

# Inland Rail

*Melbourne to Brisbane Inland Rail* **2015**

## **INLAND RAIL IMPLEMENTATION GROUP Report to the Australian Government**

---



REPORT TO



Australian Government

AUGUST 2015

# *Inland Rail*

*Melbourne to Brisbane Inland Rail* **2015**

## **INLAND RAIL IMPLEMENTATION GROUP Report to the Australian Government**

---

**August 2015**

#### Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to below as the Commonwealth).

#### Disclaimer

While this report represents the views of the Inland Rail Implementation Group, these views do not necessarily represent those of the Australian, New South Wales, Queensland and Victorian governments or the Australian Rail Track Corporation.

# Letter of Transmittal

The Hon Warren Truss MP  
Deputy Prime Minister  
Minister for Infrastructure and Regional Development

24 August 2015

Dear Deputy Prime Minister

It is with pleasure that I submit to you the Inland Rail Implementation Group Report.

This report is the culmination of 18 months of substantial and detailed work on developing and independently validating a robust business case, and of constructing a feasible delivery plan. Over the course of this work, we have consulted widely with stakeholders, an activity that will need to continue as Inland Rail is implemented.

Inland Rail represents an opportunity to invest in infrastructure that will serve Australia for the next 100 to 150 years. Not only will it deliver a freight service between Melbourne and Brisbane that is strongly competitive with road, it will also connect south-east Queensland with Perth and Adelaide. Its construction over the next decade will provide a 10-year infrastructure development stream delivering significant flow-on benefits, such as regional employment and opportunities for the construction industry.

Inland Rail is a significant piece of national infrastructure that will improve rail connections to capital cities and ports for regional communities in Victoria, New South Wales and south-east Queensland. It will enable a strongly competitive rail service, increase national productivity, and, importantly, provide for greater regional economic development along the Inland Rail corridor, such as through the support of agriculture, minerals traffic and regional industries.

Inland Rail has significant merit and, in my view, should be built now. Indeed, if it is not, it may never be built, perpetuating the investment in and commitment to expensive road upgrades. Business needs certainty, and in its absence, the logistics industry will further invest in supply chains and infrastructure that prevent the utilisation of rail, for example, locating distribution centres away from rail lines, entrenching a road-only solution to the freight task.

The business case for Inland Rail is robust and has been subject to significant and independent validation. The proposal put forward by the Implementation Group represents the optimal solution for delivery of a freight railway that is affordable and meets the needs of customers. The Australian Government can be assured that Inland Rail is a sensible investment.

I believe Inland Rail is an outstanding project for the future of Australia. I commend the project to you and recommend that the Australian Government urgently proceed to a decision on the project's delivery. Such a decision will provide industry, and those who will invest in complimentary infrastructure such as terminals, with the confidence they require for their business decisions.

Yours sincerely

A handwritten signature in black ink, appearing to read 'John Anderson', with a horizontal line underneath.

The Hon John Anderson AO  
Chair, Inland Rail Implementation Group

# CONTENTS

FOREWORD - IMPLEMENTATION GROUP ROLE AND WHAT THIS REPORT DELIVERS .....	vi
Executive Summary .....	vii
Inland Rail at a glance.....	vii
The Inland Rail service offering.....	vii
Benefits of Inland Rail .....	viii
The economics of Inland Rail.....	x
Delivery of Inland Rail.....	xiii
Funding profile and scheduling based on a 10-year delivery plan.....	xiv
Next steps .....	xv
Key findings and recommendations .....	xx
1. Introduction .....	1
Project context.....	1
The idea for an inland railway.....	3
The Inland Rail Implementation Group.....	5
A consultative approach.....	7
Ensuring a rigorous business case .....	10
2. What is the problem? .....	12
Freight productivity and national wealth .....	12
The challenge of moving freight along the Melbourne–Brisbane corridor.....	15
Recent investment .....	19
3. Potential solutions to address the problem .....	22
Maritime freight.....	23
Dedicated sea freight services.....	23
Use of international shipping.....	25
Airfreight.....	27
Road freight.....	28
Rail solutions.....	32
Enhancing the existing east coast railway .....	33
The Australian Rail Track Corporation’s 2010 baseline solution.....	37
Strategic options assessment.....	38
4. Inland Rail.....	40
Demand analysis .....	41
Service specifications .....	46
Are ARTC’s track engineering standards appropriate for the Inland Rail freight task?.....	50

