

A new approach to land transport?- Submission to the Garnaut Climate Change Review

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A. Introduction

This submission is in response to the *"Issues Paper - Forum 5 Transport, Planning and the Built Environment"* and shall add to a general submission made in January 2008 to the Review. As before, it will draw on research conducted at the University of Wollongong and supported, in part, by the (former) CRC in Railway Engineering and Technologies. However, it does not necessarily reflect the views of either organisation.

The earlier submission noted the increased concern about climate change, both overseas and in Australia, and gave comment on transport and oil use. This included reference to earlier Australian inquiries going back to 1979, the growth of energy intensive road transport fuelled in part by road building (often at the expense of the less energy intensive modes of rail and urban public transport) and a "road deficit". The aggregate road deficit, estimated under one set of assumptions at nearly \$13 billion per annum, rises from tax concessions, subsidies (for example the Queensland Fuel Subsidy Scheme) and external costs including greenhouse gas emissions. Of this amount approximately \$3 billion was attributed to articulated trucks (with about about \$1.5 billion being under-recovered road system costs and a further \$1.5 billion of external costs).

Reference was also made to the value of research and development into reducing dependence on oil and reducing greenhouse gas emissions.

B. Passenger transport

Questions for Consideration include:

What are the key barriers to the adoption of cost-effective and low-emissions mode use in the passenger transport sector?

How might these be addressed effectively and efficiently by government policy?

What policies would be suitable to address barriers to the uptake of more fuel efficient passenger vehicles?

Low-emissions mode use in the passenger transport sector includes walking and cycling (as noted on page 3 of the Issues Paper) as well as public transport. **All could be encouraged and facilitated by better infrastructure along with progress in the removal of hidden subsidies to road vehicle use - particularly for peak hour commuting in major cities.**

Having dealt with hidden subsidies to road vehicle use in the earlier submission (which follows below), comment is made about infrastructure and overseas perspectives.

B.1 Re better infrastructure assisting mode choice

Perth urban rail provides a good example. In 1981, Perth had some 48 route kilometres of urban passenger railways and less than 7 million passengers per year using the rail service, which was destined for closure and replacement by buses. However, a change in State Government in 1983 led to electrification and modernisation.

With the completion of the 71 km Perth - Mandurah line in December 2007, Perth's urban railways extended to 172 route kilometres. In 2006-07, there were nearly 36 million passengers. The boost in patronage is assisted by a world class service. During weekday peak hours, trains on the new line travelling at speeds up to 130 km/h, there are six trains an hour each way with some taking as few as 48 minutes. This compares very favourably with a 70 minute journey time by car.

As noted by WA Minister for Planning and Infrastructure Allanah MacTiernan in a Media release of 12 March 2008, "*Patronage figures soar on Perth-to-Mandurah railway*" patronage in fact "*exceeded 80 per cent of our predicted patronage in just 11 weeks, which is an outstanding result,*"

As seen by Minister MacTiernan at the AusRail conference in 2005, "*The big picture plan is designed to future proof Perth delivering a sustainable and exciting city for the 21st Century. We need to build resilience into our city if we are to manage growth and deal with/withstand the global challenges of climate change and oil depletion. ... While buses will always be an important part of our public transport system, the evidence is that rail services have the greatest ability to attract commuters who have a choice. If we are to get people out of their cars and onto public transport, rail is a much better bet.*"

In addition, the \$1.6 billion investment of the Perth Mandurah railway is expected to take an estimated 25,000 cars off the freeway every day; and importantly reduce fuel use by 15 million litres of fuel and greenhouse gases by 67,000 tonnes. It also opens up opportunities for Transit Oriented Design.

The surge in railway patronage in Perth's new railway line is even more spectacular than that following the opening on 23 June 1979 of Sydney's Eastern Suburbs Railway. Here patronage projections made in planning the new railway were too low and exceeded by about 40 per cent in the first year. It is hard now to imagine Sydney without its Eastern Suburbs Railway. Yet, in the 29 years since its opening, Sydney has built few new railway lines (East Hills Glenfield 1988, Airport Line 2000, and now Epping Chatswood Rail Link due late 2008 and described elsewhere as half a railway being built during a time over six freeways and tollways were built).

B.2 Overseas perspectives

New Zealand was mentioned in the earlier submission and continues to take both climate change and potential oil price problems seriously. To update re transport, in December 2007, the New Zealand Government released "Sustainable Transport", a discussion document to update the 2002 New Zealand Transport Strategy. To quote from Minister Annette King's speech in launching the paper: "*Transport in the future will be more sustainable. There will be more hybrid and full electric vehicles. More freight will be carried by rail and sea. More people will walk, cycle, and use public transport. There will be lower CO2 emissions as travel behaviour changes and the use of electric vehicles becomes more widespread.*"

To make sure New Zealand transport becomes more sustainable, their Government set some ambitious targets in this discussion paper - including by 2040:

- to halve per capita domestic greenhouse gas transport emissions from 2007 levels, and
- for New Zealand to be one of the first countries in the world to widely use electric vehicles.

