Submission to the Department of Infrastructure and Regional Development
National Freight and Supply Chain Strategy

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The submission is based on research conducted at the University of Wollongong for over three decades into the topic of rail freight efficiency and competitiveness and related topics. However, it does not necessarily reflect the views of the University. This research includes a 1998 Transport Reviews paper *Rail freight efficiency and competitiveness in Australia* and a 2014 Conference on Railway Excellence paper *A competitive interstate rail freight and passenger network*. The summary of these papers follows in Appendix A.

Related papers of this writer include: 2009 *Australian freight railways and commodity exports* Canadian Transportation Research Forum; 2010 *Australian Rail Freight Productivity* 3rd International Conference on Transportation and Logistics, Kyushu University, Japan; and, 2016 December Railway Digest with Ian Gray and Nick Montague *The prospects for short line operations in New South Wales*.

2.1 What is moving where, why and how

Who knows? The following matters were raised earlier this year with National Transport Commission (NTC) and appear relevant to the present Inquiry.

A. Aviation statistics for Australia such as published by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) are of a standard that should be aimed for in the land transport sector in Australia. However, the recent TrainLine reports published by BITRE and the Australasian Railway Association show appreciable rail data limitations.

B. In 2007, the House of Representatives Standing Committee on Transport and Regional Services (often refereed to as the Neville Committee after the Committee Chair Mr Paul Neville MP) released a detailed report *The Great Freight Task: Is Australia's transport network up to the challenge?* The report outlined Australia's growing land freight task, gave, numerous examples of inadequate transport infrastructure, and the first two of 25 recommendations addressed data deficiencies.

Recommendation 1

The Committee recommends that the Minister for Transport and Regional Services require the Australian Transport Commission and the Bureau of Transport and

Regional Economics to undertake the establishment of a national transport database.

Recommendation 2

The Committee recommends that the Minister for Transport and Regional Services urgently initiate legislation requiring transport industry operatives to supply essential information for the proposed transport database.

In more detail, the Committee in its 2007 report noted, **Transport Data**

2.80 During the course of this inquiry, it became apparent that the data available on freight transport left much to be desired.

2.81 The problem is not a new one. …the Productivity Commission had called attention to it in 1999… in its report on *Progress in Rail Reform*, the Commission had noted that:

> There is a lack of up-to-date transport data in Australia, impeding public debate and sound policy formation.

2.82 Again, in a supplement to that report, the Commission said, under the heading Data Gaps and Inconsistencies:

> Despite the extensive list of sources used to compile the database, a number of data gaps and inconsistencies remain, limiting the scope of this performance assessment.

2.83 In 2004, the National Transport Commission recognised the need for better data sources and proposed a national data framework. Professor Laird said that although efforts had been made to improve the situation, the BTRE noted in June 2006 that the problem still existed

> There is no single comprehensive source of time series data on freight transport movements in Australia. Time series of Australian freight movements must be derived from a range of different sources together with a range of assumptions…
>
> The issue of rail data is perhaps the most vexing. …After 1997, the recently privatised railways have declined to permit public release of City to City data. …

2.84 The Committee considers that this problem should be dealt with immediately. It believes that the NTC proposal should be revived and that commercial interests should be required by law to provide the essential information the Australian and State Governments need to plan the long-term development of transport infrastructure.

C. Data deficiencies in Australian land transport data were noted at some length in the *Back on Track: Rethinking transport policy in Australia and New Zealand by* Philip Laird, Peter Newman, Mark Bachels and Jeffrey Kenworthy. 2001 UNSW Press, Sydney. This book, inter alia, included a ten point land transport plan of which item 10, guided by the United States experience, included *Establish a National Bureau of Transportation Statistics to improve transport data.*

Data deficiencies in Australian land transport data really need addressing.

