering services, whether on-board or at stations, should not cover their costs.

Railways have shown increased willingness to reconsider their service standards in recent years. One recent proposal is to introduce a 'family' class on long-distance trains which would provide sleeper accommodation but with less elaborate catering facilities and fewer services; this enables on-board staffing levels to be reduced by over 50 per cent whilst still retaining an acceptable level of service. Further initiatives, related to revenue rather than to cost, are aiming to include the cost of hauling the on-train recreation facilities (club car etc.) in the fare of the appropriate users so as to better tailor services to demand.

Passenger handling

Passenger handling and ticketing costs are a significant cost element in non-urban passenger operations. One obvious alternative is to sell tickets through agencies and this has been widely adopted in recent years and a clear target for ‘best-practice’ is to reduce cost-of-sales to the standard travel industry commission level. An associated cost is the revenue accounting associated with ticketing; this can be contracted out for a fixed fee per transaction, again reducing fixed costs and enabling costs to be more closely aligned with revenue.

Station terminal services pose further problems. Few stations, other than major terminal stations and inner suburban stations, now have sufficient volume to warrant full-time specialised passenger staff. At the same time, the need for other operational staff at many centres is also disappearing as small freight handling is either discontinued or removed to freight centres and as trainworking becomes centralised. It is inevitable that station services will be done by part-time staff, if by anyone at all but the biggest centres, and ‘best-practice’ costs have been developed based on this assumption.

Carriage capital

Historically, railways have maintained large fleets of passenger carriages for peak periods. The average utilisation of these vehicles was consequently very low as the operating fleet was combined with those used only at peak periods. As the cost of passenger rollingstock is generally well over \$1 million/car, ‘most efficient’ practice is nearly always to replace existing services, when the rollingstock is life-expired, with alternative modes such as road coaches for peak demands. Therefore, although, as noted on page 152, the existing services have been costed as rail services, the replacement cost of carriages has been costed on presumption of replacement by road coach technology.

Impact on non-urban passenger service operating costs

The terms of reference divide non-urban passenger services into:

- (a) country passengers carried by each of the SRA, V/Line, Westrail and QR; and
- (b) interstate passengers for the whole of Australia.

The impact of ‘best-practice’ has been calculated by adjusting the individual components of operating costs of each group of passenger services in turn for the difference between current costs and ‘best-practice’. Table 4.1 summarises these components both at present and under ‘best-practice’.

Table 4.1: Operating cost components - non-urban passenger services

<i>Cost Area</i>	<i>Total cost (89-90)</i>		<i>Potential saving</i>		
	<i>\$ m</i>	<i>% total</i>	<i>\$ m</i>	<i>% total saving</i>	<i>% reduction</i>
Train crew	37	7	14	7	38
On-train crew	47	9	16	8	34
Locomotive/self-propelled maintenance	58	11	22	11	38
Carriage maintenance / exam	104	20	39	20	38
Fuel	25	5	2	1	8
Terminal	80	16	29	15	36
Signalling / control	22	4	8	4	36
Infrastructure maintenance	35	7	12	6	34
Corporate / business overheads	107	21	55	28	51
TOTAL	515	100	196	100	36

Table 4.1 excludes coach services and off-train trading and catering expenses. One of the major cost categories is corporate and business overheads. Non-urban services currently attract large corporate overheads, and these costs average over 20 per cent of the total cost of operating the service. This is a high mark-up, even allowing for the extra management time and effort required for passengers compared to freight, and it has been reduced to around 15 per cent for the 'best-practice' costs.

Table 4.2 gives the separate results for each of the systems still operating non-urban passenger trains, together with a summary result for interstate traffic as a whole. Revenue figures exclude catering revenue. Because of the diversity of the services operated, these figures should be interpreted with some caution. At one extreme the interstate services offer sleeping-car accommodation, with some 20 passengers per vehicle travelling for up to four days with full on-board services; at the other, the Victorian non-urban services include commuter services to Geelong and other centres that would be included in the urban area in New South Wales. Both types of service are expensive to operate, but for entirely different reasons, and the apparent uniformity of the 'best-practice' costs is misleading in this context. A further factor is that the load factors (passenger-km:seat-km) differ between the systems and this would also need to be standardised before detailed conclusions could be drawn regarding relative efficiency.

The Victorian services have been costed assuming a continuation of the existing locomotive-hauled services; it is likely that these services will be largely replaced by self-propelled railcars, which should see a reduction in the cost of operating the service, although capital charges will increase.

Table 4.2: Unit non-urban passenger revenue and cost by segment

	<i>1989-90 (c/pass-km)</i>		<i>Best-practice (c/pass-km)</i>	
	<i>Revenue</i>	<i>Operating cost</i>	<i>Operating cost</i>	<i>Including repl. capital</i>
Interstate services	8.9	18.0	11.5	16.2
Intrastate				
SRA	8.8	17.6	11.0	13.9
V/Line	5.5	23.7	14.3	18.7
QR	6.6	17.7	11.9	15.5
Westrail	8.6	20.3	11.8	15.0

Capital assets

Non-urban passenger services are operated to timetables which represent a compromise between effective use of the capital assets and the need to operate services at times which are attractive to passengers. Whilst locomotive utilisation can to some extent be increased by interworking with the freight fleet, the passenger locomotives are often specialised (for example, lower-powered or geared for faster running compared to freight locomotives) and hence may not be fully interchangeable.

Utilisation of locomotive-hauled carriages and self-propelled railcars depends solely on vehicle availability and the timetabling of services. There is some flexibility in this, which generally increases with the longer the trip distance; at one extreme the Victorian commuter services are as constrained as urban services as to the times they can operate.

Table 4.3 gives the locomotives and rollingstock required for each of the services under 'best-practice'. However, they should be regarded as indicative only at the system level; accurate estimates would require an in-depth analysis of the entire operation to fully assess the scope for rotation of vehicles between services. The estimates below include non-passenger vehicles (dining-cars, club cars, crew cars etc), which depend on the type and level of service being provided.