The 2007 discussion paper also proposes an expanded role for Coastal Shipping and notes targets for other objectives including *"...increasing public transport use, increasing rail and shipping's share of freight movement and reducing carbon dioxide emissions from the vehicle fleet. Each of them is challenging and none of them will be achieved without acceptance that change is necessary and a willingness to make different transport choices."*

Not surprisingly, the Automobile Association (AA) in a submission, as seen by Minister King in a March 2008 speech to the AA, *"felt the Sustainable Transport document focused too heavily on environmental sustainability and set lofty transport targets."*

However, in a March 2008 speech to the AA, the Minister reiterated the need for change: *The creation of a truly sustainable transport system – one that delivers on our economic, social and environmental needs – is not optional. We cannot carry on with 'business as usual'. Reducing transport's contribution to greenhouse gas emissions is vital. It is non-negotiable for the success of our transport system and for our position as a responsible international citizen."*

On 14 December 2007 **the "International Symposium-Climate Change and Transport Strategy-"** was held at Nagoya with a total of approximately 350 experts in attendance from Japan and around the world, who specialize in climate change, transportation and the economy. The Symposium's Keynote Speaker was Lord Nicholas Stern, Professor at the London School of Economics who spoke on "Climate Change, Economics of a Global Deal and the Role of Transport". What follows is edited from an account at the website <http://ecotransport.jp/en/eventreport.html>

- Unless action is taken now to reduce greenhouse gases (GHG), there is positive scientific evidence that a major disaster will result.
- Targets must be established to prompt action now to reduce CO₂e (CO₂ equivalent) throughout the world by 50% (80% in developed nations). For example, targets achievable by 2020 need to be set.
- There is no specific remedy, but a combination of mitigating mechanisms are required, including a pricing system (taxes, ETS), regulations, infrastructure investment, public transportation systems, and technology.
- Transport is a principal source of GHG emissions, and thus one major cause of climate change
- Such emissions account for 13□14% of CO₂e and 23□24% of CO₂ emissions (30% in OECD nations)
- On the per passenger-kilometer basis, railways have a much smaller impact on the environment and climate change than aircraft or automobiles.
- The demand for aircraft and airports is continuing its rapid increase (5% annually on a global scale). Airports and aircraft management systems are directly confronting a serious problem of capacity.
- It was reported that the development of high-speed railways on high-density urban lines can alleviate problems of congestion as well as automobile and aircraft transport

capacity, in addition to being consistent with appropriate climate change policies.

In brief summary, "delaying climate change mitigation is dangerous and costly" and when we consider passenger transportation from the perspective of the global environment, it is necessary to increase the traffic share allocated to railways.

C Freight transport

Question for Consideration *What policies could support cost-effective emissions reductions in the freight sector?*

As per passenger transport, **this could be encouraged and facilitated by better rail infrastructure along with progress in the removal of hidden subsidies to the use of the longer distance and/or heavier trucks.** Some progress has been made in the first quarter of 2008 in adopting a road pricing determination of the National Transport Commission and their recognition of the need for "*a new approach*" to transport. It is trusted that the Review may facilitate further change.

A good starting point would be the Senate Rural and Regional Affairs and Transport Legislation Committee Inquiry into Australia's future oil supply and alternative transport fuels. The findings and recommendations of the Committee's Final Report of February 2007 are commended to the Climate Change Review, and include recommendation # 7 "*... that corridor strategy planning take into account the goal of reducing oil dependence ... Existing Auslink corridor strategies should be reviewed accordingly.*

The Senate Committee reporting on oil also noted (para 8.7) that "*Fuel efficiency or possible oil depletion do not figure particularly in the 2004 Auslink White Paper (Commonwealth government transport policy). The Auslink policies and first five year program are based on goals of general economic efficiency, considering the predicted strong growth of freight transport over the next 20 years....However it may be expected that if there is a long term rise in the price of fuel, this will favour rail because fuel is a greater proportion of costs for road transport. This may suggest a need to increase the pace of catchup investment in rail infrastructure. Auslink corridor strategies ought to allow for this.*"

This approach is commended, and it will also assist in reducing greenhouse gas emissions from transport. So also would a positive response to each of the 25 recommendations of the House of Representatives Standing Committee for Transport and Regional Services August 2007 report "The Great Freight Task: Is Australia's transport network up to the challenge?"

By way of example, the Queensland MainLine Upgrade of the 1990s including extensive track straightening has delivered substantial benefits for moving both people and freight. If this approach could be now extended to the Melbourne - Sydney - Brisbane corridors linking Australia's three largest cities, substantial benefits would follow. If the necessary track straightening was to be completed (AusLink 2009 - 14 to follow the present ARTC work) there could well be a reduction in diesel use in intercapital city freight movements and a potential reduction of greenhouse gas emissions by 2014 of 400,000 tonnes CO₂-e per annum.

Earlier Submission

1. The remainder of this submission is the one sent January 2008 to the Review, and in part, was based on and updates a submission made in February 2007 to the Prime Ministerial Task Group on Emissions Trading.

2. The world scene in regards to climate change is rapidly changing. Events of note include the Stern report released in the United Kingdom in 2006. The years of 2006 and 2007 were notable for an increased concern within Australia about global warming¹.

