Submission to the New South Wales Dept of Planning and Environment re the EIS for Inland Rail, Albury to Illabo

Philip Laird, University of Wollongong, August 2022

This submission, by way of comment, is based on research conducted at the University of Wollongong. However, the views and research findings are the responsibility of the writer. Some background is given in Appendices A, B, C and D.

1. The EIS deals with an existing 185 km section of track between Albury and Illabo in New South Wales. To quote from the summary "The key features of the proposal include:

- adjustments to approximately 44 km of track across 14 enhancement sites to accommodate the vertical and horizontal clearances according to Inland Rail specifications, comprising:
- realignment of track within the rail corridor at 14 enhancement sites
- lowering of track up to 1.6 m at three enhancement sites
- changes to bridges and culverts at enhancement sites to accommodate vertical clearances and track realignment as follows:
- replacement of two road bridges and adjustments to adjoining intersections
- replacement of three pedestrian bridges
- demolition of two redundant pedestrian bridges
- modifications to four rail bridges
- ancillary works, including adjustments to nine level crossings, modifications to drainage and road infrastructure, signalling infrastructure, fencing, signage, and services and utilities."

Elsewhere in the EIS summary, it is noted that the proposal will, inter alia,

* offer better transit time and reliability for freight transport
* improve road safety by removing more trucks from the road network.

This work is regarded as necessary to allow for a basic inland railway. It is submitted that consideration should be given to further enhancements, including the easing of tight radius curves and replacement of certain level crossings by grade separated crossings.

2. As noted in Appendix A, Inland Rail now has a long history. In part, this goes back to revised 2011 Inland Rail Alignment Study (IRAS) for the Australian Rail Track Corporation (ARTC).

Appendix B gives cogent reasons why Inland Rail should be built, or upgraded, to appreciably better standards than the present Melbourne-Sydney- Brisbane railway. Which was rated in 2008 by former NSW rail chief Len Harper[1] as *"inadequate for current and future needs"*.

The IRAS design settled for a ruling curvature of just 800 metres. This is too tight and much less than the Queensland standard of 2200 metres. At the very least, it is submitted that 1200 metres should be the minimum curve radius.

The line from Stockingbingal and Forbes was completed in two sections during World War I. For almost all curves, a standard minimum radius of 60 chains was adopted. This is about 1200 metres. One hundred years later, with modern earthmoving machinery, Australia should be able to do better than 1200 metres and much better than 800 metres for minimum curve radii for track to carry trains at 115 km/h.

As noted in Appendix C, curvature not only impacts on transit times, but also fuel use, and maintenance costs for both the track and the rolling stock. The existing North South line from Melbourne to Brisbane to Sydney is clearly substandard in terms of excessive tight radius curvature. **It is surely worthwhile ensuring that the new sections of the inland railway are constructed to a higher standard, and older sections have at least some tight radius curves eased.**

Appendix D gives further comment on standards.

3. Between Junee and Uranquinty (52 kilometres), there are several locations with ruling curvatures of 440 metres (22 chains) and with 1 in 40 gradients for both down and up trains.

The present line was identified by State Rail in the 1980s to contain five locations suitable for upgrading with a tightest curve of 800 metres and to a ruling grade of 1 in 80.

The total length of upgrading is 23.52 kilometres and would require cuttings of no more than 10 metres, and fills of 1 metre or less,

[1] Harper, L., 2008. The major task of increasing rail traffic on the East Coast, Track and Signal Oct-Nov-Dec 20 p9-13. Note that this assessment was given after much of the ARTC track upgrades of the Albury-Macarthur and Broadmeadow Acacia Ridge had been done.

and would have decreased the total rise by 16 metres and the total fall by 16 metres. M-Train Computer Simulation for an Energy R & D Corporation project at UOW in the early 1990s showed that substantial fuel savings of 13 per cent for "down" (southbound) trains would result (with 3 per cent fuel savings for "up" trains) along with transit time savings.

Such work would also avoid the so called “reverse curves” which are two or more curves in close proximity where the train moves in one direction, and then in another. This could be an advantage when it comes to operating double stacked containers.