Table 4.3: **'Best-practice' non-urban passenger rollingstock by service group**

	<i>Passenger-km (m)</i>	<i>Locomotives</i>	<i>Self-propelled</i>	<i>Locomotive-hauled carriages</i>
Interstate services	1 134	28	7	250
Intrastate				
SRA	537	6	43	38
V/Line	631	26	-	170
QR	297	10	2	60
Westrail	66	-	11	-

5 EXISTING URBAN PASSENGER SERVICES

This chapter discusses the change in the cost of urban rail passenger services that would result from the introduction of ‘international best-practice’ input costs. Some of the cost components (for example, locomotive maintenance, track maintenance) are the same as for non-urban services and have been discussed in Chapters 3 and 4. The first section of this chapter discusses the cost areas that are specific to urban passengers and summarises the types of changes that are likely to arise. The second section then considers the urban passenger services in each of Sydney, Melbourne, Brisbane, Adelaide and Perth, as defined in the terms of reference and summarises the impact on their operating costs of the assumption of ‘international best-practice’.

‘International best-practice’

As with non-urban passenger services, the various suburban services have differing technical characteristics, as shown in Table 5.1.

Table 5.1: **Urban rail systems**

<i>City</i>	<i>Traction</i>	<i>% seat-km</i>	<i>Passengers per annum (million)</i>
Sydney	Electric 1500v DC	95	} 248
	Diesel railcar	4	
	Locomotive-hauled	1	
Melbourne a	Electric 1500v DC	99	} 96
	Locomotive-hauled/ railmotor	1	
Brisbane	Electric 25kv AC	92	} 43
	Diesel rail motor	2	
	Locomotive-hauled	6	
Adelaide	Diesel railcar	100	11
Perth	Current		} 9
	Diesel railcar	93	
	Locomotive-hauled	7	
	Under construction		
	Electric 25kv AC	100	21

a A small number (about 1.1 million) of urban passengers also travel on the V/Line-operated Melbourne commuter services.

Some of the cost components of urban passenger services have been discussed in Chapters 3 and 4. In some cases (primarily concerned with locomotive-hauled operations) the comments are equally valid whether applied to passenger or freight operations. However, in others the different operating conditions of urban services means that the comments require some qualification. This section therefore discusses those areas that require amendment as well as those cost components that have not been previously discussed.

A key factor in the development of ‘best-practice’ costs for a suburban system is the assumption made concerning ticket selling. Conventional rail systems incur heavy costs with the selling of tickets at stations and manual checking at station barriers. In addition, such systems are not well suited for integrated ticketing, which currently applies in Melbourne, Adelaide and Sydney.

The generally-used alternative of ticket machines seems to experience difficulties in Australian conditions, particularly from vandalism. Nevertheless, it is clear that ‘best-practice’ for major suburban systems is to adopt some form of automatic ticket issuing and collection, backed up by fines that are sufficient to act as a deterrent. The ‘best-practice’ costs have been constructed on this basis.

Multiple-unit maintenance and servicing

There are several types of electric multiple-units (EMUs) currently operating, reflecting the different power systems, gauges and general level of traffic on each system. The Brisbane and Perth EMUs form one group, with a 25kV power supply, 1067mm gauge and generally modest passenger volumes. The Melbourne and Sydney EMUs by contrast are 1500V, standard and broad gauge and, particularly in the case of Sydney, carry very heavy loads. Much of the Sydney fleet is double-deck, with commensurate impacts on capacity and cost. The Brisbane and Melbourne fleets are relatively new (around 10 years or so), the Perth fleet is being delivered while the Sydney fleet is a mixture with some very new but others over 60 years old.

‘Best-practice’ maintenance schedules were developed in Perth as part of the ‘greenfield’ electrification planning in 1987, showing marked reductions in maintenance requirements compared to existing systems. These schedules were based on experience in UK, SE Asia and Hong Kong. However, as noted above, the Sydney fleet performs a more demanding task and the ‘best-practice’ has been adjusted accordingly.

Servicing costs depend on the frequency and intensity of cleaning. This is again a service issue and these costs thus depend on the standards adopted. The ‘best-practice’ costs used assume daily minor internal cleaning, bi-weekly major internal cleaning and tri-weekly external washing by machine.

Train crew

One of the major potential productivity improvements is the introduction of DOO on suburban trains. The guard is then not required for any operational purpose and can theoretically be redeployed. Two arguments have been raised against this; one is that the guard is required for passenger security and the other is that the guard is required for revenue protection, either as an on-board ticket seller or as a ticket inspector.

Whilst these arguments have some validity, the degree to which staff are required to be physically present in order to act as a deterrent, whether to physical violence or to fare evasion, is a moot point. There are clearly trade-offs which can be made between physical staff levels, remote surveillance systems and enforcement procedures and penalties. Certainly, the need for passenger security is probably confined to the evening services, whilst revenue protection can be addressed by a small force of inspectors backed up by suitably high fines. This report assumes that there is one on-train staff for every four drivers, sufficient to man every evening train as well as provide revenue protection staff during the day and weekends.

DOO operation on the suburban systems requires investment in some systems to ensure adequate visibility of the train for the driver (via TV cameras), automatic door closing and communications systems. Typically, these costs are in the \$20-50 million range.

A further factor in suburban crew costs is related to working practices and the peaked nature of the service provided. Railway operating staff traditionally only work straight shifts, except in unusual circumstances. However, suburban services are peaked, so that many staff will only operate services for a fraction of their shift. The same problem arises in bus services, where it has been solved using broken shifts in which, for a penalty, the shift is broken into two segments covering the two peaks, thereby saving a whole shift. The financial impact of the current practice can be assessed by comparing the three key statistics of vehicle hours (measuring the time during which a train is actually being operated), worked hours (measuring the time staff are physically in attendance) and paid hours (measuring the time for which they are paid, which includes allowances for weekend and evening work and for broken shifts). A key issue in suburban rail operations is to align worked hours more closely to vehicle hours by changing work practices, either through the introduction of broken shifts (as has recently been done in Adelaide) or through other forms of flexible rostering which keep working hours constant but increase the ratio of productive time.

