

# **Submission re Public Infrastructure**

**To the Productivity Commission from Philip Laird, University of Wollongong,  
December 2013**

Given Australia's current overall shortage of 'fit for purpose' infrastructure, the inquiry is considered as timely. The submission shall mainly be confined to the rail sector, and will draw on research conducted at the University of Wollongong. However, it does not necessarily reflect the views the University. The submission shall look at:

1. Some examples of cost effective rail projects;
2. Comment on some expensive rail projects;
3. Comment re state of rail system;
4. The costs of an inadequate rail system;
5. Disincentives for private sector investment in rail; and,
6. Comment on rail privatisation.

## **1. Some examples of cost effective rail projects**

Over the past twenty years, such projects include the Queensland Rail Mainline Upgrade of the 1990s, the Alice Springs to Darwin railway (2001-03), Victoria's Regional Fast Rail (2001-06), and, the Perth to Mandurah Railway (2003-07).

### *1.1 Queensland Rail Mainline Upgrade*

Up to 1986, the Brisbane -Townsville line was characterized by having low axle loads (15.75 tonnes) with numerous speed restrictions. As part of the civil works carried out in association with Brisbane - Rockhampton electrification during the 1980s, four major deviations were completed along with selected tight radius curve easing. As a result of these works, the transit times for freight trains between Brisbane and Rockhampton were reduced from an average of about 15 hours to 12 hours whilst freight train gross loads were lifted from 760 to 1200 tonnes.

In 1992, Queensland Rail commenced its Mainline Upgrade or MLU at an initial cost of \$526 million. The MLU program had many aspects and included the acquisition of new container wagons and locomotives along with upgrading of bridges and rail deviations and for heavier axle loads and faster trains. Some 672 old timber bridges between Brisbane and Cairns were replaced with concrete box culverts or concrete bridges and a further 157 bridges

were strengthened. In addition, MLU included no fewer than 45 rail deviations between Nambour and Townsville. The average cost of these deviations, extending for about 160 km and built to modern engineering standards, was just \$1.3 million per kilometre.

Track upgrading work under MLU allowed the maximum weight of a freight train behind a locomotive to be further increased to 1500 tonnes for a 2800 class locomotive. Brisbane - Cairns freight transit times fell from 40 hours to 27 hours.

As a result of the improved train operations, QR was able to maintain freight tonnages and live stock traffic on its North Coast Line (NCL). This was at a time when rail freight operations came under increased competition from road freight. Along with faster and heavier trains, the completion of MLU resulted in an improvement in reliability of freight train movements, and, provided track infrastructure of sufficient quality to support rail - rail competition on the Brisbane - Cairns corridor.

In summary, MLU and other work allowed intermodal rail freight to grow to over 3 million tonnes pa by c2005 (as noted by the AusLink Brisbane Cairns corridor study).

In addition, MLU supported the introduction of passenger tilt trains, as of 1998.

Whilst MLU was followed by more track investment, including straightening and duplicating 14km of rail line between Caboolture and Beerburrum by 2008 on a much improved alignment, further investment is now required on the North Coast Line. Comment on this follows in Section 3.

## 1.2 Alice Springs to Darwin railway

After nearly a century since an intergovernmental agreement between the Commonwealth and the Government of South Australia (c1908) to provide a railway between Adelaide and Darwin, a 1420 km line was completed from Alice Springs to Darwin, in late 2003.

The time to all but finish the job, from "financial close" in April 2001 to September 2003, was a record 29 months. This was for less than \$1m per kilometre. In fact, the construction cost an average of \$800,000 per km. This followed good planning with corridor protection and some preconstruction, and involved construction on four fronts, with two each centred at Tennant Creek and Katherine.

The first revenue freight train left Adelaide on 15 January 2004 for Darwin and was followed in early February by *The Ghan* passenger train. By mid 2005, demand was so high that a weekly Adelaide - Darwin 'Ghan service was made into a twice-weekly service. Freight services, initially three intermodal trains each way each week, within a few years,

expanded at five or more such trains winning over 90 per cent of the SA-Darwin freight market. To this were added ten bulk trains (four Bootu Creek Mine Manganese and six iron ore) and trains carrying piggyback oil tanker trucks.

### *1.3 Victoria's Regional Fast Rail*

Regional Fast Rail (RFR) included some 500 route km of track being upgraded to modern standards with heavier rail and extensive resleepering and new signalling systems. The most notable part of the RFR track upgrades was an 8.2 km deviation bypassing the curves at Bungaree east of Ballarat. The deviation included two of Australia's largest rail bridges, spanning Lal Lal Creek (363 metres) and Moorabool River (270 metres).

The track and signalling upgrades on all four corridors were completed by early 2006 and new V/Locity trains (made in Victoria) were then tested. The initial cost was \$550 million, with later safety requirements incurring extra cost.

The new trains, moving at speeds up to 160 km/h, were well received by the travelling public. Within a year, patronage increased by some 30 per cent and within five years, patronage had doubled. It has since grown, to the extent that the initial order for 29 two car sets, over time, went to 58 three car sets - a three fold growth.

Victoria's Regional Rail Link, now under construction with significant federal funding, will deliver further benefits.

### *1.4 Perth to Mandurah Railway*

The 72km Perth Mandurah railway was completed in 48 months, and opened on December 2007. The cost, as noted in the book "48 months – 48 minutes" (Longhurst, D., 2008, Rowlhouse Publishing) was about \$1.184 billion. The electric rolling stock, made in Queensland, cost about \$300 million.

The route of the project was changed to include more direct access to Perth after a change of government by Minister Alannah MacTiernan, who managed to gain (p23) "the extra funds that were required from the Treasury."