The world scene in regards to oil supply and demand is also rapidly changing, with some impact on Australia's balance of payments. This led to the Senate Rural and Regional Affairs and Transport Legislation Committee holding an Inquiry during 2006 into Australia's future oil supply and alternative transport fuels. The findings and recommendations of this Committee in its Final Report of February 2007 are commended to both the new Government and the Climate Change Review.

3. It is submitted that more disclosure of timely information on energy use, by both government and industry would be in the national interest. Carbon pricing will assist both government and industry to gather this information. A further way to assist a greater awareness of energy use and emissions would simply be for government, through legislation, to require the disclosure of relevant information in the relevant annual reports. This should go further than disclosing the cost of any emission trading costs and ideally include the quantities of energy (petrol, diesel, electricity etc) used each year. It would also be helpful to include the energy equivalents used in both Full Fuel Cycle (FFC or primary) energy and end-use energy in terms of Megajoules, plus emissions (CO₂-e).

4. More effort in research and development in reducing both energy use and greenhouse gas emissions is required. There is a case for establishment of a federal Energy and Greenhouse Research Corporation. Further comment is offered in Appendix A.

5. New Zealand ratified the Kyoto protocol in 2002, and along with increasing fuel excise (see page 5) during 2007 took a number of measures, including budgetary, to place more emphasis on sustainability. To quote [http://www.beehive.govt.nz/feature/energy ...](http://www.beehive.govt.nz/feature/energy...)) *"It's important that New Zealand plays its part in tackling climate change. We need to reduce our greenhouse gas emissions from energy use. This strategy, and its companion document, the New Zealand Energy Efficiency and Conservation Strategy, help us do that,"* said Prime Minister Helen Clark.

6. Shortly after Canada ratified the Kyoto Protocol, Canada had a One - Tonne Challenge which called on Canadians to reduce their annual greenhouse gas emissions by

¹ See for example, Steffen, W (2006) *Stronger evidence but new challenges: 'Climate change science 2001 – 2005*, DEH-AGO, also the actions of the Government of South Australia (<http://www.climatechange.sa.gov.au>) including legislation (*Climate Change and Greenhouse Emissions Reduction Act 2007*)

one tonne per annum. Australia, now having ratified the Kyoto Protocol, could well consider supporting a similar challenge for all Australians. Some notes re transport initiatives in Canada follow on page 10.

Comment on transport and oil use

7. The Prime Ministerial Task Group on Emissions Trading issues paper noted, inter alia, in 'Context setting' that "*Significant effort will also be needed to restrain emissions in other sectors, especially transport.*" This submission reflects the views expressed by the writer in various publications that there is considerable scope in reducing energy use in the transport of people and goods. In turn, this will reduce greenhouse gas emissions. These publications include a 1989 conference paper², a 2001 joint authored book³, a 2003 paper⁴, and a February 2007 paper on road pricing⁵.

8. In August 1978, Australia introduced import parity pricing for all Australian-produced crude oil. This was not a popular move at the time, but in hindsight was a good decision. The Prime Minister of the day made it clear that import parity pricing was being introduced in response to a changing world situation and a need to encourage energy conservation, oil exploration in Australia and the development of alternative energy sources.

This action stands in contrast to the decision of the Howard Government in May 2002 in rejecting the package of recommendations of the Fuel Taxation Inquiry. Although the recommendations of the inquiry were pragmatic and included fuel indexation at a later stage, as a package were rejected by the Government of the day. It is submitted that the new Government may care to revisit the findings of this inquiry.

This inquiry followed the freezing of fuel excise indexation in February 2001. The loss of Commonwealth revenue from freezing fuel excise indexation was noted in Budget Paper #2 (May 2001) at \$150m for 2001-02 increasing to \$1135, for 2004-05. Since March 2001, this excise has remained at 38.143 cents per litre. The CPI has increased from 132.7 in March 2001 to 155.7 in September 2006, an increase of 17.33 per cent.

From the Survey of Motor Vehicle Usage (SMVU) conducted annually by the Australian Bureau of Statistics (cat. no 9208.0) passenger vehicles used 16,299 million litres of petrol in the 12 months ended 31 October 2006. Had of this fuel been levied at an excise rate adjusted for CPI, at the 17.33 increase it would have been approaching 44.753 cents per litre. The difference in total fuel excise collection for petrol used in cars etc would have been over \$1 billion.

² *The potential for liquid fuel savings in Australian land freight transport*, Greenhouse and Energy 1990, edited by D. Swaine, p 304-314, CSIRO Australia

³ *Back on Track: Rethinking Transport Policy in Australia and New Zealand* P Laird, P Newman, M Bachelors and J Kenworthy UNSW Press, 240 pp ISBN 086840411X

⁴ *Australian transport and greenhouse gas reduction targets* Australasian Transport Research Forum 2003, Wellington, New Zealand (see patrec.org for ATRF papers)

⁵ *Road pricing in Australia - too little or too much ?* Australian Road Summit Sydney 27 - 28 February 2007

Following the reduction on 1 July 2000 of diesel excise for heavy trucks to about 20 cents per litre, environmental and social externalities of some heavy truck operations were put as zero. The ABS SMVU notes that a total of 5,744 million litres of diesel was used by articulated and rigid trucks. Although not all of these trucks may have been eligible for rebates, the difference between the above noted 44.753 cents per litre and 20 cents per litre for this amount of fuel is about \$1.4 billion. This compares with the May 2006 budget speech announcing concessions to the road freight industry worth \$1.2 billion.

