Transport and Infrastructure Net Zero Consultation Roadmap

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Department of Climate Change, Energy, Environment and Water

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Not answered

12 What sector do you represent?

Not answered

13 What state or territory do you live in?

Victoria

14 Postcode

Not answered

15 What area best describes where you live?

City

16 1. Do you support the proposed guiding principles?

Yes

17 1.1 Please add details to your response.

Support is extended to the five guiding principles, however, in item 2, that part that states “This includes incentivising the private sector to leverage their capital, innovation and effort to achieve net zero” needs to be balanced with an obligation on the public sector to prioritize infrastructure investments that will lead to a reduction in emissions.

18

2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Yes

19 ## 2.1 Please add details to your response.

Re Avoid – for people reducing unnecessary car trips would be a start (or even thinking twice before driving a car when there are public transport or active transport options available).
Re Shift – more encouragement to shift to less energy intensive modes for freight and passengers is needed.
Re Improve – better energy efficiency for freight and passengers in all modes is needed.

20 ## 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Yes

21 ## 3.1 Please add details to your response.

It would be a good start.

22 ## 4. What should be included in a national policy framework for active and public transport and how should it be developed?

More investment is needed into urban public transport and intercity transport. If Australia is to move to net-zero emissions in transport, we will need High Speed Rail, at least on the Newcastle – Sydney-Melbourne corridor.

23 ## 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

Proper road pricing of all light vehicles including electric vehicles is long overdue. This includes reducing and then eliminating external costs (including those of emissions) of light road vehicle use.

More and better data is needed. For a start, ABS should be resourced to reinstate its Survey of Motor Vehicle Usage.

Reducing transport emissions was the subject of reports produced by the Bureau of Infrastructure, Transport and Regional Economics during the 1990s and up to 2009. This Bureau could well be encouraged and funded to revisit this important issue.

24 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Until the revised strategy is released, it is hard to say what additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction.

However, based on the current strategy, more action is needed from Government to improve road pricing for heavy trucks, including the introduction of mass distance charging for heavier long distance trucks in South East Australia (the option of which was provided for in the establishment c 1992 of the National Road Transport Commission).

Improved mainline rail track to support faster and heavier freight trains. Addressed later in this submission.

25 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

These two actions would assist in modal shift from road to rail for many freight tasks. As rail is some three times more energy efficient than road for many freight tasks, would facilitate emissions reduction in the movement of goods.

26 7. Do you agree with the proposed net zero pathway for light road vehicles?

No

27 7.1 Please add details to your response.

It needs to be a lot more ambitious in order to get a meaningful reduction in emissions. This will require attention to road pricing for light vehicles, with disincentives for the use of large light vehicles (SUVs etc) when the use of smaller vehicles would work.

28 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

More than these two initiatives are needed to get meaningful reductions in emissions from the movement of people. As above, road pricing really needs addressing.

29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Not answered

30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

No

31 9.1 Please add details to your response

As above, It needs to be a lot more ambitious in order to get a meaningful reduction in emissions, and attention needs to be given to road pricing for heavy vehicles.

32 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

33 10.1 Please add details to your response. Why did you rank them in that order?

Not answered

34 11. What role should low carbon liquid fuels play in the heavy vehicle decarbonisation?

Not answered

35 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?

Not answered

36 13. Do you agree with the proposed net zero pathway for rail?

No

37 13.1 Please add details to your response.

It needs to be more ambitious and needs to address mainlin track infrastructure deficiencies. As above, the Class I railroads of Canada and the United States of America are appreciable more energy efficient than the interstate rail operations in Australia.

38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

39 14.1 Please add details to your response. Why did you rank them in that order?

Not answered

40 15. What role should low carbon liquid fuels play in rail decarbonisation?

Not answered

41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?

Not answered

42 16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?

Not answered

43 17. Do you agree with the proposed net zero pathway for maritime?

Not answered

44 17.1 Please add details to your response.

Not answered

45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?

Not answered

46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?

Not answered

47 19. Do you agree with the proposed net zero pathway for aviation?

Not answered

48 19.1 Please add details to your response.

Not answered

49 20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.

Not answered

50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?

