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THE TRANSPORTATION SECTOR: ECONOMIC ISSUES AND CHALLENGES IN THE NINETIES

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ABSTRACT: This paper discusses a number of initiatives undertaken in Australia to improve the efficiency of the transport sector, long recognised as one of the most inefficient links in the economic cycle of production, distribution and consumption. We use examples of practice in government trading enterprises (rail, bus, ports, airports), as well as private sector benchmarks (private bus and trucking). The paper also outlines some of the topical issues such as the 'blind' commitment to light rail, road user charges, safety and truck driving hours, and the future of our cities.

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1. Introduction

Transportation is a topic of everyday conversation. We all rely on various forms of transport to get to work, to school, to the shops, and to participate in out-of-home social and recreation activities; the goods and services we purchase and consume are readily accessible as a result of transportation. Physical imports and exports are vitally dependent on an efficient transport system, and our major "*export*" - tourism - is totally reliant on the transport sector for collection and distribution. For many in Australia their entire livelihood depends on the movement of people and goods. The tyranny of distance is, today, still as strong a challenge to Australia as it was when Geoffrey Blainey first documented the issues. As the world becomes *smaller* and more competitive, the role of an efficient and effective transport sector becomes even more pronounced.

The image throughout the 70's and 80's of Australia as a nation with inefficient and uncompetitive ports, shipping, railways and airports as well as stringent almost anti-competitive regulatory regimes, has spurred governments at the State and Federal levels to take a closer in depth look at the reasons for the accumulated state of disarray and despondency. Although export-related transport sectors such as ports and railways have come under particular scrutiny through an almost endless and continuing number of official inquiries (primarily by the Industry Commission and the Bureau of Transport and Communications Economics), without exception, all areas of transportation have been going through a major review of their role, their effectiveness and the basis of claims of inefficiency and negative externality in the delivery of services.

In this paper we discuss a number of initiatives undertaken in Australia to improve the efficiency of the transport sector. We use examples of practice in government trading enterprises (rail, bus, ports), as well as private sector benchmarks (private bus, trucking). We outline some of the topical issues such as the blind commitment to light rail in capital cities, uniform road user charges, safety and truck driving hours, and the future of our cities.

The primary emphasis is on the reforms aimed at making the transport sector more cost efficient and hence more competitive. Issues of allocative efficiency which are also critical to giving a supplier a competitive edge are briefly discussed, but except for markets which have been deregulated (e.g. domestic aviation), efforts to relax price setting constraints have been in the main disappointing. There is still a tendency in many subsectors (e.g. passenger rail and roads) for governments to link pricing and hence revenue-raising to

State budgets and political equity issues rather than to allocative efficiency. Consequently, the desirability of encouraging cost efficiency is not always translated into the subsequent setting of efficient prices even after due allowance for the mix of commercial and non-commercial obligations.

One of the challenges in writing an overview paper of a sector is in deciding how best to organise the topics. There are some very clear sub-sectoral issues which need comment (e.g. the proposed national road-user charges scheme, the role of high-speed rail, and airline deregulation); also there are some broad-based developments such as the growing interest in the economic performance (productivity in particular) of all government transport trading enterprises (GTE's) and the establishment of benchmarks and targets linked to incentives and sanctions for non-compliance. To try and do justice to both the specifics and cross-over issues, the paper is arranged as follows. We begin with a broad statement on what have been the major changes in the transport sector as a whole in recent years. This is followed by some specific economic issues which continue to dominate the agendas of each of the main sub-sectors. They are handled under a number of broad headings: stuck in traffic and the economics of cities, reducing the tyranny of distance, the suppliers of transport services, and the regulatory/charging challenges.

2. A Common Theme: Cost Efficiency and Corporatisation

In the last five years, the common denominator of change throughout the transport sector has been the corporatisation of GTE's, an explicit (often vague) statement on community service obligation (CSO) for all government-sector trading monopolies, and inquiries into ways of identifying strategies to make GTE's more cost efficient. Bound up with these cross-over initiatives has been the underlying dominance of rational economics (encouraged by hard fiscal times), the general lack of a desire to privatise assets (Qantas/Australian and shipping being the only exceptions, but also with some reluctance from some sections of politics, and a current interest in Victoria with the buses) which suggests something about control (Hensher 1986), but with mixed support for privatising the supply of services through competitive tendering (Hensher 1989), and the shedding of labour as the *first-step easy 'solution'* to achieving (labour) productivity gains.

Despite the strong and growing support for market forces as the expression of the efficiency ideals of society, governments have tended to adopt what the Austrian economist Hayek called a constructivist's approach (Klein 1992) to the market when

adopting the philosophy of modern welfare economics as the yardstick for net social benefit maximisation (which also embellishes the externality argument). That is, they proceed by first "solving" an economic problem for the central planner's optimal solution, and then try to see if the market outcome can replicate the plan. The presumption that government failure is better than market failure is implicit in this position, and fails to see the attraction of property rights and a strong law-based regulatory regime for ensuring that market failure does not occur.¹

Corporatisation of GTE's in NSW is based on the philosophy of private-sector imagery: establishing objectives, incentives and sanctions *as if* the business of GTE's were in the private sector. The Government, as the 100% shareholder represents the holding company of wholly owned subsidiaries, with their own Boards and management. The right to commercial freedom must be balanced by a reciprocal obligation to report results regularly to the holding company *against agreed targets* (Moy 1993). While laudable, the conversion of a culture driven by multiple objectives, security and the weak bankruptcy constraint is still struggling to reform its basis for existence. The transport bureaucracy is struggling with the idea of separating responsibility for policy and ownership from the perceived obligation to provide services. Whether the market (by free entry - e.g. economic deregulation) or governments (by controlled entry - e.g. competitive tendering) should determine the nature of service is an issue of continuing debate. Progress is being made, but slowly. The productivity gains in recent years in the State Rail Authority (SRA) and the State Transit Authority (STA), for example, are in large measure attributable to labour shedding and changes in accounting practices. The labour shedding arguably is a belated response to technological change (dieselisation, electrification, central traffic controls etc.) and changing market conditions (loss of competitiveness for many traffics). The challenge of cultural changeover is still ongoing. Indeed the complication of acting commercially with political input into the determination of CSO's is a constraint which is far more ambiguous in practice than would be the case if the private sector was the provider.

For example, under the 1990 NSW Passenger Transport Act, the STA has to identify its commercial and non-commercial services, and then indicate to the NSW government that it does not wish to continue to provide any non-commercial service (subject to compliance under the Act with minimum levels of service - see below). The government has the power to determine which non-commercial services should be treated as a CSO, and hence subsidised by the State. The STA in requesting CSO determination has to adjust its submission to allow for normal commercial practice (akin to the private bus operator with an industry approved economic rate of return) which absorbs some amount of internal-cross-subsidy in the interest of service integrity. The STA still has a strong political arm influencing its destiny (the Director-General of Transport, Head of the Department of

Transport, the regulatory agency, is on the board of the STA), and a strongly organised workforce and union affiliations.. A major constraint is in the limits to fare setting. On the one hand the STA is required to be commercial, on the other hand it currently has no independent power over its revenue potential through fares (with minor exceptions such as quoting on charter services). Private operators can set any fare up to a maximum, although this maximum is the outcome of private industry self-regulation.

The transport sector, possibly more than any other sector of government activity (with the possible exception of telecommunications and electricity), is on the path of economic and managerial reform. While public enterprises can be regarded, to date, as a partial success story of microeconomic reform, the competitive and ownership/incentive environments within which they operate have been changed much less than is possible (Forysth 1992). Where international best practice is measured, Australian organisations still have a way to go to catch up; and this can only be achieved through more permanent structural reforms. Whether the ultimate benefits to the industry translate into real macro benefits to the economy as a whole (rather than primarily showing up as a redistribution effect), remains to be seen, although the evidence in at least two areas - deregulation of domestic aviation and road user charges - is not encouraging (see below). Nevertheless a commitment in the government sector to economic reform through cost efficiency improvement is to be encouraged. More flexibility in price setting and allocative efficiency should also be promoted, especially at the State level. The links between costs, prices and service quality remain tenuous in transport GTE's. Price increases linked to productivity gains (the centrepiece of the NSW Prices Tribunal) then becomes problematic.²

3. The Providers of Transport Services

Underpinning the reform of the transport sector is a recognition of the need to extract higher levels of productivity from all enterprises engaged in transport, be they responsible for infrastructure (e.g. the Roads and Traffic Authority of NSW, the SRA, the Federal Department of Aviation), and/or the supply of services (e.g. the Federal Airports Corporation, the STA, the SRA, private bus operators, coastal shipping). In this section, we take a closer look at the urban bus sector, the government railways, ports and the National Rail Corporation (NRC).

3.1 The Urban Bus Sector

As a conservative response to pressures to use the market as the final arbiter of optimal service supply, competitive tendering is being introduced systematically throughout a growing number of countries. The tendering philosophy is diversifying into many interpretations or "models" of the tendering process (Hensher 1989). The most widely implemented model is the UK model which, in London, emphasises cost-only contracts and, outside of London, bottom-line or minimum subsidy contracts. Outside of London, tendering is confined to situations where commercial provision of services has not followed economic deregulation.

Recent developments in Australia and New Zealand offer alternative models. The Australian model introduced into NSW in the 1990 NSW Passenger Transport Act is a major variation. This Act, applicable to all private operators and the STA, converts all existing urban spatial monopoly rights into contracts.³ It emphasises the need to ensure that the incumbent operators in the private sector are given a 5-year period to satisfy the minimum levels of service, as a recognition of their historical contribution. This period of grace also applies in principle to the STA.

The NSW model is characterised by competitive franchising which guarantees the supply of services by a single operator in a predefined spatial context. All incumbents are given the first opportunity to conform with the service requirements, leaving undefined the precise routes. The service standards have to be satisfied according to key influences on the role of bus transport such as population density and car ownership rates. The services provided of a commercial nature are supplied jointly with the provision of school services whose costs are reimbursed under a "school subsidy travel scheme" (SSTS). If an operator chooses not to provide the (minimum) level of service specified under the Act, then the services will be put out to competitive tender. An incumbent can opt immediately to withdraw or can use the 5-year period of grace to make all efforts to conform to the minimum levels of service. Holding the subsidy constant, the minimum service level initially suggests more value for money where services have to be upgraded. The 20-25% gain in cost efficiency commonly found (for example in London) when a public service is put out to competitive tender (see Domberger 1989) is unlikely to be as great in the context of transforming the lean services of the NSW private bus operators to competitive regulation. Service levels however are showing signs of major improvement; for example the recent introduction of a high frequency hail n'ride mini-bus service, "the Nepean Nipper", by Westbus. The Victorian government is currently evaluating the NSW model together with prospects for privatisation of the government bus fleet.