Corridor alignment .....	53
The alignment between Melbourne and Parkes: Albury or Shepparton? .....	55
Gowrie to Grandchester: the 2003 or 2010 alignment? .....	57
North Star to Toowoomba segment.....	59
Economic analysis .....	61
Benefits .....	61
Costs.....	65
Results of the benefit-cost analysis.....	69
5. Property acquisition, land tenure, planning and environmental approvals .....	75
6. Financing strategy .....	81
ARTC scoping study .....	84
7. The Port of Brisbane link.....	85
8. Inland Rail delivery strategy.....	90
A 10-year programme .....	90
Funding .....	94
Project governance .....	95
9. Expenditure strategy for the initial \$300 Million .....	97
10. Inland Rail: other related proposals and complementary private and public sector investment.....	102
Other related proposals .....	102
Complementary private and public sector investment.....	107
Intermodal terminals.....	107
Road .....	108
Port of Brisbane link .....	109
11. Next steps.....	110
12. Glossary .....	112
13. Attachment A - ARTC 2015 Programme Business Case.....	114

## FOREWORD – IMPLEMENTATION GROUP ROLE AND WHAT THIS REPORT DELIVERS

On 28 November 2013, the Deputy Prime Minister and Minister for Infrastructure and Regional Development, the Hon Warren Truss MP, committed the Australian Government to fast-tracking the delivery of a Melbourne to Brisbane Inland Railway.

An Implementation Group was established by the Deputy Prime Minister to lead the development of a 10-year delivery programme for Inland Rail by the Australian Rail Track Corporation (ARTC) and prepare the business case. Responsibilities included settling the alignment, determining construction priorities, commencing pre-construction and monitoring the development of the programme. The Deputy Prime Minister also requested that a dedicated freight route connecting the interstate line with the Port of Brisbane be examined. The Implementation Group is chaired by former Deputy Prime Minister, the Hon John Anderson AO.

This report of the Implementation Group responds to the Australian Government's request. It sets out a strategic analysis of the need for Inland Rail as one potential solution to the future freight task along the Melbourne–Brisbane corridor and includes the main features of a business case for Inland Rail developed during 2014 and 2015 by ARTC. The report also provides Government with recommendations on the delivery of Inland Rail. The report should be read in conjunction with ARTC's 2015 Inland Rail Programme Business Case, which is attached.

While the 2015 business case and delivery plan for Inland Rail is new, it substantially builds upon the pre-feasibility study undertaken for the Australian Government by ARTC in 2010. As work proceeded, it became clear that a more comprehensive approach was required than originally anticipated in order to meet the stated needs of potential customers. This included ensuring that Inland Rail had the capacity to not only meet current needs but also to be readily upgradeable for future requirements. Additional work was also undertaken that included a major update and review of cost estimates, review and independent validation of the demand estimates and testing the opportunity for private sector financing of Inland Rail.

In addition, the Implementation Group noted the 2014 Productivity Commission report<sup>1</sup> that emphasised selection of the right public infrastructure projects as the most important aspect of achieving good outcomes for the community—particularly the recommendation for a rigorous, benefit-cost analysis (BCA) for all projects above \$50 million to guide project selection and improve the transparency and quality of decision-making.<sup>2</sup> Consequently, the Implementation Group put a strong emphasis on ensuring that there was a robust and independently validated business case for Government to consider.

While this report represents the views of the Implementation Group, these views do not necessarily represent those of the Australian, New South Wales, Queensland and Victorian governments, or ARTC.