9. A new approach to energy use in transport was suggested in 1979 in a government Australian Transport Advisory Council publication called *Transport and Energy Overview*. 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.

10. Many Government and parliamentary inquiries over the last 17 years, in Australia have explored the question of how to reduce greenhouse gas emissions. A list of related inquiries, is given in Appendix B. Of particular note is the Senate Standing Committee on Industry, Science and Technology in its 1991 report *Rescue the Future: reducing the impact of the greenhouse effect* addressed, inter alia, transport. Noting that transport contributed over a quarter of Australia's Carbon dioxide emissions, the Committee made six specific transport recommendations. These comprised:

- an integrated national transport strategy within two years.
- a national action plan for urban public transport
- minimum fuel economy of 8 litres per 100 km for all new vehicles sold in Australia reducing to 6 litres per 100 km by 2005.
- incentives for fuel efficient vehicles, mode shifting to public transport, and replacing high standing charges (registration and insurance) by those proportional to vehicle use.
- favouring LPG and natural gas
- research re use of lower carbon fuels

The 1991 Senate Committee report also noted that ***"already much has been written and said, including strategies and recommendations that would greatly reduce greenhouse gas emissions. The element that is missing is not information but action."***

Reducing greenhouse emissions from transport goes hand in hand with reducing dependence on imported oil, and conserving Australia's limited domestic resources. The present Review may well reach the same conclusion as the 1991 Committee did.

11. A 1991 report from an Ecologically Sustainable Development (ESD) Working Group on Transport is also of note. This report was one of nine reports on ESD sponsored by the Federal Government. The ESD transport final report gave a careful examination of the issues, and made some 30 recommendations. These addressed concerns about concessions within the Fringe Benefits Tax system that encouraged the provision of

company cars, the need to encourage the use of public transport as part of salary packages, better vehicle pollution control measures, effective schemes to improve fuel efficiency with labelling, the removal of subsidies to encourage greenfield suburbanisation, road pricing mechanisms, priority for high-occupancy vehicles, bicycling etc.

Many of these recommendations were passed over by Government when formulating budgets, although some influenced 1992 Government policies on ESD, and a National Greenhouse Reduction Strategy. This included reducing *'...total energy consumption in transport through improved technical and economic efficiency of urban and non-urban transportation and switching to alternative transport technologies or modes where this reduces greenhouse emissions per passenger or unit of freight'*.

In addition, it was suggested that *"Government funding of interurban road and rail infrastructure development, including the National Highway system and the National Rail Corporation's network, should be brought onto an even-handed basis that incorporates ESD principles, by assessing both road and rail projects according to a single set of criteria covering national and local economic, social and environmental benefits and costs'* (finally but only partially achieved with AusLink in 2004, some 12 years later).

12. Also of note are the Industry Commission's 1994 report on Urban Transport, a Senate Committee 2001 report ***The heat is on*** and the Fuel Taxation Inquiry report of 2002 that was cited above.

In addition, a National Strategy for Lowering Emissions from Urban Traffic and a National Action Plan, as approved by the Australian Transport Council in August 2002, recommended a new approach. To quote from the communique for this meeting: *The Strategy and Action Plan developed by the National Transport Secretariat in collaboration with all states, territories and the Commonwealth government provides a groundbreaking national approach to reducing greenhouse emissions from the transport sector. This includes, within the next 5-10 year 'programs that encourage people to take fewer trips by car' and transport 'from predominantly fixed to predominantly variable costs' to '... ensure that transport users experience more of the true cost of their travel choices.'*

To these reports and policy approaches must be added the 2005 report on Sustainable Cities by the House of Representatives Standing Committee on Environment and Heritage and the 2007 report of a Senate Committee into their Inquiry into Australia's Oil Supplies.

13. To quote from <http://www.greenhouse.gov.au/transport/index.html> (accessed 2 January 2008 and now somewhat in need of updating) *"The Australian transport sector accounted for around 80 million tonnes of Australia's total net greenhouse gas emissions in 2004, representing 14 per cent of Australia's total emissions. About 89 per cent of these emissions came from road transport, including cars, trucks and buses.*

Greenhouse gas emissions from the transport sector are growing substantially, rising by 28 per cent between 1990 and 2004. Latest projections indicate that emissions from the transport sector will rise by 40 per cent between 1990 and 2010."

From the ABS SMVU conducted annually by the Australian Bureau of Statistics (cat. no 9208.0) all registered motor vehicles in Australia traveled an estimated 209.4

billion kilometres in the 12 months ended 31 October 2006, and this was an increase of 8.9 % compared with the 12 months ended 31 October 2002. These vehicles consumed 28,898 million litres of fuel in the 12 months ended 31 October 2006. This was an increase of 10.45% from the 26,164 million litres of fuel used for the 12 months ended 31 October 2002. **This suggests a decrease in average fuel efficiency for all Australian road vehicles from 2002 to 2006.**

By way of contrast to fuel use by road vehicles, during 2004-05, rail used some 0.80 billion litres of diesel and 1750 GigaWatt hours of electricity (Australasian Railway Association, 2006, the 2005 rail productivity report at ara.net.au). This modest energy use was for both rail freight and passengers.