The project included two underground stations. The average cost, excluding rolling stock, was about \$18 million per kilometre. Further information is given by Waldock, R., Martinovich, P., Cartledge, A., Hamilton, R. (2008), New Metro Rail Project – Lessons Learned May 2008, Public Transport Authority WA, Perth at :

[http://www.ceiid.wa.gov.au/Docs/KNF\\_200805/MAY08-NewMetroRailProject.pdf](http://www.ceiid.wa.gov.au/Docs/KNF_200805/MAY08-NewMetroRailProject.pdf)

Even though the project was a success by national and international standards, those responsible took the time to reflect on what could have been improved. Of particular interest is one page *What Would We Do Differently Next in the presentation Lessons Learnt Southern Suburbs Railway CONSTRUCTION - COMMISSIONING - OPERATIONS*

1. Tighten and manage project scope or ensure a suitable model is in use that allows for variations to be more successfully managed;
2. Make better use of contract management clauses and tools available to manage poor performance and program management;
3. Develop a means to deal with interface issues resulting in scope change by initial works packaging;
4. Ensure specifications are set to appropriate level with key elements prescriptively defined. Take a more proactive approach to risk management with appropriate interventions included in standard specification; and,
5. Ensure suitable investment in the retention of appropriately skilled technical expertise in house.

The point about adequate in house technical expertise is an important one. It was also touched upon in a recommendation (#22) of the House of Representatives Standing Committee on Transport and Regional Services (2007) *The Great Freight Task: Is Australia's transport network up to the challenge?*

Of particular note re how Perth Mandurah was completed, on time and within budget, is the evidence given, in a private capacity, by Mr Peter Martinovich, at a public hearing held 6 December 2011 for an Inquiry "Rail Infrastructure Project Costing in New South Wales" by the General Purpose Standing Committee No.3 of the NSW Legislative Council.

The Perth to Mandurah project, officially opened in December 2007, has proved surprisingly successful. Data released Public Transport Authority (PTA) of WA for 2012-13 patronage data shows a record 65.5 million rail trips for the Perth Urban rail system. Of these trips, some 21 million were for the Perth to Mandurah railway that became operational in December 2007. Moreover, PTA data shows Perth bus patronage growing each year since the Mandurah line was opened.

## **2. Comment on some expensive rail projects**

Firstly, the 2012 report of above cited inquiry, "Rail Infrastructure Project Costing in New South Wales" included 9 recommendations. All 9 recommendations were accepted later

that year by the NSW Government. It is fair comment that some people felt that this Committee could have gone further in addressing a significant problem in NSW.

Further comment is given in a paper "Passenger rail infrastructure projects in Australia 2000-2012 how much did we pay and what did we get?" by Mr. S Martin, to the 2012 Conference for Railway Engineering at Brisbane. To quote in part from the abstract:

Between 2000-2012, 28 major urban passenger rail projects were constructed in Australia, at a cost of approximately A\$8.8 billion. The projects represented in this paper include heavy rail and light rail constructed in Australian capital cities between 2000 and 2012 and includes the construction of new heavy and light rail lines and the extension, amplification and electrification of existing rail lines.

The data collected in the survey has been scaled up to constant 2012 dollars and further analysed to develop indicative construction cost profiles for certain kinds of projects, along with a discussion of the various risks and circumstances associated with the inception, development and delivery of these projects.

Attention is also drawn to a 2012 report *Can we afford to get our cities back on the rails?* of the Grattan Institute. The paper looks back to the 19th Century, and towards the end, after reviewing a number of potentially valuable projects, and possible measures of part funding them, concludes:

None of these measures are politically easy but there is evidence that voters have a big appetite for change in urban transport. In a 2011 survey for the National Transport Commission close to half the population agreed they would - like to be able to drive less - and more than four in five agreed that the government should develop more public transport services to give people a realistic alternative to driving. With political leadership and a clearer linking of costs and benefits, new urban rail lines might yet have a place in our future transport mix.

Perhaps the most obvious lesson of history is that urban passenger rail is a long-lived asset that can benefit a city more than a century after it is built. As J.J.C Bradfield wrote about the Sydney Harbour Bridge: —Future generations will judge our generation by our works.

Comment is given on three New South Wales projects with cost blowouts (Epping Chatswood, Cronulla-Sutherland and the Southern Sydney Freight Line). Here, it is of note that many factors may require additional project expenditure, and these are outlined later.

These factors may include environmental impact mitigation (e.g. route relocation, and/or noise walls), occupational health and safety requirements, and third parties (including Councils) securing generous compensation measures (e.g. parking near stations).

It is also of note that a major uncertainty in project costs is the weather. Good weather may allow a project to proceed without delay, and in some cases, by way of example former Hume Highway deviations, to be opened months early. Bad weather may not only result in delays, but additional costs.

### 2.1 *Epping Chatswood*

In 1998, an official NSW Government statement *Action for Transport 2010* listed a number of rail projects for completion, including the 28 km Parramatta Rail Link by 2006 at an estimated cost of \$1.4 billion. Instead, the 12.5 km Epping to Chatswood section opened on 23 February 2009, at a cost of about \$2.3 billion.

In short, that is not quite half the railway with a cost escalation of about \$900m. The final average cost per km of the Epping Chatswood Rail Link, at about \$184m, was about 10 times that of Perth - Mandurah. This factor of 10 is not explained by the amount of tunnelling required.

Possibly the most extreme pre-approval cost inflator for the Epping Chatswood Rail Link was a decision announced in August 2001 to replace the proposed Parramatta (Chatswood) Rail Link rail bridge over the Lane Cove River by a tunnel. This was despite the fact that there was a nearby road bridge.

As noted (Review, [infrastructure.gov.au/roads/F3toM7Review](http://infrastructure.gov.au/roads/F3toM7Review)):

In 1989, the NSW Government of the day accepted community concerns relating to a surface road linking the F3 to the M2 Motorway through the Lane Cove National Park. This resulted in the project not proceeding at that time because of these potential environmental effects on the Park and on those that use the Park. A similar decision was taken more recently by the Carr Government on the issue of the proposed Epping to Chatswood rail line bridge in the Lane Cove National Park. Due to community concerns a decision was made to put the rail line in tunnel....