---

<sup>1</sup> *Public Infrastructure*, Productivity Commission Inquiry Report, Vol. 1, No. 71, 27 May 2014, available at: [www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0003/137280/infrastructure-volume1.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0003/137280/infrastructure-volume1.pdf)

<sup>2</sup> *Productivity Commission Inquiry Report into Public Infrastructure*, Australian Government response, Commonwealth of Australia, November 2014 p 75.

# EXECUTIVE SUMMARY

## INLAND RAIL AT A GLANCE

Australia's freight task is set to experience significant growth over the next several decades. The current national infrastructure network cannot support this projected growth, and without further rail improvements to the east-coast rail network, the use of rail for freight will decline. This will place increasing pressure on already congested roads through Sydney and will increase the use of heavy trucks such as B-doubles and potentially B-triples along the Hume-Pacific and Newell road corridors.

Inland Rail provides a high performance and direct interstate freight rail corridor between two of Australia's largest cities (Melbourne and Brisbane) and also links south-east Queensland with Perth and Adelaide. It provides a reliable road-competitive solution to the freight task and enables the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight challenge. By connecting Brisbane more directly with Adelaide and Perth (via Parkes), Inland Rail would deliver immediate interoperability with the high performance east-west trans-continental line.

When completed, Inland Rail would provide a strategic infrastructure backbone for eastern Australia, creating the opportunity to prioritise the optimal development of local and regional road and rail links by state and local governments.

The Inland Rail programme also provides the opportunity to improve the rail connection to the Port of Brisbane through a complimentary project that would connect the existing Acacia Ridge terminal to the Port via a dedicated freight rail connection.

The Australian Infrastructure Audit (Infrastructure Australia May 2015)<sup>3</sup> noted that, "freight rail will need to play a growing role in the movement of goods between ports and inland freight terminals, and in the movement of containerised and general freight over longer distances".

Inland Rail is a sensible and effective intermodal investment to address the growing freight task. It is a freight infrastructure initiative that would deliver a step-change in the productivity of freight services in eastern Australia—a productivity shift that will benefit our nation for the next century.

## THE INLAND RAIL SERVICE OFFERING

A significant element of the Implementation Group's work was the development of a service offering, tested with rail operators and logistics companies who would be the major users of an Inland Railway. This was essential to ensure this new infrastructure meets users' needs both now and into the future.

Importantly, the proposal is that Inland Rail is an open access, vertically separated railway. That is, the rail track operator would not operate the trains, and access is available to any operator who pays for train

---

<sup>3</sup> Volume 1. Audit Finding 54, p 9. <http://infrastructureaustralia.gov.au/policy-publications/publications/australian-infrastructure-audit.aspx>



paths. Access and pricing arrangements would be through a voluntary access undertaking approved by the Australian Competition and Consumer Commission, consistent with current ARTC practice.

The work undertaken by the Implementation Group and ARTC has identified the key features that Inland Rail would deliver:

Inland Rail's service offering	
Reliability <sup>4</sup>	98% reliability equivalent to that of road.
Price	Reduced rail costs for non-bulk, intermodal freight travelling between Melbourne and Brisbane of \$10 per tonne.
Transit time	<ul style="list-style-type: none"> <li>○ Less than 24 hours between Melbourne and Brisbane—saving 10 hours and 200 km.</li> <li>○ A 500 km reduction between both Brisbane and Perth, and Brisbane and Adelaide.</li> </ul>
Freight availability	When the market wants it.
Inland Rail's technical specifications	
Train length	1,800 metres now with capacity for 3,600 metre train lengths in the future.
Axle load	21 tonnes at 115 km/h, and 25 tonnes at 80 km/h now, with future-proofing for 30 tonnes at 80 km/h. New structures such as bridges and culverts and the earth formations however will be built to handle 30 tonnes immediately.
Double-stacking	7.1 metre clearances for double-stack operation.
Interoperability	Full interoperability with the interstate mainline standard gauge network with dual-gauging in Queensland to provide connectivity to that state's narrow gauge regional network.

## BENEFITS OF INLAND RAIL

The Melbourne–Brisbane corridor is one of the most important and dense general freight routes in Australia, supporting the most significant population, employment and economic areas in the nation.