14. The Organisation for Economic Co-operation and Development (OECD) in its 2004 Annual Report noted (page 48) the need for government to avoid '*Environmental harmful subsidies*' that exacerbate adverse environmental impacts; also (page 51) that *governments can use taxes to encourage their citizens to take better care of their environment.*

It can be argued that Australia's recent past and present road pricing policies have encouraged an increase in road vehicle use. This is by design or accident and coupled with a lack of investment into both urban and regional rail, has led to excessive automobile dependence in our main cities. It has also ensured that Australia continues to have the highest road freight activity in the world (expressed as net tonne kilometers per capita).

15. The Canadian Federal Government (like the US Government) funds urban public transport. Canada's Federal Transport agency, Transport Canada is involved in funding urban transportation, has a program Moving on Sustainable Transportation or MOST, and a *Sustainable Development Strategy 2004-2006* with tax changes on 1 July 2006.

16. The New Zealand Parliament approved in February 2002 a Land Transport Package called Moving Forward. Along with increasing petrol tax by 4.7 cents per litre in 2002 and a further 5 cents per litre in 2005 with proceeds going to alternatives to roads and replacing of road funds with transport funds, the package aims for a transport system that is '*affordable, integrated, safe, responsive and sustainable.*' Further initiatives have since taken place, and it is now likely that Auckland will have electric trains before Adelaide.

Of note is a speech given by the Prime Minister Rt. Hon Helen Clark MP on 26 July 2007 to a conference 'Transport - the Next 50 years' held late July at Christchurch New Zealand. Limited excerpts from the address follow.

"One thing is for sure: the era when transport planning focused excessively on building infrastructure to service the private motor-car is coming to an end. Today the focus is shifting to how to plan integrated and diversified transport systems, in which many modes play their part.

"...I believe that the sustainability challenge is a defining issue for the twenty first century. ... Sustainability is a term most commonly applied to the need for sound environmental policies. But it is a concept I believe we also need to apply across economic, social, and cultural policies too. Those are the four pillars of a sustainable nation.

"The four pillars are mutually reinforcing: we cannot build a strong economy on a society where too many are left to fail, and where we plunder the natural environment for short term gain.

"Conversely we cannot build a strong society on an economy which fails to generate the wealth required to fund opportunity and security for our people, protect our environment, and develop our culture.

"Once you take a broader view of sustainability, it becomes clear that we have a once in a generation opportunity to improve our way of life, our standard of living, and the state of our environment by putting sustainability at the heart of our thinking and decision making – as we must do with transport policy."

17. During the late 1990s, two notable contributions to the transport debate in Australia were made by non government organisations. One was from the Chartered Institute of Transport in Australia who 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. ..."*

The Institution of Engineers, Australia (1999)⁶ found that 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.

18. Some ten years on from the first warning, with recent international events and oil prices, the warnings and remedy of these two conservative bodies are even more relevant. The challenge for Australia is to reverse the long standing transport policies that act so as to increase both oil dependence and transport greenhouse gas emissions.

⁶ Institution of Engineers, Australia (IE Aust -1999) *Sustainable transport: responding to the challenges*. See also related IE Aust 2001 reports re Sustainable energy use and sustainable energy innovation in the commercial building sector.

19. The Bureau of Transport and Regional Economics has more than once examined reducing energy use and greenhouse gas emission from transport, including in 2002⁷ with some 11 groups of measures. These include 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.

20. It is well known that on average, buses and trains are more energy efficient than cars and aeroplanes in moving people; also rail and road freight had increased their energy efficiency during the 1990s, and that rail is more energy efficient than road in moving freight. Further data is easily supplied on request.

21. In consideration of transport, road pricing and greenhouse gas emissions, along with the need to sustain the economy and standard of living of people, there are three questions worth considering:

- a) Whether transport activity should be subject to a carbon tax ?
- b) Whether particular transport activities, including road and rail are subsidized, and if so should these subsidies be reduced ?
- c) Whether existing transport infrastructure could be improved to reduce both oil use and greenhouse gas emissions ?

22. Re question (a) it is submitted that a modest carbon tax in Australia is long overdue. In regards to various estimates for the costs of greenhouse gas emissions, a value of \$25 per tonne of carbon dioxide equivalent (CO₂e) was supported by several writers (eg Quiggin⁸) and is similar to a value of \$NZ30 per CO₂e tonne used by Transfund New Zealand⁹. It may be argued that a cost of \$25 per tonne of CO₂e is either too low, or too high. A BIC¹⁰(2001) recommendation was for a tax using \$40 per tonne of CO₂e.

Greenhouse gas emissions are discussed by the Productivity Commission in their 2006 *Road and rail freight infrastructure pricing* report (including on page 182-183 with data showing that a \$10 per tonne CO₂e charge would require for a 20 tonne load Sydney - Melbourne load, around \$12 for line haul road and \$5 for rail.