The summary notes “realignment of track within the rail corridor at 14 enhancement sites’. It is to be hoped that grade and curve easing, as above, could be considered, **at the very least for reverse curves with curves of tight radius.**

4. It is also desirable that all sections of track crossing state roads should have no level crossings. This is particularly the case where the track traverses the City of Wagga Wagga.

The EIS summary notes level crossings in many places. It would be helpful to have a detailed list of all level crossings.

5. It is desirable that the ARTC “service offering” of 24 hours transit time for freight trains between Melbourne and Brisbane be reduced to 22 hours, or even 21 hours.

This question was canvassed at the Inland Rail conference held in July 2018 at Parkes, where Woolworths chief supply chain officer Paul Graham said Inland Rail had been a long time coming and to get produce to market as fresh as possible he would like to see a transit time of 22 hours. James Dixon from Australia Post said 21 hours would be “fantastic”. The then CEO of Inland Rail at ARTC, Richard Wankmuller, said that if Australia did not build Inland Rail there would be a “huge increase” in road freight and said the transit time had to be brought “down to 22 hours or less” and it had to be “very straight and very flat” as well as very reliable.

The question of transit times was also taken up in 2020 by members of Senate Rural and Regional Affairs and Transport References Committee in their inquiry into the Management of the Inland Rail

project by the Australian Rail Track Corporation and the Commonwealth Government. This Committee did report in August 2021, with a report called *"Inland Rail: derailed from the start"*.

6. In regards to axle loadings, the current ARTC interstate mainline standards are simply too low; and only allow the operation of freight trains with a 23 Tonnes Axle Load (TAL) at speeds up to 80 km/h, or with a 21 TAL at speeds up to 115 km/h.

At the very least, the standards agreed for the interstate rail network in the longer term to in September 1997 at a special meeting of Transport Ministers of the Federal, State and Territory governments (the Australian Transport Council) should be used. These standards were, along with increased clearances to allow double stacking of containers, "*axle loads up to 21 tonnes, a maximum speed of 125 km/h and an average speed of 100km/h; and at axle loads between 21 and 25 tonnes a maximum speed of 100 km/h and an average speed of 80 km/h*".

The environmental impact assessment process should also allow for future proofing for improved speed - weight performance of freight trains.

7. The EIS Exec. Summary does not appear to canvass the weight of rail. It is noted that new sections of Inland Rail is to have that 60 kg per metre will be used on this section of the inland railway (as opposed to 50 kg per metre for Alice Springs to Darwin). This is commended.

8. The current ARTC crossing loop ruling length is 1800 metres. Class I railroads I Canada are now moving to 3600 metres (12,000 feet).

It is submitted that at least 2700 metres for crossing loop lengths should be used on new construction for an Inland Railway.

In any event, it is understood that there is to be future proofing of crossing loops on Inland Rail for 3600 metres. Is this still the case for Albury to Illabo?

9. Improved road safety is briefly mentioned on page 6 and 17 of the Summary of the EIS.

An inland rail route will reduce road freight on the Newell Highway. During the 5 years to 31 December 2010, Transport for NSW

data shows that 32 lives were lost in road crashes involving articulated trucks on the NSW sections of the Newell Highway. This was about 52 per cent of all Newell Highway fatalities.

Here, updated data would be helpful.

10. Reduction of emissions are considered as important, and rate a brief mention in the Summary of the EIS on page 17

"The preliminary GHG assessment of Scope 1 sources identified a small increase in GHG emissions as a result of the proposal. However, the Inland Rail program is expected to reduce carbon emissions by 750,000 tonnes per year from 2050 and bring a net GHG emission improvement by moving a higher proportion of freight from road to rail."

This is the same wording as used in the Exec Summary of the EIS for Border to Gowrie.

It would be have been good to have had an estimate of the reduction of carbon emissions by 2030; a year in which hopefully the Inland Rail is operational for its entire length, and, Australia has committed to reduce its emissions by 43 % from 2005 levels.

