

Submission to the Productivity Commission
Inquiry into road and rail freight infrastructure pricing
P.G. Laird, University of Wollongong May 2006

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A. Introduction

1. This submission will draw on research conducted at the University of Wollongong and supported, in part, by the CRC in Railway Engineering and Technologies (Rail CRC). However, it does not necessarily reflect the views of either organisation. The submission draws on a Rail CRC Project (re rail transport energy efficiency and sustainability as per Appendix A), various publications of the writer and also earlier submissions to the Federal Government and the Productivity Commission.

2. Given the need to upgrade road and rail infrastructure to meet an expanding freight task and the changing world scene in regards to oil supply and demand, the Commission's current inquiry is timely. It is agreed (Issues paper p 17) that the Commission should focus on economic costs as the relevant measure for pricing, albeit with regard to social and environmental factors.

B. General comments on road pricing

3. A landmark 1954 Privy Council case, on appeal from the High Court, and its consequences severely restricted Government's ability to impose charges on interstate trucking. Based on an now outmoded interpretation of Section 92 of the Constitution, the net effect over decades was to limit interstate highway user charging to maintenance costs only. By way of contrast, rail freight charges have generally included some component for the cost of construction. An article is attached in Appendix B.

As observed in 1956 in a House of Representatives report on gauge standardization re the then new interpretation of Section 92: *"In these circumstances, it is nonsense to speak of fair competition between road and rail as regards to interstate transport. A great part of railways costs relates to the construction and maintenance of the permanent way, whereas the heavy interstate road trailer not only gets its road free, but destroys in and puts the burden of its repair upon the rest of the community."*

Parts of this situation regarding funding of mainline freight railways and 'highway subsidisation' of line haul heavy trucking has persisted over the years to present times.

4. In Australia, since the 1990s, road pricing for the most part has been going backwards at a national level (for example, diesel rebates for some heavy trucks in 2000 and freezing of fuel excise indexation in 2001) and in at least two states (NSW with toll rebates, and Queensland's failure in June 2000 to end its Fuel Subsidy Scheme). Moreover, the pragmatic recommendations of the Fuel Taxation Inquiry were set aside in the 2002 Federal Budget whilst all Transport Ministers in March 2006 voted to reject a benign third determination by the National Transport Commission of road user charges for heavy vehicle.

5. The difficulties of getting a movement from 'business as usual' or 'more of the same' to a more sustainable approach should not be underestimated. Over the years, many government inquiries have been held that touch on road pricing of heavy vehicles. Alist of these inquiries

and related reports is given in Appendix C. Some of these inquiries and reports complement the selected studies noted by the Commission in Box 2 of its issues paper for this inquiry.

Appendix D also notes some comment from various Non-Government organizations re the need for a new approach. Although some reform has taken place, the fact remains that as recognized by the Senate Rural and Regional Affairs and Transport Legislation Committee in its AusLink 2005 report and other reports, further reform is needed. This Senate Committee report on AusLink noted, inter alia:

- a. the need for efficient charges for use of infrastructure, including for heavy trucks *"...that compete directly with rail [and] affirms the need to confirm working towards efficient pricing of access to infrastructure..."* (p28).
- b. public transport issues *"are still on the table"*. Moreover (p30) *"there may be a case for Commonwealth assistance to major projects such as rail extensions which are unlikely to happen, or unlikely to happen soon enough, without the involvement of the bigger budget which the Commonwealth commands."*
- c. support for a forum such as a National Transport Advisory Council (NTAC) for *"co-ordinating policy"* in *"investment policies modal integration and access pricing"*.
- d. support for more research and better data, including protocols in the case of rail to allow *"information gathering of industry-wide importance"*.

6. It is also important to ensure that major cities do not get so congested to the point that urban road freight movements become unduly constrained. This issue is of increasing importance. As argued by the Industry Commission (IC), in its 1994 report on Urban Transport (see, for example, Laird, Newman et al *Back on Track-rethinking transport policy in Australia and New Zealand*, UNSW Press 2001, pp 96-98), the way people then moved themselves around Australia's larger cities was in need of reform. Very briefly, the IC in 1994 gave a good appreciation of major problems in major cities and gave a carefully considered way of moving forward. The IC also recognised the complexity of the problem and that the important thing **was to start the reform process**.

7. Twelve years after the IC report, the need for reform is even greater in order to reduce high economic, environmental and social costs imposed by excessive automotive dependence. The Productivity Commission report in 2005 on its inquiry into energy efficiency had sole recommendation on transport, as follows: *Australian governments should investigate the feasibility of introducing congestion pricing where it is likely to improve the economic efficiency of road use (including greater energy efficiency). It may be appropriate for such a study to be incorporated in a wider examination of efficient road pricing or in a review of passenger transport reform as a whole.*

8. Between 1994 and 2006, passenger vehicle kilometres in our major cities have significantly increased (for example, in the order of 25 per cent in Sydney from 1991 to 2001 during which time the population increased by about 10 per cent; very recently, the current NSW Minister for Roads has noted that the number of cars in Sydney has increased by about one million since 1995). Moreover, major Australian cities (with the notable exception of Perth) have seen very modest growth in either urban public transport passenger numbers or the extension of their urban rail systems.

9. The reform process was not assisted by the move to reduce and then freeze indexation of fuel excise in early 2001. This impacted on federal finances, with estimates cited in the 2001 Budget Papers (No 2, p 40) as follows:

2001-02	\$150m
2002-03	\$425m
2003-04	\$785m
2004-05	\$1135m

The Commission may care to gain updated estimates, and also an estimate of foregone revenue for 2005-06. This is money that could have gone to improving land transport infrastructure.

10. The cost of the diesel fuel rebate granted since June 2000 would also be of interest. This would include the cost of the rebate each year for rigid heavy trucks, articulated trucks, and for rail.

C. Land freight transport

11. Land freight transport is an increasingly important topic. The growing rail and road freight tasks in Australia are shown in Table 1.

TABLE 1 AUSTRALIAN LAND FREIGHT TASKS (*and tonnages*)

	Billion tonne kilometres				<i>(million tonnes)</i>
	1994-95	1998-99	2002-03	2003-04	2003-04
<i>Rail</i>					
'Govt.' rail *	62	67	41±	43±	(162)
Non-Govt. **	48	60±	117±	125±	(432)
Total	110	127 ±	158	168	(594)
Coal	28	33±	44	46	(239)
Iron Ore	47	50±	66	72	(220)
Other Intrastate	18	24±	21	23	(119)
Interstate	17	20±	26	27	(16)
<i>Road</i>					
B-Doubles	9	19	35	38.2	-
Road trains	15	20	19	25.2	-
Interstate	26	30 ±	37 ±	?	?
Articulated trucks	89	99	116	121.3	769
Total road	119	127	153	157.7	1696

* Includes former State and Federal Government operated systems in 1994-95, Queensland Rail (QR) only in 2002- 03 and 2003-04

** Excludes Government operated systems, all except QR in 2002-03 and 2003-04

Note: coal and iron ore includes relatively small domestic movements, also data caveats

References include: For rail, Steering Committee on National Performance Monitoring (1996), Bureau of Transport and Regional Economics (BTRE - 1999), various Annual Reports, Australasian Railway Association (ARA, 2005) and some estimates (indicated by ±).

For road. ABS (2004) Note that total road includes light commercial vehicles (6.6 btkm in 2003-04) and rigid trucks (27.8 btkm in 2003-04).

12. Under National Competition Policy, much attention has been given to rail - rail competition for freight, but until recently, little attention has been given to competitive neutrality affecting land freight.

It is of note re rail-road competition for land freight, that at the ATC meeting on 14 November 1997 it was agreed that competitive neutrality should be investigated '*without delay*'. A BTRE report did follow in 1999; however the Commission's recommendation in 1999 from its inquiry into progress in rail reform for an inquiry into road provision, funding and pricing was rejected. The National Competition Council (NCC) has not seen competitive neutrality as part of their function although the NCC 2000 *Annual Report* considered they could take more of a role in rail reform.

In February 2000, the Senate Select Committee examining National Competition Policy recommended, inter alia, that '*...the NCC address the matter of road-rail competition for freight as a matter of urgency.*' However, the federal government in August 2000 rejected this recommendation on the grounds that the issue was a matter for Government.

13. Work on the South Sydney Freight Bypass along with other basic track work recommended in a 2001 Australian Rail Track Corporation (ARTC) National Track Audit is only now about to commence under a \$1.8 billion investment over 2004-2009 for tracks used by freight trains. However, much of this work will be funded by loans as opposed to grants.

There is a need for advanced planning for further track upgrades. This includes track straightening, and in places, heavier rails and/or increased clearances. Sections J to M of this submission give more attention to this issue.

Intermodal freight terminals also need attention. In addition, there needs to be harmonisation between the states regarding access arrangements and rail safety regulation. In addition, a good case can be made that the rail freight industry in Australia is over-regulated whilst the road freight industry is under-regulated.

14. Some rail freight has benefited from some Government subsidies as well as imposing external costs. It is hoped that the present inquiry will be able to present updated estimates. From a 2001 paper of this writer "Land freight external costs in Queensland" prepared for Queensland Transport (QT- and published in 2003 by QT as one of three rail studies), rail systems in Australia had an annual freight deficit of some \$525 million in 1989-90 (Industry Commission, 1991). Of this amount, over \$300m was due to losses in interstate rail freight. By the mid 1990s, the aggregate rail freight loss had been reduced to the order of \$200m (Bureau of Industry Economics, 1995). In 1998-99, Queensland Rail, Freight Corp and Westrail showed combined freight operating profits of \$224m. This profit far outweighed ongoing National Rail losses that year (reduced from over \$300m a year to a small profit in 2000-01), and, Community Service Obligation (CSO) payments towards the haulage of some intrastate rail freight.

In NSW, CSO rail freight payments to FreightCorp were stated as \$80m in 1998-99 and \$76.5m in 1999-00. It is understood that a smaller amount was paid to Queensland Rail for rail freight CSO's as part of CSO's for Metropolitan and Regional Services, and that coal traffic was not in receipt of any CSO's. In addition, in 1999-00, about \$263m was paid for CSO's to the Track Infrastructure Services within Queensland Rail. The NSW allocation to the Rail Access Corporation for track CSO's was stated at \$167.2m for 1999-00 to "*...cover*

the cost of maintaining the non-commercial lines operated by the Corporation." It is understood that some of the \$167.2m would have been for interstate mainlines, and, that the Hunter Valley coal lines are regarded as commercial lines.