The willingness of Government to avoid social and environmental impacts of surface infrastructure projects in Sydney has seen major projects being constructed in tunnel, including the Eastern Distributor and M5 East Freeway. In all cases, while these projects result in external benefits not costs, they result in very high capital costs

and higher operational costs, placing these projects on the limit of economic acceptability and affordability.

The Lane Cove River rail tunnel required ‘cut and cover’ and was one of “the most significant challenges” for the Epping Chatswood Rail link. The decision of the NSW government of August 2001 to replace a bridge over the Lane Cove River by a tunnel:

- a. added complexity, cost and delays to the project (which was followed in 2003 by a decision to only construct the section from Epping to Chatswood);
- b. required steeper grades and lengthened the Epping to Chatswood link by almost one kilometre, adding to travel times and operational costs;
- c. deprived the University of Technology Sydney at Kuringai a nearby station; and,
- d. restricted the options for deployment of electric multiple units.

Lessons should be learnt from the Parramatta Rail Link and these include a need not to give undue weight to the claims of special interest groups.

One additional source of problems for Epping Chatswood was a decision of the NSW government to separate project supervision, from State Rail initially to the Transport Infrastructure Development Corporation or TIDC. TIDC was sometimes referred to, unofficially of course, as "Twice Indicated Direct Costs". Later this became "Thrice Indicated Direct Costs".

## 2.2 *Cronulla-Sutherland*

A second NSW Government rail project with significant cost escalation and delays was that of Cronulla-Sutherland part duplication and signalling.

As noted in a Media Release CRONULLA LINE DUPLICATION: TWO YEARS LATE AND TRIPLE THE COST of 23 April 2010 by then Shadow Minister Shadow Minister for Transport Gladys Berejiklian MP “The project was first announced in 2003 at a cost of \$106 million and was promised to be completed by 2008”. This cited an earlier Media Release (Hon Carl Scully, 25 February 2003) who noted that the project would also include signaling and train stabling. The project was opened in April 2010 at a cost of \$436 m.

## 2.3 *Southern Sydney Freight Line*

A third rail project in Sydney, with delays and cost escalation has been that of the Southern Sydney Freight Line (SSFL). This was constructed mainly for the Australian Rail Track Corporation (ARTC) on land to be leased from RailCorp.

In 2005, a cost estimate was \$175m. In early 2009, this was revised to \$309m with completion expected by early 2010. The SSFL was finally open for operations on 21 January 2013, as a "1 billion piece of infrastructure" (Ministerial and ARTC Media Release of this date). The cost escalation from 2005 was over \$800m.

The aim of the SSFL was to provide a dedicated freight line for a distance of 36 km between Macarthur and Sefton in southern Sydney, allowing passenger and freight services to operate independently. It was part of a wider program of works (all up about \$3 billion) to improve the efficiency and cost-effectiveness of rail freight services along the North-South Rail Corridor between Melbourne, Sydney and Brisbane. Prior to its completion, during morning and afternoon peak periods, freight services were not permitted to run between Macarthur and Sefton due to passenger priority.

More detail follows. Following the take up in September 2004 of a 60 year mainline track lease (after protracted negotiations) the ARTC continued planning for the SSFL. In April 2006, an Environmental Assessment was put on exhibition for public comment.

On 5 February 2009, then Federal Transport Minister Albanese announced that construction work had commenced on the 36 km SSFL, to "help clear the single largest bottleneck on the interstate rail network." The project was then scheduled to be completed by early 2010 at a cost of \$309 million.

It was clear by Spring 2009, that there would be delays to the SSFL. On 3 November 2009, the ARTC announced that the programme for delivery had been delayed "due to three key issues that have directly impacted on the original delivery programme"

Firstly, the windows available to conclude signal design and modifications to the RailCorp ATRICS signalling system do not match the current project delivery schedule which means signal changes may not be made until November 2010 or early 2011.

Secondly, it has become necessary to redesign part of the route to minimize impact on the Glenfield Garbage Tip. Changes to the garbage tip area have necessitated this redesign so as to minimize the impact on the tip area and reduce the exposure of the line to future environmental issues in the tip area.

In addition, requirement for more extensive service re-location along aspects of the rail corridor has had an impact upon estimates of quantities of materials required for the project. ...."



On 14 September 2010 the ARTC announced that "The Leightonfield-Sefton section of the SSFL is expected to be finished by mid 2011" whilst deferring the section between Macarthur and Leightonfield.

On 1 August 2011, ARTC announced that Leighton Contractors had been selected by to deliver the final stage of the SSFL (in an Alliance contract worth \$150 million).

In respect of delays for a related project, it is of note the lead up to the 2007 Federal election, Prime Minister Howard announced \$840 million to expand track capacity between North Strathfield to Gosford. This received bipartisan support.

On 5 February 2009, then Federal Transport Minister Albanese announced "The allocation of \$15 million to accelerate planning and design work on the Government's \$840 million investment in a new dedicated freight line between North Strathfield to Gosford".

By late 2011, ARTC and RailCorp were still to agree (after four years) to a scope of works that will benefit both freight train movements and passenger train movements. Work on part of this project has only recently started.

#### *2.4 Some NSW rail project cost factors*

Many factors may require additional project expenditure. These factors may include environmental impact mitigation (e.g. route relocation, and/or noise walls), occupational health and safety requirements, and third parties (including Councils) securing generous compensation measures (e.g. parking near stations).

It is also of note that a major uncertainty in project costs is the weather. Good weather may allow a project to proceed without delay, and in some cases, by way of example former Hume Highway deviations, to be opened months early. Bad weather may not only result in delays, but additional costs.

A further source of problems since 1995 (and including the time of the Sydney 2000 Olympics in which State Rail gave a Gold Medal performance), was constant changing of both chief executives and structure of State Rail. From 1995 to 2011 there was no fewer than 8 chief executives. A new structure was introduced in 2013.