The New Zealand model is based on the UK 1985 legislation as applied outside London. It is broader in that it embraces all passenger transport modes. Although promoted as

"deregulation" the NZ approach evolved as part of the process leading up to the commencement of the Act on 1 July 1991. It is much more akin to competitive tendering with procedural variations. Commercial registration is permitted but unlike the UK model, there are a number of planning instruments which act as negative incentives to commercial registration. The consequence is a predominance of minimum-subsidy tenders. All contracts are for areas and not individual routes. Regional Councils can substantially influence the setting of service and fare levels, and are able to preclude commercial services to secure desired service and fare policies. The latter contrasts with the UK model in which the bottom-line tender is a "last resort" facility, adapted to what the commercial market reveals. Incumbents may receive a non-mandatory price preference up to 25% prior to July 1992 and then up to 12.5% up to June 1993. Any single application of this rule requires its application to be extended equitably to all existing operators in the area under the jurisdiction of a Regional Council.

In the transitional stage, the NZ model has been modified continually in order to minimise "disruption" to incumbent bus operators. A fixed infrastructure subsidy is paid to incumbent rail and ferry operators. The initial result of the procedures laid down is a 16% reduction in subsidy with very little change to the overall provision of service.

A distinction must be made between the transitional and longer term impacts of competitively and non-competitively based reforms. Whether the appropriate incentives are in place to ensure real efficiency gains in the longer term application of competitive tendering/franchising remains to be proven. The priority on the development of comprehensive performance monitoring procedures is becoming clearer as more heterogeneity occurs in the reform procedures. The NZ model is the most "comprehensive" and also the most unwieldy. The NSW model is very conservative but identifiable. In both cases, the desire to protect the incumbent is paramount.

While the NSW Passenger Transport Act has been beneficial for the urban bus industry as a whole, it is not clear whether the productivity gains via contracts are as great as those achievable by economic deregulation. Evans (1990) and White (1990) conclude from the tendering in London and deregulation in the rest of Britain that local bus markets have remained highly monopolised after deregulation; competition is relatively rare and is probably now well past its peak. Competitive tendering within a coordinated system in the U.K. has yielded substantial cost savings (typically 30%) without the associated passenger losses and instability found in deregulated areas. Evans suggests that any potential benefits to passengers of higher frequencies of service under deregulation were offset by the uncertainty caused by irregular headways and frequently changing timetables. Implicit in this evidence is the rationale for a more predictable controlled application of competitive

regulation, as adopted in NSW. There is strong interest in Victoria and Queensland in the NSW model. These two states make up the balance of the majority of private bus and coach operations in Australia.

To assist the NSW government in monitoring the performance of the STA, the Minister of Transport (Bruce Baird) publicly references the private bus operators in Sydney as the benchmark for best practice. Indeed, there is a strong view in the international bus industry that the Sydney operators are the international benchmark for best practice. They receive no operating or capital subsidy (although some purchases are sales-tax exempt), work practices are very flexible (with multi-tasking and casual employees), and hours worked equate with paid hours (in contrast to many public operations where paid hours are well in excess of worked hours - Hensher 1987). Table 1 summarises some partial indicators of performance to highlight the difference between private and public bus operations in Sydney.

Table 1. Private and Public Bus Operations in Sydney (1990/91)

Partial Performance Indicator	Private Buses	Public Buses
Total cost per vehicle kilometre	\$2.01	\$3.54
Labour cost per vehicle kilometre	\$0.89	\$1.06
Overhead cost per vehicle kilometre	\$0.34	\$0.60
Driver cost per paid hour	\$15.77	\$18.48
Vehicles per unit of labour	0.74	0.32
Average annual kilometres per vehicle	42,901	50,018
Total cost per vehicle hour	\$44.31	\$66.56
Total cost per vehicle per annum	\$76,471	\$176,887
Capital cost per vehicle kilometre	\$0.277	\$0.441
Cost per passenger	\$0.80	\$1.57
Revenue per passenger (SSTS reimbursements)	\$0.86	\$1.50

Source: Data files compiled regularly by D. A. Hensher

Although the indicators in Table 1 highlight the greater performance of the private bus operator, such partial indicators can be misleading and unfair. A more appropriate measure of overall relative performance is total factor productivity (TFP), after adjusting for differences in the operating environment which are outside of the control of the operator (for example, traffic congestion levels which are on balance less of a concern for the private operator who serves the outer-metropolitan areas in Sydney). The study by Hensher (1987) of all public bus operators and a sample of private urban operators in

Sydney prior to the introduction of incumbent contracts, shows that, after adjusting for ownership, but not the operating environment, the private operators are up to 25% more productively efficient than the STA and up to 14% more cost efficient than Transperth, the latter being the most efficient public operator. When the operating environment outside of the operators control is taken into account, the private operator has a TFP advantage up to 10% greater than the least efficient public operator and up to 6% for the most efficient public operator. This difference translates into sizeable cost savings.

3.2 The Railways

The public rail sector in Australia has been identified as one of the least efficient providers of transport services, especially passenger movements. Overmanning, featherbedding, poor management and a lack of understanding of (or even interest in) markets were common assessments of the rail systems in the seventies and well into the eighties, especially the larger systems on the east coast. While all is still not well, there have been very serious efforts made in the last six years to turn the rail systems around and to be realistic about their ultimate role as a provider of freight and passenger services. The virtual monopoly of bulk freight movements contributed in part to the malaise (e.g. 90% of bulk non-time dependant freight in the Sydney-Melbourne Corridor - see Ferris 1993), as did the attitude that competition with road transport for the movement of non-bulk was too difficult. Railways had in the main failed to understand the role of prices, service quality (i.e. travel time, reliability, door-to-door service) and marketing in generating traffic and market share. In a Delphi panel survey of 22 transport *experts* in Australia, Podoliak (1992) identified the critical issues affecting the viable operation of non-urban passenger rail services. Fares and the quality of passenger service were rated highly followed closely by on-line performance, the technology in use, especially the infrastructure and labour/industrial relations. When asked to rank the disadvantages of existing rail services, the slow speed and hence travel time dominated the responses, with the price (value for money) and image the next most disadvantageous.

With operating deficits in excess of \$2 billion per annum in the eighties, following on from the disturbingly high rate of growth of the deficits in the late 1970's, equivalent to \$120 per capita, and low operating cost recovery ratios such as 0.3 for Victoria and 0.6 for NSW, the reform of this sector was urgently needed. With the exception of Westrail which began

the reform process as early as 1984, the main impetus in the other systems (especially SRA and Australian National) began in 1988.

The passing of the NSW Transport Administration Act 1988 and the appointment of consultants to review the SRA, and an implementation program based on their recommendations, marked the beginning of the turnaround program. Hensher et al (1992) have calculated TFP indices for each of the rail systems over the period 1971/72 to 1990/91 (Figures 1a and 1b). Although the full impact of some of the reforms such as privatisation of the Tangara maintenance workshops and the closure of a number of engineering/maintenance workshops (the most cost inefficient section of the railways) are still to be felt, there are nevertheless some very encouraging signs of productivity improvement accruing to actions beyond labour shedding.

Interpretation of a railway's performance varies according to whether the measure of output is final demand (e.g. freight tonne kilometres and passenger kilometres - TFP_d) or intermediate demand (e.g. train kilometres - TFP_s). Australian National (AN) has the highest TFP throughout the 20 year period while PTC-Vic has the lowest. Of all the systems, AN uses its inputs best to carry passengers and freight. AN is able to use a fixed amount of the input set to supply a service which attracts higher patronage (passenger and freight) than do other systems. One reason for AN's good performance is the absence of a major urban passenger service. Westrail, however, is best at using its inputs to produce train kilometres, as it had the highest TFP_s . Westrail is able to supply more train kilometres for a given amount of inputs than any other operator. If AN is excluded due to the absence of a significant urban passenger task and the systems servicing all three markets (urban and nonurban passengers, and freight) are examined, then Queensland Rail (QR) is the best performer in respect of moving more people and freight for a given amount of inputs. However, QR does poorly in producing train kilometres from its inputs. SRA has been the worst performer on gross TFP_s in respect of the use of inputs to perform a train kilometre task, but PTC-Vic has been the worst performer in respect of using its inputs to move passengers and freight (i.e. TFP_d).

AN's demand side measure of TFP has almost trebled between 1971/72 and 1990/91, while the two poorest performers, SRA and PTC-Vic doubled productivity. Overall increases in supply side productivity were much lower. The best performer, Westrail, almost doubled its TFP_s value while SRA and PTC-Vic increased TFP_s by a half and AN by a third. QR had only a marginal increase in supply side productivity between the beginning and end of the study period.

It is interesting to note the constancy of the five systems' rankings in productivity over the twenty year period. Since 1976/77, the rankings of the systems on TFP_d have remained the same: AN 1 (most productive), QR 2, Westrail 3, SRA 4, and PTC-Vic 5 (least productive). Similarly, the rankings based on TFP_s have also remained the same since 1976/77: Westrail 1, AN 2, PTC-Vic 3, QR 4, and SRA 5. In 1990/91 only, SRA had a marginally higher level of TFPs than QR.

In the last two years however SRA has started showing signs of exemplary gross TFP annual growth rates, albeit from a relatively poor productivity base. At the same time however gross TFP annual growth rates for Westrail and AN, the best performers in the last 20 years, have deteriorated. For example, in 1990/91, SRA had growth rates of 4.67% for TFP_d and 6.26% for TFP_s , in contrast to AN of -1.33% and 0.16% respectively, and for Westrail of -5.54% and -2.13% respectively. After allowing for the relativities with respect to management, technology, scale and composition, this places SRA in an encouraging position in respect of net TFP growth. The "Ross Sayers" effect, shorthand for the NSW government's appointment of Ross Sayers as Chief Executive and the reformation of SRA, may just be starting to have a positive impact. There is strong evidence that AN in particular and to a lesser extent Westrail and QR have benefitted substantially by good management direction, giving these railways a productive edge over the other rail systems.