Not answered

51 21. Do you agree with the proposed net zero pathway for transport infrastructure?

Not answered

52 21.1 Please add details to your response.

Not answered

53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?

Not answered

54 22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?

Not answered

55 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?

Not answered

56 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?

Not answered

57 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?

Not answered

58 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?

Not answered

59 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?

Not answered

60 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?

Australia really needs to have better freight and passenger road and rail passenger and freight data. For road, this could be achieved by reinstatement of the Australian Bureau of Statistics Survey of Motor Vehicle Usage. For rail, Australia needs place on the public record the quality and quantity of data that was available up to the mid 1990s.

61 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?

Not answered

62 27. Do you have any feedback on the proposed review process?

Not answered

63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?

Not answered

64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?

Not answered

65 29. Is there any further information or documentation that you wish to be considered with your submission?

As noted in the main submission, an 2022 International Energy Efficiency Scorecard ranked Australia 23rd for transport out of the world's 25 largest energy users. Clearly, this needs improvement.

66 Would you like to upload a document?

Yes

67 Have you removed any identifying information from your submission?

Yes

68 Upload a submission

07.24 PL UOW Submission transport Net Zero.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered

Submission to the Department of Infrastructure
re Transport and Infrastructure Net Zero Consultation Roadmap

Philip Laird, University of Wollongong, July 2024

The production of the Roadmap and invitation to provide comment is appreciated. This submission is based on research conducted at the University of Wollongong, however, the conclusions and views are those of the writer. It comprises: firstly some general comments; secondly address some of the questions posed; and thirdly, give attention as to how upgrading rail track infrastructure can reduce emissions.

I. General Comment

1. Action to reduce transport emissions in Australia is long overdue. As demonstrated by changing weather patterns and older reports and a 2021 report "Net Zero by 2050" of the International Energy Agency[1], there is good reason for addressing climate change.

The 2008 Garnaut Review informed Australia that without stronger action, droughts and bushfires would become more frequent and intense, and ''observable by 2020''.

Which indeed both droughts and bushfires were. Since 2020, Australia has more floods to contend with and climate risk is of increasing concern.

2. Australia's record to date in reducing its CO2 emissions has been taken to task by many commentators. It also has an excessive level of emissions per capita.

3. In the absence of a price on carbon emissions, transport measures going beyond electric vehicles and the new vehicle fuel efficiency standard become even more important.

4. The Annual Climate Change Statement 2023 [2]notes the need for reducing emissions across all sectors. This applies to transport which in 2022-23 at 98 million (m) tonnes were 21 % of all emissions. With two "additional measures" for abatement - the National Electric Vehicle Strategy and the 2024 New Vehicle Fuel Efficiency Standards for light vehicles may well assist in 2030 transport emissions for light vehicles in reducing by 7m tonnes. The funding in the 2024 federal budget for active transport should also assist over time in reducing emissions in people moving.

However, as noted in Table 1, emissions from road freight (but not rail) are expected by 2030 to increase[3] by 5m tonnes pa.

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[1] https://www.iea.org/reports/net-zero-by-2050

[2] https://www.dcceew.gov.au/climate-change/strategies/annual-climate-change-statement-2023

[3] https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2023

TABLE 1 FREIGHT EMISSIONS 2020 AND PROJECTED FOR 2030

	2020	2030
Articulated trucks	12	14
Rigid Trucks	8	10
Light Commercial Vehicles	17	18
Railways (mostly freight)	4	4

Reference Annual Climate Change Statement 2023 Emissions in millions of tonnes (Table 20, Australia emissions projections)

In the 10 years from 2020 to 2030, road freight emissions are expected to increase from 37m to 42m tonnes whilst emissions from railways remain at 4m tonnes.

For many freight tasks, as noted by Minister Catherine King at a Rail Decarbonisation conference in September 2023 at Melbourne***,… rail is three times more fuel efficient than road in moving freight, rail is the key and we need not only more trains on our tracks but also to improve efficiencies so we have to stay on track to get to net zero.***

The Minister also observed that transport is our third largest source of carbon emissions and is on track to be the largest by 2030. This should be averted if at all possible.