2.2 Competitiveness in the Australian freight sector

The **Australian road freight industry** is one of the most competitive in the world, and displays, in some instances, commendable innovation. However, many of the gains have been due to a high outlay by Government at three levels on roads that are now over $24 billion per annum. The improved roads have allowed for an ongoing relaxation of mass and dimension limits for certain heavy trucks.

In Australia, NTC data shows that in 2014-15, heavy vehicle operators paid combined road user charges and registration fees revenues of about $3 billion. This was about 12.5 per cent of all government outlays on roads of some $24 billion. A case can be made that this level is too low, resulting in appreciable hidden subsidies for the heavier trucks that haul long distances each year. Many authorities over the years have recommended that should be remedied, with mass distance location pricing in the more populated parts of Australia.

It is of note that mass distance charges have been in use in New Zealand since 1978, and for a heavily laden semitrailer now amount to 56 cents per kilometre (or at $A1 = $NZ1.05, about 53 cents Australian per kilometre). In Australia, the same truck hauling 100,000 kilometres a year or more, pays registration and fuel road user charges of less than 17 cents per kilometre.

The difference is about 36 cents per km. So, for a Melbourne –Sydney haul of some 860 kilometres, the difference in road user charges for the same truck would be over $300.

Data from New Zealand shows that their road user charges, which are mostly made up of mass distance charges levied on heavy truck operations, account for some 37 per cent of all revenue to their land transport fund.

The resulting hidden subsidies for heavy long-distance trucks are one reason why there has been a steady drift from rail to road for interstate freight, to the point that there are now over 15 million tonnes per annum (mtpa) of freight moved between Sydney and Melbourne, by over 3000 B-Doubles and semi-trailers each day. On this corridor, rail now moves about 2% of intercapital city freight in containers (2015 ARTC Business case for the Inland Railway) along with some steel and other bulk freight. In the early 1990s, rail moved over 20 % of intercapital city freight on this corridor.

The **Australian rail freight industry** has operations ranging from world best practice (notably the iron ore railways of the Pilbara Region of WA) down to substandard. Along with the difficulties caused by break of gauge (something Britain, Canada, New Zealand and the US mainly solved during the late 19th Century), there are text book examples including coal haulage by rail to Port Kembla south of Sydney that needs four powerful locomotives to haul just 44 wagons with 75 tonne payloads (3300 tonnes), through the congested inner - west Sydney network and over sustained steep grades and much poorly aligned track.

Australia's inter-state rail network largely owned or leased by the Australian Rail Track Corporation (ARTC) is substandard with lower axle loads and restricted train lengths when compared with mainlines of the two Canadian Class I railroads and the United States Class I railroads. On the North South corridor and over the Adelaide Hills, double stacking of containers is precluded, and average speeds still fail, despite the ARTC investments that did not extend to track straightening (except for minor curve easing), to meet the standards set in the late 1990s by the Australian Transport Council. Clearly, and as also noted by Neville Committee in its 2007 freight report, the some track straightening is needed on the interstate deviations.

It is important that construction of new sections of an Inland Railway be undertaken to higher standards than currently prevail over much of the ARTC network. The approach in the 2016 ARTC Service Offering for axle loads and crossing loops suggests current ARTC standards, with "future proofing" allowing for 30 tonne axle loads and 3600 metre long crossing loops later. This raises the questions: will 60 kg per metre rail be used rather than the light weight 50 kg/m as used on the Alice Springs Darwin line; also, is the ARTC 1800 metre length long enough?

Average speed depends on the minimum radius of curves. The ARTC has suggested a ruling curvature of 800 metres should suffice but in more difficult terrain it could be 400 metres. Surely, it should be agreed to adopt a Queensland Rail standard of a minimum radius of 2200 metres for curves on new track.

In short, standards much superior to the current ARTC standards should be employed for all new construction. As suggested by NSW rail engineer John Whitton in the 19 th Century, any savings in cheaper construction will be offset forever by higher train operational costs.