Figure 1a Total Factor Productivity (TFP_d)

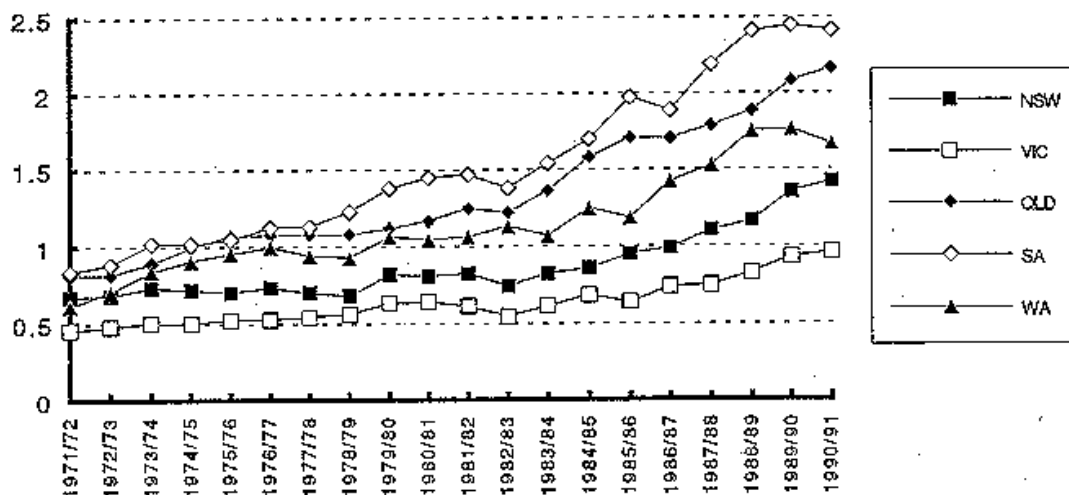
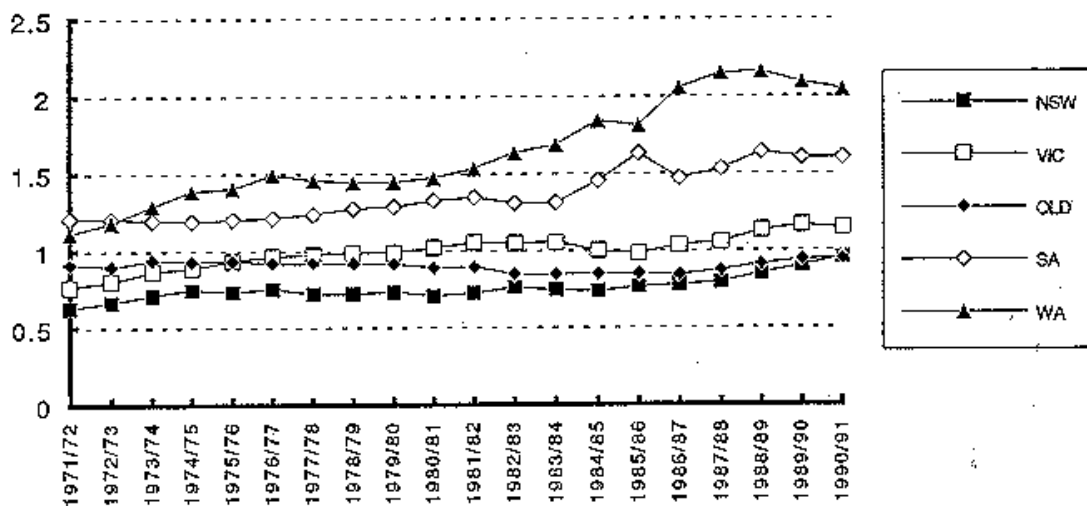


Figure 1b Total Factor Productivity (TFP_s)



The assessment of the productivity of all Australian rail systems has highlighted the usefulness of a single composite index for establishing a benchmark of “best national practice”. The extent of improvement in line with best international practice remains to be determined.

3.3 The National Rail Corporation and Interstate Freight

An important initiative of the Federal and State Governments is the establishment of the National Rail Corporation (NRC). Against a background of (i) a dismal showing of rail in interstate freight (losses totalling \$380m in 1989-90), with (ii) no rail system making a profit on interstate freight operations when financial performance is measured on a fully distributed cost basis, and (iii) rail's market share on the Sydney-Melbourne corridor declining from 51% in 1965-66 to 25% in 1985-86; the NRC was proposed. The State Premiers' Conference in 1990 ratified the concept of a single rail corporation, designed to operate on a strictly commercial basis and be subject to the Trade Practices Act, have access to the infrastructure necessary to achieve commercial viability, operate best practice productivity standards, have the capacity to contract for the supply of services, provide access to the network to other operators on a commercial basis, and provide any services to governments on a commercial basis. These are laudable objectives indeed.

A shareholders' agreement was drawn up between all incumbent railways, with the NRC established as a company incorporated under the Companies Code with a corporate plan requiring a 75% shareholder approval under special resolution which must be forthcoming within 60 days (in order to provide a mechanism for breaking any deadlocks). Under this agreement, the various parties have an obligation to transfer nominated functions and to provide access to related assets, within three years, by either ownership or long-term lease, which will count as equity if transferred and non-equity if access only is provided. Access will be provided on an avoidable cost basis.

The negotiations between all of the railways are progressing. One of a number of major stumbling blocks has been the resolution of equity share and voting rights, which requires a determination of the value of transferred assets. This is complicated because of the absence of any historical market-based valuation of rail assets, and the fact that each party is contributing only part of a network which requires access by other non-contributing elements of the railways (e.g. intercity passenger and intra-state freight and passenger rail services). Consideration of a voting element accorded equally to each shareholder was included to complement the commercial worth, in five years time, of the business and

assets that each partner contributes. Slowly, over a two year period, all governments have passed legislation in support of the transfer.

Negotiations with the unions on conditions of employee transfer to the NRC, redundancy packages, skill enhancement, standard conditions of employment etc. have taken much longer than planned. A two year enterprise agreement with the rail unions was signed in late February. The deal allows for National Rail to be covered by just two unions, instead of more than thirty, and provides for pay rises of 8.5 per cent in return for consolidation of penalty rates, annual leave loading and other allowances in the salary structure. Over 10,000 employees of the incumbent rail systems are directly affected. A much better multi-tasking classification structure which is flatter and consistent with the skills used by the workforce in executing its responsibility has been developed. The NRC embarked, in the middle of 1992, on a study to establish a new classification system. The study involves 48 rail workers and NRC representatives in a *bottom-up* audit of skills, duties, qualifications, and problems that apply in functional work areas required by the NRC (Ferris 1993). The process is complete, but the status of the final classification is not yet confirmed.

The implementation of the transfer of labour, assets and functions is progressing, although much slower than originally planned. The injection of a further \$450m (in the One-Nation Statement) as a Federal contribution to their original \$415m (the former treated as additional equity, but with the Commonwealth not seeking to have the commercial value of the sum recognised), has since been redistributed in part (\$150m to community job schemes) to other areas because of the inability to date of the NRC to set in place the planned \$1.7 billion in borrowings over the next 10 years and a commitment to major reinvestment in locomotives, terminals and crossing loops. Since the redirection of the \$150 million, 600 million has been made available for construction investment. In respect of infrastructure (especially track), given all reasonable projections on market share and hence total freight tonnes likely to be captured by NRC, there is excess capacity which should under good commercial practices be sold off (or closed down). This has proven to be difficult (if ultimately impossible) under the current arrangements.

As an extension of this point, when the NRC was set up, the suggestion that an infrastructure company might be established separate from operations was rejected. If one were to view railways in the same way that airports and airlines are structured, then the case for either owning or leasing all of the Governments' track and having a bidding system for the right to use the track at particular times (from both private and public sector operators) may well have been a more efficient outcome. It should remain as an option for the future. The proposal to privatise British Rail is based on the preservation of the current

ownership profile for infrastructure, with operations' access opened up to bidding for access rights.

3.4 The Waterfront and Coastal Shipping

"In the case of the waterfront, where competition is weak, the ultimate success of the reform process remains in doubt. Enterprise agreements to implement the reform strategy are still only partly in place and substantial productivity gains are only now beginning to flow ... [whereas for coastal shipping] under the spur of competition, tripartite reform and industry planning have been a conspicuous success" (Dick 1992, 219)

Reform of Australia's ports is principally about labour shedding, the implementation of regulatory incentives/disincentives to simulate weak competitive pressures, redefinition of user charging structures, and the monitoring and enforcement of performance contracts. The workforce has been reduced from 8,800 to 4,000 over the last 3 years (with some new employees to rejuvenate the ageing workforce). The cost to date of this right-sizing has been met by the Commonwealth government (\$165m), by the shipowners (\$165m), by direct employers of stevedoring labour (\$10m) and a remaining \$80m, still to be recovered from sources yet to be decided.

As of mid 1990, two important events occurred. First, the interim stevedoring award replaced 20 existing awards with a common industry award (Dick 1992), although one of the two major employers, Conaust, withdrew from the Association of Employers of Waterside Labour (AEWL) and entered into direct negotiations and agreements with the Waterside Workers Federation (WWF). Secondly, the Waterfront Industry Reform Association (WIRA) reached agreement with all parties on a set of performance indicators for stevedoring, port operations and ship delays (WIRA 1992). The establishment of best practice standards is still to be determined, which will be important for setting targets for redundancy and recruitment as well as productivity-linked payment schemes.

In addition to the productivity improvements in ports, Australian shippers have benefited from reforms to coastal shipping, despite the lack of evidence that Australian coastal shipping was gaining in competitiveness on international shipping. The reforms introduced in 1989 by the Federal government were especially designed to reduce crew sizes and provide investment incentives, with resulting lower rates. While the changes have helped to restrain freight costs for shippers (e.g. an average decline of 6% in some Bass Strait freight rates and lower costs for bulk cargoes), the recession more than any other single factor contributed to price cuts.

Short-term costs such as redundancy payments and ship modifications have masked savings under the changes, although a more important influence on rates seemed to be a rise in underutilised shipping capacity. The reform program appears to have given some operators greater confidence to invest in new vessels, improving both blue water and shore-based operations.