Further cost escalation can occur when inappropriate OHS requirements are imposed. One example given at a 2011 meeting was an electrical substation on the NSW RailCorp network requiring both a disabled parking space outside and toilet inside, when it was unlikely that a disabled person would ever be asked to go to the substation.

Further problems were to arise from the December 1999 Glenbrook fatal collision of two trains, and, the January 2003 Waterfall fatal derailment. These two fatal accidents stand in contrast with the safety record of other rail authorities in Australia.

### 2.5 *Some costs of NSW rail project cost escalation*

Cost escalation, and other problems prevented the 1995-2011 NSW government from delivering on the official 1998 NSW Government Action for Transport Statement.

One important project was the North West Railway (now finally about to start). Another was track upgrades to speed up trains between Sydney and Newcastle.

Yet another was a new Waterfall-Thirroul Route that was to reduce Sydney Wollongong train transit times by 15 minutes. In 1998, the cost estimate was understood to be some \$300 million. This was totally revised in 2003 (in a consultants report to the NSW Government) to cost about \$1.4 billion  $\pm$  30 per cent. Two partial realignments of this winding track near Helensburgh were noted at an indicative cost of \$779 million (best travel time savings) and \$600 million (best value). Ten years later, such work is now needed. As noted by in the 2012 State Infrastructure Strategy of NSW by Infrastructure NSW, speeding up of trains between Sydney and Newcastle, and Sydney and Wollongong, should be addressed.

The failure to date complete these three important NSW rail projects has resulted in more road vehicle usage in the Sydney Greater Metropolitan Region. Road vehicle usage in Sydney is costly in many ways, not just in road system costs, but also road crashes (conservatively estimated at about \$3 billion per year), air pollution health related costs from air pollution from motor vehicles (a further \$1 billion per year), and noise.

In addition, a 2007 BTRE publication "Estimating urban traffic and congestion cost trends for Australian cities" Working Paper 71 (p13) notes the social costs of road congestion during 2005 in Sydney as about \$3.5 billion. By 2020 this was expected to rise to approximately \$7.8 billion per year for Sydney.

### 2.6 *Other comment re New South Wales rail*

Poor transport planning within NSW cost NSW significant federal funding from 2008 to 2013. This is not only for urban rail passenger tracks but for freight rail tracks.

As an example of poor, delayed, or even non existent transport planning in NSW, consider the challenge of developing a freight strategy for NSW. This was mentioned in the 1998 official NSW Government statement *Action for Transport 2010*. An article in the

Australian Financial Review for 6 August 2001 "NSW ports, freight facilities under review" noted that the then NSW Transport Minister (Mr Scully) has "ordered five, 10 and 30-year plans to address potential bottlenecks in the operation of ports in the international economy."

As noted in the article, the then Minister went on to say "we are thinking ahead to ensure that we are not going to be disadvantaged in the medium term".

From 2001 to 2011, time went by without a NSW whole of state freight strategy being released.

A draft NSW Freight and Ports Strategy was on exhibition late 2012 and early 2013. The final strategy, at the time of writing this submission, is still to be released. In the meantime, Port Kembla and Port Botany were assigned, on a long term (99 year) lease by the NSW Government to the same company, thus lessening potential competition between the two ports (which works very well in New Zealand between Tauranga and Auckland).

### **3. Comment re state of Australia's rail system**

To begin, reference is made to the 2010 Engineers Australia Infrastructure Report Card:

"Rail has been given a D+ rating. Rail infrastructure includes metropolitan passenger networks, freight and regional passenger services, grain lines, the interstate networks and private railways. The low rating has been given on the basis that urban rail networks cannot cope with demand. There is a need for a high speed rail network along the eastern coast of Australia to ease airport congestion and to reverse the trend of declining regional rail utilisation, which is resulting in more road traffic. The interstate network and Pilbara railways in particular are in a good condition.

"Improving the efficiency and productivity of existing rail networks is a challenge in many jurisdictions. For instance, increasing train length, load capacity, operating speed and turnaround time will require considerable improvements in rolling stock, below-rail infrastructure, and port-rail connections and intermodal hubs. The investment to achieve improvements will require substantial investment over at least a decade."

The result for rail was a set back from a C- in 2005 to D + in 2010. Roads overall maintained their C rating. Sydney comes in for particular mention, including its population predicted to increase by 550,000 people by 2021 and that transit times need reducing to the neighbouring centres of Wollongong, the Blue Mountains and Newcastle are. In several cases, these times are slower than in the past. Examples are cited, including from a 2009

paper *On the Right Track: Why NSW Needs Business Class Rail*, by Buckingham and Hartwich from The Centre for Independent Studies.

The 2010 EA Infrastructure Report considers that it is "essential to increase rail freight to accommodate the greater freight task..." and to this end, it is necessary to improve the interstate and regional freight lines, plus develop multi-use intermodal terminals. Coal lines in NSW and Queensland will also need attention. Improved separation of freight and passenger trains is "particularly needed in Sydney and Brisbane". The relative low pricing of road freight is noted and ensuring 'user pays' is an issue (p19) *"that will need to be addressed sooner rather than later."*

The new high speed rail feasibility study was welcomed, and a need for land corridor protection, including to Canberra, is noted in the Report Card. Finally, failure to address integrated land-use and transport planning and the existing deficiencies of rail (p24) "will impose huge costs on future generations."

This echoes an earlier theme of a 1994 National Transport Planning Taskforce report in commenting on the need for better planning for transport in Australia into the 21 st century: *"Perpetuation of existing arrangements will condemn the nation to ineffective results"*

It is now submitted that with few notable exceptions, Australia's overall rail infrastructure is substandard on four important fronts:

- \* urban rail serving major cities with the exception of Perth;
- \* the interstate mainline network;
- \* Queensland north coast line; and,
- \* the rural network serving grain exports.

In addition, well over 100 years since Britain, Canada and the United States resolved the question of railway gauges in favour of a uniform and standard gauge (4'8.5" or 1435mm), Australia still has a multiplicity of railway gauges.