Passenger handling and ticketing

Station costs are a very high cost in suburban operations and automatic ticketing (or self-ticketing) is a key factor in enabling more efficient operations. There are a wide variety of potential systems of varying degrees of complexity. Systems may be closed, in which all passengers are checked

entering and leaving the station (as in the London Underground for example) or open, in which it is the passenger's responsibility to hold a ticket (and in some cases to validate it) but in which there is no physical barrier to the system. Tickets may be sold off-station (for example, from small businesses) or from machines or staff on-station.

In addition, station staff perform a role in customer relations and, traditionally, in assisting passengers to board and alight.

The technical choice of ticketing system is influenced by many factors; station layout, average trip length, passenger density and the need for integrated ticketing are key considerations. Both Perth and Adelaide are largely unmanned systems; both also have a common ticketing system permitting intermodal use with a zone system. At the other extreme, Sydney and Brisbane still have largely traditional systems with station ticket selling of single-mode tickets and manual control at barriers.

'Best-practice' will vary from system to system depending on local conditions. On low-density systems, the onus will always be on the passenger to carry a valid ticket and checking will need to be by exception. On the higher-density systems, passenger volumes will generally justify closed systems at the key centres, together with some physical manning for issuing and checking; however, even on, say, the Sydney system, it is most unlikely that outlying suburban stations would ever operate on any but an open system.

Building maintenance

Suburban systems have a large number of station buildings which require upkeep. Whilst the facilities provided are partly for the passengers' use, a large proportion is also for the use of the staff based there. Many of the functions historically performed at railway stations, such as signalling or the handling of small freight and parcels, have long since either disappeared or been relocated; nevertheless the physical facilities remain and need to be maintained. This problem is exacerbated when station buildings are listed by conservation groups. The likely changes to ticketing procedures and station manning in the next few years will see this problem increase.

The simplest way to reduce station maintenance costs is to do it on fewer and smaller buildings, and certainly a greenfield railway, such as the Perth Northern Suburbs railway, is normally able to adopt that approach by suitable design. However, where there are existing buildings there are generally limits, either practical or financial, to the extent to which it is possible to demolish or redesign existing assets. The second line of attack is to reduce the unit costs of maintenance. Traditionally this type of work has been done in-house by railways tradesmen; 'best-practice' is to open this work to external contractors and enable them to compete with in-house staff.

Impact on urban passenger service operating costs

The terms of reference divide urban passenger services into those operated in each of Sydney, Melbourne, Brisbane, Adelaide and Perth.

The impact of 'best-practice' on each system has been calculated by adjusting the individual cost components of each group of passenger services in turn for the difference between current costs and 'best-practice'. Table 5.2 summarises these components both at present and under 'best-practice'.

Table 5.2: Operating cost components - urban passenger services

	<i>Total cost (1989-90)</i>		<i>Potential Saving</i>		
	<i>\$ m</i>	<i>% total</i>	<i>\$ m</i>	<i>% total saving</i>	<i>% reduction</i>
Train crew	226	21	82	21	36
Vehicle maintenance / cleaning	193	18	63	16	33
Fuel	66	6	1	-	2
Passenger handling / terminal	228	21	99	26	43
Signalling / control	33	3	11	3	33
Infrastructure maintenance	173	16	43	11	25
Corporate / business overheads	164	15	89	23	54
TOTAL	1 083	100	388	100	36

Table 5.3 gives the separate results for each of the systems. Unlike the two previous sections, the urban systems are difficult to generalise and 'best-practice' costs thus differ markedly between systems, depending on the nature of both the network and current operations. The discussion below therefore includes some reference to current system plans.

The costs in Table 5.3 have been expressed in terms of cents per passenger-km. This is not a statistic that is automatically available for most urban systems, because of the difficulties associated with broad-banding of stations and zonal fare systems; even the base patronage figures are in some cases broad estimates only because of the multimodal systems in place and the difficulties associated with estimating the use of daily tickets and weekly tickets and school passes. The average trip lengths used to construct the passenger-km estimates used in the table are unlikely to be more accurate than to within 10 per cent.

The costs per passenger-kilometre reflect not only the underlying cost of operating the system but also the service level provided by the system. This is best measured by load factor, that is, the ratio of passenger-km to seat-km or vehicle-km. Although all systems operate within a similar range (with an average load of 20-30 passengers per vehicle), this factor should be taken into account before making detailed analysis of the figures.

Table 5.3: Unit urban passenger revenue and cost by system

	<i>1989-90 (c/pass-km)</i>		<i>Best-practice (c/pass-km)</i>	
	<i>Revenue</i>	<i>Operating cost</i>	<i>Operating cost</i>	<i>Including repl. capital</i>
Sydney	6.0	13.6	9.4	17.9
Melbourne	8.4	24.7	12.5	21.9
Brisbane	6.3	14.1	10.1	15.1
Adelaide	6.3	27.1	19.5	28.0
Perth ^a	6.9	28.9	9.4	14.9

a The large disparity in costs in Perth between existing and ‘best practice’ reflect both assessed efficiency improvements and the impending conversion of the Perth system from an ageing diesel system to a new electrified system.

The comparatively high cost for Melbourne reflects the lower vehicle occupancy, which is a partial reflection of the comparatively short average trip length. As many vehicles will only make one trip during each peak, low average passenger trip lengths lead to the vehicle capital only being used by passengers for a smaller time each peak compared to systems with a longer average trip length.

Sydney

The Sydney system is large and complex by any standards. Much of the infrastructure and service facilities are also old. The introduction of ‘best-practice’ would see a large fall in operating costs, but would involve significant capital expenditure in a number of areas. Station improvements designed to allow automatic fare collection would cost \$60-100 million and passenger information systems costing about \$30 million would also be required to permit station de-manning to be fully pursued. However, as discussed above, even Sydney does not have the passenger volume to justify a fully-closed ticketing system. Around 95 per cent of passengers use 50 per cent of the stations and the low-volume stations would probably be either partially or completely de-manned under ‘best-practice’.

The age of the Sydney system is such that some improvements will be driven by engineering necessity as much as by the desire to reduce operating costs. In particular, the signalling system is close to age-expired; any replacement system would see most remaining boxes removed and control centralised. Such a project will have very large capital expenditures of around \$400 million.