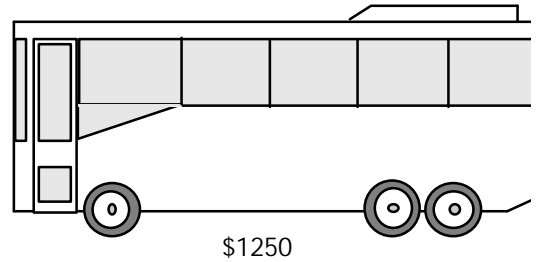
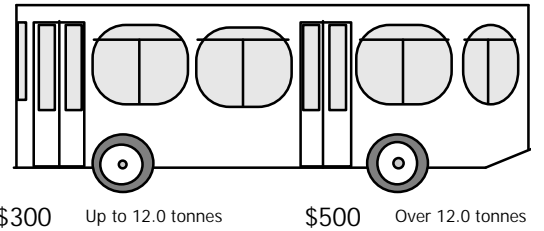
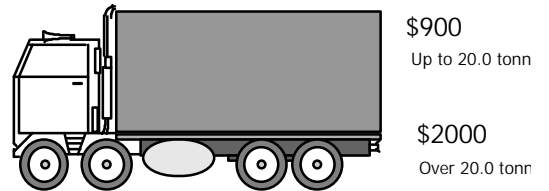
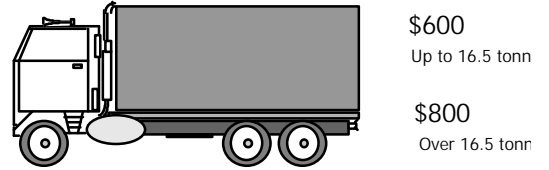
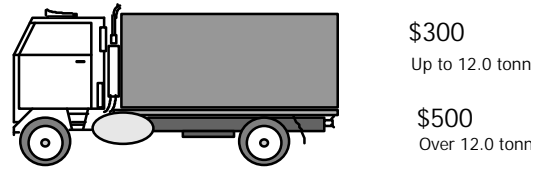
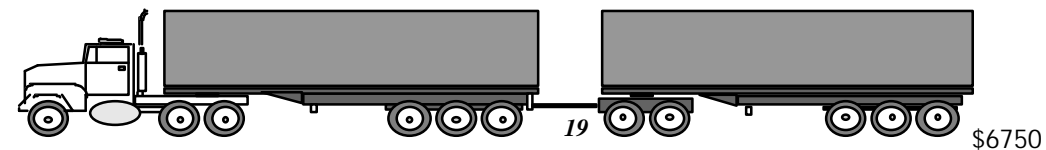
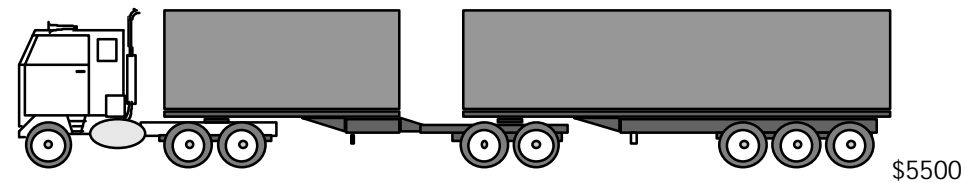
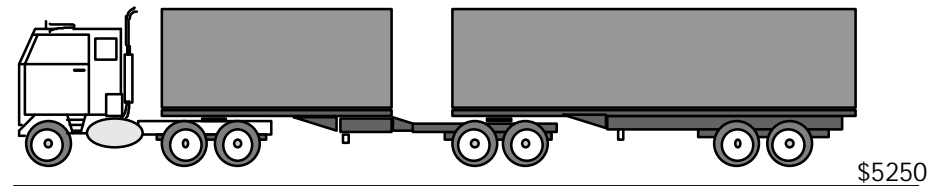
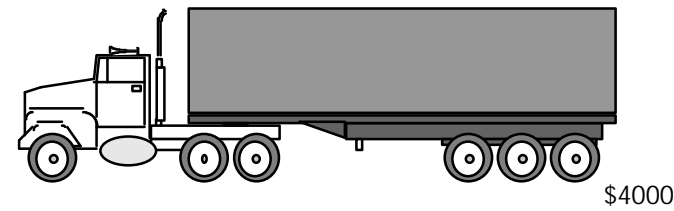
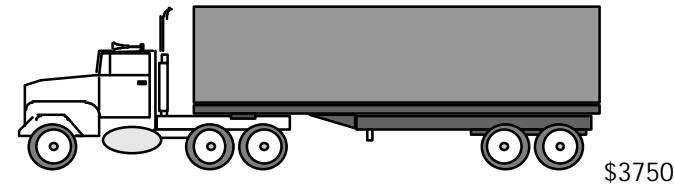
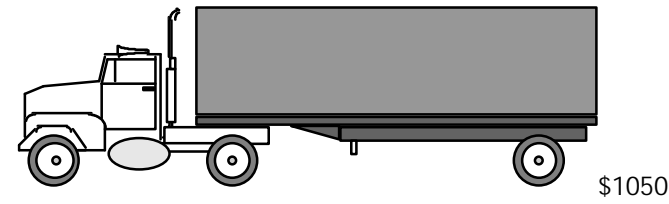
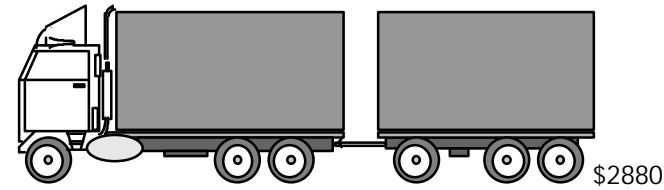
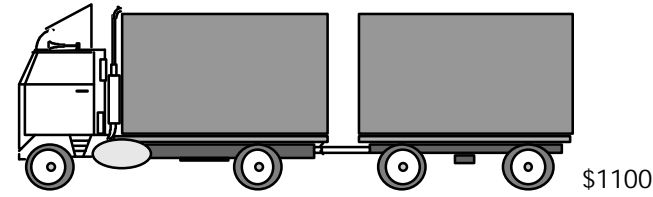
Port service charges (PSC's) are under criticism from local shipping who have complained that about 60% of the savings achieved with its own reforms have been absorbed by the increased shore-based charges. PSC's incorporate wharfage applied under State Government legislation by the Port Authority, and an additional charge to equate the old wharfage charged prior to July 1990. July 1990 was the date when the ports of Sydney, Melbourne and Fremantle changed their port pricing systems, increasing costs to shipowners but reducing them to shippers. The Trade Practices Commission has questioned the asset revaluations of port authorities used in calculating new PSC's, suggesting the need for increased monitoring of port procedures. However, port authorities are currently largely exempted from trade practices scrutiny by Section 51 of the TPA.

4. The Regulatory and Charging Challenge

Land transport is the largest domestic transport sector on all key indicators. 85% of all domestic passenger trips are by road and a further 4% by rail. 70% of all trips by short-term visitors to Australia are by land transport. Road transport dominates the domestic freight task as defined by tonnes shipped (72% of all 1991 domestic freight tonnes). On tonne-kilometres performed coastal sea freight and road have almost equal shares at 35% (Cosgrove and Gargett 1992). The road sector is the fastest growing for both passenger and freight movements, reflecting the level of service (especially the door-to-door advantage), greater reliability and in the freight sector for non-bulk the overall attractiveness of offered freight rates (which bear little resemblance to recommended rates - Hensher et al 1991, 1992). The potential savings from land transport reform far outweigh those from the wharves. Bringing the wharves up to world standards will benefit GDP by \$500m (1991 dollars) per year, a fraction of the \$4 billion per year that could be saved by reforming loss making and inefficient railways. Removing regulatory and tax inconsistencies from the trucking industry could save up to \$1.2 billion per annum. The Bureau of Industry Economics (1992) has recently reviewed the performance of the road freight sector.

4.1 Uniform Road User Charges

On December 21, 1991 the Federal Government passed the National Road Transport Commission (NRTC) Act, and gave the Commission an initial task of developing a uniform system of registration charges for heavy trucks and buses (Table 2). The development of consistent legislation and regulation was a secondary but important task for the Commission.



Road vehicles under 3 tonnes were excluded from consideration at the time, but as of May 1992 the Light Vehicles Agreement gave the NRTC additional responsibilities for the balance of road vehicles (Aplin 1992). By mid-June 1992, the NRTC produced a charging schedule to apply from July 1, 1995. The charging regime is the outcome of balancing the principles of improving resource allocation in road transport, uniformity of charge levels and administrative simplicity.

The basis of the set of charges is a link between road charges and road expenditure, but with the caveat of basing charges on the recovery of actual expenditure - known as PAYGO. The link with strict efficiency-based user charges is quite tenuous. PAYGO seeks to recover from road users total expenditure on roads, not just the (short run) marginal costs of road use. It is more akin to, but not identical to, long-run marginal cost pricing. Avoidable costs for a vehicle-type are distributed on the basis of vehicle-kilometres travelled. Separable costs are distributed using an equity-based cost-occasioned allocation procedure, proposed by the Interstate Commission (Barnard 1992) which seeks to match expenditure on classes of roads to travel on those roads by classes of vehicle. Externalities are excluded.

NRTC has three *charging* instruments available - registration fees, mass-distance charges and shadow fuel charges - the latter an allocation of a notional share of diesel excise. The remainder is defined as a tax. The distinction between a tax and a charge is critical in the argument on hypothecation, although from the payers point of view it is irrelevant unless their acceptance is conditioned by the knowledge of how the revenue is expended.

While one might be cautious about the real efficiency base of the set of recommended charges, as an instrument of significant microeconomic reform, heavy vehicle charges are likely to be somewhat irrelevant. The Industry Assistance Commission's conjecture in its 1988-89 annual report that 16% of GDP gains through economic reform would come from the road transport sector attributes the bulk of the gain to improved efficiency in the provision of road infrastructure. This throws the challenge directly to the State road planning and construction authorities to increase their productivity. Research by Meyrick and Associates (1992) for NRTC indicates that the potential gross efficiency gains are modest - between \$1m and \$25m depending on the demand elasticity assumptions. When it is realised that road transport costs constitute less than 2%, on average, of inputs to other Australian industries (Aplin 1992), and that the proposed road user charges will typically be less than 5% of heavy vehicle operating costs (with some up to 10%) (Hensher et al 1992), the impact in aggregate on GDP gains is small indeed.

4.2 Long-Distance Trucking: Safety and Reward

The on-road performance of long-distance truck drivers is constantly in the news and the transport industry literature. The topic has become a particular concern to the Federal Minister of Land Transport (Bob Brown) who has initiated a number of investigations through the Federal Office of Road Safety (FORS). One such study, undertaken by Hensher and Colleagues (1992) investigated the extent of a relationship between economic reward and other factors which may contribute to the performance on the road of drivers and hence the level of exposure to risk. The major elements of the inquiry are summarised in Figure 2.