The comments in a 2014 Conference on Railway Excellence paper by Phillip Imrie called *Productivity goals – the next steps* are relevant.

> In the 1990s, the Australian Federal Government embarked on a series of national productivity reforms aimed at delivering a world competitive economy. These reforms were accompanied by productivity requirements covering the operational configuration of the national rail network. These requirements (in effect targets) included the composition of the network, its basis of management as well as targets for productivity in terms of transit time, axle loading, train length, clearance outline and service reliability. The targets were selected on the basis that they allowed above rail operators to be competitive in the market place of the time.
>
> Since the 1990s however, global opportunities and competition have increased. As a result, to maintain the level of continuous improvement required to match global progress, the original targets need to be revised significantly to produce a new set of goals which are required to support the future economic competitiveness of Australia.

A further factor affecting rail freight performance is that of Intermodal Terminals. These were considered, along with some shortcomings, in the above mentioned Neville Committee report *The Great Freight Task: Is Australia's transport network up to the challenge?*

General comment

As a result of high road productivity, low road pricing for heavy trucks, and a substandard rail system serving south east Australia, there are too many loads on roads. Some twenty years ago, Australia had the most road freight (net tonne km) per capita. Is this still the case ?

In 2003-04, the articulated truck task was 121 billion tonne km. Since then, this road freight task has shown strong growth to 157 billion tonne km in 2015-16 (ABC SMVU), whilst non-bulk rail showed little or no growth.

By the late 20th century there was ample evidence that all was not well with railways - particularly in New South Wales. Here, a House of Representatives Standing Committee on Transport, Communications and Infrastructure found in 1989 that "...*The plain fact is that a greatly increased amount of freight could be carried*

across the continent by rail more efficiently and with greater safety than it ever could be by road. ... If rail were more efficient and carried the amount of freight it should, lives would be saved, less non-renewable resources would be used and less pollution would be generated."

As seen by the Secretary of the Australian Treasury, Dr Ken Henry (2002 at a BITRE Colloquium) projected increases in urban traffic and interstate road freight raised "important issues"*;* also "*Not dealing with these issues now amounts to passing a very challenging set of problems to future generations*."

Five years after Dr Henry's comment, with yet another inquiry (the above cited Neville Committee), the then chairman of the Committee, Mr Paul Neville MP said (on ABC Radio 4 February 2007) "*We know that the freight task is going to double in the next 20 years, and because of that, our roads will become totally and utterly congested if we don't do something serious about rail in that time*."

A speech given by the then NTC Acting Chairman on 14 February 2006 noted that "only 10-20 per cent of the road freight task is contestable." Accepting that only 10 per cent of the 2003-04 articulated truck task of 121 billion tonne km is transferred to rail, the reduction in diesel use at 2004 estimates of 36.7 tonne km per litre (ABS, SMVU) would be about 330m litres (per year). The diesel needed by rail would be about 110m litres and allowing for some road pickup and delivery, a net saving of over 200m litres per year would result. There would also be an appreciable reduction in both carbon dioxide emissions and improved road safety.

Incidentally, the current discussion paper does not appear to mention emissions. Perhaps the final document could mention this, and emissions could be adopted as a likely key indicator.

3.1 Urban growth pressures

Trucks are important to Australia, but there are too many running on roads in both major cities, and certain regional cities.

Hence soft targets to get more containers moving to and from ports onto rail. It would be good to see more containers on rail and to get some bulk freight, currently on roads through cities, onto rail, or in some cases, sea. Or pipelines or conveyors.

By way of example, for over 40 years, Hansons had moved aggregate from their Bass Point Quarry in Shellharbour to inner Sydney by ship. However, in 2011,

they sought and obtained permission from the New South Wales Government to discontinue the use of shipping and put quarry trucks on congested Wollongong and Sydney roads. What would it take to get this freight back onto coastal shipping?