The introduction of 'best-practice' in maintenance would require investment of around \$60-80 million to upgrade maintenance depots. Sydney is currently part-way through a rollingstock re-equipment program and the costs in this report assume that the Sydney fleet is completely double-decker.

The double-deck cars used by Sydney enable it to have the highest ratio of passengers per vehicle and this is reflected in its lower 'best-practice' unit cost.

Melbourne

The Melbourne system has had substantial capital investment in rollingstock in recent years, as well as replacement of some infrastructure items. Nevertheless, traffic densities are generally not large, around half of those in Sydney, and this means that its operations need to be geared towards the lighter end of urban rail operations. Some progress has been made in this, with the conversion of the lightly-trafficked St. Kilda and Port Melbourne lines to light rail but currently there are no firm plans for this policy to be extended. The Melbourne system is thus operating in a number of situations with a technology, and hence cost structure, that is unsuited to current traffic levels.

Melbourne is currently reorganising its maintenance facilities and replacing its central Jolimont facility with a series of suburban depots (of which the first, at Epping, is currently being commissioned at a cost of \$43 million). These should enable maintenance costs to be reduced significantly as these greenfield sites will be accompanied by multiskilling and workforce restructuring. However, a full program of such depots will cost a further \$100-120 million.

The largest single issue, and one that is currently unresolved, concerns the interlinked issues of station manning and on-train guards. The ticketing issue in Melbourne is complex both operationally and industrially. Alternative ticketing systems are currently being considered; however, all these options still require major station manning. If it is true that the system cannot be practically operated without such manning levels, there must be doubts about whether heavy rail is the most appropriate transport technology for the prevailing traffic densities. This ultimately is a matter of judgement and is as much a social issue as it is a pure transport operations one. 'Best practice' in such a context can therefore only be subjective. Melbourne is currently reorganising its station staff into districts and multiskilling them so that they can function both on trains and at stations. This should produce substantial improvements in labour productivity. However, these costs could still be further reduced with the introduction of DOO whilst still providing adequate customer and revenue protection services, by the standards of other systems.

Melbourne has the historical legacy of a large route network and infrastructure costs are also an important area for cost reduction. As discussed for Sydney, one method is to reduce the amount of infrastructure, both trackwork in the form of redundant layouts, and obsolete buildings, that needs to be maintained. Work and management practices are also important; maintaining infrastructure at

night rather than during the day doubles the amount of usable time between trains as well as reducing the need for costly safeworking procedures, thus enabling overall maintenance costs to be reduced.

1989-90 was a poor year for the Melbourne suburban system. Train performance was poor and patronage was affected both by this and by the protracted tram stoppage. Available statistics indicate that Melbourne had average vehicle loadings 15-20 per cent below the other systems in this year and this should be considered in comparing its results with other systems.

Brisbane

The Brisbane system is relatively new, having been electrified in the late 1970s to the mid-1980s. There are still some residual diesel-hauled services but the bulk of the operation is performed with modern electric multiple-units. Consequently, there are relatively few technical factors adversely affecting their cost structure.

The biggest potential change is the introduction of DOO and a ticketing system which allows stations to be de-manned. The Brisbane network, although physically smaller than Melbourne's, has much the same passenger density in the Brisbane metropolitan area ², and the same comments therefore apply as for Melbourne.

Adelaide

Adelaide operates a low-volume network with a fleet of comparatively new diesel railcars. Parts of the network operate at extremely low densities, with even the peak service often consisting of only one or two railcars. Adelaide is also different in that the suburban service is completely integrated operationally and managerially with the bus system, which far outweighs it in terms of passenger volumes (the greatest corridor flows in Adelaide occur on the O-Bahn busway rather than on a rail line). It has therefore already introduced a number of measures which have their origins in bus rather than rail operations. The most notable of these are the introduction of broken shifts for drivers (albeit on a limited basis at present) and the introduction of part-time labour.

Station manning is not a major issue in Adelaide as most stations are unmanned. However, trains still carry one or more on-board staff (as ticket-issuers/collectors) who would not be required under 'best-practice' ticketing procedures.

² The Brisbane suburban area doubled in physical size in 1988-89 but with only a 5 per cent change in passenger-kilometres when it was redefined to extend from Gympie to Toowoomba.

In spite of these measures, however, the Adelaide system remains an intrinsically expensive one, given the current service pattern. This is primarily because of its very low average number of passengers per train, around 25 per cent of that achieved in Sydney.

Perth

The Perth suburban system is currently poised to be converted to electric traction, with new EMU sets replacing a mixture of diesel railcars (some of which are long life-expired) and locomotive-hauled sets (including some equally life-expired carriages). A new rail line, which will approximately double Perth's suburban rail patronage, is also under construction from the city centre to the northern suburbs.

Electrification has provided the opportunity for the introduction of efficient practices throughout the suburban network, and there are few aspects of the new service that are not 'best-practice'. The 'best-practice' costs in Table 5.2 assume electrification and the completion of the Northern Suburbs line. The costs have been developed from the costs anticipated by Transperth, with some adjustments for 'best practice'; the most significant area concerns the use of train guards, with Perth still maintaining average manning levels of one-and-a-half men per train after electrification.

The reduction in operating costs in Perth needs to be balanced, however, against the capital charges incurred in electrification and the Northern Suburbs line. The financial capital charges (depreciation and interest) associated with these projects will increase by over \$50 million by 1992-93 in real terms compared to current levels and together make up some two-thirds of the total cost of operating the suburban system.

Capital assets

The capital stock required to operate an urban service is determined by the level of the peak service. Rollingstock utilisation can be improved by improving the availability of vehicles and hence reducing the number of spare vehicles required to cover maintenance requirements, but any such improvements would be marginal in the context of this study. The current fleets and peak trains for each system are given in Table 5.4. For a new system, a margin of 10-15 per cent is normally allowed.