The study found that economic rewards to both owner drivers and employers of drivers have a major influence on the propensity to speed and hence levels of risk on the road; but that in particular⁴:

- (i) it is the freight rate (linked to reward for owner drivers) per se which acts to stimulate road practices in various forms in order to ensure that an acceptable level of total earnings (net of truck-related expenses) is obtained. Any deviation from a fixed salary tends to encourage practices designed to increase economic reward which are not synergetic with reducing exposure to risk.
- (ii) the uncertainty of annual earnings encourages the practice of self-imposed schedules and the taking of stimulants to enable extension of the productive working week. While the extended working week does increase the earnings, the incidence of productive (i.e. driving) time decreases as total working hours increases. Any strategy which can reduce the uncertainty of earnings must reduce the hours of total work, increase the amount of sleep time and consequently reduce the incidence of self-imposed schedules and hence the use of stimulants.

Regular contracts may be a preferred form of load allocation, initially obtained by a process of competitive bidding, with possibly relatively short contracts in order to ensure that bid prices remain competitive. This may be the only way to minimise the amount of unproductive waiting time and to eventually prune the industry. Major implementation of competitive bidding in other transport industries is seen as a preferred alternative to complete economic deregulation primarily because of the inability of deregulation to manifest an acceptable program of internalising the negative externalities of unfettered competition.

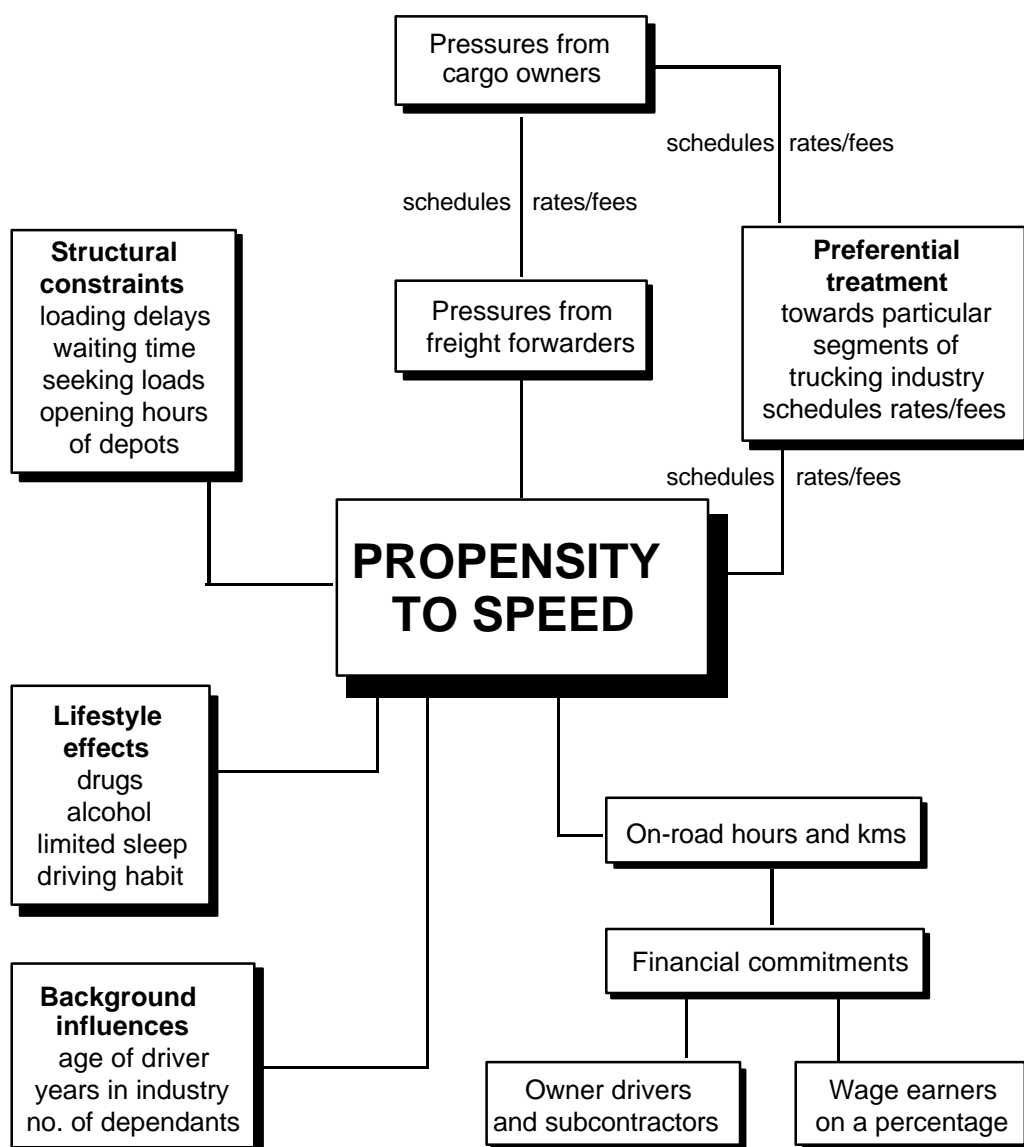


Figure 3 Major elements of the study of on-road performance of long-distance truck drivers (Hensher et al 1992)

The anecdotal evidence which tends to lay the blame for bad on-road behaviour on owner drivers is fallacious. Small company employee drivers have some of the worst industry practices in respect of speeding, use of stimulants and incidence of fines. Indeed many of the influences on variations in on-road performance, pill taking and self-imposition of schedules which often lead to speeding are not correlated with whether a driver is an owner driver or an employee driver.

Lifestyle factors appear to have evolved as a result of the ease of entry to the industry coupled with its highly competitive nature which demands non-routine and unpredictable work practices for a significant number of drivers in the industry. There appears to be a

case for much more stringent safety regulations centred on the health of the driver as distinct from the “health of the rig”. There is a great temptation for commentators to argue that if someone wants to enter this industry, get burdened with high debts and work excessive hours to “make a quid” then they should be allowed to. This may be acceptable wisdom if safety of human resources at large were not at risk. It is precisely because of the negative externalities aligned to safety that changes are required in the competitive practices in the industry. The transactions costs are sufficiently high to warrant some restrictions on competitive practices *in* the market. Competition *for* the market should be given serious consideration.

5. Reducing the Tyranny of Distance

Australia's non-urban domestic passenger task is dominated by the automobile. In 1991, 61% of non-urban passenger kilometres were by car (complementing the 86% of urban passenger kilometres by car). The only other modes capturing respectable shares for long-distance travel are air (15%) and coach (14%) (Cosgrove and Gargett 1992). In this section, we take a closer look at the economic deregulation of the domestic aviation market with particular reference to the experience in the first twelve months when Compass was the only new entrant. The demise of Compass is an important lesson in business strategy in a dynamic competitive market.

5.1 Deregulation of Domestic Aviation and Compass

Economic deregulation of the Australian domestic aviation market came into force on 1 November 1990. After a history of regulated duopoly of air services on the national trunk routes the winds of economic change had finally arrived. The "skies are free" was seen as the symbol of the benefits which now would flow to the travelling public. One airline, Compass Airlines Pty Ltd, was prepared for entry well before November 1990. It was heralded into the market as the people's airline, funded by public subscription, and offering both low fares and high quality service in modern Airbus equipment, servicing the major capitals of Australia. Almost exactly one year on, with no other new entrants, Compass ceased operations. The Provisional Liquidator suggested that Compass failed to appreciate the likely cost of start-up, the likely lack of coordination of resources and facilities for a new business, and the response of its competitors, concluding that:

"Each of these events depleted the available cash resources so Compass was forced to become radical in its approach, thereby exacerbating the strain on profitability and ultimately its cash resources" (Ferrier, 1992, .6).

To what extent was Compass responsible for its own downfall? A detailed assessment of the collapse of Compass is given in Nyathi et al (1993). Herein we highlight some of the main lessons for new entrants and the benefits that the early entrant brought to support the virtues of economic deregulation.

Compass was under capitalised and fought a losing battle against the majors who had greater resources. Experts in the aviation industry posit that a new domestic airline of Compass' size needed at least \$120 million clear of leasing and other commitments to underwrite its first year of operations (AFR 17/01/92). Bryan Grey's original estimate was \$100 million which he cut back to \$85 million after a capital raising proposal to investors through ANZ McCaughan failed. He finally went to Potter Warburg who agreed to underwrite a public float of \$50 million which, in the event, was rushed and was over-subscribed (Sharp 1990). Compass eventually obtained a \$15 million premium, but this proved to be insufficient.

The majors repositioned themselves and raised the barriers to entry for incumbents with strategies of vertical and horizontal integration. They bought a number of travel agencies and firms providing complementary products, and both joined the Galileo CRS, formed strategic alliances with car hire firms, hotels and other travel related suppliers. Perhaps the most costly barrier as far as Compass was concerned was that of the terminal leases the incumbents negotiated with the Federal Government.

Australian and Ansett introduced frequent flyer programmes into Australia after deregulation. Compass responded by offering two free tickets with every Compass Class purchase to the same destination, a costly alternative to the airline. Product differentiation relating to brand identification, customer loyalty and goodwill becomes a barrier when an entrant has to commit expenditure to dismantle the loyalty achieved by incumbents. In Compass' case, this expenditure included image building advertising, special introductory travel packages and heavy discounting on some new routes such as Sydney-Perth. Although these might be regarded as *the normal costs of doing business*, they depleted Compass' meagre cash resources.

The high operating costs of the majors were the main motivation for Compass' entry. But the assumption that Compass made was that the incumbents were not capable of cutting costs to "reasonable" levels. Compass had a strong profit incentive to pursue the cost leadership strategy. An inevitable consequence is price competition. Lower costs mean that the firm can afford to undercut its competition on fares, but this may be only sustainable in the short run. The majors were given the benefit of three years before Compass' entry to rationalise their operations. Even so, Compass costs were lower than

that of the majors and it was a cost leader. However, this leadership needs to be transformed into profits through sensible pricing policies. Compass' discounting proved to be too deep and in the end its advantage was dissipated. Ted Harris, the Australian Airlines Chairman commented:

"The reason for the collapse was that Compass sold its airline tickets at prices so heavily discounted that the company ceased to be able to meet its financial obligations. What we had was a Myer Sale which should have lasted one week [but] lasted 12 months." (Sydney Morning Herald, 5/01/92).