11. External costs are important, yet do not appear to be addressed in the Exec Summary of the EIS. There are three broad scenarios.

A. No completion of an inland railway, and continued reliance on high levels of road freight.

B. Completion of an inland railway as envisaged

B. Completion of an inland railway to best practice engineering standards.

The NSW Independent Pricing and Regulatory Tribunal of New South Wales in its 2012 Review of Access Pricing for the NSW Grain Line Network gave two sets of values for external costs for road and rail freight in non-urban areas – based for the most part in work done for the 2001 ARTC Track Audit - with each IPART unit value higher than those used by the IRAS. The higher value unit costs (that include an allowance for unrecovered road system costs from articulated trucks of one cent per net tonne kilometre (c/tkm)) are, in non-urban areas: road freight 2.79 c/tkm - rail freight 0.24 c/tkm.

With an inland route built to good standards and rail gaining 80 per cent of market share, rough calculations with various assumptions show

that an operational inland railway could accordingly reduce land freight external costs by about $200m per annum. It would have been helpful if the EIS documents had addressed reduction of external costs.

12. Like the Alice Springs to Darwin railway that commenced operations in early 2004, the new Inland Railway should be capable of conveying passengers.

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APPENDIX A SOME BACKGROUND

1. The inland railway is a concept that is now over one hundred years old and has been the subject of many papers and studies. Almost all interested parties agree that an inland route from Melbourne to Brisbane should proceed through Parkes and Moree and that it will involve a rail tunnel under the Toowoomba Ranges.

2. The inland route is a project that ranks with the Alice Springs - Darwin railway that was finally completed in 2003.

The first Adelaide - Darwin freight train ran in January 2004 and the first passenger train ran in February 2004. After 18 years of operations, freight tonnages have exceeded initial projections. The line continues to carry passengers.

3. In May 1998, FCL opened an intermodal terminal at Parkes. In 1999, a rail triangle at Parkes was opened. This was to facilitate train movements from Cootamundra to Goobang Junction and then to Broken Hill (and hence Adelaide or Perth). Further intermodal facilities have since been built at Parkes and another rail triangle near Goobang Junction was completed in 2020.

4. In 2004, the ARTC took a 60 year lease over the NSW interstate mainlines and Hunter Valley coal lines. This lease was later extended to include rail track to Moree.

The ARTC was given in 2016 the responsibility of overseeing the construction of new track for the Inland Railway, including Narromine to Narribri (N2N) with the exception of Gowrie to Helidon, Helidon to Calvert and Calvert to Kagaru to be delivered by a PPP (more details awaited); all up 600 km of new track.

5. The ARTC has had some success with Hunter Valley coal lines along with the East - West rail corridor linking Melbourne, Adelaide and Perth. However, despite an outlay of over $3 billion by the ARTC on the North South corridor between

Melbourne, Sydney and Brisbane, this corridor performs poorly. The competitiveness of freight services on the North South corridor is limited due to 'steam age' alignment and low clearances.

If an inland rail link from Melbourne to Brisbane through Parkes is to succeed, it will have to be built to a much higher standard than much of the North-South corridor in terms of key performance indicators.

These indicators include axle loads, average speeds, ability of carry double stacked containers, length of crossing loops and the number of temporary speed restrictions (the fewer the better). The speed-weight capabilities depend on the track quality in terms of formation, weight of rail, sleepers as well as alignment (both gradient and curvature).

6. In 2007, the House of Representatives Standing Committee on Transport and Regional Services released a report *The Great Freight Task: Is Australia's transport network up to the challenge?* noted a need to*"...move beyond the steam age era and build modern railways to cope with the 21 st Century demands."*

This is opposed to a continuation of Australia *"...doing too much patching"*. In short, the Committee set the challenge *"to raise Australia's rail transport to world's best practice"* and considered *"... that it is time that Australia made a national commitment to sharply raising the standard of the rail network to provide a fast, modern, flexible and efficient system. "*