Shipping was once used extensively to move oil and petrol to regional ports. Some of this then went by rail. With the advent of B-doubles in the late 1980s, more was then moved to rail.

Yet, today, Australia over-relies on road freight of petrol and diesel, often with tragic consequences. One such was the 2013 fatal crash involving an oil tanker at Mona Vale, in Sydney where later the company owning the truck was found in 2014 pleaded guilty to 67 counts of operating unsafe vehicles, related to its Victorian fleet. The key safety breaches included problems with trucks' brakes and shock absorbers, oil leaks and worn tyres.

External costs of articulated truck operations (excluding an older estimate of the under-recovery of road system costs of $1.5 billion per annum) were estimated by this writer in 2006 (*Freight transport cost recovery in Australia*, Australasian Transport Research Forum, Gold Coast) as a further $1.5 billion per year.

External costs include road congestion, noise and air quality as well as emissions. These costs were canvassed in the 2012 report by the NSW Independent Pricing and Regulatory Tribunal of New South Wales in its Review of Access Pricing for the NSW Grain Line Network. Most external costs are imposed in urban areas.

Although external costs do not appear to be mentioned in the current discussion paper, it is submitted that they are significant, and should be picked up in the final document and as a likely key indicator.

3.2 Corridor Pressures

It is not just port corridor pressures but land transport corridors that need attention.

By way of example, the 2007 Neville Committee noted the option and advantages of a Fassifern Maitland new rail freight route. It was noted in a 2012 Infrastructure NSW document, and a 2016 NSW Planning statement. It also appears in current Infrastructure Australia Priority List. Yet, a corridor is yet to be identified and protected, as it was over 10 years ago by the Queensland Government for a Toowoomba Range rail crossing to form part of an Inland Railway.

3.3 Regulation

It is submitted that the road freight industry is under-regulated and the rail freight industry is over regulated.

Some years ago, Frank J. Hussey in an article "Safety and Compliance – Road vs. Rail" imagined of a group of 5 truck drivers and 5 train drivers with the necessary equipment and "endorsed licences" to drive their respective vehicles, and a registered business, who have separately decided to establish an interstate freight operation.

Basically, the trucking company can start straight away. However the rail company has significant administrative hurdles to be addressed with regulators before starting operations: Formal accreditation, Personnel management, Qualifications to drive the train, and then, Track Access agreements.

This is a sure recipe for more "loads on roads" and perverse safety outcomes.

A related situation is the difficulty in getting 'short line' operations up and going to assist movement of grain. The Neville Committee in the above cited 2007 report noted the positive Canadian experience with Short Line operations, and recommended their consideration in Australia.

The above cited 2016 paper *The prospects for short line operations in New South Wales* notes, inter alia, **a one-size-fits-all approach to rail regulation and policy** as one of 10 factors leading to lack of short line operations in Australia.

4.3 National freight performance indicators

In a recent publication "Freight rates in Australia" Bureau of Infrastructure, Transport and Regional Economics (BITRE) notes that the major trends are steep declines in real freight rates from 1975 to 1985 for road and from 1985 to 1995 for rail and then a basically flat trend.

Freight rates will continue to be an important key indicator. So also will service factors including reliability and transit times. However, it is suggested that other indicators should be measured, monitored, and regularly reported on. Some suggested indicators follow.

A. The first and foremost one should be safety. Some data on fatal crashes involving articulated trucks is given by BITRE Road trauma Australia 2016 statistical summary and this is helpful. However, it would be good to see this extended to other

modes; and to give averages of the number of fatalities (and separate data for serious injuries) per billion tonne kilometres.

B. The second one is energy efficiency. In previous decades, the growing use of oil in road transport and the cost of oil imports was of concern to government. International oil prices are likely in future years to concern governments. In 2004, oil prices were rising, yet there were government forecasts that oil could be expected to drop back to $20 a barrel. However, by mid 2008, oil prices had peaked at about $146 per barrel. With the global recession, oil prices have since receded and fluctuated. However, there is a case for any national freight strategy, as did the 2011 Queensland Government freight strategy (a generally commendable document), to recognise "oil vulnerability."