A longitudinal analysis of the discount war showed that Compass initiated a number of the discounts, and where it had not, it responded with even deeper discounts compared to what the majors had put up. Signs of Compass' desperate need for cash were reflected in its pricing policies especially after August 1991. A comparison of Compass' pricing strategies and that of the majors reveals that while the majors matched Compass fares at the low end of the market, they did not discount to all their customers; their discounting was selective. Compass' yield deteriorated rapidly from February onwards, yet Australian's yield was on a slow downward trend because of the depth of the discounts in mid-year (Figure 4).

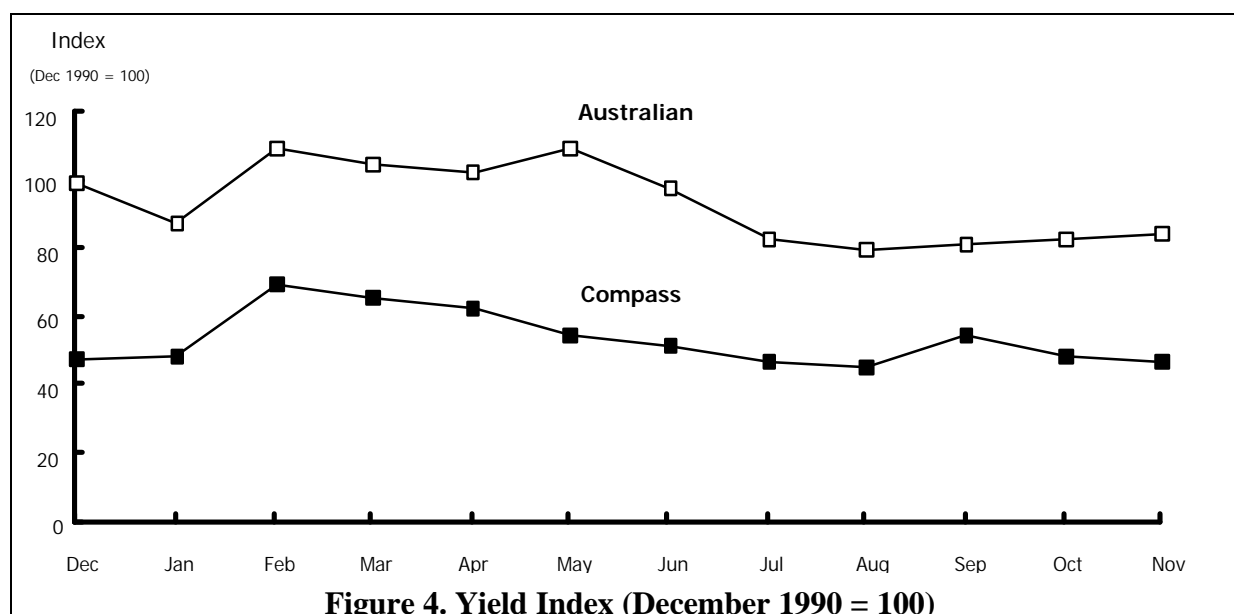


Figure 4. Yield Index (December 1990 = 100)

A costly assumption that Compass made was that the majors would not respond to its discounts in the way they did and consequently underestimated the degree of the ensuing price war. When the majors responded by discounting to the same level of fares as Compass, Mr Grey accused them of predation. Both of the major incurred losses for the year, but they were better capitalised than Compass and were able to sustain the fares war.

The company was *under-capitalised from day one*, and, proceeding with substantially less than the \$100 million first believed necessary, Compass increased its risk. Knowing of its poor capitalisation and subsequent lack of cash, management should have moved early enough to correct the under-capitalisation problem, possibly by raising new equity. Instead, it gambled on "borrowing from passengers" as much of its discounting appears to have been motivated by the need for cash rather than market share build-up. The company's discounted fares tended to *overlap* as one type of discount offer would come in whilst the other was still active. After the peak selling period just before Christmas, there were not sufficient buyers to sustain the cashflow.

The combined delays in receiving the third and fourth Airbus's reduced Compass' available capacity by approximately 26% from that planned to the 30th of June. Compass came into the market at a time when demand for leased aircraft was bullish. The operating leases it struck with Polaris and Monarch Airlines were at punitive rates; 1990 was the peak of an ordering binge. But after 1990, lessors managed to place only 22% of the 850 aircraft they had committed to buy. For instance Triple A, a potential entrant in 1991, claimed that its aircraft cost one tenth of the \$800,000 a month Compass paid for its two A300s (Age 15/09/92).

The Compass collapse precipitated the government's wide review of aviation policy, both domestic and international. The main tenet of the reform programme is ultimately the creation of a single aviation market with New Zealand under the Closer Economic Relations (CER) umbrella. Stage one of the policy means the removal of equity barriers between Australian operators with the result that the privatisation process will be enhanced. Qantas has since merged with Australian, and has been partially privatised with British Airways acquiring a major shareholding.

Stage two opens up the trans-Tasman services to any Australian or NZ airline, allowing domestic airlines to compete with international carriers on that route no later than 1993. Qantas will not be allowed to operate purely domestic sectors in its own right until multiple designation on international routes is extended to areas other than the Tasman. Stage three involves the implementation of a single aviation market with a common border which would allow all Australian and NZ airlines to operate within the two nations as well as trans-Tasman. True economic deregulation is a long way off in international aviation (Dwyer and Forsyth 1992).

The option of merging of the Australian, New Zealand and trans-Tasman markets was examined by a Joint Australia-New Zealand study team consisting of the Bureau of

Transport and Communications Economics and Jarden Morgan NZ Limited (1991). The team found that:

- Any benefits to consumers from a relaxation of regulatory barriers to entry would come in the form of reduced airfares and an improvement in the quality of air services.
- Deregulation would create new opportunities for entrants, while subjecting the incumbents to the rigours of new competition.
- The net welfare gains from a single Australasian aviation market relative to Australian domestic aviation would be \$53 million.
- If Air New Zealand were to respond to a possible Ansett competitive threat in the Australasian market by entering the Australian market, the welfare gain would be \$141 million.
- Welfare gains would be less if there was to be restricted cabotage.

The study concluded that, overall, there are some net welfare gains to be had from a single aviation market under varied scenarios. Table 2 summarises the welfare consequences of Australian domestic aviation, and a single Australasian aviation market.

Table 2. The Welfare Consequences of Australian Deregulation and a Single Australasian Market

	Australian Deregulation Single Market	
	\$M	\$M
Consumer Gain	236	329
Change in Airline Profits	-48	-88
Cost Cut Transfer	-71	-71
Net Welfare Gain	117	170

Source: (BTCE and NZ Study Team, 1991).

In the international distribution of the welfare gains, Australia will stand to gain more. The achievement of the net benefits of a single aviation market might be constrained in the short term by the excess demand for runway access at Sydney's Kingsford-Smith Airport. Additional *terminal* capacity would be required if domestic airlines which entered the trans-Tasman market sought to use their existing domestic terminal facilities to process international passengers.

The collapse of Compass and the proposed single market has made it harder for new start-ups to raise capital. The cost of capital is a real barrier to entry. The Corporations Act

provisions increasing director and stockbroker liability also suggest it might be a while before the stock market thaws. For instance, stockbrokers Porter Partners were obliged out of prudence and in a bid to parry away any possibilities of litigation in the light of a Compass collapse to spell out that "*Compass must be regarded as speculative.*" (The Age 15/01/92).

6. Stuck in Traffic and the Economics of Cities

Thirty years ago, William Vickrey stated that

in no other major area are pricing practices so irrational, so out of date, and so conducive to waste as in urban transportation. Two aspects are particularly deficient: the absence of adequate peak-off [peak] differentials and the gross underpricing of some modes relative to others (Vickrey 1963, 452)

Thirty years on, the situation has not changed in any noticeable way. Market structures for public transport and roads are essentially the same as they were in the late fifties, with a few exceptions such as private urban tollroads (Beesley and Hensher 1990) - although the fixed toll for a vehicle type is set on financial and administrative criteria rather than for economic efficiency,⁵ preserving the delusion noted by Vickrey (1963, 455) that the primary role of pricing should always be that of financing the service rather than that of promoting economy in its use.

Hensher (1993) assessed the debate on the role of public transport and the automobile in moving people in cities and arrived at the following conclusions:

- Urban passenger transport is inefficiently priced. When combined with the relatively lower cost of housing further from the centre of urban areas, the actual or perceived under-pricing tends to encourage greater suburbanisation than would otherwise occur.
- An important issue missing in the debate on the future of urban passenger rail and bus systems is the future of the automobile in the context of alternative regimes of pricing signals and physical planning controls. Without this context, the whole debate is lopsided and unproductive. Without a major effort to make the car less attractive, the *economic* future of public transport (especially rail), in the absence of massive public subsidy, does not look good.

- In the presence or absence of a cost-related pricing strategy for all means of passenger transport, net immigration in urban areas will be a major factor in determining the levels of congestion both on our roads and within public transport (especially rail services).
- All forms of transportation infrastructure and services are potential candidates for improvement. However they must be evaluated in a context of cost-related pricing (accommodating the fuller set of costs such as environmental pollution). Market forces are a very powerful feature of the process - the challenge is to establish appropriate pricing signals such that consumer preferences for transport and location result in choices being made which are socially and environmentally acceptable outcomes.
- The issue of the shape and density of urban areas should be an outcome of the pricing process, physical planning codes and associated accompanying investment activity, and not a constraint on it. The density and dispersal characteristics of our cities do not have to necessarily change in any major way to create a circumstance more conducive to major social and environmental gains. Society will not benefit by a one-sided strategy to starve the suburbanisation preference any more than starving the urban consolidation desire. This will place increasing pressure on all governments to be more open and flexible in urban design.
- The introduction of road congestion pricing should be accompanied by advanced planning for rail capacity expansion where modal shifts are expected to be significant (but do not uncritically assume this), otherwise the congestion on the roads will be transferred to the rail network, the latter already exhibiting high levels of within-train congestion during peak periods.
- Planning for the full spectrum of urban densities reflecting efficient social prices for land use and travel (i.e. a full set of spatial bundling choices) should assist in making public transport economically more attractive, but not dominating the automobile except in selective market segments.
- One should be cautious about downtown and public transport promoters who have chosen to depend upon the downtown "solution" rather than consider the merits of the arguments that fixed-rail alone cannot compete with efficiently priced and well-managed automobile transport, sound bus systems and supplementary transit schemes like dedicated busways, transit lanes and super expresses. Some years ago Melvin Webber predicted that BART in San Francisco " may become the first of a series of multi-billion-dollar mistakes scattered from one end of the continent to the other" (Webber, 1979, 132). We must be wary of the view that a rail system is by definition a transport of

delight, a symbol of progress at which all can marvel, whatever the reality of its actual performance in enhancing social mobility, alleviating congestion, or reducing pollution (Richmond 1991).