On the other hand, there is no doubt about rail's potential to perform well in moving freight in Australia. Examples of world best practice operations include the iron-ore trains in the Pilbara, Central Queensland electric coal trains, and East West rail freight operations west of Adelaide and Parkes.

### 3.1 *Urban Rail*

Most people rely on cars for getting around major cities such as Sydney and Australia's other capital cities. This is partly due to the growth since World War II of low density suburbs that are not always well served by public transport.

For much of this time, urban public transport was either static or declining. Rail moves urban passengers in Australia's major cities, by either conventional 'heavy rail' systems (now mostly electrified) or by light rail (including trams). In Australia, urban heavy rail passenger numbers have risen from a low point of about 310 million passengers in the late 1970s to about 601 million in 2011-12 (ARA Australian rail industry 2013 data). In terms of passenger kilometers (number of passengers times average length of journey), this was a modest 13.8 billion pass. km compared with the total metropolitan movement by cars (eg 147.3 billion pass. km. in 2007-08 - BITRE, 2009).

Urban rail patronage in Australia saw appreciable growth in the five years to 2007-08 by some 22 per cent (from about 494 million passengers in 2002-03). The largest growth was recorded in Melbourne (some 30 per cent from 134m to over 200m in five years with more expected in 2008-09) and Perth (31 to 42 m over five years). Over those five years, CityRail had shown a modest increase of some 8 per cent.

Melbourne needs a metro, and Brisbane needs a Cross River connection. It is also of concern that within NSW, completion of the 35 km Maldon-Dombarton line (to improve rail freight access to Port Kembla and to give more passenger capacity on the existing South Coast line) is still to be committed to.

### 3.2 *Interstate rail track*

In the area of interstate rail freight track, whilst recognising the work done by the ARTC on the East-West corridor (linking Melbourne to Perth) and more recently the North-South corridor (Melbourne-Brisbane), much more work is needed on both corridors. In short, much of the North-South track linking Australia's three largest cities has substandard alignment and it needs straightening. The present track linking Australia's three largest cities is at least 150 km longer than it needs to be and has excessive curvature limiting speed weight performance. Indeed, as noted in a 2008 submission by the ARTC to Infrastructure Australia (p20) "*For rail to move to the next step in competitiveness, or even in fact to maintain competitiveness against a constantly improving road network, there is no alternative but to start to consider deviations of the current poorly aligned sections of the network.*"

Both the East-West and North-South corridors have long standing restrictions on axle weights. The current standard in Class I railways in Canada and the United States is for wagons with 285 000 lb (gross weight) which corresponds to axle loads of 31.8 tonnes. This requires track with good formation and heavy rails etc. In short, the mainline track of

Canadian and US Class I Railroads allows for “FAST AND HEAVY” freight trains moving at 100 km/h with 25 tonne or more axle loads. However, the Australian standard over much of the ARTC network (excluding the Hunter Valley coal lines in NSW) is restricted to 23 tonne axle load (TAL) limit for wagons moving no faster than 80 km per hour, or a 21 TAL limit for wagons moving no faster than 115 km per hour.

In addition to overhead clearances being unduly restrictive east of Adelaide and Parkes, crossing loop lengths are at best is mostly limited to 1800 metres (except for Sydney-Brisbane where it will be 1500 metres). Canadian National is now extending its loops to 10 000 feet or about 3000 metres.

In addition, work on an Inland Railway railway linking Melbourne to Brisbane via Parkes has been slow whilst subject to numerous studies. The Commission may care to inquire as to how if Western Canada can have two viable long distance rail routes from Winnipeg to Vancouver (CP via Calgary and CN via Edmonton) (plus sorted out its gauge problems long ago) why South East Australia can have only one major interstate rail track. This is despite Australia’s Melbourne-Brisbane route serving a larger population over a shorter distance. In short, Western Canada has two major interprovincial lines of good quality, whilst Eastern Australia, with its larger population, has one interstate mainline of poor quality.

In 2008, Mr Len Harper on behalf of the Chartered Institute of Logistics and Transport noted the tracks linking Australia's three largest cities “... *are inadequate for current and future needs.*” That year, the ARTC stated: “*there is no alternative but to start to consider deviations of the current poorly-aligned sections of the network.*”

Indeed, in 2004, as noted in the AusLink White paper, the ARTC was prepared to build “... deviations at 14 locations, totaling 121 kilometres, to ease curves on the North Coast railway between Newcastle and Brisbane (\$158 million).” A special allocation of \$450m to the ARTC for this work was made in the May 2004 Federal budget. However, these deviations did not proceed, and only recently has more limited curve easing work taken place. Almost a decade later, it appears that the ARTC is yet to move to advanced planning in the manner done by the NSW Roads and Traffic Authority for Pacific Highway Upgrades, or, the Queensland Government for duplication of the Landsborough to Nambour section of the Queensland North Coast line on improved alignment, or, a Toowoomba Range rail crossing.

To expedite major rail deviations, as is the case with reconstruction of the Hume and Pacific Highways, some effort in planning and investment will be required by Government. A case study of a major deviation between Hexham and Stroud Road was noted in 2007 report of the Neville Committee (The Great Freight Task: Is Australia’s transport network up to the

challenge? page 116). Here, the construction of 67 km of new track would replace a substandard 91 km section to halve transit times and reduce fuel use by 40 per cent.

The Australian Government makes funds available for the advanced planning of the Pacific and other major interstate highways. It is submitted that funding provision should be made for expediting advanced planning for major rail track upgrades. The case for special federal funding to allow the ARTC to expedite such forward planning is strengthened by the fact that the ARTC is a Corporation as opposed to a public authority.

This includes giving more attention to reserving corridors, by both State and Federal Governments. This is not only new railways, or minor works close to existing railways, but also for future rail deviations. As seen by a former Queensland Transport Minister, The Hon Paul Lucas MP (as quoted, *Track and Signal*, Oct-Nov-Dec 2005, page 77) there is a need to “reserve rail corridor land before it becomes a costly issue”.