On the basis that rail is three times more fuel efficient than road for freight, if the emissions from articulated and rigid trucks were to be reduced from 20 m tonnes to 18m tonnes (instead of rising to 24m tonnes) by transfer of some road freight to rail, then the increase in rail emissions would be 2m tonnes. The net decrease would be 4m tonnes.

This would be much better than an increase of 5m tonnes.

Such a large modal shift of road freight to rail may well be regarded as unrealistic. However, the very least that the Australian government could be doing is to **put in place land transport policies and funding of rail track upgrades to at least ensure that overall emissions from freight do not appreciably increase.**

5. The shift of freight from rail to road

Freight tasks are measured in tonne-kilometres (tkm – the number of tonnes multiplied by the distance a load is moved). Since the 1970s, Australia's rail and road freight tasks have shown large increases. The rail freight task, mainly due to bulk freight including iron ore exports (895m tonnes in 2022-23) and coal (338m tonnes)[4], has shown strong growth. The road freight task has shown exceptional growth, mainly due to non bulk freight rising from about 29 billion tkm (btkm) in 1976-77 to 163 btkm in 2021-22. [5]

Since the 1970s, the non bulk rail freight task increased from about 10 btkm to only 34 btkm.

[4] https://www.industry.gov.au/publications/resources-and-energy-quarterly-december-2023

[5] https://www.bitre.gov.au/publications/2022/australian-infrastructure-and-transport-statistics-yearbook-2022

A BITRE report[6] gives reasons for this increase in road freight including*: "Investment in the National Highway System … [such as] continued upgrade and duplication of significant parts of the system" and 'Several rounds of incremental reforms to heavy vehicle dimension and mass limits, which resulted in progressively broader network access for larger dimension and higher mass freight vehicles."*

Road pricing with hidden subsidies for heavy truck operators with heavy payloads and or long distance annual hauling is a further issue that needs addressing.

The outlay on roads by all levels of government now exceeds $30 billion a year.[7] Past road funding, by way of grants, has allowed reconstruction of the entire Hume Highway to modern engineering standards at a cost of as much as $20 billion, with a similar outlay to reconstruct most of the Pacific Highway by 2020.

By way of stark contrast, the outlay of the Australian Rail Track Corporation (ARTC) in 2021-22 on the entire 7500 km interstate rail network was a meagre $153m.[8] This does not include funding for Inland Rail.

As recently noted by Infrastructure Minister Catherine King[9] the ARTC is *"really struggling with maintenance, investment and building resilience"* on this rail track.

6. It is noted that the 2024 federal budget did provide additional funding for the ARTC network.

The lack of investment on the existing interstate mainline network up to 2024, and connections to it, stands in contrast to significant private investment by the rail freight industry in intermodal terminals, along with new locomotives and rolling stock.

In commenting on rail's low modal share of freight (on the Sydney Melbourne and other corridors), Pacific National CEO Mr Paul Scurrah notes[10] *"Each year, billions in funding is hardcoded in federal and state government budgets to upgrade roads and highways, which then spurs on greater access for bigger and heavier trucks. …Through access charges, rail freight operators pay 'full freight' rates to run on tracks plagued by pinch points, speed restrictions, weight limits, sections susceptible to frequent flooding, and a lack of passing opportunities on networks shared with passenger services."*

7. The need to reduce emissions in freight was also recognised by the Australian government in bringing forward a review of the National Freight and Supply Chain Strategy.

Much attention in Australia[11] and overseas[12] is being given to trucks reducing their emissions.

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[6] https://www.bitre.gov.au/publications/2022/australian-aggregate-freight-forecasts-2022-update

[7] https://www.bitre.gov.au/publications/2022/australian-infrastructure-and-transport-statistics-yearbook-2022].

[8] https://www.artc.com.au/about/reports/annual-reports

[9] https://minister.infrastructure.gov.au/c-king/interview/qa-afr-infrastructure-summit]

[10] https://www.fullyloaded.com.au/logistics-news/2301/pacnat-ceo-says-it%E2%80%99s-time-to-get-australian-freight-back-on-track

[11] (https://www.climateworkscentre.org/news/decarbonising-short-haul-road-freight-could-halve-australias-freight-emissions

[12] https://www.oecd-ilibrary.org/sites/0c13b23d-en/index.html?itemId=/content/component/0c13b23d-en

There are two other ways as well. One way is to move some of the freight that used to be moved by rail, now being moved by road, back to rail. This is part of a recently released freight decarbonisation strategy released by the Victorian government[13].