The amount of subsidy to certain general rail freight operations is not known, and the increasing interest in competitive neutrality (e.g. a formal Competitive Neutrality complaint lodged c2001 by Capricorn Capital regarding National Rail) does not encourage government authorities to be specific on such subsidies. For the Queensland average rail freight CSO's in 1999-00, it is only possible to give a rough guide as follows; the non-coal freight task was 6882 million tonne km (tkm), and the freight CSO was below \$76.5m, so the average rail freight CSO's were below 1.1 cents per net tkm in 1999-00. It would be expected that most coal rail freight is not in receipt of any CSO's, and, other non-coal [regional] rail freight is in receipt of CSO's higher than 1 cent per net tkm.

D. Road pricing of heavy vehicles

15. The issue of road pricing for heavy trucks in Australia has long been contentious with inquiries going back to the 1970s (eg Bland, Sir Henry's 1972 Report of the Board of Inquiry into the Victorian Land Transport System and a Commission of Enquiry into the New South Wales Road Freight Industry (McDonell, 1980)). During the 1980s, detailed work was undertaken by the Inter-State Commission.

The Victorian inquiry was not surprised in the early 1970s to find an appreciable subsidy to rail freight. However, it was a surprise to many that the inquiry found that the hidden subsidies to road freight were even higher.

In regards to improved cost recovery from rail and road freight transport, it appears that limited progress was made for each mode during the 1980s. Further progress was made during the 1990s and the current decade to date in improving cost recovery from rail freight. However, for the past 16 years (with the exception of Federal parliament in 1991 setting an annual registration fee for B-Doubles of about \$11,000 under FIRS) road cost recovery from heavy trucks has been going backwards.

16. The above noted finding of the Victorian inquiry that hidden subsidies to road freight are higher than subsidies to rail freight was also made in the New Zealand Surface Transport Costs and Charges study released in 2005.

17. It is of note that a BTRE (1988 - actually BTCE) study found during 1985-86, articulated truck operations had a resultant under-recovery of road system costs of \$1283 million. Using different methodology to the BTRE, a hidden subsidy was calculated (Laird, Newman et al, 2001, see Appendix E) of \$1235m in 1997-98, and, the average hidden subsidy for road freight moved by articulated trucks was 1.25 cents per net tonne km. For haulage on lightly constructed regional roads, the hidden subsidy is higher, with an earlier estimate of the NSW Roads and Traffic Authority noted by the Industry Commission (1991, Rail Transport, p116 in the context of bulk haulage on local roads) as 3 cents per net tkm.

The BTRE (1999 report re competitive neutrality page xi) noted *"Under the current road user charging system, trucks overall are undercharged for their use of the road system. Moreover, larger more heavily laden vehicles and those travelling larger distances are*

charged the least (per tonne kilometre) while smaller, less heavily laden vehicles and those travelling shorter distances cross-subsidise them." The BTRE (1999 loc.cit, p 58) suggested that *"Mass-distance based road use charges offer greater scope to reflect the avoidable cost of heavy vehicle road use."*

18. The so called "Fourth Power Law" and its associated Equivalent Standard Axle Loadings or ESA's goes to many overseas and Australian studies basing separable pavement costing on the concepts of Equivalent Standard Axle Loadings (ESAs); where one ESA measures the effect on a road pavement of twin-tyred axle loaded to 8.2 tonnes (or reference load), with the effect of load variation being related to the fourth power of the axle load.

The use of ESA kilometres for separable pavement cost allocation goes back to at least the 1970s by State road authorities, and Austroads (formerly NAASRA or National Association of Australian State Road Authorities). They have been used ever since including by the Commission of Enquiry into the New South Wales Road Freight Industry (McDonell, 1980), the Inter-State Commission (ISC) during the 1980s, and the National Road Transport Commission in its first two determinations of road user charges for heavy vehicles. They were also used by the National Transport Commission (NTC) in the third determination of road user charges for heavy vehicles.

19. The use of ESA kms has been subject to some question over the years. An Australian Road Research Board Internal Report by Kinder and Lay (1988) called Review of the Fourth Power Law, reviewed this law, and related results to date from Australian tests using an Accelerated Loading Facility. The general conclusion was that the fourth power law represents the best available single tool for estimating pavement wear due to traffic but it must be used with care and within its limitations.

20. The ISC (1990, p84) used 6.104 cents per ESA km for arterial roads in 1989-90, and using NSW Roads and Traffic Authority (RTA) road cost indices (1996 and 2005 RTA Annual Reports), a unit cost of 9.72 per ESA km would result. This is appreciably higher than values cited by the NTC.

A February 2004 ARRB Transport Research Report No 361 "Estimates of unit road wear cost" by B. Vuong and C. Mathias after detailed analysis gave two estimates using different approaches of unit road wear unit rates of 7.49 and 8.85 cents per ESA - km. The average of these two relatively close estimates is 8.17 cents per ESA-km. By use of NSW RTA road cost indices (2005 RTA Annual Report over the last two years of 107.1), a value of 8.75 cents per ESA -km results.

Some earlier studies have differentiated between the cost per ESA km for an arterial road and the higher cost per ESA km for rural roads of light construction.

21. The National Transport Commission in its third determination found road system costs due to articulated trucks amounting to \$1039m for 2005-06 with \$469m for rigid trucks (Third Heavy Vehicle Road Pricing Determination (THVRPD Draft Regulatory Impact Statement (DRIS), Oct 2005, p20).

Appendix E outlines the methodology used by the Commission of Enquiry into the NSW Road Freight Industry (McDonell, 1980, Vol. IV, Appendix 3.1). Using this methodology with the above recent and robust estimate of 8.75 cents per ESA km for arterial

roads, and NTC data gives appreciably higher estimates of road system costs due to heavy trucks. These include approximately \$2572 million for all articulated trucks, and \$991m for all rigid trucks, in 2005-06. Further detail is given in Table 2.

Under the current NTC scheme, cost recovery is in two parts. First are the annual registration charges estimated from NTC THVRPD data (Tables 46 Technical Report for numbers of trucks and Table 2 DRIS for charges) as a total of \$300m for articulated trucks, and \$154m for all rigid trucks. Secondly a fuel charge at 20 cents per litre and using NTC estimates of fuel use (THVRPD Tables 46 Technical Report) the fuel charge totals \$620m for articulated trucks, and \$378m for all rigid trucks. This gives cost recovery of \$998m from all articulated trucks and \$454m from rigid trucks, with further information given in Table 2. The resulting under-recovery of road system costs is seen to be about \$1516m from all articulated trucks, and \$424m from rigid trucks.

These estimates present a much different picture to NTC estimates. As per Appendix E, it is not claimed that the modified McDonell methodology is 'correct' (indeed, it could now usefully be updated). However, the alternative estimates do give support for a total review of the methodology currently used by the NTC. It is of note that the McDonell, former ISC, NRTC and NTC methodologies each make some use of each of ESA kms, Average gross mass (AGM) kms and passenger car equivalent (PCU) kilometres. A new methodology could well use each of these parameters, but in a much improved manner than used by the NTC.

For 9 or more axle B Doubles, the estimated under - recovery of road system costs using the McDonell methodology etc is \$400m. From the NTC THVRPD (Technical Report, Table 45, p 95) there were 5976 such vehicles in 2003, given an average subsidy of about \$67,000 per year. This compares with the NTC 2005 THVRPD (DRIS page 33 estimate) that the subsidy in the second determination of charges for heavy vehicles " ...amounted to \$8400 per 9-axle B Double." which also noted that "The proposed subsidy in the Third Determination is still significant, but smaller, at \$5400."

From the NTC THVRPD (Technical Report, Table 45, 95) is of note that the number of the 9 or more axle B Doubles significantly increased from 707 in 1997 to 5976 in 2003. It appears that the appreciable subsidies are encouraging the rapid growth in numbers of these trucks, quite possibly into inappropriate applications (eg using narrow city roads or lightly constructed rural roads).

TABLE 2 ATTRIBUTED 2005-06 ROAD SYSTEM COSTS, CHARGES ETC (and freight tasks with average unit subsidies)

	Costs	Charges	Deficit	2003-04	cents per ntkm*
	\$m	\$m	\$m	btkm	
Six axle semitrailers	1111	469	642		
Nine or more axle B-Doubles	568	168	400		
All B-Doubles	692	205	487	38.2	1.19
Road trains	391	119	272	25.2	1.08
All articulated trucks	2436	920	1516	121.3	1.17
Rigid trucks	956	532	424	27.8	1.42

References: Costs as per Appendix E, charges based on a fuel charge of 20 cents per litre and annual charges per vehicle (DRIS, and THVRPD data (Technical Report) freight tasks ABS SMVU 2004 with averages using freight tasks increased by an assumed 7 per cent to 2005-06.

22. New Zealand has successfully used mass-distance charges for heavy trucks since 1978. If the operators of semi-trailers hauling heavy loads long distances each year in Australia paid New Zealand charges, they would pay about three times the current NRTC charges. For B-Doubles, the ratio is about four.

This is not to suggest that Australian truck drivers should be immediately paying New Zealand level of charges or moved to mass distance pricing immediately throughout all of Australia (or even the populous zone). It is simply that the appropriate level and structure of charges lies somewhere between the current Australian system and the New Zealand system. In this regard, it is of note that Switzerland and Austria have had truck kilometre charges for some years now, and that they were introduced in Germany at the start of 2005.

23. As recognised by many earlier definitive reports by Government, fuel taxation is of limited effect to achieve equitable charging. So also are annual fixed charges. Hence the desirability of "*variable mass distance charges*" that were provided for in a 1991 intergovernmental agreement of heavy vehicle road pricing principles. However, this option was set aside by the NRTC in the first two determinations and the NTC in the third determination.

It is of concern that the NTC third determination proposals did not provide for even the most basic mass differentiation and/or distance differentiation in the setting of charges. The former FIRS had two levels of annual registration charges for six axle articulated trucks, a lower one for standard Gross Vehicle Mass (GVM) of 38 tonnes, and a higher one to allow for a legal GVM of 42.5 tonnes. It would be more equitable to go back to such a scheme. In the same way, there should be consideration given to distance differentiation in the setting of charges. It would be cost-effective and fraud proof systems to offer rebates to low kilometre vehicles and extend Safe-T-Cam nationally to assist in compliance. For those truck operators paying full fees (as opposed to low kilometre fees), it would be possible to offer quarterly or even monthly charges to make it easier to meet payments.