In 2012, the Parkes Shire Council together with the NSW Local Government and Shires Association hosted the "Melbourne to Brisbane Inland Rail Symposium". At this event, bipartisan support was expressed for completion of an inland railway. A debate took place as to construction standards, with a communiqué (at www.inlandrail.com.au), inter alia, calling for ***"… a modern, high standard railway from Melbourne to Brisbane that will be able to transport freight in a highly efficient way. A railway built to "future-standards" will serve the nation for centuries."***

APPENDIX B COMMENTS OF PARKES SHIRE COUNCIL

In evidence given to an inquiry held on 9 November 2020 by the Senate Rural and Regional Affairs and Transport References Committee in their inquiry into the Management of the Inland Rail project by the Australian Rail Track Corporation and the Commonwealth Government, the General Manager of Parkes Shire Council made the following pertinent comment.

"Unfortunately the rail network in regional New South Wales is very similar to what it was back […many years ago]. That's definitely a competitive disadvantage for us. From our perspective, if the investment cycle is 100 years, we need to make sure we plan this railway for the next 100 years. That's very important. It's the tyranny of distance for inland New South Wales that creates a major competitive disadvantage for us. Our fuel is more expensive, our fertiliser is more expensive, and it's more expensive to get our freight out. We currently have short trains travelling at low

speeds with low axle capacity and congested networks and, as a consequence, very high freight costs.

"Yet we're competing with the likes of Canada, where they have faster trains, higher axle loadings and much lower costs. That's why we now have a predominance of trucks on our network. Trains in Canada carry up to 10,000 tonnes with highly efficient balloon loop loading compared with trains on our network, which run at a fraction of that. Through Parkes, for example, we have a truck a minute, 24 hours a day, 365 days a year, and that's set to double. That's just unsustainable. We really need to do something to drive that modal shift.

"Parkes has been advocating for a shorter, faster, flatter railway for well over 20 years, firstly as part of the Australian Trunk Rail Group, which later changed to the Great Australian Trunk Rail Group. We were on that initially. Then in 2006 we led the first rail symposium, from which was formed the Melbourne to Brisbane Inland Rail Alliance. We understand that that was the catalyst for the north-south rail study made by Ernst & Young, which everyone had a chance to make submissions to.

"In 2010 ARTC completed the alignment study, which we also made submissions to. We held the second Inland Rail symposium in 2012, and again the outputs of that symposium were strong. We need fast, flat railways to be competitive.
…
"Then there was the 2014-15 business case. Again, we made submissions to that, another opportunity to provide submissions. But it was definitely the confidence created by the $300 million commitment in 2013 and the huge lift by the $8.4 billion commitment of the Australian government in 2017, that has really driven opportunities for regional Australia.

"We certainly experienced a major lift during the $300 million Parkes to Narromine section. We're not going to get the advantage of this railway line until it's actually installed, and that's what we're really pushing for. It's imperative, in our view, that the railway be delivered as soon as it possibly can be, and we support the Prime Minister's release that it will be accelerated. That's where the real benefits are from our perspective. This is part of the backbone of the Australia rail network, and it's very important that it be efficient. To drive that modal shift, to get the trucks off the road, we need a railway that's short, fast, flat, and more reliable than trucks."

APPENDIX C CURVATURE COSTS - THE CONCLUSIONS STILL HOLD Philip Laird Rail Horizons December 2008

The comprehensive 1908 book 'Railroad Construction' by Walter L Webb (John Wiley, New York, Fourth Edition) in Chapter 22 on Curvature notes (p 484) in part that, "In the popular mind, curvature is one of the most objectionable features of a railroad alignment. The cause of this is plain." In short, curvature:

* increases operating expenses (via increased tractive force requirements, the wear and tear on roadbed, track, and equipment),
* may affect the operation of trains,
* may affect travel with transit time, and,

* may actually result in increased danger of collision or derailment.

A quantification of some of these factors is attempted. This includes the total track resistance on a 10 degree curve would be approximately **double** that that the train would encounter on tangent track. A ten degree curve is really tight curve of 574 feet (some 172 metres) radius. For such a curve, the excess rail wear is some 226 per cent over that of tangent track (roughly 22.6 per cent per degree over that on tangent track). Other indicators depend on degrees of curvature per mile (with 528 degrees in one mile increasing the expenses of each train passing over it by 34.59 per cent. An example is given of the operating cost savings of a crooked line with reverse curves being replaced by a single simple curve.