Table 5.4: Current urban fleets

<i>City</i>	<i>Passenger-km (m)</i>	<i>Peak vehicles</i>	<i>Fleet size</i>	<i>Kilometres per annum(000)</i>
Sydney	4 220	1 375	1 650	105
Melbourne	1 299	670	919	71
Brisbane	772	320	362	103
Adelaide	180	107	131	56
Perth a	244	94	104	72

a Forecast on completion of electrification and Northern Suburbs line

Rollingstock utilisation in terms of vehicle-km can also be increased by running additional off-peak services but unless patronage increases commensurably, this will only increase utilisation at the expense of reducing the average load factor. Average distance per vehicle should therefore not be taken in isolation as an indicator of efficiency in capital utilisation.

6 THE 'COMMERCIAL NETWORK'

This chapter discusses the nature of the network that would result if, following the introduction of 'international best-practice' input costs, rail operations were restructured to eliminate all freight services and lines which would not cover long-run avoidable costs.

It is obvious from the results presented earlier in this report that few, if any, urban passenger services would be commercially justified at the current fare levels. That is not to say that these services are intrinsically uncommercial. Most services would clearly stand the fare increases needed to cover operating cost; covering capital costs would be a more difficult matter, especially if alternative modes were available. Some country services could probably be commercial given an aggressive pricing policy; the Ghan in AN and one or two of the Queensland coastal services and NSW XPT services are likely candidates, although no detailed analysis has been undertaken.

The analysis of freight traffics described in this chapter is based on that undertaken for the Railway Industry Council in 1988-89, with some adjustment for the reduced level of 'international best-practice' costs compared to the RIC input costs. The approach adopted is as follows:

- (i) Consider in turn each of the products carried on each system and eliminate those whose revenue fails to cover their long-run avoidable costs (LRAC). LRAC is defined for the purposes of this analysis as the sum of train-running and terminal costs, including replacement capital costs for track and rollingstock.
- (ii) Consider each branch line in turn and compare the contribution from the traffics on each line, **over the whole length of their trip**, with the cost of maintaining the branch infrastructure.

The results of this analysis should be treated as indicative rather than definitive, particularly at a local level. The analysis deals with traffics at the product level and all are either included or excluded; in practice some traffics within a product will be viable and others will not be. There are still some traffics subject to regulation and the tariffs in these cases may or may not reflect competing road rates; there would thus be some adjustments at the margin to those traffics included.³ Finally, the RIC analysis did not allow rail-heading (that is, the consolidation of traffic by road to a suitable railhead); this meant that, when a branch line was shut in the analysis, all the traffic was lost whereas in practice there would be opportunities for integrated transport systems, thus maintaining traffic density on the linehaul sections of the network. In spite of these

³ Not all regulated traffics have rates that are above competing road rates. Some regulated traffics have significant internal cross-subsidies, generally with long-distance traffics being subsidised.

approximations in the analysis, however, the results nevertheless present a realistic overview of the size and scope of a fully commercial network.

Most coal and minerals traffics are retained in all systems; the majority of grain traffic is retained but some of the longer-haul grain which has a poor average yield due to the disproportionately heavy taper which exists for grain freight rates with respect to distance is eliminated. Intrastate general traffic fares poorly. In the majority of the States this is comparatively short-haul traffic comprising manufactured and industrial goods such as fertiliser and other rural products such as wool, timber, fruit and vegetables and processed food. Around 20 per cent of the interstate traffic is divested; this mostly consists of low-rated traffics on the eastern seaboard.

A large number of rural branch lines close, reducing the route network by around 25 per cent. The network then consists of the main interstate trunk routes and the Queensland coast line, the coal and minerals lines and the more densely operated grain lines. No branch lines remain for purely general freight.

Table 6.1: Estimated 'commercial' freight railway ^a

	<i>Net tonne-kilometres (m)</i>		<i>Ratio of commercial value to base case value using best practice for both (c/ntk)</i>	
	<i>Base</i>	<i>Commercial</i>	<i>Revenue</i>	<i>LRAC ^b</i>
Coal and other minerals SRA and QR	24 208	24 208	1.00	1.00
Interstate freight	14 962	12 269	1.06	1.00
Grain	5 067	4 510	1.06	0.84
Other intrastate				
SRA (excl coal, minerals)	1 418	723	0.88	0.87
V/Line	590	325	0.93	0.71
QR (excl coal, minerals)	2 996	569	1.32	0.70
Westrail	2 316	1 922	0.96	0.94
AN	1 705	1 517	0.98	0.92
Total other intrastate	9 025	5 056	1.02	0.68

- a No account has been taken of possible changes in pricing strategies or their effects on traffic.
- b LRAC (long-run avoidable cost) is defined for the purpose of this analysis as the sum of train running and terminal costs, including replacement capital costs for track and rollingstock. It does NOT include any capital charges associated with non-renewable capital, for example, initial construction upgrading, electrification, etc.
- c Based on a broad estimate of full costs in the commercial case.

Table 6.1 contains some traffics which still fail to cover their full costs. They remain because their **AVOIDABLE** costs are less than the revenue they earn and their share of fixed infrastructure costs can be met by other traffics (for example, interstate freight) on the lines over which they pass.

This of course depends on institutional arrangements; if each group of traffics is made to stand-alone (for example, the general freight business in a system had to cover its share of full costs), the commercial network would be rather smaller in the eastern states.

7 SUMMARY AND CONCLUSIONS

This chapter summarises the results of the analysis presented in this report and draws some broad conclusions.

Comparisons are not only odious, they are dangerous. This is especially so when operating costs are a function of past investment, for which it is very difficult to standardise. The analysis presented in this report nevertheless takes into account both such differences and also specific geographical factors on as neutral a basis as possible.

The potential for improved operational costs arises from three main areas:

- (i) Changes to operational procedures and work rules to permit reductions in the absolute level of resources required to do a specific job.
- (ii) Changes in the cost of supplying support services. At a policy level this can be achieved by increasing the contestability of supply of these services; at a less ethereal level it requires a thorough examination of management and work practices to ensure that inputs are being supplied at the lowest possible cost.
- (iii) Selected investment in projects designed to improve operational efficiency. Such projects can, however, require large amounts of funds, particularly in urban systems which were originally labour-intensive and are having to be 'retro-fitted' to instead become capital-intensive.

The potential gains in freight vary from system to system and from traffic to traffic depending on operating practices and the relative importance of the different inputs. Overall, freight operating costs would reduce by 30 per cent.