E. External costs

24. Some welcome attention was given by government to road and rail freight external costs by the Australian Transport Council in their 2004 National Guidelines for Transport System Management (2004). This writer has briefly examined land freight externalities (Laird, Revised Land Freight External Costs In Australia, Australasian Transport Research Forum 2005 with further information is given in Appendix F). Further work is required in the area of land freight external costs. This includes the cost of rail congestion, either when freight trains are held back or subject to a curfew, or, passenger trains are delayed by freight trains.

25. The Bureau of Transport and Regional Economics (BTRE) in a 2005 Working paper *Health Impacts of transport emissions in Australia: Economic costs* gives a mid-range estimate of the annual health related costs from air pollution from motor vehicles in Australia's capital cities at \$2.33 billion for the year 2000. This comprises \$1596 million from the estimated cost of mortality (premature death as a result of air pollution), and \$735 million for morbidity (quality of life and/or productive capacity of victims impaired or reduced as a result of air pollution; and, this estimate is appreciably lower than a 2003 BTRE estimate). Following a European approach (Kunzli N, Kaiser R and Medina S, Public health impact of outdoor and traffic related air pollution: a European assessment, *Lancet* Vol 356, Sept 2 2000)

the BTRE effectively attributes air pollution costs to PM10 (particulate matter of size less than 10 microns) levels.

26. In a further 2003 BTRE paper (*Urban pollutant emissions from motor vehicles: Australian trends to 2020*) estimates are given of both PM10 emissions in Australia's capital cities and the kilometres driven for various types of motor vehicles. Analysis of this data shows (Laird, 2005 loc.cit.), in part, that the average health cost of air pollution from operations of cars (and other small passenger vehicles) in Australia's capital cities is 1.3 cents per vehicle kilometre. The average health unit cost for within Australia's mainland State capital cities range from 0.7 cents per vehicle kilometre (Perth) to 1.6 cents per vehicle kilometre (Sydney).

To recover an average cost of 1.3 cents per car kilometre in capital cities through fuel taxes would require, assuming an average fuel use of 11.4 litres per 100 km (ABS SMVU 2001 estimate), a fuel levy of about 12 cents per litre.

27. From Appendix F, using the above BTRE data, the average health cost of the operation of articulated trucks in capital cities is about 0.65 cents per net tonne km. This is conservative when compared with the Australian Transport Council National Guidelines for Transport System Management (2004 Volume 2 Appendix 2) Default Externality Values that include air pollution at 0.87 cents per net tonne km in urban areas. The lower estimate is derived from estimates from the health costs from air pollution on a PM10 basis due to the operation of articulated trucks in capital cities of \$146.6 million (Laird, ATRF, 2005, loc.cit.) and in for air pollution in non-urban areas, a cost of \$113m, a total of \$260m. From the use of about 3000 million litres of diesel, the overall average health costs from the pollution of operation of articulated trucks across Australia (not just urban areas) would require a diesel fuel levy of nearly **9 cents per litre**.

28. Assuming unit external costs of accident involvement, air pollution, noise pollution, greenhouse gases (\$A25 per tonne) of 0.98 cents per net tonne km in non-urban areas and 1.65 cents per ntkm for haulage in urban areas (Laird, 2005) with an articulated truck freight task of 121 btkm (Table 3) including about 25 btkm in urban areas (from ABS (2004) data), the social and environmental costs for 2003-04 were about \$1350m. Under present rebates for diesel use, this amount is not being recovered.

Rail freight operations generate external costs (accidents, air pollution, noise and greenhouse gases with estimates of unit costs of 0.17 cents per net tonne km (ntkm) plus an additional 0.26 cents per ntkm for haulage in urban areas (Laird 2005). With a non iron - ore rail task of 96 btkm in 2003-04 (Table 3) and assuming say 10 btkm of this freight task is in urban areas, an external cost of about \$190m results. Again, in the absence of any diesel fuel excise being levied on rail, these external costs are not being recovered.

29. Further work is required in the area of land freight external costs. However, this should not stop government now incorporating into road user pricing and rail pricing conservative values for external land freight costs, so that the operators of diesel powered road vehicles and trains pay a basic externalities charge. This charge could be later adjusted following refinement of the initial estimates. It is also recommended that the additional revenue generated be applied to long overdue land transport infrastructure upgrades.

It is submitted that Government should support a move to a “polluter pays” principle, plus ensure internalisation of all current external costs for road and rail freight. It is submitted it would be desirable to also put some cost for greenhouse gas emissions.

30. The costs to Government and the community of effectively encouraging both line haul and some bulk freight to road transport (via substandard national track and 'highway subsidization') are high. These costs include extra fuel use and the impacts affect not only quality of life, but also impose a monetary cost that could be considerably reduced by comparatively modest investment in rail track and improved road pricing.

F. Energy questions

31. The needs to improve fuel efficiency of both road and rail freight, and where appropriate, shift freight from road to more energy efficient modes, are increasingly important.

A good approach to energy use in transport was given 27 years ago in a government Australian Transport Advisory Council 1979 publication *Transport and Energy Overview*. This report was prepared, following the second major world oil price shock during the late 1970s. Although the data used in this report is now dated, the approach is commended, as are the conclusions. In part: *"... rail is relatively energy efficient compared to road for long distance freight ... (and) ... does have fuel substitute options, such as coal-oil slurries or electrification As far as possible pricing and cost recovery policies should be consistent across the modes so as to encourage use of modes appropriate to particular tasks. Appropriateness may be defined broadly as minimising the total social cost of transport services, including externalities.*

32. A recent NTC publication 'Twice the task' gives a somewhat business as usual approach to a growing freight task, but is very light on both road pricing for heavy trucks and mainline track straightening and strengthening. This is despite track straightening proposals being noted in the 2001 ARTC Track Audit, the 2004 Federal budget speech, the 2004 AusLink White Paper, and the 2004 AusLink National Guidelines for Transport System Management in Australia (AusLink Plus proposals as noted on page 248 of Vol 3)

A speech given by NTC Acting Chairman on 14 February 2006 notes that "only 10-20 % of the road freight task is contestable." Accepting that only 10 per cent of the articulated truck task of 121 billion tonne km moved to road would reduce diesel use by trucks, at 2004 fuel use (ABS SMVU of 36.7 tonne km per litre), by about 330 million litres (per year). The diesel needed by rail would be about 110 million litres. Even allowing for some road pick up and delivery, this would result in a net saving of over 200 million litres per year. There would also be an appreciable reduction in external costs.

If 20 per cent of the articulated truck task was to move to rail, then the new savings would be over 400 million litres per year. Elsewhere (Productivity Commission, energy efficiency inquiry, submissions, and report page 265) this writer has estimated that at least 8 per cent of the 2002-03 road freight task could conditionally be transferred to rail, however, road could win some traffics currently moved by rail if rail was not upgraded etc.

G. Substandard highways and rail track

33. Many organizations and individuals have argued that Australia's land freight infrastructure needs improving, and that more funds should be allocated to this, with some preference for user pays. This writer and others (Kilsby D, Laird P and Bowers D on behalf of the National Committee on Transport of Engineers Australia in a 2004 ATRF paper Australian Transport Infrastructure: Fit For Purpose?) suggests, inter alia,

"... that there is a large backlog of necessary works to bring Australia's land transport infrastructure up to scratch. These capital works are broadly identified. The problems are very different in metropolitan and regional areas, and these are distinguished. The paper then argues for a better pricing framework than we currently have, and for interim government intervention in the modal choice for port-related freight before an improved pricing framework can be achieved. The paper concludes with a number of policy recommendations, which if implemented together would eventually allow Australia to claim that its land transport infrastructure was truly "fit for purpose" for present and future freight and passenger tasks."

34. Australia's rail track supporting rail freight in South Eastern Australia, with the exception of Hunter Valley coal lines, ranges from basically substandard to adequate. This statement is made for the following reasons.

- a) The interstate standard gauge mainlines compare poorly on speed-weight terms with the Canadian/US Class I railroads that for the most part are capable of moving 286,000 lb wagons at 60 miles per hour with double stacked container capability. That is nearly 32 Tonnes Axle Load (TAL) moving at 100 km per hour. Compare this with the existing interstate standard gauge track after upgrading by the Australian Rail Track Corporation under the current AusLink program. This track will still be limited to 23 tonne axle load limits for wagons moving no faster than 80 km per hour, or 21 tonne axle load limits for wagons moving no faster than 115 km per hour. East of Parkes and Adelaide, it will still be only single stacked container capability.
- b) As recognised by many reports, including the Engineers Australia Infrastructure Report Card, much of the track linking Australia's three largest cities has steam age alignment and is in need of straightening.
- c) Growing rail congestion affecting parts of the Sydney, Melbourne and Brisbane networks. Improved separation of freight and passenger trains is also needed in Adelaide.
- d) Failure, in part due to flawed rail freight privatisation procedures, to complete residual gauge standardisation of broad gauge freight lines in Victoria and South Australia.
- e) Allowing grain lines in New South Wales, Victoria and South Australia and other states to degenerate, and remain with low axle loads (eg 19 TAL in NSW).
- f) Failure over many years to invest in the Tasmanian track (now being addressed).

35. More attention shall be given to interstate mainlines in Sections J, K, L and M. In Victoria, as with Tasmania and South Australia there is a case to follow the recently developed New Zealand model and for the relevant State Government to take back the intrastate track.

In NSW, the effectiveness of rapid loading grain silos at West Wyalong and The Rock continues to be constrained by their branch lines being restricted to 19 TAL. In the case of the silo at The Rock, this is despite the main line capable of handling 25 TAL being no more than two kilometres away. It is odd that at the time of installation about 1999 neither the owner of the new silo or the Rail Access Corporation, or Freight Corp sought to make a small marginal investment to lay heavier rail etc for two kilometres. It is also puzzling why this situation has persisted for so long, where now between them, ABA, the NSW Government and/or ARTC, and Pacific National have declined to make the investment. A further challenge is extending 23 TAL capability to Boree Creek. It appears that construction of a triangle and loop on heavier rail to give direct access to Melbourne Port (where most of the wheat from this silo goes) could be a good investment.

36. The issue of limited weight for wagon loadings also affects the export of wine from the NSW Riverina region via Melbourne. Currently, container trains with wine currently go via Leeton to Junee and Melbourne, but the line to Junee is restricted to 19 TAL. It is understood that in this case, a modest increase to 21 TAL would give good benefits. The necessary investment in rail track would be very small when compared to the large private investment of Casella Estate Wines to build a large new state of the art winery and bottling plant with many millions bottles a year of [Yellow-tail] wine being exported to the United States.

37. In the short term, there is a good case for rehabilitation of NSW branch lines. The alternative is to see more and more freight move by B-Doubles on lightly constructed roads. The fact that rail operations are no longer vertically integrated means that government may need to work harder to seek contributions from beneficiaries as well as provide more public funds to facilitate track upgrades that will enhance Australia's export potential.