Grade compensation is also discussed. Plus, in separate chapters, the questions of grades and "the improvement of old lines." In this regard (p 536):

"One of the most difficult matters is to convince the financial backers of the road that the proposed improvement will be justifiable. The cause is simple. The disadvantages of the original construction lie in the large increase of certain items of expense which are necessary to handle a given traffic. And yet the fact that the expenditures are larger than they need be are only apparent to the expert, and the fact that a saving may be made is considered to be largely a matter of opinion until it is demonstrated by actual trial. On the other hand the cost of the proposed changes is definite, and the very fact that the road has been uneconomically worked and is in a poor financial condition makes it difficult to obtain money for improvements."

Australia now has the dubious distinction of having its three major cities linked by track on much 'steam age' alignment. Simply put the Sydney Melbourne rail distance at about 960 km is at least 60 km longer than it really needs to be and the Sydney Brisbane rail distance at about 980 km has about 90 km of excessive length. Here the 97 km Hexham - Stroud Road section is capable of replacement by a 67 km Karuah Valley route (as noted on page 116 of the 2007 Neville Committee Report *"The Great Freight Task: Is Australia's transport network up to the challenge?"*).

The excess length is largely due to the fact that 33 per cent of the 420 km from Junee to Menangle (near Campbelltown) and that 41 per cent of the 962 km from Strathfield to Acacia Ridge - noted by the Neville Committee as "a bit of a goat track"- has tight curves (of less than 800 metres radius). The Neville Committee on page 128 of its 2007 report took the view that **"…the greatest need for Australia is *the reconstruction and realignment of the main freight networks."***

Indeed, as seen by the ARTC in a submission to Infrastructure Australia in 2008, and one hundred years after Webb's book, ***"… 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."

This would surely have to include poorly aligned sections of the Albury to Illabo track.

APPENDIX D More than ever, it's time to upgrade the Sydney-Melbourne railway

Philip Laird, The Conversation August 4, 2022

Extracts from https://theconversation.com/more-than-ever-its-time-to-upgrade-the-sydney-melbourne-railway-187169

It's 14 years since former NSW rail chief Len Harper described the rail link between Australia's two largest cities, Sydney and Melbourne, as ***"inadequate for current and future needs".***

And it's 31 years since former Prime Minister Gough Whitlam put the problem more bluntly during a TV interview: ***there are no cities in the world as close to each other with such large population as Sydney and Melbourne which are linked by so bad a railway.***

…Why has rail been losing ground to roads? … Mainly with funds from the federal government, the entire Hume Highway was subsequently rebuilt to modern standards at a cost of about $20 billion in today's terms. The mainline track between Sydney and Melbourne … has many defects. Much of the track within NSW has a "steam age" alignment to ease grades, adding an extra 60 km to the journey. Far too many tight-radius curves slow down freight and passenger trains.

…On the same 1991 TV program as Whitlam made that earlier remark, another former state rail chief, Ross Sayers, argued that a tilt train – a train designed to negotiate curves more quickly – could travel at more than 200 km per hour between Sydney and Melbourne on an upgraded alignment. "We could set the passenger transit time at five, or perhaps five and a half hours," he said. This is still a good, viable option.

Five and a half hours would be half the time the current XPT services take. And the gain isn't purely speculative: when Queensland straightened much of its track between Brisbane and Rockhampton for faster and heavier freight trains – and then, in 1998, introduced a new tilt train – passenger transit time halved from 14 to seven hours.

…If Australia fails to bring the Sydney–Melbourne track into the 21st century, we can expect not only excessive greenhouse gas emissions but also growing costs from many more trucks on the Hume Highway. Congestion at Melbourne and Sydney airports will worsen, and Australia will be left increasingly out of step with other countries in Europe, North America and Asia.