If we use a \$25 per tonne CO₂e charge, this would require for a 20 tonne load Sydney - Melbourne load, around \$30 for line haul road and \$12.50 for rail. See later for more comment re Sydney - Melbourne land freight.

⁷ BTRE (2002) *Greenhouse policy options for transport - Australian trends to 2020* Report No 105

⁸ Quiggin J (1998) *Taxing times: A guide to Australia's tax debate*, UNSW Press

⁹ Austroads (2000) *Australia Valuing emissions and other externalities: A brief review of recent studies*

¹⁰ Bus Industry Confederation (2001) *Getting the Prices Right: Policy for More Sustainable Fuel Taxation for Road Transport in Australia* Submission (by Mr John Stanley) to the Commonwealth Fuel Taxation Inquiry.

For petrol use in cars, using a factor of 1 litre of petrol directly emits 2.4 kg of CO₂e¹¹, at \$25 per tonne, a **fuel levy of 6 cents per litre** is warranted.

In reducing greenhouse gases, one can take a view that each sector should be required to *'pull its weight'*.

In the transport case, imposition of a carbon tax is supported with the proceeds going into upgrading land transport infrastructure that will reduce oil use and greenhouse gas emissions in land freight transport. The appropriate level at this stage would appear to be \$10 per tonne, then moving to a higher amount.

23. Re question (b), in 2001, Prof Peter Newman and myself argued (loc. cit. footnote 3) that hidden subsidies to road vehicle use, even with excluding congestion costs and not having any allowance for greenhouse gas emissions, resulted in the late 1990s of a 'road deficit' of \$8 billion per annum. This estimate has since been updated (footnote ref 5) and including an annual \$0.8 bn non-tariff automobile industry assistance programme; an estimated increased health cost of lack of physical activity due to excessive car use of about \$0.8 bn per annum in Australia (Mason 2003)¹² and greenhouse gas emissions at \$25 per tonne, a case can now be made that there is a 'road deficit' of around \$13 billion per annum.

Of this near \$13 billion per annum, approximately \$3 billion can be attributed under one set of assumptions to articulated trucks being under-recovered road system costs (about \$1.5 billion) plus external costs (a further \$1.5 billion).¹³ It is appreciated that there are also appreciable subsidies to rail passengers that have increased in recent years, plus subsidies to rail freight that have decreased in recent years. Rail freight external costs (excluding the iron ore railways - see ref 13) were estimated at \$215 million.

24. Re question (c) relating to improving transport infrastructure, this would be an excellent exercise for within government (eg BTRE). Following the success of Queensland's MainLine upgrade of the 1990s, one useful improvement is to straighten out interstate mainline track. As noted by the the Neville Committee¹⁴ noted [p 128] that "*... the greatest need for Australia is the reconstruction and realignment of the main freight networks. This would:*

allow faster speeds and greater axle loads; □
clear the way for longer trains and double stacked containers;
make it possible to reduce the steepness of grades, straighten lines and remove loops; and
allow for the elimination of many level crossings."

¹¹ AGO Factors and Methods Workbook, Department of the Environment and Heritage, December 2006 page 10

¹² Mason, C (2003) Personal communication, also *Transport and health: en route to a healthier Australia?* Medical Journal of Australia Vol 172, 6 March 2000 pp 230-232)

¹³ Laird P (2006) *Freight transport cost recovery in Australia*, Australasian Transport Research Forum, Gold Coast

¹⁴ House of Representatives Standing Committee on Transport and Regional Services (2007) *The Great Freight Task: Is Australia's transport network up to the challenge?* <http://www.aph.gov.au/house/committee/trs/networks/report.htm>

The Neville report notes that a 67 km rail deviation could replace the existing 91 km Hexham - Stroud Road section would halve transit times and reduce fuel use by 40 per cent.

By way of a further example of improved rail infrastructure reducing emissions¹⁵, for the moving of land freight between Melbourne, Sydney and Brisbane, if the intermodal terminals were to be improved and the interstate track was to be straightened out for a real improvement in transit time with improved road pricing, appreciable annual savings by 2014 would result in diesel use (155 million litres) along with reductions of greenhouse gas emissions (about 400,000 tonnes CO₂e) and external costs (\$274m).

This paper (footnote ref 15) notes that on the Melbourne - Sydney and Sydney - Brisbane corridors, rail has now less than 12 per cent market share of intercapital city intermodal land freight. This in part reflects the 'steam age' alignment which requires all trains moving between Melbourne and Sydney traverse some 72 circles of curvature, and trains between Sydney and Brisbane traverse 177 circles. The track straightening recommended includes construction of about 196 km of rail deviations in five locations between Menangle and Junee to remove some 256 km of track with substandard alignment and reduce transit times by over two hours.

25. Several papers were presented at the September 2007 Australasian Transport Research Forum in Melbourne that outlined measures to reduce GHG emissions now in force. Firstly, keynote speaker Professor Elizabeth Deakin of the University of California, Berkeley in her paper "California Futures: Towards a Workable Transport – Greenhouse Policy", noted that although the US as a nation was not carrying its weight, many states are making an effort. This included California where state wide enforced reductions of GHG require year 2000 levels by 2010 (as opposed to an 11 per cent growth under business as usual (bau) and a further reduction to 1990 levels by 2020 (cf 25 per cent below bau). These efforts have resulted in some litigation (including Massachusetts vs the Federal Environment Protection agency).