The second way to reduce freight emissions is to improve rail freight energy efficiency. Whilst the iron ore rail operations in Western Australia are the most energy efficient rail operations in the world, interstate rail freight operations in Eastern Australia compare poorly with overseas counterparts.

The Class I railroads of Canada and the United states now have a high energy efficiency of nearly 500 ton-miles per (US) gallon of fuel.[14] In metric terms, this works out to about 192 tonne km per litre (tkm/litre). This is far better than current Australian interstate rail freight operations that appear to be approximately 140 tkm/litre[15].

In turn, this is better than the 2019-20 average fuel use of articulated trucks in Australia of about 40 tkm/litre.

8. Inland Rail, if and when completed in the 2030s, has the potential by 2050 to reduce emissions by 0.75m tonnes pa[16].

In the meantime, there is a need to upgrade the existing interstate mainline track and particularly on the existing Melbourne-Sydney rail corridor with its severe speed weight restrictions. This is addressed later.

9. Reducing emissions in passenger transport (beyond electric vehicles and new vehicle efficiency standards) will be a real challenge. So also is road pricing.

One approach, as used in New Zealand is to have a higher fuel excise for petrol, supplemented by 6 cents per litre for accident compensation[17], offset by lower annual registration and third party compulsory insurance levies.

Such an approach was recommended c 2002 by Ministers forming the Australian Transport Council. It is now time, in Australia, at a national level, to revisit this proposal.

The need for reform in road pricing is long standing. By way of example, although not a major focus of the Harper 2015 Competition Policy Review, road pricing was considered. In part, the review noted in part that *"… roads are the least reformed of all infrastructure sectors, with institutional arrangements around funding and provision remaining much the same as they were 20 years ago."*

The increasing use of electric vehicles is a cogent reason for road pricing reform.

10. A congestion charge for major cities where adequate public transport options are available, as used in Singapore, London and Stockholm, could well reduce emissions and should at least be considered.

11. An earlier comment piece[18] notes that an 2022 International Energy Efficiency Scorecard ranked Australia 23rd for transport out of the world's 25 largest energy

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[13] https://www.vic.gov.au/freight-transport-decarbonisation

[14] https://www.aar.org/issue/freight-rail-climate-change/

[15] Australian Rail – The 2008 Industry Report

[16] https://www.artc.com.au/uploads/Environmental-Social-Governance-Report-2022.pdf

[17] https://www.aa.co.nz/cars/owning-a-car/fuel-prices-and-types/petrol/

users. Reasons for this included poor performance with no 2025 fuel economy standards; poor on light vehicle average fuel economy; low electric vehicle sales share; no heavy vehicle fuel economy standard; and no smart freight programs. Clearly, this needs improvement.

12. The Australian government needs to take measures to ensure that by 2030, emissions from freight are decreased from say 2019 levels rather than increased. This is as opposed to accepting a 'business as usual' approach which has an over-reliance on road freight. Reducing emissions from freight will require policy reform on many fronts, including road pricing for heavy vehicles. It will also require a much better balance between road and rail track funding along with improved rail track project delivery.

II. Answers to most questions

1. Do you agree with the proposed guiding principles?

Support is extended to the five guiding principles, however, in item 2, that part that states *"This includes incentivising the private sector to leverage their capital, innovation and effort to achieve net zero"* needs to be balanced with an obligation on the public sector to prioritize infrastructure investments that will lead to a reduction in emissions.

2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Re Avoid – for people reducing unnecessary car trips would be a start (or even thinking twice before driving a car when there are public transport or active transport options available).

Re Shift – more encouragement to shift to less energy intensive modes for freight and passengers is needed.

Re Improve – better energy efficiency for freight and passengers in all modes is needed.

3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction? It will be a good start.

4. What should be included in a national policy framework for active and public transport and how should it be developed?

More investment is needed into urban public transport and intercity transport. If Australia is to move to net-zero emissions in transport, we will need High Speed Rail, at least on the Newcastle – Sydney-Melbourne corridor.