H. Federal spending on road and rail

38. In the 25 financial years from 1974 to 1999, in 1999 values, the Federal Government allocated an estimated \$17.9 billion (bn) to the National Highway System, with \$42.8 bn on all roads (Laird, Newman et al 2001, Appendix C); also a net allocation (excluding equity in National Rail) of \$1.2 bn was made to rail capital works, and about \$1.5 bn to urban public transport. Federal allocations in the five years to 2004, in 2004 values (being 1.1526 times 1999 values), were about \$4.0 bn to the National Highway System, \$8.8 bn to all roads, \$0.9 bn to rail capital works, and virtually nothing to urban public transport (Laird, Adorni-Braccesi and Collett) Australian land transport - is it sustainable ? Towards Sustainable Land Transport Conference November 2004 Wellington New Zealand).

Accordingly, in the 30 financial years from 1974 to 2004, in 2004 values, the Federal Government allocated an estimated \$24.6 bn to the National Highway System with \$58.0 bn on all roads, \$2.2 bn to rail capital works, and about \$1.8 bn to urban public transport.

39. Recently revised AusLink funding of some \$15 billion in five financial years from 2004 to 2009 allocates more funds to road and rail, but none specifically to urban public transport. Although the percentage of rail funds under AusLink has increased from the 4 per cent in the preceding 30 years, there is considerable scope for further improvement.

I. Federal spending on the Hume Highway

40. Further analysis shows that in the 25 years from 1974 to 1999, in 1999 values, the Federal Government allocated \$3.66 billion (bn) to the Hume Highway System (Laird, Newman et al 2001, p199). Later information suggests that this was understated for the final five years by \$0.2 bn. The total is \$4.45 bn in 2004 values. From information provided by DOTARS, the Hume Highway allocations for construction each year from 1999-00 to 2003-04, and indexation, the total with indexation was \$385m. From information provided by the NSW Roads and Traffic Authority, and Vic Roads, the total maintenance outlay in these five years on the Hume Highway was \$141m with indexation (an average of \$28m per annum). The total over these five years was \$526m in 2004 values. Accordingly, the total outlay by the Federal Government on the Hume Highway in the 30 years from 1974 to 2004, in 2004 values is an estimated \$5 billion (4.98 bn).

41. To this would be added most, if not all, of the \$518m for a 17 km major upgrade at Albury -Wodonga due for completion in mid 2007, plus other 2006 budget initiatives. As noted then, the Federal commitment is now \$1398m. The aim is now to have all but 20 km upgraded to dual carriageway standard by 2009, with the balance completed by 2012.

42. In the early 1970s, the Hume Highway was a basic two-lane sealed road. The Commonwealth Bureau of Roads in 1975 noted the majority of the Hume Highway between Goulburn and Albury is deficient when compared with the standard for a two-lane rural highway with a design speed of 110 kph. Deficiencies included those related to both vertical and horizontal alignments, pavement and formation width, pavement performance, and periods of closure due to flood.

The NRMA in 1975 also gave details of the poor condition of the Hume Highway in the 1970s - including grades, alignment (tight curves), narrow shoulders and basic bridges, along with high road crash fatalities and injury numbers. In 1971, no less than 101 km of the then total length of the Hume Highway of 878 km was then in urban areas.

43. The net result of the massive reconstruction to date of the Hume Highway under full Federal funding has been a reduction in overall length by some 32 kilometres, along with a major improvement in grades, alignment and capacity. Plus numerous town bypasses.

44. The combination of a vastly upgraded Hume Highway with low road pricing for heavy trucks coupled with freight trains restricted to a substandard railway on steam age alignment has ensured that line haul road freight between Sydney and Melbourne has grown to about 10 million tonnes per annum.

However, the over-reliance on road freight, with over 3000 intercity trucks on the Hume Highway some nights, comes with significant external costs. This includes loss of life. From data supplied by the NSW Roads and Traffic Authority and Vic Roads, during the 4 years to 31 December 2003 articulated trucks were involved in 38 fatalities (35 per cent) out of a total of 108 fatalities in road accidents on the Hume Highway in both states.

45. External costs of road and rail freight in both urban and non-urban areas were addressed in the ARTC Track Audit. These estimates were revised (see Appendix F) as 2000

costs of 2.75 cents per ntkm for road haulage in urban areas, 1.98 for road haulage in non - urban areas, 0.43 for rail haulage in urban areas, and 0.17 for rail haulage in non - urban areas. These costs, adjusted to 2005 values (at 3 per cent pa) suggest that, for Sydney - Melbourne intercity freight, with a road distance of 840 km including a 50 km urban haul, the external cost for each tonne of road hauled intercity freight is about \$19.80. This is against \$1.70 per tonne for rail line haul (940 km 840 km including a 50 km urban haul) and \$1.40 per tonne for road pick up and delivery (some \$16-70 a tonne less than road line haul).

With an estimated 9.8 million tonnes of line haul Sydney - Melbourne intercity freight on the Hume Highway during 2005, the estimated external costs are approximately \$196 million.

J. The Sydney - Melbourne railway

46. By way of contrast to the well endowed Hume Highway, the Sydney - Melbourne railway retains for much of its length a 'steam age' alignment. In the 485 km of track between Campbelltown and Junee, about 27 per cent (141 km) of this track has tight radius curvature where trains have to slow down and twist and turn to the left or right the equivalent of about 61 circles.

Most of this track was laid down during the 1910s during duplication with deviations. Moreover, as demonstrated by computer simulation of freight trains via various University of Wollongong projects, modern superfreighters would save both time and fuel (about 12 per cent between Goulburn and Yass) if they could revert to the track alignment laid down by Whitton during the 1870s.

47. The present work being undertaken by the ARTC by 2009 with some, but not full AusLink assistance will reduce Sydney - Melbourne freight train transit times from about 14 hours to about 11 hours, and improve reliability. Rail's market share of line haul freight is expected to pick up from its present low 11 per cent or so. However, the track will still retain its steam age alignment with its severe speed weight penalties.

The cost for this rail corridor upgrade is noted by the ARTC as \$240m, plus \$192m for the Southern Sydney Freight Line. However, along with the ARTC having to raise much of these funds for basic upgrading from its own limited resources, the NSW and Victorian Governments are still making loan repayments for construction of an Albury - Melbourne standard gauge line that was completed in 1962.

48. Using BTRE forecasts (Freight between Australian Cities 1972 to 2001, Info sheet 22, 2003) by 2015, Sydney - Melbourne intercity freight will have grown to about 15 mt. Thus an ARTC projected 19 per cent modal share for rail by 2015 will lead to an increase of 2 mtpa of intercity line haul road freight on the Hume Highway. Moreover, it is probable that by 2012 with completion of the Albury Bypass and construction of dual carriageways for the remainder of the Hume Highway, B-Triple trucks will be running between Sydney and Melbourne.

49. For rail freight to be competitive on the Sydney - Melbourne corridor with trucks, some track straightening will be required. However, the failure to date to even start advanced planning on just one Main South rail deviation stands in contrast to the massive Hume Highway upgrades that have taken place to date, and, the planned future road deviations.

50. Between Menangle and Junee in NSW construction of three new sections of track and two rail deviations amounting to about 200 kilometres of new track at five locations, some 260 kilometres of track with substandard alignment would be removed. Not only would this reduce point to point distance by 60 kilometres, but freight train transit times would reduce by nearly two hours, with substantial reductions in fuel and other trains costs, plus lower track maintenance costs. This would allow rail to more effectively compete with line haul trucking for intercity freight.

51. With a 9 hour transit time and road user charges at recent New Zealand levels, economic modeling for an earlier ARC/RIC project showed, with qualifications, rail gaining a 50 per cent modal share of Sydney-Melbourne freight would be possible (Laird P and Michell M (2004) Interstate rail track upgrading options to 2014 ATRF, Adelaide).

Currently, Sydney-Melbourne line haul road freight uses an estimated 19 litres of diesel per tonne of freight as opposed to about 7.5 litres for line haul rail freight. This would reduce to 6.5 litres if the 200 km of new track was built. The difference in fuel use, allowing for road pick up and delivery when rail line haul is used if rail was now winning 50 per cent of freight as opposed to 10 per cent is about 50 million litres of diesel on 2005 tonnages.

K. Rail deviations and gauge standardisation

52. In general, the benefits of replacing sub-standard alignment with track built to modern engineering standards include:

- Reduced point to point distance.
- Faster and heavier freight trains and improved rail passenger services.
- Transit time, fuel and less brake wear savings to train operators.
- Reduced track maintenance costs.
- Improved rail freight reliability.
- Reduced road accidents involving heavy trucks due to rail's ability to more effectively compete with trucks.
- The potential for elimination of level crossings, flood mitigation, and improved clearances.

53. From 1992 to 1997, Queensland Rail undertook a MainLine Upgrade (MLU) between Brisbane and Cairns. This included 120 km of high quality rail deviations with easy grades and curves. The work supplemented about 40 km of deviations between Nambour and Gladstone undertaken as part of Queensland's Main Line Electrification project completed in 1989.

The benefits of MLU included improved reliability of rail freight services to and from North Queensland [including livestock trains]. It also facilitated the rail transport of fruit and vegetables from North Queensland to the Sydney and Melbourne markets. In November 1998, Queensland Rail introduced a highly successful electric passenger tilt train service between Brisbane and Rockhampton.

Subsequently, further deviations were constructed at Mackay, with extensive concrete resleepering. After many years of study, approval was given on 29 August 2005 to duplicate the Caboolture - Beerburum track on an improved alignment by 2009, and to proceed to Beerburum - Landsborough, at a total cost of about \$450 million.

Some AusLink funding for the rail part of the Brisbane - Townsville corridor is long overdue. So also are further rail deviations north of Nambour.

54. Another recent Australian example of a rail deviation includes a recently completed new 8 km deviation near Ballarat as part of Victoria's Regional Fast Rail. There are many overseas examples of track straightening to improve train performance.

55. During the 1960s, gauge standardisation between Perth and Kalgoorlie in the 1960s included a new dual gauge route through the Avon Valley from Midland to Northam, with high clearances and easy ruling grades. This replaced an older section with steep grades and poor alignment, and assisted in reducing Kalgoorlie - Perth freight train times from 31 hours to 13 hours.

Today rail wins 81 per cent of interstate freight in and out of Perth. This high modal share of interstate freight in and out of Perth has in part relied on the above WA works, a 25 year concrete resleepering by Australian National, and conversion of Melbourne - Adelaide - Port Pirie from broad gauge to standard gauge track.