Secondly, an award winning paper "Moving More with Less: Integrated transportation demand management at the University of British Columbia" (UBC) Carole Jolly from Vancouver, Canada, outlined that although UBC student numbers were up 28 per cent since 1997, car kilometers were down 22 per cent, and transit was dominant with a reduction of 16,000 tonnes of GHG per year. This was mainly due to the students, via a referendum, agreeing to an increase in fees in exchange for all students getting a 'free' bus pass in 2003. It was helped along by targets being set with carefully monitoring. The scheme, which has precedents in the US (Washington State, and Boulder) has since been extended to a satellite UBC campus. It was also put into effect in September 2007 at the University of Alberta in Edmonton, Canada, for transit including light rail to the main campus as well as buses.

Thirdly, in a joint paper "Reducing VKT, Reducing emissions: a long road ahead" Anne Percy of the Auckland Regional Transport Authority referred to two initiatives – Northern Express buses coupled with park and ride saved 1162 tonnes CO₂e pa and a multifaceted Travel Wise school encouraged more walking and less driving, reducing

¹⁵ P Laird (2007) Melbourne - Sydney - Brisbane Rail options for 2014 AusRail Plus conference, Sydney

CO₂e by 685 tonnes pa. Further cuts are expected as urban rail upgrading and electrification proceeds in Auckland.

The observant reader will note that each of the above three examples are from overseas. Hopefully the next ATRF will have some Australian examples.

26. To quote from the Government of Canada's ecoTRANSPORT Strategy initiatives announced to date (<http://www.ecoaction.gc.ca/ecotransport>) include:

- The ecoAUTO Program encourages Canadians to buy fuel-efficient vehicles by offering rebates ranging from \$1,000 to \$2,000 towards the purchase of more fuel-efficient vehicles that meet the required criteria.
- The ecoMOBILITY Program will help municipalities reduce urban passenger transportation emissions by increasing transit ridership and the use of other sustainable transportation options.
- The ecoTECHNOLOGY for Vehicles Program will involve purchasing and testing a range of advanced technologies and showcasing them at public events across Canada.
- The ecoFREIGHT Program is aimed at reducing the environmental and health effects of freight transportation through the use of technology.
- ecoENERGY for Fleets – Benefiting trucking companies and other commercial fleet operations by helping them cut fuel costs and reduce harmful emissions. The ecoEnergy for Fleets Initiative will emphasize information-sharing, workshops and training to help fleets increase their fuel efficiency.
- ecoENERGY for Personal Vehicles – Provides Canadian motorists with helpful tips on buying, driving and maintaining their vehicles to reduce fuel consumption and greenhouse gas emissions that contribute to climate change. Reducing fuel consumption means saving money and, more importantly, helping the environment.

27. The fact that Canada is prepared to subsidize the purchase of fuel-efficient vehicles stands in contrast to Australia's effective subsidization of four wheel drive vehicles with lower tariffs. The 4WD subsidy was addressed by the House of Representatives Standing Committee on Environment and Heritage in its 2005 report 'Sustainable Cities': where, inter alia, *The committee recommends (#9) that the Australian Government review the tariff policy on four wheel drive vehicles with a view to increasing the tariff rate on four wheel drive vehicles, except for primary producers and others who have a legitimate need for four wheel drive capability.*

28. Other transport recommendations of the 2005 report 'Sustainable Cities' are also of note, and include (part # 6) that *the Australian Government significantly boost its funding commitment for public transport systems, particularly light and heavy rail, in the major cities:* also that (# 8) *The committee recommends that the Australian Government review the current FBT concessions for car use with a view to removing incentives for greater car use and extending incentives to other modes of transport.*

APPENDIX A ENERGY / GREENHOUSE RESEARCH AND DEVELOPMENT

It is a good question as to how much Government should fund research and development into reducing dependence on oil and reducing greenhouse gas emissions.

This question re energy use was canvassed by the Productivity Commission in its inquiry into Energy Efficiency. Its finding 7.2 (2005 report 'The private cost effectiveness of improving Energy Efficiency', p143) as follows remains of concern: *The need for special energy efficiency research and development funds has not been substantiated. Sourcing funds from existing more general research and development programs enables contestability between proposals and selection of those yielding the greatest net benefit.*

This negative view of supporting energy efficiency research and development stands in contrast with the Productivity Commission's strong support of the generous *Automotive Competitiveness and Investment Scheme (ACIS)* worth over \$4 billion over 10 years. This includes the ACIS Stage 2 *Motor Vehicle Producer Research and Development Scheme (MVP R&D Scheme)* which is directed to encourage Australian motor vehicle producers to invest in high-end R&D technologies, offering up to \$150 million in R&D assistance from 2006 to 2010. This assistance commenced on 1 January 2006.

The Energy Research and Development Corporation (ERDC) was formed in 1990 to increase commercialisation and the effectiveness of a long standing National Energy Research, Development and Demonstration Council. It was regrettably abolished about 1997.