### 3.3 *Queensland North Coast Line*

As noted above, the good work done in the 1990s with the Main Line Upgrade now needs complementing with further investment. The scope of work needed, in part, is outlined in a report of the House of Representatives Standing Committee on Transport and Regional Services (the Neville Committee - 2007, *The Great Freight Task: Is Australia's transport network up to the challenge?* page 103), there is a “*demonstrable need to expedite Caboolture-Landsborough duplication and re-alignment and to start planning for other rail deviations and bridges...*” on the Brisbane - Townsville route. As well, the Burnett River near Bundaberg “*...is now subject to a 15 km/h ‘flat’ speed restriction (i.e. no acceleration or braking).*”

Any failure of this rail bridge would have significant consequences for Central and Far North Queensland. The Neville Report (2007, p 128) also found 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.*”

### 3.4 *Rail in regional Australia*

Grain line condition in many states has deteriorated, and this in part is a consequence of privatisation of certain rail assets. Many such lines now need rehabilitation. Again, the

issues were well covered (including the option used in Canada where governments move to support rather than overregulate short line operations) in the above cited 2007 report *"The Great Freight Task: Is Australia's transport network up to the challenge?"*

As is often the case, New South Wales is of particular concern. The title of an article in *The Land*, 11 August 2011 says it all: "Call this a rail system? - 'Third world' branch lines driving freight onto roads." Rail access pricing of NSW grain lines was the subject of a review by the Independent Pricing and Regulatory Tribunal (IPART). The 2012 report of this review also gives attention to road cost recovery from heavy trucks, and external costs.

#### **4. The costs of an inadequate rail system**

Very simply, an inadequate rail system leads to an over dependence on road transport to move people and freight. International comparisons by Newman and Kenworthy showed that by the 1990s, Australian cities such as Canberra and Perth were as car dependent as cities such as Detroit and Houston in the USA. In addition, by the mid 1990s, Australia's road freight task was the highest per capita in the world (Austroads, 1997).

Australia's road vehicle use comes at a high cost. Firstly, over \$15 billion a year is now expended by Australia's three levels of government on road construction and maintenance (BITRE, 2011). Secondly, over 1300 lives are lost each year from road crashes in Australia. Coupled with other road injuries, the cost of road crashes has been conservatively estimated at \$18 billion a year (BITRE, 2011).

The total cost of road vehicle operations, including the fuel they use, buying and maintaining the vehicles, road works, and road crashes, was broadly estimated at about \$80 billion for 1992-93 by the Allen Consulting Group (1993). From Reserve Bank of Australia data this was about 11 per cent of Gross Domestic Product GDP. This 11 per cent in 2013 was about \$150 billion, and is regarded by this writer as now a conservative estimate.

There are numerous other hidden costs of road vehicle use, including health impairment from motor vehicle emissions in all capital cities, estimated for the year 2000 at \$2.3 billion. In regards to hidden costs, Prof. Stanley (2011) has estimated, after taking into account fuel excise and annual registration charges, but not including road congestion, a 'road deficit' of \$14 billion a year. This compares with an older estimate of a road deficit of \$8 billion a year of hidden subsidies of this and other writers. Under current road pricing, road deficits are increasing.

Road congestion costs are now in the order of \$10 billion a year (BITRE, 2011). This cost is projected to double over the next decade.



These road deficits include a 'road freight deficit' of at least \$3 billion per year. About half of this amount is unrecovered road system costs from the operation of articulated trucks. The other half is due to the involvement of such heavy trucks in road crashes coupled with other environmental and social costs.

#### 4.1 *Oil Vulnerability*

Road transport is highly energy intensive. Energy efficiency and oil vulnerability issues affecting the transport of people and freight are identified in many reports, including a report released 7 February 2007 of the Senate Rural and Regional Affairs and Transport Committee from the Inquiry into Australia's future oil supply and alternative transport fuels. The report noted 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.*"

In this regard, the 2008 Garnaut Climate Change review report noted (Chapter 21 'Transforming transport', p 503) that "*Governments have a major role in lowering the economic costs of adjustment to higher oil prices, an emissions price and population growth, through planning for more compact urban forms and rail and urban public transport. Mode shift may account for a quarter of emissions reductions in urban public transport...*"

If international oil prices continue to trend upwards, or even if they stay about the same as at present and the Australian dollar falls to levels of several years ago, Australians will be looking at petrol prices of \$2 per litre. Indeed, this level has already been reached in New Zealand. An increase in Australian petrol prices to \$2 per litre will put a lot of pressure on existing public transport. This may result in an increased level of scrutiny as to past government failure to extend Australia's urban rail network.

### 5. **Disincentives for private sector investment in rail**

It is submitted that present road pricing within Australia results in a disincentive by the private sector to invest in new railway track, or to upgrade substandard existing track.

One approach to road pricing is given by the Railway Technical Society of Australasia (Submission #186 to the 2004 House of Representatives Environment and Heritage Committee's inquiry into Sustainable Cities whose 2005 report ) which proposed a **ten point transport pricing plan** along the following lines:

#### i. Re tolls

A. remove toll rebates in Western Sydney, which is a costly scheme to administer.

- B. reinstate tolls at Berowra and Waterfall, with the proceeds being used to expedite long-overdue improvements of both the Pacific and Princes Highways.
- ii. Remove the Queensland Fuel Subsidy Scheme (done in 2009)
  - iii. Impose a congestion charge for access to the Sydney and Melbourne CBDs. It works well in London. And/or impose an environmental fuel levy for motor vehicle use in the Greater Metropolitan Areas of state capital cities and Canberra.
  - iiii. Restore fuel excise indexation, with the additional revenue going into improved transport infrastructure. To ensure best use of funds, replace road funds by transport funds.
  - v. Ensure that the further determinations of heavy vehicle road user charges by the National Transport Commission recovers - at least the populous zone - the full road System costs from heavy articulated trucks, B-Doubles and road trains. At present, these vehicles are cross-subsidised by other road users. Ensure that additional revenue is directed towards not only National Highway System maintenance (to compensate for changes under AusLink), but rail track and improved intermodal facilities.
  - vi. Increase annual registration fees for the heavier four wheel drive vehicles.
  - vii. Support the recommendation of the Productivity Commission from its 1999 Inquiry into Progress in Rail Reform into an inquiry into road provision, funding and pricing. Also have the Productivity Commission (again) examine urban transport.
  - viii. Increase rail fares, with all proceeds going into a better rail system.
  - ix. Improved land transport data, with publication of accurate, comprehensive and up-to-date information on all modes of transport, with details of energy use and greenhouse gas emissions.
  - x. Ensure that major airports and seaports are not in receipt of hidden subsidies.