The freight transported along and within the corridor includes bulk and non-bulk manufacturing and construction inputs such as steel, paper, coal, grain, and non-bulk household consumables such as groceries, fruit and vegetables, household furniture and appliances.

Of these supply chains, the non-bulk goods that are unitised, palletised and/or in containers (referred to as general freight), represent the largest volume of product moving end-to-end along the Melbourne–Brisbane corridor. These supply chains are also significant between points within the corridor, particularly freight originating from, or destined for, Sydney.

Bulk commodities such as grain and coal are also significant supply chains by volume but tend to utilise only small sections of the transport network within the corridor as they typically flow from regional areas to the nearest metropolitan centre or port.

An effective transport connection between our major cities is important to Australia's long-term economic future as these urban centres represent our largest producers and consumers of non-bulk, interstate freight. High performance freight transport along these corridors will benefit Australian

<sup>4</sup> Reliability is defined as the percentage of goods arriving by road during the required delivery window, or available to be picked up at the rail terminal or port when promised. It does not refer to punctuality of services.

businesses competing against import supply chains through lower input costs and cheaper delivery to consumers.

Sea and airfreight solutions cannot fully address the capacity constraints for interstate freight moving between Melbourne and Brisbane. Shipping does not provide the level of service (transit time and service availability) required by the majority of the Melbourne–Brisbane non-bulk intermodal market, and airfreight has only a limited role in the transport of bulky or heavy goods.

The only two viable options for meeting the majority of this growing freight task are rail and road. While road will continue to be the mode of choice for many freight customers, the further the distance to travel, the more advantageous rail can be for business and the community. The current rail infrastructure between Melbourne and Brisbane, particularly in and north of Sydney, is inadequate to support a step-change in rail's market share. Even with significant investment, the inherent urban and topographical constraints would be difficult to overcome to deliver a service offering similar to Inland Rail. Consequently, rail could not provide a competitive choice of mode for freight movement, constraining eastern Australia to a predominately road-only freight solution.

Inland Rail will complement existing road and rail infrastructure, substantially enhancing Australia's eastern infrastructure by creating a highly efficient, integrated network of road and rail. It will offer redundancy for the east-coast rail network, and for rail freight, reduce the distance between Melbourne and Brisbane by around 200 kilometres, and between Brisbane and Perth by around 500 kilometres.

Estimates indicate that Inland Rail would provide savings of \$10 per tonne for Melbourne–Brisbane inter-capital freight, and will also significantly improve rail connections between eastern Australia regional areas and the east coast ports.

On the basis that one interstate train on the Inland Railway is the equivalent of approximately 110 B-doubles, Inland Rail in 2050 would reduce the freight task's carbon footprint by 750,000 tonnes and result in 15 fewer serious road crashes each year.

Inland Rail will provide an open access, standard gauge rail connection that is interoperable with the rest of the national rail network, and will be supported by a modern GPS-based Advanced Train Management System that replaces traditional line-side signalling and allows for more effective, efficient and safer train control.

Inland Rail may also provide new opportunities for the land bridging of international containers, imported motor vehicles and petroleum products through Brisbane, Melbourne and/or Perth should the net benefits of Inland Rail outweigh the net benefits of additional port calls. While land bridging is a possibility, the Implementation Group acknowledges that international liner shipping is highly complex and no work has been undertaken to test whether such a response to Inland Rail from the shipping industry would be forthcoming.

Inland Rail would also remove the need to transit through Sydney, reducing pressure on Sydney's metropolitan rail network and improving the performance of the Sydney–Newcastle rail corridor.