5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

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[18] https://theconversation.com/why-electric-vehicles-wont-be-enough-to-rein-in-transport-emissions-any-time-soon-195722

Proper road pricing of all light vehicles including electric vehicles is long overdue. This includes reducing and then eliminating external costs (including those of emissions) of light road vehicle use.

More and better data is needed. For a start, ABS should be resourced to reinstate its Survey of Motor Vehicle Usage

Reducing transport emissions was the subject of reports produced by the Bureau of Infrastructure, Transport and Regional Economics during the 1990s and up to 2009. This Bureau could well be encouraged and funded to revisit this important issue.

6. The Australian Government has already engaged in consultation on the 2023 review of the National Freight and Supply Chain Strategy and those consultations will also inform the final Roadmap and Action Plan.

Until the revised strategy is released, it is hard to say what additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction.

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Improved mainline rail track to support faster and heavier freight trains. Addressed later in this submission.

These two actions would assist in modal shift from road to rail for many freight tasks. As rail is some three times more energy efficient than road for many freight tasks, would facilitate emissions reduction in the movement of goods.

7. Do you agree with the proposed net zero pathway for light road vehicles?

It needs to be a lot more ambitious in order to get a meaningful reduction in emissions. This will require attention to road pricing for light vehicles, with disincentives for the use of large light vehicles (SUVs etc) when the use of smaller vehicles would work.

8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.

More than these two initiatives are needed to get meaningful reductions in emissions from the movement of people. As above, road pricing really needs addressing.

9. Do you agree with the proposed net zero pathway for heavy road vehicles?

As above, It needs to be a lot more ambitious in order to get a meaningful reduction in emissions, and attention needs to be given to road pricing for heavy vehicles.

13. Do you agree with the proposed net zero pathway for rail?

It needs to be more ambitious and needs to address mainlin track infrastructure deficiencies. As above, the Class I railroads of Canada and the

United States of America are appreciable more energy efficient than the interstate rail operations in Australia.

26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?

Australia really needs to have better freight and passenger road and rail passenger and freight data. For road, this could be achieved by reinstatement of the Australian Bureau of Statistics Survey of Motor Vehicle Usage. For rail, Australia needs place on the public record the quality and quantity of data that was available up to the mid 1990s.

29. Is there any further information or documentation that you wish to be considered with your submission?

As noted in the main submission, an 2022 International Energy Efficiency Scorecard ranked Australia 23rd for transport out of the world's 25 largest energy users. Clearly, this needs improvement.

III. Rail track infrastructure

1. It is submitted that much more attention needs to be given to the adequacy of rail track infrastructure in Australia.

2. This ranks from better than world class for the iron ore railways of Western Australia (as noted in item 1. 16 above) down to rail tracks in Eastern Australia inadequate for current and future use.

3. The first limitation of many mainlines in Eastern Australia is that of axle loads. Most of the ARTC network allows 21 tonne axle loads at speeds up to 110 km/h, but for heavier trains, up to 25 tonnes axle load, speeds are capped at 80 km/h. The Hunter Valley network can operate to 30 tonnes.

As also noted above, the six Class I railroads operating in Canada, Mexico and the United States provide lessons for Australia. Much of their networks are capable of moving freight trains with 32 tonne axle loads and can move them quickly (at 70 mph or 112 km per hour).

4. Freight train lengths on the ARTC network are mostly limited to 1800 metres. They are much longer in the Class I railroads. Canadian Pacific has in recent years lengthened many crossing loops to 12,000 feet. This is a bit over 3600 metres.

5. As a result the Class I railroads have freight trains operating at appreciably higher energy efficiency than that of interstate freight trains in Australia. Item 7 above notes that in metric terms, Class I railroads in Canada and the United states average out at about 192 tonne km per litre (tkm/litre). This is far better than current Australian interstate rail freight operations that appear to be approximately 140 tkm/litre[19].

[19] Australian Rail – The 2008 Industry Report

6. In order for rail to assist in reducing emissions in Australia, rail will need to improve its competitiveness with road transport and energy efficiency. This will require track upgrades.