Comment is now given on fuel excise, Sydney rail and road pricing, and road pricing for heavy trucks.

### 5.1 *Fuel excise*

In the year 2000, conditional rebates were given to diesel use and in early 2001, the Federal government reduced fuel excise and froze indexation. Since March 2001, petrol excise has remained at 38.143 cents per litre. The ongoing freezing of fuel indexation is in contrast to escalating road spending. A case for raising fuel excise by about 10 cents a litre has been made by the Bus Industry Confederation (2012) *Moving People: Solutions for a Livable Australia*.

Following the introduction of partial rebates of diesel excise for some heavy trucks (scope later widened), and the freezing of indexation of fuel excise, *the combined forgone petrol and diesel excise during 2009-10 was about \$4 billion.*

New Zealand has increased its fuel excise more than 10 cents a litre since March 2002, and on 1 August 2012 it became 50.524 cents per litre. In December 2012, it was stated that there would be further increases of 3 cents per litre for three years in a row. [http://beehive.govt.nz/release/petrol-tax-and-road-user-charges-increase ...](http://beehive.govt.nz/release/petrol-tax-and-road-user-charges-increase) It was also noted that road user charges for heavy trucks on a mass distance location basis, and certain other vehicles, "will be increased by an equivalent amount." This allows for a \$36 billion investment for roads and alternatives to roads for a period of 9 years.

## 5.2 Sydney rail and road pricing

The 2004 AusLink White Paper raised the option of congestion pricing for major cities (and also mass distance charges for heavy trucks).

Questions about Sydney's train fares, including some quite generous concession fares, were addressed in 2003 in an official report on Sustainable Transport following a Ministerial Inquiry into Sustainable Transport conducted by Mr Tom Parry. However, the recommendations on fares in this report by were rejected by the government of the day.

As noted by a 2012 report of Infrastructure NSW, Rail fares have fallen in recent years to about 20 per cent of operating costs. (State Infrastructure Strategy of NSW, page 107 "In 2010-11, the total cost of running the railway was \$3.5 billion, compared with farebox revenue of only \$700 million. In the four years from 2006-07 to 2010-11, operating expenses increased by \$588 million, while farebox revenue increased by only \$136 million)."

For too many politicians, road pricing reform is a 'no go' area. Yet, as observed by the 2010 Henry Tax Review, road pricing needs addressing. This includes the use of congestion pricing in major cities.

As a result of perceived shortcomings with Sydney's trains, buses and ferries, more and more cars are being driven on Sydney roads. More freeways and tollways have been built, yet road congestion increases. There is a widely held view, with some merit, that Sydney people should not have to pay a road congestion charge until public transport has been significantly improved. However, appreciable investment is now needed to improve Sydney's rail system and other public transport.

Attention is invited to a recent paper "Complementing distance based charges with discounted registration fees in the reform of road user charges: the impact for motorists and

government revenue" by D. A. Hensher and C. Mulley in Transportation. To quote in part from the abstract:

The call for a congestion charge is getting louder and more frequent in many countries as major metropolitan areas experience increasing levels of road congestion. ... In this paper we show, in the context of Sydney (Australia), that this can be achieved by the reform of registration fees in the presence of a distance-based charging regime that can deliver financial gains to motorists, with prospects of revenue growth to the State Treasury.

### 5.3 *Road pricing for heavy trucks*

Since its formation in January 2004, the National Transport Commission (NTC) has found it difficult to advance either road pricing for heavy trucks or gain increases in rail productivity. Moreover, in March 2006, after heavy lobbying by the road freight industry, a benign NTC determination with increased charges for B-Doubles was overruled.

Later in 2006, the Productivity Commission found the NTC charges to be "*conservative*" and made recommendations that CoAG take up road pricing.

Two other approaches to road pricing include:

*Intermediate* - including the former Inter-State Commission findings during the 1980s, the 1990-91 Over-Arching Group recommendations and NSW permit fees for heavier semitrailers and all B Doubles in use up to 1996.

*High, or "user pays"* - including a Bureau of Transport and Communications Economics 1988 report *Review of road cost recovery* (noted in the 1996 report of the Productivity Commission), an earlier NSW Commission of Inquiry (McDonell) methodology and long standing New Zealand Road User Charges.

Each of the above cited methodologies uses Equivalent Standard Axle (ESA) kilometres for separable pavement cost allocation which depends on the fourth power of the axle loads. In addition to the use of ESA kms, each methodology uses vehicle kilometers, average gross mass kms and passenger car equivalent kilometers as parameters for cost allocation.

Use of the McDonell methodology to calculate road system costs attributable articulated trucks gave c2005 an estimate of about \$1500 million per year higher than the NTC approach (which is light on ESA kms and makes more use of the other parameters). External costs (road crashes involving articulated trucks, pollution, and emissions etc) add approximately a further \$1500 million per year of hidden subsidies.

In May 2010, the Henry Tax Review made several pertinent recommendations for road pricing reform. These included one that CoAG "should accelerate the development of mass-distance-location pricing for heavy vehicles..."

Plus "COAG should nominate a single institution to lead road tax reform, and ensure implementation of this agreement."