To quote Senator Meg Lees (Hansard, Wed 25th March 1998) in speaking to a disallowance motion after the Government had moved to close down ERDC. *"The Energy Research and Development Corporation was set up to manage the federal government's direct investment in energy innovation and research in energy supply and use. The way this works is that it invests in energy projects right from concept through to commercialisation, focusing on traditional energy supply, alternative and renewable energy sources and systems, and sustainable energy use. It covers a range of things, including gas and liquid fuels, electricity generation, distribution and application of energy use in Australian industry, manufacturing, transport, the built environment, appliances, processing and agriculture-in other words, the full gamut.*

"The ERDC selects projects and then funds them to meet these priorities. Therefore, it supplies support to the private research sector. It is a big injector of funds in research and development--indeed, the major injector of funds--and was about ensuring that Australia had a leg-up in the new technology field, that we actually got into the sunrise industries and really made a contribution to the future of energy trends and use. "

"It has in its short time developed a very good reputation, a good name in the industry and research institutions, and it was helping to create a lot of jobs, not just jobs directly in the specific research areas but, as processes and procedures came on stream

and as products were developed, further jobs down the line. As an Australian it was very good to see the Australian stamp on much of this marketed technology. "

With a modest Federal outlay of about \$12.5 million a year, and a small dedicated professional staff, ERDC supported projects that were mainly funded by industry with the strong prospect of saving energy. The scope of its later projects was wide ranging. One was improved control of electric motors with big power savings, and applications including a sawmill in Tumberumba, Queensland Rail's Brisbane-Rockhampton electric tilt train that started running in 1998, and exports to Hong Kong's Mass Transit Railway. Solar heating and solar power cell development was supported along with energy efficient housing.

So also was the use of methane gas drained from NSW coal mines to run bulk haulage trucks, and compressed natural gas to run quieter cleaner garbage trucks for Waverley Council. Another ERDC project (Weekend Australian 17-18 May, 1997 p42) was to make drink vending machines more power efficient with a saving each year for each new machine of \$350. The electricity saved meant less carbon dioxide emissions to the greenhouse and less air pollution in our cities.

In short, ERDC actively supported measures to save energy, increase Australia's international competitiveness and to reduce greenhouse gas emissions. There is a clear need for Australia to improve its performance in these areas.

The 1996 State of the Environment Australia report noted that Australia's average energy consumption per head (at 16.2 gigajoules per head in 1993-94) had increased in recent years, and, is a little higher than the OECD average. In a warm country, we should be using below the OECD average. This report also notes that Australia has a high fuel use per capita which is some 20 per cent higher than the OECD urban average, and the relatively poor average fuel efficiency of our car fleet.

Australia also has the highest road freight activity per capita in the world, and road transport uses much more fuel than rail or sea for a given long distance or bulk freight task. Clearly, there is ongoing need for improvement in energy efficiency, and we cannot be 'relaxed and comfortable' about market forces delivering, on their own, the necessary gains.

In place of ERDC, other arrangements were made, including an increased reliance on State Governments and private sector, along with Universities working with reduced resources, to advance essential energy research of national significance.

In one sense, the Australian Greenhouse Office (AGO) became the Federal Government's lead agency in energy efficiency. However, issues of energy efficiency and conservation, and reducing greenhouse gas emissions from the electricity and transport sectors appear to have been subordinated to suggestions that somehow Australia is meeting its agreed Kyoto targets for greenhouse gas emissions.

It is recommended that consideration be given to the establishment of a federal Energy and Greenhouse Research Corporation.

**APPENDIX B SOME GOVERNMENT INQUIRIES AND REPORTS RELEVANT
TO REDUCING OIL USE AND GREENHOUSE GAS EMISSIONS
IN TRANSPORT (including improving road pricing)**

During the 1970s

1979 Australian Transport Advisory Council *Transport and Energy Overview*

During the 1980s

1980 Sydney - Melbourne rail electrification study
1984 National Road Freight Industry Inquiry
1986 Federal Department of Energy, Inter-State Commission
1987 Inter-State Commission

During the 1990s

1991 Senate Standing Committee on Industry, Science and Technology *Rescue the Future: reducing the impact of the greenhouse effect*
1991 Industry Commission Rail Transport, and Greenhouse Gases (two inquiries)
1991 Ecologically Sustainable Development (ESD) Working Group on Transport
1994 Industry Commission Urban Transport
1994 National Transport Planning Taskforce
1996 Bureau of Transport and Communications Economics in its 2002 Report No 105 *Greenhouse policy options for transport 2020*
1997 Australian Academy of Technological Sciences and Engineering re urban air pollution
1997 House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform (the Neville Committee) Planning not patching
1998 The Neville Committee Tracking Australia
1999 Productivity Commission 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*
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 House of Representatives Standing Committee on Environment and Heritage Sustainable Cities

- 2005 Senate Rural and Regional Affairs and Transport Legislation Committee re AusLink
- 2007 Senate Rural and Regional Affairs and Transport Legislation Committee re Inquiry into Australia's future oil supply and alternative transport fuels
- 2007 House of Representatives Standing Committee on Transport and Regional Services The Great Freight Task: Is Australia's transport network up to the challenge?