7. The Class I railroads in North America have past and present Capex (capital expenditure) of about $25 billion p.a. The funds for giving upgrades to the interstate rail network of Australia have been very limited, and have allowed for very little improvement in alignment.

8. Given a marked slow down on the delivery of Inland Rail for its entire length, there is now a need to upgrade the track alignment between Melbourne, Sydney and Brisbane.

We start with Melbourne to Sydney.

Here, attention is need this decade to completing three major deviations identified in ARTC's 2001 Interstate Track Audit:
Wentworth (near Macarthur to Mittagong, about 40 km);
Centennial (near Goulburn to Yass, about 70 km)); and,
Hoare (near Yass to Cootamundra, about 80 km).

The estimated cost for the three deviations was then about $800m.

The benefits of this and other minor works is that 260km of steam-age alignment could be replaced by 200km of new track allowing that freight train transit times to fall by two hours. The energy use would also be reduced by at least 10 percent.

Other work that could usefully be done on the existing Melbourne-Sydney rail corridor (on sections of track not bypassed by deviations) is to ease all tight radius curves to a minimum radius of 800 metres; and. to reduce the number of level crossings.

It would also allow, with the use of suitable tilt trains, the Sydney Melbourne passenger train time of 11 hours to be halved to under 6 hours.

A precedent for such gains in Australia has already been provided by the Brisbane Rockhampton tilt train operating (for 25 years now). This operates over tracks straightened for faster and heavier freight trains.

However, given the questions raised in the 2023 Schott Review of the Inland Rail Project, the question as to whether ARTC is the best placed agency to deliver such Melbourne-Sydney track upgrades arises.

9. On a number of assumptions, the potential reduction of emissions upgrading the Melbourne-Sydney rail track as above is also about 0.75m tonnes pa.

One assumption is how much freight on this corridor is contestable between road and rail. One estimate is given by Dr Garry Glazebrook in a June 2023 report Freight and High Speed Rail[20] (on page 31) that

"The total contestable merchandise freight market between Sydney and Melbourne is thus estimated at approximately 100,000 tonnes per weekday (counting both directions)."

If one accepts this estimate of 100,000 tonnes per weekday over 50 weeks, that is say 250 days, this results in 25m tonnes per annum.

From earlier calculations, Melbourne-Sydney trucks used on average 19.4 litres per tonne.

[20] https://www.fastrackaustralia.net/freight-and-high-speed-rail

Melbourne-Sydney trains moving over upgraded tracks 6.47 litres per tonne. It we also assume one litre per tonne for road pickup and delivery, the difference between road freight and intermodal freight is about 12 litres per tonne.

For 25 mtpa, that is 300m litres which is (at 2.7 kg per litre) a reduction of 810m kg pa CO2-e per annum.

This is higher than the projected reduction of emissions from completion of Inland Rail.

10. The Sydney to Brisbane section

It is noted that as part of the 1992-1995 Keating Governments "One Nation" scope of rail track upgrades, two deviations were constructed north of Grafton to ease grades and curves. There were at Lawrence Road and Rappville. The total distance of new track was about 21 km. M-Train simulation demonstrated appreciable transit time and fuel savings.

By 2013, the ARTC was completing its NSW North CoastCurve Easing Program between Newcastle and the Queensland border with a number of level crossing projects. As reported [21] the then Federal Infrastructure and Transport Minister Anthony Albanese said once fully completed later this year, the $170 million North Coast Curve Easing Project will allow trains to run at higher speeds along this busy part of the Network, shaving almost an hour off transit times along Australia's east coast.

As noted in the 2007 Neville Committee report, Between Sydney and Brisbane, a 67km bypass of the 91km Hexham-Stroud Road track would give good benefits.

A further project, investigated by TfNSW in 2023 would be a 30km Lower Hunter Freight Bypass (Fassifern-Hexham)[22]

The two projects, if combined would require 97km of new track on an improved alignment. This would then shorten the Sydney-Brisbane rail line by 34km and cut 60 minutes off transit times. It would also reduce fuel use and emissions.

There is again the question of which agency would be best suited to deliver such projects.