56. The Adelaide - Port Pirie gauge standardisation project was opened for freight trains in 1983 and passenger trains in 1984. However, the Federal Government required Australian National to raise loans for this project.

It took until 1995 to complete the Melbourne-Adelaide rail standardisation project. It was assisted by a House of Representatives Standing Committee on Transport etc in its inquiry and 1989 report "Rail: Five Systems – One Solution". This report held, *inter alia*, that "*Considerable benefits would flow to the nation from the standardisation of the Melbourne-Adelaide route*".

In 1990 an intergovernmental agreement had been made to form a National Rail Freight Corporation (NRFC). However, in its subsequent response to the Committee's report, the gauge standardisation project became to the Government "*... a matter for the NRFC's commercial judgement.*" and that the NRFC "*...should be able to earn a rate of return sufficient to fund all investment from non-government sources (including internally generated funds) without reliance on government guarantees.*"

Fortunately, a wider view prevailed and Prime Minister Keating was able to announce on, February 1992, a commitment of \$450m for a "One Nation" rail program to include, as a cornerstone, Melbourne-Adelaide gauge standardisation.

L. Funding questions and advanced planning

57. The practice of forcing rail systems and now the ARTC to rely on loans for some track upgrades stands in contrast to ongoing full funding of the National Highway System. There is also a problem as recognized in previous inquiries that the ARTC from its present access charges (weighed down by highway subsidization) would not be able to generate sufficient funds to significantly upgrade the track (eg to the Canadian/US Class I railroad standards).

58. The Hume and Pacific Highways have had over \$10 billion in today's terms of Federal funding since the National Highway System was formed in 1974. Further massive road funding was announced in the 2006 budget along with \$270m to complement the \$550m already allocated to the ARTC since 2004.

The level of funding identified by the National Transport Planning Taskforce in 1995 to upgrade railways to upgrade, straighten and strengthen the existing interstate mainlines was \$3 billion (to the year 2010). This outlay was recommended by the Neville Committee in 1998. In today's terms this amount is \$4 billion.

The ARTC is only committed to spend less than half of this amount by 2009. There is nothing as yet in the pipeline for rail deviations, as the 2004 AusLink White Paper commitments for rail deviations were in 2005 replaced by ARTC with upgrades within the existing rail corridors.

59. As discovered by the NSW Roads and Traffic Authority in their upgrades of the Hume Highway and the Pacific Highway, it does take time to plan, assess environmental impacts and acquire land for major road deviations. The road builders take this advanced planning very seriously and are given sufficient Federal funds to undertake such detailed planning.

60. It is **recommended** that the ARTC, or another rail agency with a specific direction to undertake advanced planning for rail deviations, be given additional resources make a serious start on the advanced planning of major rail deviations.

M. The Pacific Highway and rail deviations

61. The upgrading of the Pacific Highway to date has brought qualified benefits. The upgrades to date, including the opening of the Yelgun - Chinderah bypass in August 2002 and the concurrent decision of the RTA to approve the use of B- Doubles on the entire length of the highway, have led to a significant increase in the number of long distance heavy trucks using this highway. This is clearly a case of '*induced heavy traffic.*'

62. Further factors affecting the increase in heavy traffic have been the prevailing low level of road cost recovery from the heavier long - distances trucks, and, the present condition of the Sydney - Brisbane railway. The increase in traffic to date since 2002 on the Pacific Highway coupled with variable road standards has had adverse road safety impacts. Here, data supplied by the NSW Roads and Traffic Authority shows that for the 10 years to 31 December 2003 and for road accidents on the non-urban sections of the Pacific Highway from Maitland to the Queensland Border, articulated trucks were involved in 36 per cent of all fatalities over this 10 year period, also for the calendar year 2003 with road accidents on the non-urban sections of this highway, there were 55 fatalities, of which 21 involved articulated trucks.

63. There is a case for selected tolls to expedite further Pacific Highway upgrading. However, upgrading the Pacific Highway and leaving the present NSW North Coast Railway in its present substandard condition will lead to a further increase in the number of heavy trucks on the Pacific Highway. Failure to upgrade the NSW Short North line between Hornsby and Broadmeadow will also contribute to growing rail congestion and also road congestion on the Sydney to Newcastle freeway.

64. The need for an integrated approach to road and rail infrastructure is recognised in the Federal Government's new AusLink Programme. Where appropriate, the use of shared land corridors for road and rail upgrades should be encouraged by the Federal government. An example of a recently planned shared corridor is the Tugun bypass. They are yet to occur on the Pacific Highway south of Tugun.

APPENDIX A Rail CRC Project 24 Energy Efficiency and Sustainability

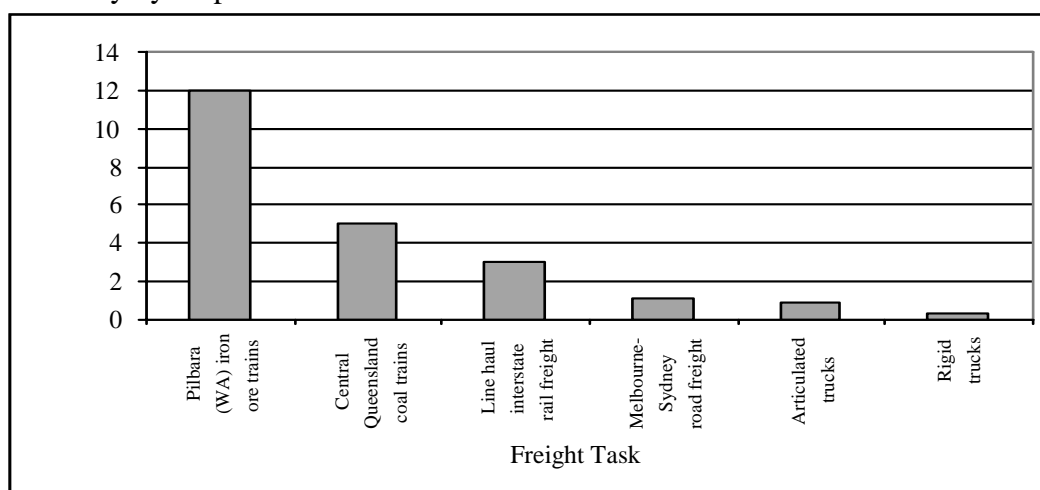
Sources of data re energy use in transport operations in Australia include the Australian Bureau of Statistics (ABS), the Bureau of Transport and Regional Economics (BTRE), the Apelbaum Consulting Group (ACG), the Australasian Railway Association (ARA-Australian Rail Industry Report 2005) and this writer. A common theme is that rail transport is more energy efficient than road transport.

Rail freight In Australia, fuel use per tonne for BHP Iron Ore operations has decreased by 43 per cent between 1980 and 2000 to about 0.75 litres per tonne of iron ore (Darby, 2001 *Technology for profit*, Proceedings 7th International Heavy Haul Conference). This gives a world record energy efficiency of at least 12 net tonne per Megajoule (net tkm/MJ) on a Full Fuel Cycle (FFC) basis where 1 litre of diesel is equivalent to 41.77 MJ.

Queensland Rail (QR) and former government rail systems had an average FFC energy efficiency in rail freight of 2.98 net tkm/MJ in 1997-98 (ACG). This includes the use of electric power for QR where 1 KWh is equivalent to 12 MJ on a FFC basis giving Central Queensland coal trains an energy efficiency of at least 5 net tkm/MJ. CRC project 24 data for 2001-02 suggests an average for non iron ore freight trains of 3.3 net tkm/MJ.

By 2004, US Class I railroads had gained an average energy efficiency of 3.8 net tkm/MJ (FFC). The Canadian Pacific Railway 2005 Annual Report publishes data implying an impressive energy efficiency of 4.05 net km/MJ (FFC). There are problems in gaining accurate and up to date land transport data within Australia.

Driving techniques, equipment, train mass, terrain and track alignment all influence rail fuel consumption. With 4000 HP locomotives, upgraded wagons, and incentives for drivers to save fuel, Melbourne - Sydney - Brisbane standard superfreighter average energy efficiency now appears about 2.7 net tkm/MJ on the existing track. Computer simulation from an earlier project for the Rail Infrastructure Corporation has shown that for the entire Sydney - Melbourne track, a major track upgrade (with three major deviations outlined in the ARTC Track Audit and the 2002 ATRF paper cited below) would increase rail freight energy efficiency by 12 per cent.



APPENDIX B Notes on interstate roads and heavy trucks

This is the text of an article *A half-century of highway subsidisation – or 50 years after Hughes and Vale* from *Railway Digest*, November 2004 p 26-29

On 17 November 1954, the Privy Council released a decision that effectively determined that various charges imposed by the NSW Government on interstate truck operations were invalid. The legislation called into question was the 1931 NSW Transport Co-ordination Act which had been prompted by the depression and intended to stop excessive loss of goods traffic from rail to road. It also reflected the fact that rail freight operations were expected on main lines to generate sufficient revenue to not only maintain the track, but also repay the cost of its construction. In contrast, individual road users do not normally pay road construction costs.

After World War II, there were bigger trucks (although small by today's standards) and more men wanting to drive them. With problems in the railways, including a system strained by World War II and facing crippling coal shortages at times, there was plenty of demand for trucking services. This extended to interstate trucking, despite relatively poor roads and low-powered trucks.

By mid 1952, the NSW Government was imposing a three pence per ton mile tax on interstate freight. This added several pounds per ton to the cost of road freight moving between Sydney and Melbourne or Brisbane.

The truck drivers were bitterly opposed to this tax and related regulations. They gained much publicity with "Barney's Barrow" which was pushed by hand in 11 days in July 1952 from Sydney to Melbourne carrying a copy of the Constitution, and arrived two days earlier than a parcel consigned by rail between the two cities (Frost, 1997, p56). The trucking industry also sought relief from the courts. Commencing with action in NSW courts, a case brought by Hughes and Vale Pty Ltd reached the High Court of Australia in 1952. Later, the High Court (1953) handed down a four to three decision that the tax on long distance road freight was admissible. However, the High Court gave leave for the case to be appealed to the Privy Council.

The case centred around interpretation of Section 92 of the Constitution that states in part "*On the imposition of uniform duties of customs, trade, commerce, and intercourse among the States, whether by means of internal carriage or ocean navigation, shall be absolutely free.*" Very briefly, until the Hughes and Vale case, the High Court had tended to restrict the application of Section 92 in transport matters, however, in other cases including the 'Banking case', the Courts after World War II tended to widen the scope of Section 92.