The improvements in non-urban passenger operating costs again vary from State to State, with an average of 36 per cent. However, it must be remembered that there are extensive railway-operated coach services in three States, which have been introduced in the last ten or twenty years to replace uneconomic rail services. The 'best-practice' costs in this report assume the continuance of rail operations for these services; if 'best-practice' is extended to include replacement coach services, very few such services would be operated with trains. A further factor in these services is that a large proportion of the patronage is travelling on some form of reduced fare.⁴ Even though railways are reimbursed for many of these concessions, such a large proportion inevitably creates a false picture of the true underlying level of demand.

⁴ For example, in Queensland, under a third of total passengers are paying full fare, and nearly 40 per cent travel free.

Urban services in Australia are diverse, with wide differences in technology, service level and demand. Overall, the average improvement in Australia from the introduction of ‘best-practice’ is estimated at 36 per cent, but this will require large amounts of capital in some cases, particularly where automatic ticket collection is proposed.

Even under ‘best-practice’, there would still be many services and traffics which would be non-commercial, with their revenues failing to cover the total of their operating costs and charges for replacement capital. Assuming constant revenues, a strictly-defined commercial freight network would be much reduced, as described in Chapter 6, carrying only 14 per cent less tonne-kilometres but reducing the size of the network by around 25 per cent. It is unlikely that many urban or country passenger services would continue to be operated by trains under a commercial approach at current fare levels; however, fares are currently set in many cases at unrealistically low levels and a number of these services can probably be made commercially viable at fare levels which are still attractive to passengers.

ATTACHMENT A: TERMS OF REFERENCE

A consultancy to estimate the effects of adopting international best practice in Australia's rail systems

Objectives of the consultancy

1. The objectives of the consultancy are to compare productivity in Australia's rail systems with comparable overseas systems and to estimate the effects on rail costs and activity levels of the introduction of international best practice.

Specific data requirements

2. For the following commodity and system categories:

- (a) coal and other minerals carried by the SRA and QR combined;
- (b) urban rail passengers in Sydney, Melbourne, Brisbane, Perth, Adelaide and those five cities combined;
- (c) interstate passengers Australia-wide;
- (d) country passengers carried by the SRA, V/Line and QR;
- (e) interstate freight (as defined for the analysis provided to the NRFC);
- (f) grain carried by each of the SRA, V/Line, QR, Westrail and AN;⁵ and
- (g) other rail traffic by system,

estimates are required of the productivity improvements possible in the following input categories from moving to international best practice:

- locomotive maintenance;
- wagon maintenance and train examination;
- fuel/energy consumption;
- train crew;
- terminal operation;
- signals and communication;
- track maintenance;
- track capital;

⁵ Subsequently amended to grain services for all systems taken together.

-
- locomotive capital;
 - wagon capital;
 - corporate overheads; and
 - total.
3. For the commodities listed in paragraph 2, estimates are required of the cost of rail freight (passengers) and the return from rail freight (passengers) in cents per net tonne-kilometre (or per passenger-kilometre), if
- (i) 1988-89 rail cost structures (including indicated improvements) were maintained and the traffic task remained constant; and
 - (ii) the productivity improvements identified in paragraph 2 were fully implemented.
4. For the commodities listed in paragraph 2, provide estimates of numbers and utilisation rates of major capital items such as wagons and locomotives if
- (i) 1988-89 rail cost structures (including indicated improvements) were maintained and the traffic task remained constant; and
 - (ii) the productivity improvements identified in paragraph 2 were fully implemented.
5. For the commodities listed in paragraph 2 and for the cost conditions specified in paragraph 3(i) and 3(ii), provide estimates of net tonne-kilometres (passenger-kilometres) carried, and estimates of revenue and costs in cents per net tonne-kilometre (per passenger-kilometre) if specified rail services were discontinued.
6. In the collection of data and compilation of the estimates set out in paragraphs 2 to 5, the consultant must give due regard to the confidentiality concerns of each rail system.
7. The consultant shall prepare a report to professional standards, detailing:
- the basis for the choice of international best practice, including any allowances made for different Australian conditions;
 - a description of any models used to assess the gains from introducing international best practice, including details of the assumptions behind any 'base case' scenario employed in such analyses; and
 - the nature of major technical impediments to achieving international best practice.
8. The work specified in paragraphs 2 to 7 is to be completed by 19 April 1991.

ATTACHMENT B: AUSTRALIAN RAIL AUTHORITIES AND RESPONSIBILITIES

<i>State</i>	<i>Rail authority</i>	<i>Operations</i>
New South Wales/ACT	State Rail Authority CityRail Countrylink Freight Rail	Sydney and Newcastle suburban and interurban rail services ^a NSW country passenger rail services ^b NSW freight services ^c
Victoria	Public Transport Corporation	All bus and rail services within Victoria ^c
Queensland	Queensland Railways	All rail services within Queensland ^d
South Australia/NT	Australian National State Transport Authority	All rail services in South Australia and Northern Territory except the Adelaide suburban passenger services Adelaide suburban bus and rail services
West Australia	Westrail Transperth	All rail and intrastate bus services outside the Perth metropolitan area and south of the 26th parallel Perth suburban bus and rail services ^e
Tasmania	Australian National (Tasrail)	Ex TGR rail freight services in Tasmania ^f

a Outer limits are Nowra, Moss Vale, Lithgow and Muswellbrook.

b Including standard-gauge services from Queensland border to Brisbane, for which the SRA is reimbursed by QR.

c Includes Melbourne suburban rail services (previously part of The Met (MTA), extending to Werribee, Bacchus Marsh, Sunbury and Cranbourne, Country passenger services (previously V/Line) and Freight services (previously V/Line).

d Outer limits of suburban services are Caboolture and Ipswich.

e Perth suburban rail services operated by Westrail under contract to Transperth.

f Excludes privately-operated Emu Bay Railway.

ATTACHMENT C: SUMMARY OF NFG2 COST CONVENTION

This attachment summarises the NFG2 cost convention, used as the basis for the analysis in this report. It first describes some general principles common to all aspects of railway costing and then considers each of the main cost areas in turn. The description of the cost areas is not intended to be definitive. Instead, it sets out the main components of railway costs and identifies the principal factors influencing cost variability. Additional factors that influence costs in particular systems are discussed in Chapter 2.