In the run up to the 2010 election, the Australian Trucking Association was urging political parties to (see [atatruck.net.au](http://atatruck.net.au) media release 20 July 2010) "... reject the Henry Review's recommendation to rush into imposing mass-distance-location pricing, which could impose a heavy burden on operators."

It is not only the rail industry that has an interest in road access pricing. Road pricing reform to attain "competitive neutrality" is also in the national interest. An independent road safety researcher, Peter Mackenzie, found (see [ara.net.au](http://ara.net.au) media release 23 June 2009) that a 15 per cent shift of freight from road to rail (the so called 'contestable freight') could save as many as 45 lives per year from reduced road trauma.

Based on relative fuel use calculations and the size of the Australian articulated road freight task (144 billion tonne kilometres in 2007 using about 3.8 billion litres of diesel, and rail using one third of the diesel that trucks use for moving non-bulk line haul freight), this would save nearly 400 million litres of diesel each year. It would also reduce carbon dioxide emissions by about one million tonnes per annum.

## **6. Comment on rail privatisation**

Rail privatisation has occurred in Australia with mixed results, and is often advocated as a way of raising funds for infrastructure. Some older information on rail privatisation in Australia and New Zealand may be found in a paper for the World Bank by Williams et al (2005). However, not all people would share in these authors qualified assessment (page 57) that "Overall the rail privatization experience in Australia and New Zealand has been positive..."

One of the poorer results was in 1997 was a sale and a track lease of the Tasmanian Rail system by the Australian government. A recent paper by this writer (2013, P Laird *Government rail asset sales, and return to the public sector, in New Zealand and Tasmania Research in Transportation Business and Management Vol 6 p 116–122*) notes emerging problems after initial success, and how after a change in ownership in 2004, the Tasmanian track lease was taken back by the public sector in 2007, followed by the trains in 2009. Here, the Australian and Tasmanian governments outlaid over \$300 million towards upgrading the

badly run-down Tasmanian railway network. The paper also notes transferring of Victoria's below rail assets including a track lease (acquired from Freight Australia in 2004) from Pacific National in May 2007 to the Victorian Government, for a consideration of \$133.8 million, and, in December 2002, following the cessation of National Express trains operations in Victoria, their regional passenger train franchise was transferred back to the public sector.

The paper in part concludes that:

Provision of rail freight services can confer wider environmental and social benefits, and in some cases may be regarded as a Community Service Obligation. The alternative of putting such rail freight onto road, when all costs are considered, can be a costly option. However, if rail subsidies are to be paid, the question arises as to whether they should be paid to a private sector provider or a government agency. The experience, at least in the New Zealand and Tasmanian cases, suggests that the subsidies may better be directed to a government agency, charged with the responsibility of providing efficient and cost effective rail freight (and passenger) services. In the Tasmanian case, given a much smaller freight track, a decision by government that the rail system should be retained, and the rehabilitation required, it is considered appropriate that it continues to be government owned. ...

It is submitted that any future rail privatisation proposals in Australia should be subject to rigorous scrutiny. In regards to any possible sale of the Australian Rail Track Corporation, whilst there may be a case for a long term lease of the Hunter Valley coal network, there is not for the interstate network. Indeed, given the benefits of more freight on rail, there is a good case for the interstate network to be under a government authority.

Assoc Prof Philip Laird, Ph D FCILT, Comp IE Aust  
Faculty of Engineering and Information Sciences  
University of Wollongong NSW 2522

4 December 2013

## **Summary of submission re Public Infrastructure**

**To the Productivity Commission from Philip Laird, University of Wollongong  
December 2013**

The submission is confined to the rail sector and commences by noting four examples of cost effective rail projects that have delivered good outcomes in a timely manner. These are the Queensland Rail Mainline Upgrade of the 1990s, the Alice Springs to Darwin railway (completed 2003), Victoria's Regional Fast Rail (completed 2006), and, the Perth to Mandurah Railway (opened 2007).

Three expensive major rail projects are then outlined. These are Epping to Chatswood (opened 2009), Cronulla-Sutherland part duplication, (opened 2010), and, the Southern Sydney Freight Line (opened 2013). Each of these three projects were located in Sydney NSW, with lengthy delays and large cost escalation. The combined cost escalation was in the order of \$2 billion. Mention is also made of a 2011-12 NSW Parliamentary Inquiry "Rail Infrastructure Project Costing in New South Wales". Some significant costs of NSW rail project cost escalation are outlined, and other references are cited.

The submission gives an outline of the current state of parts of the Australian rail system, rated overall D+ in a 2010 Engineers Australia Infrastructure Report Card. After noting some excellent fit for purpose rail track, it is noted that much of Australia's rail infrastructure is now substandard on four important fronts:

- \* urban rail serving major cities with the exception of Perth;
- \* the interstate mainline network;
- \* Queensland north coast line; and,
- \* the rural network serving grain exports.

The costs imposed on Australia by rail track deficiencies include an over dependence on road transport to move people and freight, with large hidden subsidies along with additional liquid fuel use and emissions.

It is submitted that present road pricing within Australia results in a disincentive for the private sector to invest in new railway track, or to upgrade substandard existing track. Along with a ten point transport pricing plan, three areas for reform are outlined. There are: increasing fuel excise; congestion charging in major cities as noted in the 2004 AusLink White paper; and, a long overdue mass distance pricing for the heavier articulated trucks.

The submission concludes with a cautionary note on rail privatisation, and how one of the poorer results to date in Australia occurred in 1997 with a sale and a track lease of the Tasmanian Rail system. The track, followed later by the trains, ended back in the public sector at much cost.

It is submitted that any future rail privatisation proposals in Australia should be subject to rigorous scrutiny. In regards to any possible sale of the Australian Rail Track Corporation, whilst there may be a case for a long term lease of the Hunter Valley coal network, there is not for the interstate network. Indeed, given the benefits of more freight on rail, there is a good case for the interstate network to be under a government authority.