It appears that Messrs Hughes and Vale had appreciable backing, including good legal advice, the support of the Long Distance Road Transport Association with a new secretary (noted as a former railway executive) and a strong fighting fund (see Frost, 1997 page 58). As well, as noted by Marr (1992, p 127) Sir Garfield Barwick acted for Hughes and Vale in appearing before the Privy Council in London, and the Shell Oil Company "*was willing to fund fresh and inevitably expensive litigation*" to challenge the High Court decision.

The Privy Council's decision, delivered by Lord Morton of Henryton on 17 November 1954, in effect overturned the decision of the High Court and found that the licensing and taxing of road transport across state boundaries was invalid. The case has been commented on by legal experts such as Prof Michael Coper (1988) with a general description by Marr (1992,

p 45) who notes that the wording of Section 92 *"has been the cause of more trouble, contention and expense than any other section of the Australian Constitution. Barwick was to become the great advocate of the hidden and extraordinary power [of the words of Section 92]..."*.

The news of the Privy Council's decision quickly reached Australia. Its implication for not only NSW but all mainland States included the following:

1. Many more trucks began hauling interstate freight on the Hume and other highways.
2. Some 15 truck hauliers issuing Supreme Court writs to claim fees previously 'paid under protest' to the NSW Government. These amounted to 147,000 pounds (Ffrost, 1997). Other claims were to follow, and were upheld by the High Court.
3. Shipping companies moving interstate freight quickly lost trade. According to the late David Parker (pers. comm. 1999) up to the time of the Privy Council decision, Huddart Parker had a Brisbane – Sydney shipping service with 500 tons per week fully booked. Within a week of the decision, the demand for the service had slumped. It was quickly withdrawn. Other shipping companies continued to offer similar services to their detriment.
4. As noted in the 1955 Annual Report for the Commissioner of Railways within NSW, an urgent conference of Railway Commissioners from all States met on 2 December 1954 in Sydney and agreed to an immediate reduction in interstate rail freight rates. Further rate reductions followed.
5. As noted by Gunn (1989, p 415) "the decision meant an estimated one million pounds loss of revenue for the coming year for NSW [railways]"; also a Sydney Morning Herald editorial of 2 December 1954 : *"The first direct result of the decisions will be a drop in interstate transport costs, from which the national economy will benefit substantially. But unless the NSW railways make sweeping and far-sighted changes to meet the new situation, the benefit to the nation will be greatly reduced and the finances of the NSW Government will be gravely jeopardized."*
6. As noted by a definite 1956 report of a Federal Government Members Rail Standardisation Committee Report re the new interpretation of Section 92: *"In these circumstances, it is nonsense to speak of fair competition between road and rail as regards to interstate transport. A great part of railways costs relates to the construction and maintenance of the permanent way, whereas the heavy interstate road trailer not only gets its road free, but destroys in and puts the burden of its repair upon the rest of the community."*
7. As noted by Gough Whitlam MP on 14 August 1958 in welcoming to Parliament the then new MP for Parramatta, Sir Garfield Barwick (Marr, p 140) *"...He might help us to resolve that greatest transport problem in Australia - our road system - because there is no other country in the Western world, the motorised part of the world, where roads are deteriorating so much. It was his thesis before the courts which, of course, has meant that it is impossible for the State governments to derive a just contribution towards the improvement or construction of roads from those who travel over the roads from one State to another."*

In place of the tax on interstate road freight, the NSW and other governments sought to place alternative road user charges. As related by the Inter-State Commission (1986), and Ffrost (1997), a series of court cases followed, and eventually most states settled on a road maintenance tax of just one third of one penny per ton-mile, with the mass based on the tare plus half the legal load limit. This tax was upheld by the High Court. This did not stop ongoing court action during the 1960s leading to Federal Transport Minister Gordon Freeth

observing in a 1968 speech (Frost, 1997, p84) that "*...no other section of industry had figured so often as the long distance road industry had done in the Commonwealth Law Reports.*"

Even more litigation was to follow. In 1978, the High Court again upheld a wide interpretation of Section 92 in *Finemores Transport Pty. Ltd. v. New South Wales*. This was with a five to one decision that decided that vehicles used or intended to be used exclusively in the course of or for the purposes of interstate trade or commerce could not even be required to pay stamp duty. The five judges included Chief Justice Barwick, with Justice Murphy as the sole dissenter. However, in 1988, in the High Court decision of *Cole vs Whitfield* (Coper, 1988) with the unusual distinction of a unanimous seven nil judgement, the scope of Section 92 was confined to the prevention of laws that in effect promote state protectionism.

During the 1970s, the road maintenance tax (RMT), at 0.17 cents per tonne-kilometre, was very unpopular, and subject to increasing evasion. Indeed, the NSW Department of Main Roads aggregate RMT receipts remained near constant from 1970 to 1978 despite strong growth in road freight. During this time, trucks extensively hauling interstate freight were not even paying annual registration fees, except possibly a modest \$10 administration fee.

In April 1979, a group of truck drivers blockaded the Hume Highway at Razorback, near Picton. The protests against the road maintenance tax and other grievances quickly spread to other locations. Eventually, the NSW and other state governments capitulated to demands to remove the road maintenance tax. In all states except Queensland, it was replaced within a year or so by diesel franchise fees.

It took many years to remove the anomaly whereby interstate truck operators paid no registration charges. This was facilitated by re-establishment in 1985 (actually using 1975 legislation of the Whitlam Government) of an Inter-State Commission (ISC) using Section 100-104 of the Constitution. After careful consideration of all issues, and taking care to comply with Section 92, the ISC proposed annual charges that included \$675 for six-axle articulated trucks. This compared with a range of \$1280 to \$2753 for annual registration charges applying in the six states for semitrailers moving intrastate freight (ISC, 1986, p201).

On 1 January 1987, the Hawke Government's new Federal Interstate Registration Scheme (FIRS) came into effect. Following a review of charges by the ISC, FIRS charges were increased on 1 July 1988 to \$1250 for a six axle articulated truck with a Gross Vehicle Mass (GVM) limit of 38 tonnes; with the option of a total payment of \$3120, such trucks could legally operate at a GVM of 42.5 tonnes. The NSW annual fees for the heavier semitrailers were then about \$7000 per year. At this time, there were many government studies finding large under-recovery of road system costs from heavy trucks, including the Bureau of Transport Economics (1988) finding that the aggregate annual under-recovery of road system costs from all articulated trucks was then about \$1.28 billion.

As a result of intergovernmental agreements in 1990 and 1991, a National Road Transport Commission (NRTC) was formed to harmonise desperate regulations and to determine charges affecting heavy trucks and buses. Although it was intended that new uniform charges should be on a "user pays" basis with a mass-distance component, neither condition was met. In regard to 'user pays' the NRTC chairman simply said this would be 'untenable' during the then current recession and so the new charges were 'revenue neutral'. The new charges included \$4000 for all six axle semitrailers and were to cost the NSW Government about \$60 million per year when introduced in 1996. The mass distance

component for the heavier long distance trucks which formed part of the intergovernmental agreement was simply omitted by the NRTC.

As noted by the Industry Commission (1992) "*Annual fixed charges are not efficient because costs vary with the distance travelled and the mass of the vehicle. The result is that some vehicles - the heaviest travelling long annual distances - will meet less than 20 per cent of their attributed costs. ...The charges, as recommended, will therefore potentially distort the long-haul freight market as rail reforms take effect.*"

This state of affairs with large hidden subsidies for those who consign freight in heavier long distance trucks continues through to the present day. It is most pronounced with B-Doubles which in Australia, if hauling 250,000 km per year, pay only about one quarter of what they would in New Zealand with its mass-distance charges. For heavy semi trailers, hauling 200,000 km per year, the Australian NRTC charges are about one third of the New Zealand road user charges. The NZ mass distance charges have been used successfully since 1978.

This writer (Laird, Newman et al, 2001) has estimated that under-recovery of road system costs from articulated trucks totalled \$1.35 bn for 1997-98 and the cost of road crashes involving articulated trucks was about \$500m for that year. Road pricing for heavy trucks is now under review by the National Transport Commission in its third determination of heavy vehicle road user charges. The issue is expected to receive increasing attention while government funding for mainline rail track upgrades is limited.

In this regard, the Australasian Railway Association's Infrastructure Investment Policy 'Investing for the Future' launched in July 2004 has called on Government to address five key areas including " Review infrastructure funding and access pricing methodologies to remove inequities between road and rail" and "Utilise a transparent, equitable evaluation process for road and rail funding, factoring in externality costs, and addressing the legacy of inadequate infrastructure."

A further factor affecting rail's ability to compete for interstate land freight is extensive upgrading of the National Highway System or NHS. Since the declaration of the NHS in 1974, with full federal funding, about \$24.5 billion has been invested to 2004 in today's terms. This includes over \$4.5 billion for rebuilding 86 per cent of the entire Hume Highway to modern engineering standards with dual carriageways. Other achievements include sealing the entire National Highway System network by 1989 and upgrading all intercapital links so they can accommodate B-Doubles and, in some cases, road trains. These capital upgrades have effectively been paid for by taxpayers.

The Privy Council and related decisions did however give the benefit of road competition to rail. It also influenced the findings of the Government Members Committee (1956) chaired by the Bill Wentworth in an inquiry into gauge standardisation. This Committee recommended an immediate start to gauge standardisation between Albury and Melbourne, Kalgoorlie to Perth, and Broken Hill to Port Pirie. This work was completed during the 1960s.

The competition provided by interstate road transport also gave the Australian National Railways Commission (AN) a strong incentive not only to improve its freight train operations but also to invest in track upgrading. This included concrete resleepering over many years of its mainlines, plus, with the use of loan funds when a Federal grant was denied, Crystal Brook to Adelaide gauge standardisation. In turn, AN's success demonstrated there was a future for

interstate freight, leading to the formation of National Rail in 1992 and Adelaide – Melbourne gauge standardisation. This was quickly followed in 1995 by competition between rail operators for rail freight. In turn, the Australian Rail Track Corporation was formed in 1998, and National Rail finally reached profitable operations prior to its sale on 21 February 2002.

In recent years, supported by track upgrades and generally “fit for purpose” track on the East-West corridor, rail has increased its share of interstate land freight moving in and out of Perth to over 80 per cent. By way of contrast, the track quality linking Australia’s three largest cities of Melbourne, Sydney and Brisbane is substandard. Indeed, it has been consistently rated by Engineers Australia’s Infrastructure Report Cards as “F”.