- A fatal flaw in some of the contemporary debate on the future of our cities may be that healthy and vibrant cities should have a central core which is alive 24 hours a day. The brooding over the downtown's relative demise and to plan big to revive it may have little correlation with the virtues of a socially and environmentally preferable future.

The commentary above emphasises passenger transportation. Urban goods movement is a forgotten agenda (Ogden 1992), yet an important consideration in the city landscape. Nationally, 26% of tonne kilometres of road freight is moved within capital cities (compared with 20% for interstate road freight). Traffic congestion imposes a greater direct cost on trucks and is passed on to the consumer of goods in the form of higher prices. For example, in a recent study of the comparative costs of using the M4 motorway in Sydney which has a toll of \$4 per trip for trucks, and the alternative free route (principally the Great Western Highway/Parramatta Road), a typical cost in the am peak from Strathfield to Penrith for a 6 axle truck is \$11.35 on the M4 (plus the toll) and \$54.96 on the free route with a large number of traffic lights and traffic congestion (Hensher et al 1992b). The cost savings excluding time savings is \$39.61. Over a year and across all trucks travelling east-west in Sydney, the saving in cost is substantial (estimated as \$78m). Ogden (1992) reviews the basis for urban freight transport reform, highlighting the traffic operations, safety, noise, emissions, terminals and loading areas, urban structure and road infrastructure.

Two issues worthy of further comment are road pricing and light rail.

6.1 Road Pricing

"... our roads are no more 'doomed' to hopeless congestion than our meat counters would be if we sold steak for the price of dog food. The 'shortages' in every case would be man-made and man-fixable by rational pricing, not hopeless, irremediable acts of God" (Elliott 1992, 527)

Road pricing⁶ in urban areas is back on the agenda of both State and Federal governments. They see it as a way of attacking the high levels of traffic congestion, accommodating environmental concerns through making the car relatively less attractive and hopefully encouraging greater use of public transport. Whereas the extent of modal switching is debatable (alternative outcomes include peak spreading and more fuel-efficient vehicles -

see Hensher 1993), as an instrument for efficiently pricing the *use* of roads, road pricing is laudable (Hau 1992).

The arguments that motorists are already more than paying their way have got mixed in with the debate on congestion pricing, reflecting a lack of understanding of marginal versus average use. Superficially it is argued that since reported road expenditure is more than recovered from various taxes and charges, that the road user is on the whole paying his way. But what is true on the average is far from true of users of the heavily congested urban arterials and freeways. The exclusion by the National Road Transport Commission (NRTC) of externalities in setting road user charges for cars is a reflection of "too hard to implement" politically, despite the political interest. The revenue raised from road pricing of cars will be large:

for Sydney alone, with nearly 2 million cars and station wagons, averaging 15,000 km per annum, with 12,000 kms in Sydney, if we assume that 6,000 kms will be on the roads subject to a congestion charge (after allowing for the price elasticity) and the charge is 5 cents/km, the revenue raised is of the order of \$600m. per annum, 150% of the current SRA annual deficit.

It is true that congestion charges would be regressive in the equity sense of charging the lower income person a greater percentage of their income than the higher income earner for the same level of benefit. Elliott (1992) has argued that congestion charges would be much less regressive than the existing road use financing instruments, which charge lower income earners disproportionately to subsidise the richer individuals. For example, non-car owning taxpayers on low incomes support car users by paying for courts, fire stations, hospitals and especially the police to protect automobile users.

6.2 The Blind Commitment to Light Rail and the Role of Bus Priority Systems

The role of light rail transit (LRT) in urban transportation has evolved into a "yes it is" and "no it isn't" confrontation (Brindle 1992). The "*yes it is*" supporters might be described as having a belief that fixed track and dedicated right-of-way mass movement technology is consistent with the objectives of reducing the dominance of the automobile and in increasing the density of urban living. There is a fundamental belief that planning controls must be used to override individual preferences for use of the motor car, and a further belief that, once in place, an LRT will reshape urban density and foster life styles more conducive to reliance on public transport. The "*no it isn't*" critics are seen essentially as economic rationalists who emphasise the accommodation of market forces, i.e., accommodating people's preferences regarding urban transportation. They acknowledge that there are

market failures to overcome, chiefly the under pricing of motor cars because incremental congestion and pollution costs are overlooked by motorists, possibly along with the true opportunity costs of roads and parking facilities. The economic rationalists argue for better pricing policies to provide more accurate signals for both users and providers of transport services. Then a combination of market forces and cost benefit analysis of public projects would guide the development of an efficient urban transport system. Critics probably would respond that this is a recipe for continued reliance on the motor car.

Advocates of buses and bus priority systems (BPS) fall in between these two polar positions. BPS is promoted as a more flexible system than LRT, capable of providing high volume movements close to LRTs' at lower cost, and superior at collecting and distributing passengers at the hubs along high volume corridors. But LRT advocates see buses as an outmoded technology incapable of providing a satisfactory alternative to car use, and not capable of reshaping land use and life styles conducive to greater reliance on public transport.

A review of LRT and BPS's undertaken by Hensher and Waters (1993) concludes that western societies in the main have an attitudinal problem in regards to the relevance of buses in contrast to railways as serving more than local area markets. We pay a very high price for this cultural constraint. The current very public campaign to inform the public about the virtues of light rail is a campaign of misleading information, notably of capital and operating costs, levels of subsidy and prospects for reducing the dominance of the automobile and changing the spatial structure of our cities. Bus priority systems make no strong claim to accommodating all of these desirable outcomes either - but they do offer an equivalent service for a lower cost.

Exclusive bus lanes or high occupancy vehicle lanes of sufficient length to establish bus travel as a linehaul option (and not just a feeder facility) can return high dividends *within* the set of public transport options. It may not produce significant change in overall modal shares even though the absolute number of bus users can be substantial; but neither is LRT bringing about shifts in modal shares.

The land use impacts of bus systems have not historically been as noticeable as that attributable to rail (with notable exceptions), primarily because the idea of a bus hub is relatively new. There is no reason why bus systems cannot secure the land development benefits attributable to rail when dedicated long distance busways are in place: the only difference to rail then is that the track is not steel (Stokes et .al. 1991). The Ottawa and Curitiba experiences are exemplary. The flexibility of bus service onto and off of the fixed

"track" should give the bus system appeal not available to train (provided travellers in the main do not have to transfer or transfer with minimal effort).

Although BPS's can have a permanence of their own, as documented above, in some situations exclusive busways and LRT can be substitutable investment options. The choice will hopefully not be determined by technological bias ("trains are sexy, buses are boring" - Richmond 1991). It is difficult to evaluate the empirical evidence because selection of particular results can favour the reporter's specific biases. What the literature does suggest unambiguously, is that exclusive bus lanes can in some contexts have a role as a transitional public transport facility, allowing time for patronage levels to reveal a market for LRT. Transitional status should be linked to thresholds of patronage levels required before moving from exclusive bus to LRT, and not the suitability of maintaining a service in the selected corridor. The flexibility of a busway permits a whole range of future options including reversion to mixed freeway traffic (with road pricing/tolls) as well as modified bus services, and LRT (even heavy rail). Flexible directional capacity can be offered by bus priority together with a greater mix of express, limited-stop and all-stop services, compared to other forms of public transport. The challenge however is to make potential users aware of this.

7. Concluding Comments

More than \$8 billion annually is invested in the national transport system in the form of roads, railways, ports, airports and supporting infrastructure. A significant amount of this spending is government funded or managed, making transport by far the single largest area of government capital investment. On these figures alone, the efficiency of the transport system should be critical to the nation's economic performance. The Industry Commission has identified well over one-third of the potential gains from reform coming from the transport sector. Yet despite transport's pivotal role in economic performance and its huge call on national savings, Australia still does not have a *national transport plan*.

We can well take a lesson from Canada, whose two year Royal Commission on National Passenger Transportation (1992) provides a blueprint for a set of strategic and coordinated actions to ensure that an overall plan of action is pursued in the interests of the nation as a whole. How much expenditure should we be allocating between road, rail, air, sea and even high speed rail (Budd 1993)⁷, based on forecasts of demand under a reasonable set of feasible futures? No satisfactory set of procedures are in place in government to assess the *relative* merits of particular investment proposals against a national transport plan, such as

the very fast train, a tilt train, upgrading of the existing rail track, airport upgrading and relocation. A national plan is useful, even where there is strong belief in the free market. Some guidance and incentives in the context of a plan is desirable. It certainly aids in pointing to appropriate regulatory procedures to ensure that market forces are truly consistent with competitive ideals and the minimisation of market failure.

Although reform of the performance of the suppliers of transport is to be encouraged and is producing some very positive efforts in areas such as coastal shipping, the railways, the ports and buses, we should not forget that gains in cost efficiency (and TFP) in isolation from the broader gains achievable by identifying the best role of each means of transport in both the passenger and freight sectors is not an end in itself. Microeconomic reform also encompasses allocative efficiency and considerations of profitability, cash flow, returns on investment, effectiveness and relevance. It also heralds in a period of change and flexibility replacing predictability and stability in the transportation sector.

Notes

1. The accepted mainstream wisdom in welfare economics asks whether the market provides the right incentives to allocate resources efficiently. Where it does not, the case for government to correct the incentives or to replace the market is invoked. The alternative view (known as the Austrian view) asks whether the market provides the right incentives to discover where there is scope for increased coordination leading to **improvements** in the allocation of resources.

The challenge then becomes one of identifying what kind of government policies provide the most encouragement for the coordinating process of the market. The mainstream interpretation has seen the requirement for institutions such as the Prices Justification Tribunal, the Trade Practices Commission, cost-benefit analysis and environmental impact statements, as instruments to correct "market failure" and improve resource allocation. By contrast the Austrian perspective sees these institutions as more likely to impede the process of coordination. The emphasis is moved to the importance of freedom of entry and the development of private property rights as means to encourage the smooth functioning of markets and the competitive process and thereby to protect the public from exploitation and inefficiency, not only from monopoly but also from unnecessary government. In the transport context, this begs the question: would we have such low density urban areas as the only substantial alternative if public transport was efficiently priced and not nationalised in the central areas of capital cities, and road pricing was in place? The value of **subsidised** public transport for all, for the common good of the environment, may be a fallacy.