General principles

Four general principles need to be addressed. These concern:

- (i) allocation of labour overheads;
- (ii) allocation of materials overheads;
- (iii) treatment of unproductive time; and
- (iv) valuation of capital resources.

The following sections describe the approach used to each of these problems.

Treatment of labour overheads

The labour cost component of any direct cost item includes the labour overhead costs associated with the direct cost item. These are costs which in the long run are likely to vary with the amount of direct labour employed. They include:

- (i) Direct payroll overheads, such as:
 - payroll taxes
 - employee housing costs
 - sick pay
 - leave provisions
 - bonuses.
- (ii) Other labour overheads associated with the specific groups of employees involved (for example, uniforms and other incidentals).
- (iii) ‘First-level’ supervision and the associated clerical costs of the direct labour groups (for example, yardmasters, locomotive foremen, roster clerks, workshop foremen, etc).

- (iv) Those parts of the Branch level overhead costs which vary in the long run with the number of staff in the branch; these costs exclude certain groups such as Design Engineers but generally include clerical staff involved in day to day administration, including regional office staff and some staff in central offices.

The overheads included in unit staff costs are shown in Table C.1.

Table C.1: Allocation of overheads to labour costs

<i>Cost hierarchy</i>	<i>Description</i>
Included as overheads in labour costs	
Direct labour	Wages and salaries
Payroll overheads	Payroll taxes, sick pay, leave provisions
Direct labour overheads	Uniforms, incidental materials
First line supervision	Depot supervision for locomotive crew, foremen in workshops, rostering clerks etc
Branch administration ^a	Those Branch costs which vary with the number of employees in the Branch for example, clerical and support staff and intermediate Branch management
Not included as overheads in labour costs	
Branch administration	Others for example, design engineers
Corporate administration	Marketing, Finance, EDP etc

- a The criterion for inclusion of these overheads in unit labour costs is that the costs vary in the long-term with branch staff levels. Whether the labour units would then vary with traffic is a separate issue, and depends on the activity being undertaken.

Treatment of materials overheads

The costs of using materials includes the overheads which vary in the long term with the amount of materials used. These include:

- (i) Handling and transport costs of fuel to its site of use, whether paid to outside parties or incurred through Railway haulage.
- (ii) Transport costs of Civil and Mechanical branch materials to their site of use whether paid to outside contractors or incurred through Railway haulage.
- (iii) Operating costs of stores branches: these are generally allocated in proportion to the value of stores used, excluding locomotive fuel issues.

Treatment of unproductive time

The cost rate applied to the period of time for which a labour or capital asset is productively used includes an allowance for the proportion of time during which the resource is unproductive.

This allowance is generally estimated from historic rates of utilisation. However, higher rates of utilisation are often used for costing future situations where there are realistic plans for future improvements.

In some situations, unproductive time is caused not by technical factors but instead by staff surplus to requirements which cannot be redeployed because of policy constraints. Where these staff can be positively identified, they are generally excluded from the specific activity costs and instead treated as a corporate overhead.

Valuation of capital

The valuation of capital assets reflects two principles:

- (i) Renewable investment assets are valued at opportunity cost using a real interest rate. These are generally assets which are required to operate the system in perpetuity at a given level of capacity.
- (ii) Non-renewable assets are valued at historic cost using the relevant nominal interest rate. These are generally assets or investments made to create a particular level of capacity.

Renewable assets cover, as a minimum, such items as:

- (i) rollingstock (locomotives, self-propelled vehicles, wagons and carriages);
- (ii) track (rails, sleepers, fastenings); and
- (iii) plant and vehicles used by support services.

Opportunity cost is normally measured by the replacement cost of an equivalent unit of capacity. In some cases, a lower or higher cost may be justified; for example, where technological change would mean that a replacement asset would have significantly reduced lifetime operating costs.

When valued at replacement cost, capital is effectively valued at a 'real' cost which has adjusted the historic cost for the effects of inflation. It is therefore also annualised at the real long term cost of capital (that is, excluding the effects of inflation). The value used for the real long term cost of capital follows State or Commonwealth guidelines where available. Where such guidelines do not exist, a real rate of 7 per cent per annum is used.

Non-renewable assets generally represent investment to provide system capacity. Where depreciation is charged, they are valued at written-down historic cost. Where depreciation is not charged, the full historic cost is used. Where available, the relevant nominal interest rate is used. Where this is not available, the average interest rate paid in the previous financial year is used.

Cost areas

The various elements of railway costs are listed below:

- (i) crew costs;
- (ii) fuel costs;
- (iii) locomotive maintenance and repairs;
- (iv) carriage and wagon maintenance and repairs;
- (v) shunting costs;
- (vi) passenger and goods handling and clerical costs;
- (vii) track maintenance;
- (viii) signalling and communications maintenance costs;
- (ix) signalling and train control costs;
- (x) costs of renewable capital assets;
- (xi) costs of non-renewable capital assets;
- (xii) business overheads; and
- (xiii) corporate overheads.

Crew costs

Crew costs are best expressed as a rate per paid crew hour. However, where paid crew hours are not known, costs are expressed as a rate per train hour, where train hours include an allowance for positioning and train preparation. This principle is also applied for both locomotive crew and guards and for on-train crew (for example, conductors and technicians).

Fuel costs

In cases where a direct fuel use estimate is not available from fuel trials or train performance simulation models, fuel costs are expressed as a cost per gross tonne-kilometre (gtk) where gtk is the total weight of the train, including the locomotive. This cost should where possible include an allowance for the average grade of the journey. Although this same principle also applies to suburban trains (both electric and diesel multiple units and railcars), it is generally easier to express this cost as a cost per vehicle-km, because of their uniform weight.

Locomotive maintenance and repairs

These costs include both depot/running shed and workshops maintenance. The cost of routine running shed servicing is expressed as a cost per hour in traffic. The cost of workshops overhauls and unscheduled maintenance of a major nature is generally by broad locomotive type and divided into two components:

- (i) The cost of 'above-frame' maintenance (including body and traction motors) is expressed as a cost per hour in traffic.
- (ii) The cost of 'below-frame' maintenance, (including frame, wheels, brakegear, and axles), is expressed as a cost per kilometre.