Undoubtedly, each of the Hume and Pacific Highways would have been given F ratings if evaluated in the mid 1970s. However, both these major highways have been vastly improved since then, with ongoing improvements promised by Government. Further funds to provide more four-lane standard roads on both highways have been provided in the AusLink White Paper - \$714m for the Hume Highway and \$480m for the Pacific Highway.

Meanwhile, as part of an agreement including a 60-year lease on the NSW interstate mainline tracks, a modest \$872 million track upgrade programme has commenced. A further \$1 bn was allocated for rail in the AusLink White Paper. However, it should be noted that rail track upgrades often need loans. As well as AN’s use of loans noted earlier, construction of the Melbourne – Albury standard gauge line in 1962 was in part (30 per cent) funded by loans. These loans are due to be finally repaid in 2012.

The main challenge for intercity rail freight operators and track owners is to get “Fit for Purpose” mainline track without incurring too much debt. At present, the NSW Main South Line has severe speed-weight restrictions. In the 485 km of track between Campbelltown and Junee, about 27 per cent (141 km) of this track has tight radius curvature where trains twist and turn to the left or right the equivalent of about 61 circles. Most of this track was laid down during the 1910s during duplication with deviations. However, modern superfreighters would save both time and fuel if they could revert to the track alignment laid down by Whitton in the 1870s.

The good news is that with construction of three new sections of track and two rail deviations amounting to about 200 kilometres of new track, some 260 kilometres of track with substandard alignment would be removed. Not only would this reduce point to point distance by 60 kilometres, but freight train transit times would reduce by nearly two hours, allowing rail to more effectively compete with line haul trucking for intercity freight. Proposals for new sections of track and deviations, with estimates of benefits to train operators, the track owned and the wide community being outlined by Laird and Michell (2004).

In conclusion, the Privy Council decision of 1954 to allow interstate truck operators low cost access to the nation’s highways has cast a long shadow over rail finances. After five decades of “highway subsidisation” governments at federal and state level find it hard to move road pricing for heavy trucks onto a full ‘user pays’ basis. However, as suggested by the Australian Financial Review (2004), more ‘user pays’ in road pricing is necessary to get AusLink to work effectively. This would include funding the major track upgrades needed for faster and heavier freight trains on the North – South corridor.

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APPENDIX C GOVERNMENT INQUIRIES RELEVANT TO ROAD PRICING

Table C.1 gives some government inquiries and reports relevant to the road pricing of heavy trucks.

TABLE C.1 SOME GOVERNMENT INQUIRIES AND REPORTS RELEVANT TO IMPROVING ROAD PRICING FOR HEAVY TRUCKS

During the 1970s

- 1972 Bland, Sir Henry *Report of the Board of Inquiry into the Victorian Land Transport System*.
- 1977 Bureau of Transport Economics *Cost recovery in Australian Transport, 1974-75*
- 1979 Australian Transport Advisory Council *Transport and Energy Overview*.

During the 1980s

- 1980 *Report of the Commission of Enquiry into the New South Wales Road Freight Industry*, Volume IV, G McDonell, Government Printer, Sydney.
- 1980 Commonwealth Department of Transport *Transport pricing and Cost Recovery Seminar*
- 1981 Australia Railway R and D Organisation *Report on Rail*
- 1983 Bureau of Transport Economics *Overview of Australian Road Freight Industry*
- 1984 National Road Freight Industry Inquiry
- 1986 Federal Department of Energy
- 1986 Inter-State Commission (ISC) *Cost recovery arrangements for interstate land transport*
- 1987 ISC *A Review of Federal Registration Charges for Interstate Vehicles*

During the 1990s

- 1990 ISC *Road Use Charges and Vehicle Registration, a National Scheme*.
- 1991 Over-arching committee - report with 'user pays' charges for heavy trucks
- 1991 Industry Commission Rail Transport (in particular Ch 5 'Competitive, environmental and social aspects of rail and road transport')
- 1991 Ecologically Sustainable Development (ESD) Working Group on Transport
- 1992 National Road Transport Commission - various reports re First Determination
- 1994 National Transport Planning Taskforce
- 1997 National Road Transport Commission - various reports re Second Determination
- 1997 House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform (the Neville Committee) report 'Planning not patching'
- 1998 The Neville Committee report 'Tracking Australia'
- 1999 Productivity Commission report 'Progress in rail reform'
- 1999 Prime Ministers Rail Projects Task Force 'Revitalising Rail'

During the present decade

- 2000 Senate Environment, Communications, Information Technology and the Arts Reference Committee *The heat is on: Australia's greenhouse future*
- 2001 Australian Rail Track Corporation Interstate Track Audit
- 2001 Fuel taxation inquiry commences
- 2002 Fuel taxation inquiry report is rejected by Federal Government
- 2002 Bureau of Transport and Regional Economics in its 2002 Report No 105 *Greenhouse policy options for transport 2020* (with a preference for optimal road pricing)
- 2002 AusLink Green Paper
- 2003 Many submissions to AusLink Green Paper supporting transport reform
- 2003 Parry Inquiry (NSW Ministry for Transport) Sustainable Transport
- 2004 AusLink White Paper
- 2005 Senate Rural and Regional Affairs and Transport Legislation Committee re AusLink

Additional comment

In 1993 the Keating Government established a National Transport Planning Taskforce (NTPT). The aim was ‘... to develop a truly nationally integrated transport system.’ Three Taskforce members were appointed with a small staff and a budget of about \$1 million. The main conclusion of the summary NTPT (1994) report was that ***‘Significant changes are needed in the way Australia makes and implements transport decisions.’***

The changes are still needed. The 1994 NTPT report gave 16 recommendations, (to which no government response was made) including the following:

- ‘Commonwealth, State and Territory Governments negotiate and seek endorsements of the Council of Australian Governments to establish a framework for national strategic transport planning in Australia – a National Transport Infrastructure Network...’
- ‘That road, rail, port and airport infrastructure investments and their funding arrangements should be considered within a framework that allows intermodal, network and corridor considerations to be evaluated transparently.’ The rationale was that ‘...more flexible funding mechanisms should be negotiated so funds can be channelled into corridors and modes of highest priority.’
- ‘All governments ensure transparency in setting of taxes and charges on freight transport. In setting taxes, governments should consider the consequences for competition between modes. ...’
- ‘All governments ensure development mechanisms for pricing for the use of transport infrastructure which reflects the costs of efficient provision of that infrastructure and take into account congestion and environmental factors in a transparent way.’

The NTPT recommendation regarding transparency in taxes and charges was a discrete acknowledgment that Australian road pricing for heavy trucks could be distorting modal competition. The last recommendation cited was in recognition (NTPT, 1994, p52) that: ***‘...Investing in better roads will not necessarily achieve reduced congestion; in fact, it could prove counter productive in some circumstances, attracting more users onto the roads as travel times temporarily decrease.’***

A major effort by the Federal Government towards urban transport reform was an inquiry conducted by the Industry Commission (IC, 1994). Some quotes follow: *“Australia’s urban transport systems are falling far short of their potential contribution to the economic and social wellbeing of our cities. There are no ‘quick fixes’ available: rather a mutually reinforcing package of policies is needed. ... ‘Transport is vital to making our cities work. Many believe that the financial, economic, social, and environmental consequences of the way we build and operate our urban transport systems cannot be sustained.*

The Senate Committee on Environment, Communications, Information Technology and the Arts Reference Committee in its 2000 report ‘The Heat is On’ included 106 recommendations made by the majority of the Committee. Of these, no fewer than 21 addressed transport greenhouse gas emissions (GHG) and solutions. However, only four of these 21 transport recommendations received the full support of the Federal Government (Australian Greenhouse Office, 2001), with a further 11 recommendations being considered, already being supported, or addressed through existing measures. The remaining six recommendations, coupled with a minority party recommendation to replace road funds by transport funds, were noted as not being supported by the Government.

The Bureau of Transport and Regional Economics (BTRE) in its 2002 Report No 105 *Greenhouse policy options for transport 2020* again considered land transport, with some 11 groups of measures to reduce vehicle kilometres travelled (VKT), nine measures to reduce emissions per VKT, four road pricing measures (mass-distance charges for heavy trucks, tolls, internalising transport externalities and emission charging), carbon taxes and tradable permits. Optimal road pricing was held to offer the best way forward.

This view was shared by the Parry Inquiry (NSW Ministry for Transport, 2003) that noted, inter alia (p72) *"The thinking underlying the support for road use pricing is that road access is currently 'too cheap' (as distinct from the general cost of motor vehicle use), as motorists are not directly bearing all of the costs associated with their decision to make a journey. For example, driving a vehicle is associated with costs such as congestion, road wear and tear, pollution and accidents."*

APPENDIX D OTHER EXPRESSIONS OF CONCERN

Various Non-Governmental organisations in Australia have expressed some concern about transport policy. One example in the early 1990s follows

Australian National Report to the United Nations Conference on Environment and Development, 1991 P189, 1991 Non-Government Organisation Views

The policies of the Federal and most State Governments have been to favour increasing road capacity and road transport efficiency whilst leaving significant parts of the interstate mainline rail network in South East Australia with steep grades, sharp curves and tight clearances. This, coupled with three different gauges, has resulted in a modal shift since 1972 for interstate freight in Eastern Australia from rail transport to the more energy intensive road transport. Whilst the formation of a National Rail Corporation in 1991 will improve management and terminal operations, Government commitment is needed to upgrade mainline interstate track from nineteenth century standards so as to allow for modern intermodal freight operations.

Progress in removing large hidden subsidies for heavy truck operations through inadequate road pricing has been slow. Although an inter-governmental commitment was made in 1991 (Special Premiers Conference) to form a National Road Transport Commission, it will not be until 1995 that charges that reflect much improved road cost recovery will be attained.

Transport of people within and between cities is dominated by cars and in part reflects Government bias to car use and road funding. Planning and development of light rail transit in most Australian major cities is generally ten years behind that of North America, Europe and many Asian cities.

(Consumers' Transport Council, Comments on National Report, 26.8.91, p2)

Fifteen years later, in 2006, one can ask what has changed. The main advances would appear to be Adelaide - Melbourne gauge standardization and related works by 1995, good progress made during the 1990s by Queensland in upgrading mainline track, and more recently by the WA Government in expanding urban rail in Perth. On the other hand, as argued in the main submission, the 'user pays' promised in 1991 in road pricing for heavy trucks is yet to be delivered. So also is interstate mainline track straightening and strengthening.