10. East west rail corridor issues

During the 1960s, gauge standardisation between Perth and Kalgoorlie included a dual gauge route through the Avon Valley from Midland to Northam, with high clearances and easy ruling grades. This replaced an older section with steep grades and poor alignment, and assisted in reducing Kalgoorlie - Perth freight train times from 31 hours to 13 hours. Today rail wins about 80 per cent of interstate freight in and out of Perth. This would simply be impossible on the old track.

Questions of resilience on this vital rail corridor were raised by the failure of part of this vital corridor during the 2022 flood events.

In addition, there are upgrading options that could usefully be considered. These include a Horsham Rail bypass[23] (see "as Horsham is "something of a diversion" from a direct route between Murtoa and Dimboola in western Victoria. A deviation of some 28 km between two locations is possible: Jung at 307.5km and

[21] https://railuk.com/rail-news/another-project-completed-for-australias-north-coast-rail-upgrade/amp/

[22] https://www.transport.nsw.gov.au/projects/current-projects/lower-hunter-freight-corridor

[23] G Smith and M Michell, The proposed Horsham cut-off Railway Digest, June 2009, p35 -36)

near Wail at 351.2km; a current distance of 43.7km. As well as reducing point to point distance by some 17km, the deviation with easy ruling grades and curvature would save at least 10 minutes of transit time and 200 litres of fuel for each 1500 metre intermodal train.

As noted, the proposal ”involves a simple piece of new railway engineering across very easy country” and not only benefits to train operators, but also residents of Horsham. It is envisaged that the existing track would remain, and this would provide extra track capacity.

Next, in the 122 km from Murray Bridge to Adelaide, no less than 67 km (55 per cent) fails to meet basic fast freight standards of a ruling gradient of 1 in 80 and ruling curve radii of 800 metres. A 1997 proposal by M. Michell advocated realignment of the 65 km Murray Bridge - Mt. Lofty section to ease the present severe ruling gradients for west bound trains to eliminate the need for banking locomotives for the heavier west bound freight trains. This proposal included a major deviation between Callington and Nairne.

11. Queensland

Whilst considerable rail freight productivity gains were achieved by Queensland’s rail electrification program in the 1980s and the Mainline Upgrade program of the 1990s, further work is required to bring the Brisbane – Cairns mainline to an acceptable standard.

The 1681-kilometre Queensland North Coast Line (NCL) between Brisbane and Cairns is important for moving freight. However, as noted by a 2006 AusLink study into the Brisbane-Cairns corridor found that “current NCL infrastructure may not enable rail freight to grow at the same rate (3% per year), thereby resulting in the freight growth over 3% per annum ‘spilling over’ to road transport.’’

More freight on the Bruce Highway does nothing to improve road safety, which is the main reason for improving this highway at a cost exceeding $10 billion to the Australian taxpayer. The remedy is to further upgrade the NCL to reduce train operating costs and transit times to improve the efficiency and competitiveness of the Queensland NCL which plays a vital role in keeping supermarkets in Townsville and Cairns at Brisbane prices.

The NCL is useful when flooding closes the Bruce Highway but not the railway. A 2016 report by Ranbury Consultants for the Queensland Government found upgrades, including replacing 61 ageing timber bridges, floodproofing works and duplicating key sections of track, were necessary to ensure that the line remained a viable freight route.

As an *Engineers Australia* spokesman noted in May 2016, huge numbers of trucks would be funnelled on to the Bruce Highway unless $2.5 billion was invested in the railway to improve some of the poor alignments and repair many old bridges; also “It’s already one of the more dangerous roads in Australia, so by moving all that freight on to it is only going to make it worse.”

It is submitted that there needs to be a better balance between federal funding improvements of the Bruce Highway and the Brisbane to Cairns main line.

12. Some Victorian rail freight issues

Until 1962, Victoria was a single gauge state (broad gauge). Since then, standard gauge has slowly crept in, initially in 1962 and then in 1995 as interstate connections, but progressively also on regional Victorian lines. Rail freight is now the most impacted group on rail users across the two gauge system.

In 2023, the Victorian regional rail network is a dysfunctional mix of broad gauge and standard gauge lines as shown in Fig 1 below. The gauge split – according to BITRE May 2023 - is 1849 km of standard gauge and 2439 km of broad gauge. Rail freight operators are increasingly finding they cannot afford to have multiple fleets in Victoria where the broad gauge component has relatively poor utilisation in Victoria and no relevance or usefulness in the national context.