How then do we suggest to government and those who advise them that it is time to recast the dice?. The central issue is a recognition that governments will respond to political pressures. It cannot be assumed that the use of techniques such as cost-benefit analysis and externality (Pigovian) taxes/charges will ensure the remedy of externalities in the manner assumed by welfare economists and transport economists. Taking a step backwards, we must recognise that the task is not primarily one of computing the optimal solution to a well-defined "problem", but rather one of discovering the problem in the first place. There is not enough consideration given to good ideas; where this does occur they are increasingly being stifled by debates on intellectual property rights and the desire of governments to put private ideas out to public tender. This is a very sensitive issue in transportation as more and more private sector organisations are being asked to invest in transport infrastructure (Beesley and Hensher 1990). Having identified a problem and a possibility of making some improvement, necessary information is gathered and analysed within a process which moves forward to implementation of an improved solution.

The important question becomes: what kind of institutional framework is most likely to promote the discovery of activities with significant externalities and to resolve them with minimum cost and maximum benefit?. Will complaints from individuals and lobby groups (potentially) affected by a new tolled freeway be sufficient to alert the appropriate government authority, or is the prospect of paying damages and receiving damages more likely to spur the parties to agreement? How will the information necessary to reach an efficient solution be obtained? In the market, negotiations take place between parties who act in accordance with their own preferences and opportunities they believe open to them. In a public inquiry and cost-benefit analysis or a setting of establishing externality taxes, a major difficulty is that these preferences must be estimated. If a lobby group has to

"purchase" the right to prevent open space being developed for a freeway, will this action reveal the value placed on this "commodity"?

2. Using benchmarking as the setting for achievable productivity gains has tended to downplay the other dimensions of best practice: (i) a focus on simultaneous improvement in cost, quality and delivery (ii) closer links to customers, (iii) closer relationships to suppliers, (iv) the effective use of technology for strategic advantage, (v) less hierarchical and less compartmentalised organisations for greater flexibility, and (vi) human-resource policies that promote continuous learning, teamwork, participation and flexibility. Dertouzos (1989) describes these six responses as mutually reinforcing. Best practice cannot be measured in terms of individual items on a list which an organisation can pick and choose from at will.

3. Under the Act, all services in excess of 40 kms with no pick up and drop off in the metropolitan area are not subject to the contract arrangements, but are deregulated in respect of price and quantity controls.

4. Some of the main findings from the descriptive analysis are summarised below (Hensher et al 1991):

Driver characteristics

- the majority of truck drivers (70%) had over 10 years experience driving large trucks on a regular basis
- the average number of annual vehicle kilometres driven by drivers in the sample was around 200,000 kms
- the majority of drivers (75%) were in the age group 25 to 44 years
- 25% of drivers had no previous occupation other than truck driving. For the others a range of occupations was represented, primarily the trades, farmers and general labourers, but also a significant number of managerial and professional positions

Income / payment

- the survey highlighted the low level of income earned by drivers, particularly owner drivers (36% earned less than \$15,000 in 1989-90)
- the majority of employee drivers (79%) were paid directly in relation to the earnings of the truck

Work environment

- drivers believed that they worked an average of 105 hours per week. This included all work activities both on and off the road. Of this, about 65% on average was estimated to be driving time
- a considerable amount of time is spent by drivers in off-road work activities before embarking on the trip. Approximately 3.5 hours were spent on work related activities, such as unloading from a previous trip, loading for the next trip and maintenance of the truck, before beginning to drive
- approximately 35% of all drivers were travelling to a set schedule for the sampled trip
- but 60% of drivers maintained that even if they were not set a schedule by the freight forwarder they were aiming for their own self-imposed time of arrival. This was dictated primarily by concerns to be first in the queue to be unloaded and then to obtain the next load

Behaviour / on-road performance

- drivers from small companies recorded the highest average trip speed for the sampled trip (82.01 kph compared with the average for the sample of 81.06 kph)
- a higher average trip speed for the sampled trip was found on the longer trips
- the younger, less experienced drivers recorded the highest average trip speed on the sampled trip (those driving for less than 5 years had an average speed of 82.14 kph and those aged 17-24 years of age had an average speed of 84.72 kph compared with a sample average of 81.06 kph)
- 46% of drivers admitted to taking stimulant drugs at least on some trips
- 17% of drivers had been involved in a crash in the 2 years preceding the survey. Owner drivers and small company drivers were more likely to have been involved in more crashes than the other types of driver

Truck

- 40% of trucks were less than 3 years old. Owner drivers were more likely to have older trucks than any of the other types of driver
- the high cost of the commitment of financing the truck was highlighted by the low level of deposit of most owner drivers and the short period of the loan. The average loan period was 4.25 years and average monthly repayments were around \$2,500
- repayments on the truck were the second highest component (after fuel) of total expenses for owner drivers
- at the time of the survey (September - October 1990) 13% of drivers were driving trucks which were fitted with a speed limiter. This varied greatly by type of driver with 42% of large company trucks being speed limited
- 19% of drivers were driving trucks which had a tachograph fitted

Driver comments

- the main issues confronting the industry mentioned by drivers were the low level of freight rates relative to their operating costs and the high cost of fuel and taxes
- the most important factors which drivers considered contributed to crashes involving heavy vehicles were the condition of the roads, the behaviour of other vehicle drivers, fatigue on the part of the truck driver and lack of driving skills by the truck driver
- drivers were very supportive of the need for specialised driver training courses to upgrade the skills of truck drivers and to improve their image with the general public. 80% of drivers were in favour of introducing driver training courses

5. Where the private sector becomes involved in the ownership and operation of a tolled facility, the unconstrained social welfare maximisation criterion is subject to commercial considerations which may require the imposition of a financial constraint to ensure that a reasonable return on the investment is achieved within an acceptable time span (Harrison and Mackie 1973, Peaker 1974). This requires that at least average financial cost is covered, including normal profit. The extent to which the return on the investment is met out of user charges or other sources such as tax benefits from private participation in public projects will be influenced by a number of considerations including the toll level, the tax incentive and any deals with government on risk sharing. The central question is that if we chose a privatised mode for new roads will society be better off? For example, in the context of road congestion, will the shift to a profit maximisation base bring us closer to equating price with marginal social cost than would otherwise be the case? If privatisation of roads is to be socially successful, it should be introduced as an element of a broader planning process and not justified simply on the basis of a public funding shortfall.

6. There is a world-wide resurgence of interest in road user charging, setting the price of road use to reflect the marginal social costs of use. This has come about primarily because of recent developments in electronic technology for the setting and collection of user payments (Goodwin et al. 1989). The economic-theoretic debate is centred on pricing strategies which implicitly assume that all the road system is publicly-owned and that the basis of charging should be in accord with economic principles of efficient resource allocation. The debate on whether the prices should reflect short-run or long-run marginal costs of roads was established over twenty years ago (e.g. Walters 1968), with a number of major variations on the theme being offered in the 1970's (e.g. Kolsen et al. 1975), and the eighties (e.g. Small et al. 1989). It is now recognised that road pricing and investment are facets of the same problem, and that the setting of road user charges should account for the optimal level of the investment. Optimal investment involves some scarcity of capacity and durability; pricing a natural economic response to scarcity. Essentially the economic argument is that each user of the existing road system should contribute towards the costs incurred by the road system by their presence. Walters interprets this condition of efficient economic charges (EEC) for the use of the road as covering three cost items:

1. The variable maintenance costs, which are the infrastructure resources used up in making the journey. These costs are variable in the sense of varying with the use of the road for one additional journey. Road user charges such as that imposed in New Zealand base the variable maintenance cost on the pavement damaging power of heavy vehicle axle loads.
2. The congestion costs, which are the delay costs to other vehicles imposed by the vehicle journey.
3. The operating costs of the journey, which are borne by the traveller and are internal to the decision regarding use.

The strict interpretation of an EEC excludes the costs of new investment as part of the costs of the vehicle journey. It is a strictly short-run marginal cost pricing rule. Implicit in the rule is the assumption that the solitary vehicle does not cause the investment, and decisions made regarding an investment are independent of decisions of whether or not to use the existing roads. The implication is that funds for new infrastructure investment should not be derived from users by way of road user charges, but should be derived from other sources. These other sources can include vehicle-related taxes of a non-use nature (e.g. registration fees) and any other taxes derived from vehicle ownership which are arguably not dedicated taxes (e.g. an apportionment of fuel taxes).

A major limitation of the single-vehicle argument for EEC's for road use is the presence of indivisibility in road investment. Roads in practice serve many uses, with joint costs existing amongst the heterogeneous traffic stream. Consequently there is a case for revising the pricing rule in recognition of a possibility of allocating some of these joint costs to specific-types of traffic. The Walters' approach can be extended by recognising that there are some other costs which can be attributed not to the individual vehicle per se but to groups of vehicles distinguished in various ways. Although the overall capacity dimension of road investment is attributable to the entire traffic stream, and in particular automobiles, there are however reasonably well-defined classes of road user who require specialised infrastructure. For example, crawler lanes for heavy vehicles. Such cost items can be

removed from the global set of joint costs and treated as long-run class-specific separable costs. These costs can be avoided in the planning stage by not providing the capacity for the user class for whom they would be incurred. This extension to the Walters' interpretation of an EEC supports the argument that class-specific users impose costs on the road system by their joint use which would be avoided by their joint non-use.

In addition to the capacity dimension of road investment, there is also the durability dimension (or long term serviceability of pavement). If we accept the assumption of Small et.al. (1989) and others that for all practical purposes the structural damage to roads is caused by trucks and buses, not cars, then consideration of the durability dimension in pricing the use of existing roads can be specialised to the class of heavy vehicle.

7. When the Very Fast Train (VFT) proposal was initiated in 1984, only three countries had high-speed rail systems. Today, another 11 countries are operating or planning high-speed rail systems (Budd 1993). The Canadian Royal Commission on National Passenger Transportation (1992) highlights the important role of high-speed rail in Japan, France and Germany which is growing relative to air although declining relative to car-based travel.

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