Where direct estimates of these two components are not available, it is an assumed 50 per cent of total locomotive maintenance and repair costs are variable with each of locomotive hours and kilometre. In most cases it is convenient to group locomotives by tractive power and by horsepower: 4000hp, 3000hp, 2000hp, 1000hp and shunters.

Engine maintenance costs for self-propelled vehicles (which generally travel at a uniform speed) are for convenience expressed as a cost per vehicle-km.

Carriage and wagon maintenance and repairs

The principles used for locomotive repairs are also used for carriage and wagon (including brake van) maintenance and repairs. This also includes all non-engine maintenance of self-propelled vehicles (that is, the carriage-related maintenance of suburban trains).

Train examination and minor repairs of a routine nature are expressed as a cost per vehicle-kilometre. Workshops maintenance and repairs which are related to the vehicle body are expressed as a cost per vehicle day. Maintenance and repairs which are related to below frame items (bogies, wheels, axles, draw gear, etc) are expressed as a cost per vehicle-kilometre. Where such a breakdown of workshops maintenance and repair items is not available, costs are often divided into

two equal parts varying with days in service and kilometres of vehicle use. Carriage cleaning costs are expressed as a cost per vehicle-day.

Costs are calculated by vehicle type where possible. Where this is not so, costs are synthesised using equivalence factors within an overall control for total vehicle maintenance.

Shunting costs - terminal costs

Shunting costs include the capital costs of shunting locomotives, locomotive maintenance, locomotive crew, fuel, and yard crew. They distinguish between yard shunting and train marshalling activities.

Averaging shunting costs over all tonnes and/or wagons is often misleading and the costs should ideally be expressed per rake of wagons shunted. Direct data is often not available for such a procedure, and therefore an assumed estimate of average rake lengths for different traffics often needs to be used. Alternatively costs are expressed per shunting hour, for a specific traffic, where the hours associated with each traffic include an appropriate allowance for the unproductive time of the shunting crew.

Bogie exchange costs are expressed as a cost per wagon or per carriage. Freight transfer costs are expressed as a cost per tonne and are commodity-specific where practicable.

Passenger and freight handling and accounting costs

Passenger accounting/ticketing costs are expressed as a cost per passenger.

Freight handling costs are attributed directly to the traffics to which they relate (for example, the costs of container gantry staff), or in cases of mixed handling functions, in proportion to the time spent on different tasks.

The costs of sales/marketing sections is treated as a business overhead.

Freight accounting costs are expressed as a cost per consignment (or per tonne, when average consignment size is allowed for). Freight accounting costs also include those components of system insurance expenditures which are related to traffic damage or losses.

Track maintenance costs

Track maintenance costs are defined as the level of expenditure required to maintain track to its current standard. Under this definition routine rerailing to the same weight of rail is considered maintenance, but any incremental expenditure above this level to provide, for example, heavier weight of rail, or replacement of wooden with concrete sleepers, is treated as a capital expenditure and excluded from operating costs.

25 per cent of total track maintenance costs is taken as being variable with traffic level, assuming a fixed track standard. This therefore does not include the variability of the basic track standard with traffic, but only the variability of maintenance cost given that a particular standard is provided. In the longer-term, changes in traffic level will also lead to changes in track standard and in this case a 40 per cent variability factor is more appropriate. Alternatively, specific costs are adopted for each track standard if these are known. For cost analysis purposes, the level of traffic is measured by gtk as used for fuel cost analysis.

Where the costs of railway traffic (ballast, fuel, rails etc) is not specifically charged to the appropriate operating branch, it is included in track maintenance and allocated to traffics on a gtk basis.

Other civil costs of, for example, bridges, culverts, tunnels and buildings are regarded as invariant with traffic levels.

Where the fixed component of track and structure maintenance costs is allocated to traffics, as in the calculation of fully-distributed costs, this is on the basis of gtk, unless the infrastructure is clearly associated with specific traffics (for example, maintenance of coal loaders or of container infrastructure, etc). Any such allocations of fixed track costs are generally on a link-specific basis and are clearly distinguished from the variable maintenance component.

The costs of maintaining electric overhead equipment and substations is allocated, on a link-specific basis where possible, on the basis of electric-hauled gtk.

Signalling and communications maintenance

These costs are regarded as invariant with traffic levels. Where these costs are allocated to traffics, this is on the basis of train-kilometres, on a link-specific basis where possible.

Signalling operations, safeworking and train-control

Signalling operations, safeworking and train-control costs are regarded as invariant with traffic levels. They are expressed as a cost per train-kilometre when they are allocated to traffics.

Costs of renewable capital assets

When estimating the annualised capital costs the following asset lives are assumed:

- (i) Locomotive: 22 years (diesel), 25 years (electric), 30 years (steam).
- (ii) Wagons: 15-30 years, depending on usage.
- (iii) Other capital items: depending on asset.

For the purposes of estimating unit capital costs, locomotive utilisation should be measured by hours in traffic. Wagon capital costs are generally based on a life of 25 years. However, this is varied for specific traffics based on anticipated utilisation and expected commercial life.

Wagon utilisation is measured by wagon days, taking into account wagon turnround times, and allowing for spares. Where other information does not exist, an allowance of 10 per cent extra wagon capital to allow for spares is made.

Other unit capital costs are related to appropriate traffic units (for example, cost/container).

Costs of non-renewable capital assets

These costs generally relate to specific items of infrastructure. Where possible, they are calculated on a link-specific basis and allocated on the basis of gtk (track, structures and electrical overhead) or train-kilometres (signalling and communications).

Where these costs are of a general nature (for example, sundry plant) they are allocated as a system-wide average on the basis of gtk.

Business overheads

These costs, which comprise the costs of managing a business sector (for example, freight marketing) are allocated to traffics on a percentage mark-up basis. This is done on a sub-sector basis where the relevant data is available.

Corporate overheads

These are allocated to traffics (that is, freight or passenger) and commodities on a percentage mark-up basis.