More information should be collated and published on energy efficiency of various freight transport modes.

C. Related to energy efficiency is also reduce greenhouse gas emissions. These should also be monitored with publication of data

D. Other external costs should also be monitored with publication of data.

Conclusion

The current exhibition of a draft National Freight and Supply Chain Strategy is helpful. It is hoped the final strategy will assist in Australia getting better balance between road freight and other freight modes. The diversion of some freight from road to rail (or sea, conveyors or pipelines) would not only improve road safety but reduce the use of imported oil but also reduce greenhouse gas emissions and in some cases, after appropriate capital investment, lower freight costs.

Key indicators should include safety, energy efficiency and emissions. Plus progress in meeting targets such as a percentage of movement of containers to and from ports by rail in each major city.

With Australia's population having grown to over 24 million, road outlays costing over $24 billion per year, and road congestion due to cost $20 billion a year by 2020, freight reform is needed at a national level. The challenge is to ensure that the present review actually leads to appreciable reform without undue delay.

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28 July 2017

APPENDIX A Summaries of two papers

Rail freight efficiency and competitiveness in Australia from Transport Reviews, 1998, Vol 18. pp 241-256

In 1994-95, the Australian rail freight task was approximately 100 billion tonne kilometres (btkm). This freight task included some 37 btkm for the haulage of iron ore in Western Australia, 28 btkm for coal haulage in Queensland and New South Wales, and about 16 btkm for interstate rail freight. The paper mainly concerns how improvements can be made to the efficiency and competitiveness of interstate rail freight services through the upgrading of sections of mainline track that currently have severe speed - weight restrictions.

Recent improvements in rail freight efficiency are discussed, with emphasis on two indicators: average unit revenues (cents per net tonne km), and average energy efficiency (net tonne km per MJ). Rail freight efficiency is high for the Western Australia iron ore operations, Queensland coal operations and Adelaide - Perth general freight operations. However, between Australia's three largest cities of Melbourne, Sydney and Brisbane, some 36 per cent of the mainline track fails to meet basic Fast Freight Train standards with a ruling grade of 1 in 66 and no curve radius less than 800 metres. The constraints on efficient rail freight operations imposed by severe terrain, and how the effects of terrain may be reduced by improved track alignment, are discussed. Some economically warranted rail track investment measures are outlined, including those identified for a National Transport Planning Taskforce. These measure have the potential to reduce liquid fuel use by over 250 million litres a year.

Factors affecting competitive neutrality between road and rail freight that are outside of the present scope of Australia's National Competition Policy are broadly considered. These factors include the extensive upgrading of the National Highway System with full Federal funding, and low levels of road cost recovery from heavy trucks operating over long distances.

A competitive interstate rail freight and passenger network, Conference on Railway Excellence, 2014 Adelaide, Proceedings p121-130

An outline is given of the East - West rail corridor linking Melbourne, Adelaide and Perth, and the North - South corridor between Melbourne, Sydney and Brisbane. The competitiveness of freight services on the North - South corridor is limited due to 'steam age' alignment and low clearances. Both corridors have lower axle loads and restricted train lengths when compared with mainlines of the two Canadian Class I railroads.

The Brisbane Cairns corridor is cited as an example of where rail deviations completed during the 1990s have allowed for faster and heavier freight trains and the effective introduction of tilt trains. Proposals for an inland railway are also noted along with the impact on rail of the reconstruction of the Hume and Pacific Highways. Continuing to improve rail's share of land freight on the East West corridor (now over 80 per cent) and lifting the low shares on the North - South corridor (lower than 10 per cent on the shorter corridors) would deliver substantial savings in diesel use along with reductions of greenhouse gas emissions, and result in appreciably lower external costs