During the late 1990s, notable contributions were made to the transport policy debate by two conservative organisations. One was from the Chartered Institute of Transport in Australia found it necessary to issue a sternly worded statement at its 1998 National Symposium about the oil situation: *"Our greatest ever source of cheap energy may soon contract and the 'Petroleum Age' in which we live now can be seen to be approaching an eventual end.*

"The Symposium heard that a clear consensus is emerging that cheap oil production outside the Middle East will begin permanent decline around the year 2000, to be followed by permanent world decline within 15 years. ... 'More of the same' in our current transport plans and ways of thinking is no longer tenable. ..."

Also, as found by the Institution of Engineers, Australia (Sustainable Transport, Responding to the Challenges, 1999) we have major problems in major cities, and, there is a need to respond to the challenges. In brief:

- A Taxation and fiscal policy instruments should encourage sustainable transport. At present, these measures encourage car and truck use.
- B There is a strong case for increased investment in transport infrastructure that is more sustainable and less greenhouse gas intensive. Where market forces fail, government should intervene.
- C More holistic approaches to transport decisions are needed that integrate considerations of impacts on health, sustainability and greenhouse gas emissions.
- D There is a need for research to support cleaner transport fuels and technologies, along with transport pricing, economics and demand management technologies.

In a new decade, with recent international events and oil prices, the warnings and remedy of these two organisations are even more relevant. The challenge for Australia is to reverse the long standing transport policies that have acted so as to increase oil dependence.

APPENDIX E An estimate of 2005-06 road system costs attributable to heavy vehicles

The approach adopted in this appendix is that used by the Commission of Enquiry into the NSW Road Freight Industry (McDonnell, 1980, Vol. IV, Appendix 3.1) to calculate road system costs due to heavy trucks for 1997-98. An outline of the methodology was given by the ISC (1986, p267) and this writer (Laird, 1990 'Road cost recovery in Australia and New Zealand', Transport Reviews (United Kingdom), Vol 10, p 215-227, and, Laird, Newman et al, 2001, Back on Track, Appendix E).

In brief, the approach used by the NSW Commission was a pay-as-you-go one to gain an estimate of the to improve and maintain the NSW road system for various categories of

vehicle. These included light rigid trucks with less than 4.1 tonnes carrying capacity, heavier rigid trucks, articulated trucks and all other vehicles. Costs were identified as separable pavement costs (trucks), separable other costs (trucks), separable costs (non trucks), and common costs. For heavy vehicles, including buses, separable pavement costs were allocated using unit costs for equivalent standard axle kilometres or ESA kms. Other separable costs for trucks such as easier grades, overtaking lanes and stronger bridges were found by using broad estimates provided by the NSW Government; as suggested by the ISC, these other separable costs may be allocated on the basis of gross/ average vehicle weight kilometres. After making an allocation for separable costs for the various classes of vehicles, all other costs are regarded as common costs, which are allocated on the basis of "passenger car equivalent" distances.

For 1997-98, using NRTC second determination data, ISC ESA km unit costs adjusted for inflation and the McDonnell methodology, the total Australian road system costs attributable to all trucks was approximately \$1955 million for all articulated trucks, and \$545 million for all rigid trucks including truck - trailers (Laird, Newman, 2001, loc.cit.); also, that under the NRTC scheme with annual registration charges and a fuel charge at 18 cents per litre, 1997-98 NRTC data showed cost recovery of about \$720 million from all articulated trucks, and \$495 million from rigid trucks and truck - trailers. The resulting under-recovery of road system costs, using the above approach, was about \$1235 million for all articulated trucks, and \$50 million for rigid trucks and truck - trailers.

It is stressed that these figures, like the ones that follow, are approximations based on limited data. McDonnell (1980, Vol. IV, p1/3) noted there were serious data deficiencies affecting the road freight industry. Some 19 years later, the Productivity Commission (1999, p8) noted that "*There is a lack of up-to-date transport data in Australia, impeding public debate and sound policy formation*". This situation continues to date, despite some recent efforts to improve the provision of comprehensive and up to date transport data.

A modified version methodology developed by McDonnell is now applied for 2005-06 using data released by the NTC during the third determination. The seven step process we use is as follows.

1. Determine the total expenditure T for the given financial year for expenditure on all roads, and, the combined figure R for arterial road maintenance and construction costs, by all levels of government.
2. Allocate separable pavement costs P due to all heavy vehicles using ESA kms.
3. Find 'other separable costs of heavy vehicles' Q for the larger roads, stronger bridges, extra passing lanes plus easier grades to accommodate heavy vehicles. Take Q as 15 per cent of R with allocation between each class of vehicle on the basis of AGM kms.
4. Assign separable costs S of all other vehicles as 11 per cent of T.
5. Evaluate the remaining costs as common costs, $C = T - P - Q - S$.
6. Allocate these common costs to various classes of vehicles on the basis of passenger car unit equivalent kilometres using 1 for a car, 2 for rigid truck, 3 for an articulated truck, 4 for B-Doubles and smaller road trains and 5 for larger road trains (NRTC, 1998).
7. Calculate the total attributable costs to each class of truck and other vehicles.

It is not claimed that the modified McDonnell methodology is 'correct' (indeed, it could now usefully be updated and refined). In the same way, it cannot be claim that the methodology currently used by the NTC is correct. What can be said is that both methodologies use estimates of data, and, make some use of each of ESA kms, AGM kms and passenger car equivalent (PCU) kilometres.

The NTC's THVRPD DRIS (Oct 2005, p7) shows that an estimated \$5206 million (R) was applied to construction and maintenance of arterial roads (rural and urban). According to the NTC's THVRPD Technical Report (Oct 2005, p13) urban and rural road agency expenditure (Federal, State and Local Governments) was \$10,395 million (in 2005-06 terms). This is the amount T.

An important question is that of an average unit cost for an equivalent standard axle kilometre (ESA km). It is understood that the NTC's THVRPD process did not derive a unit cost (which depends on the type of road) from first principles or on advice from the road construction authorities but rather the NTC found it as a result of 'working backwards'. We shall use the unit cost of 8.75 per ESA km, as outlined on page.

Using these assumptions, detailed NTC's THVRPD data (Tables 46 and 47, Technical Report), and the methodology outlined above, it is found that attributable road system costs in 2005-06 amounted to approximately \$2436 million for all articulated trucks (including \$1111m for six axle articulated trucks, \$692m for 9 or more axle B-Doubles and \$391m for all road trains), and \$920m for all rigid trucks.

APPENDIX F Revised Land Freight External Costs In Australia

Executive Summary of a Australasian Transport Research Forum Paper Sydney September 2005 Philip Laird, University of Wollongong

This paper outlines some estimates of external costs of land freight transport published in Australia since 1990. The earlier reports include those of the former Inter-State Commission, the National Transport Planning Taskforce, the Victorian Environment Protection Authority and the Bureau of Transport and Regional Economics with its 1999 report *Competitive Neutrality between road and rail*.

With the increasing land freight task and projections for future growth, estimates of external land transport costs have been of increasing interest to government. Recent examples include Queensland Transport, the Victorian Department of Infrastructure, the NSW Department of Transport study of grain transport options, the Australian Transport Council's 2004 *National Guidelines for Transport System Management*, and, the 2003 Austroads report *Valuing Environmental and Other Externalities*. A New Zealand Ministry of Transport *Surface Transport Cost and Charges* study released in 2005 is also of note.

The paper gives particular attention to six external costs of road and rail freight operations in both metro and non-urban areas identified for the Australian Rail Track Corporation's 2001 Track Audit. These external costs are accidents, air pollution, noise pollution, greenhouse gas emissions, congestion, and incremental road damage. The results of two studies conducted for Queensland Transport in 2001 and 2004 that provided updated estimates for each of the Track Audit externalities are discussed. The revised estimates of unit costs include:

1. Australia wide accident costs of 0.6 cents per net tonne kilometre (ntkm) for road freight moved by articulated trucks and 0.03 cents per ntkm for rail freight;

2. An average cost of air pollution in capital cities of 0.65 cents per ntkm for freight moved by articulated trucks and 0.22 cents per ntkm for rail freight moved by diesel electric locomotives. These estimates are based on PM10 emissions as discussed in two BTRE reports *Health Impacts of transport emissions in Australia: Economic costs* (2005) and *Urban pollutant emissions from motor vehicles: Australian trends to 2020* (2003).
3. Noise in capital cities - 0.22 cents per ntkm for road, 0.12 cents per ntkm for rail.
4. A greenhouse gas cost (based on \$25 per tonne of carbon dioxide) of 0.18 cents per ntkm for road freight moved by articulated trucks and 0.06 cents per ntkm for rail freight.
5. Road congestion (metro only) 0.10 cents per ntkm for road. -
6. Pending the third determination of road user charges for heavy vehicles of the National Transport Commission, under-recovery of road system costs from articulated trucks at 1.0 cents per ntkm.

Lower unit costs are given for air pollution and noise for road and rail haulage in non-urban areas.

Even if the users of land freight transport are not required to meet their full external costs, such costs should be fully accounted for when major infrastructure investment decisions are being made. Based on the information in this report, the following values in Table F.1 are recommended.

Table F 1 Recommended revised Australian land freight externality costs

Externality Measure	Road (c/ntk)	Rail (c/ntk)
Accident Costs	0.60	0.03
Air pollution		
- Metro	0.65	0.22
- Rural	0.13	0.04
Noise pollution		
- Metro	0.22	0.12
- Rural	0.07	0.04
Greenhouse gases	0.18	0.06
Congestion (Metro only)	0.10	-
Increased road maintenance	1.00	
TOTALS		
Metro	2.75	0.43
Rural	1.98	0.17

Reference: As per text. Note that road maintenance costs for roads of light construction are higher, also that any rail track subsidies may need to be taken into account.

It may be noted that, excluding unrecovered road system costs, the metro articulated truck road external cost of about 1.75 cents per net tonne km is less than half the approximate value cited in the above Austroads report of some 4 cents per net tonne km.

It is also of note that road vehicle operators using petrol pay an appropriate de facto externalities charge through fuel excise without rebates, and the assigned average health costs from car use (1.3 cents per km) in the state capital cities equates to about 12 cents per litre of petrol used. However, following introduction of the New Tax System in 2000, the operators of heavy vehicles were granted conditional rebates for the use of diesel, which have since been further extended to effectively require no payment of external costs (cf about 20 cents per litre prior to 2000).

Further work is required in the area of land freight external costs. However, this should not stop government now incorporating into road user pricing and rail pricing conservative values for external land freight costs, so that the operators of diesel powered road vehicles and trains pay a basic externalities charge. This charge could be adjusted following refinement of the initial estimates. It is also recommended that the additional revenue generated be applied to long overdue land transport infrastructure upgrades.