13. Some NSW rail freight issues

The investment in intermodal terminals, including at Moorebank, is welcomed, as is the duplication of part of the rail track between Moorebank and Port Botany. This should allow rail to carry a greater share of containers.

The care of the Country Rail Network and its upgrading for freight, including steel sleeper and in some cases, heavier axle loads. including by John Holland and now UGL, is also of note.

Issues needing attention include, in brief,

A. A better deal for freight trains to traverse the Greater Sydney network

This was recently canvassed by both IPART[24] and the Auditor General of NSW[25] which noted, in part, "Transport agencies do not have strategies or targets in place to improve the efficiency or capacity of the metropolitan shared rail network for freight. The transport agencies acknowledge that they do not have sufficient information to achieve the most efficient freight outcomes and they do not know how to use the shared rail network to maximise freight capacity without compromising passenger rail services."

B. Completion of the 35 km Maldon Dombarton link. This would do much to take some freight trains away from the congested Hurstville – Sutherland track with many passenger trains and steep ruling grades for southbound freight (including grain) trains.

C. Opening a line from Gulgong to Maryvale. A study was completed by TfNSW in 2020. Subsequently there was an announcement to progress the project.[26]

D. Reinstatement of the Cowra Lines

14. The Short Line question

Short lines work well in Canada and the United States. Why not Australia ?

This was addressed in the 2007 Commonwealth Parliamentary report *The Great Freight Task* which states that 'the concept of local businesses and authorities arranging to take over the short regional lines, with some help from the State or Australian governments, could be a useful way of keeping the [rail] infrastructure available'.'

It is submitted that an effective review would lead to a process to facilitate the emergence of short line operations in Australia.

15. Improving bulk rail freight energy efficiency

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[24] https://www.ipart.nsw.gov.au/documents/final-report/final-report-review-nsw-rail-access-undertaking-may-2023?timeline_id=16363

[25] Auditor General of NSW 2021 Rail freight and Greater Sydney

[26] https://dugaldsaunders.com.au/rail-lines-linking-maryvale-gulgong-and-kandos-a-step-closer-to-becoming-reality/

In bulk commodities, the Pilbara Iron ore railways are in a class of their own. They move hundreds of millions of tonnes of iron ore in an extremely energy efficient manner – with some operations likely exceeding 500 tonne km per litre. Moves are being made to make them even more energy efficient.

By way of example, at a March 2023 Heavy Haul conference, Fortesque noted that their company mines and moves to export over 185 million tonnes per annum (mtpa) of iron ore. The axle loads for these trains is a high 42 tonnes.

Their rail operations result in over 2 million tonnes of CO2 emissions a year. To reduce this, they have purchased two new battery-operated locomotives from Progress Rail.

Rio Tinto noted at this conference that this company had the largest private rail network in the world of some 2000 km. They are now moving over 320 mtpa and are acquiring four Wabtec Battery Electric Locomotives with a view to "Proof of Concept" to reduce emissions.

BHP Iron Ore is progressing "Rail Technology project" where a new Communications Based Train Control (CBTC) system with 'moving blocks' is being installed. The aim is to build a "safer, smarter, better railway."

These three companies along with Roy Hill have all benefited from assistance given by the Institute of Railway Technology at Monash University (and the previous BHP Melbourne Research Laboratories).

In coal transport, there is scope for saving energy. One example noted at this conference haulage of coal from Blackwater to Gladstone (electrified), is being examined by Aurizon. Careful monitoring of electricity use and regeneration on a 57 km section (Bluff- Wallaroo) had two extremes for a coal train – the worst overall using 2 MWh of power with the best generating 0.5 MWh. Many factors contribute to such a variation, not only the way the train is driven, with the use (if any) of air brakes, but also pathing and temporary speed restrictions.

15. Improving non- bulk rail freight competitveness and energy efficiency

This should be a priority for the Australian Government with two aims; for rail to regain non-bulk freight lost to road in recent decades (including on the important Melbourne Sydney corridor) to appreciably reduce freight emissions and for rail to reduce its own emissions.

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