Some of the benefits that Inland Rail will provide are indicated below:

Benefits	
Strategic benefits	<ul style="list-style-type: none"> <li>Improves productivity and efficiency of the Australian economy.</li> <li>Provides a backbone link in the eastern Australia rail and road network.</li> <li>Makes Australian producers globally competitive.</li> <li>Expands and enhances the national standard gauge network.</li> <li>Provides capacity for freight movement that would otherwise be expensive to provide through a road solution.</li> <li>Greater regional economic development, particularly along the Inland Rail corridor, including supporting agriculture and minerals traffic, and reducing costs for regional industries.</li> <li>A 10-year infrastructure development stream with significant flow-on benefits including regional employment opportunities.</li> </ul>
Regional markets	<ul style="list-style-type: none"> <li>Improves access to and from regional markets (2 million tonnes of agricultural freight attracted from road to rail), with a total of 8.9 million tonnes of agricultural freight expected to be carried in 2050.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>More than 750,000 less tonnes of carbon per year in 2050.</li> </ul>
Safety and amenity	<ul style="list-style-type: none"> <li>Removes 200,000 truck movements from roads each year.</li> <li>Reduces congestion and creates capacity for Sydney road and rail.</li> <li>Reduces the burden on roads and improves safety.</li> <li>Reduces truck volumes in over 20 regional towns.</li> <li>Modern GPS controlled train movements through the Advanced Train Management System. Each train 'knows' where it is on the network and can be automatically braked if it exceeds speed or does not have permission to be on a section of track.</li> </ul>
Price of goods	<ul style="list-style-type: none"> <li>Lower prices for consumers as a result of lower inter-capital freight costs, reducing the cost of living.</li> </ul>
Competition	<ul style="list-style-type: none"> <li>Enhances competition between road and rail freight, which will drive innovation and efficiency.</li> </ul>
Transport networks	<ul style="list-style-type: none"> <li>An additional 160 round trip rail paths per week for freight (a 105% increase on current freight paths on the coastal route).</li> </ul>

## THE ECONOMICS OF INLAND RAIL

Major infrastructure projects like Inland Rail inevitably involve significant construction costs. Delivering Inland Rail<sup>5</sup> is expected to cost approximately \$10 billion.

An important aspect to assist governments in deciding whether or not to invest in such projects are the benefits to the community as a whole from the investment, and whether the net benefits of the project over the life of the infrastructure are likely to exceed its net cost. The economic analysis contained within the Inland Rail business case compares a scenario where there is an Inland Railway, to one where road and rail freight would use the existing roads and coastal railway, over a fifty-year period (2025-75).

Comparing these two scenarios, the economic analysis indicates that Inland Rail would deliver almost \$22.5 billion worth of direct and indirect benefits to the nation,<sup>6</sup> of which approximately \$6.4 billion direct operating cost savings would be accrued by freight users and assumed to flow on directly to consumers. The resulting net economic benefit of Inland Rail is expected to be approximately

<sup>5</sup> Melbourne to Acacia Ridge, not including an improved rail link to the Port of Brisbane.

<sup>6</sup> Measured at the 4% discount rate and inclusive of the Queensland Western Line upgrades.

\$13.9 billion—a benefit-cost ratio (BCR) of 2.62 based on a discount rate of 4%. That is, the benefits of Inland Rail are approximately 2.6 times the cost (when measured at the 4% discount rate).

There is substantial debate among economists as to what discount rate is appropriate for long-term infrastructure such as Inland Rail. Consequently, the business case has been assessed at a range of discount rates, including 4% and 7% with a sensitivity test of 10%. When measured at a 7% discount rate, Inland Rail has a BCR of 1.02, meaning that the benefits are roughly equal to the cost.

The economics of the Inland Rail programme were further tested against 30 additional sensitivity tests. A combined package of downside scenarios—representing a combination of weaker demand, greater competition from road transport and higher construction costs—indicates a BCR of 1.4 at a 4% discount rate (0.6 at a discount of 7%), while a combined package of upside scenarios indicates a BCR of 4.1 at a 4% discount rate (1.5 at a discount of 7%).

The business case indicates that Inland Rail will generate significant economic activity, including jobs and an increase in Gross Domestic Product (GDP). Around one-third of the economic benefit of Inland Rail is related to the benefits that accrue over the longer-term, i.e. past year 50 (at a 4% discount rate). This is a consequence of the long asset life and the consequential ongoing freight benefits of Inland Rail beyond the next half-century. It does, however, make the BCR sensitive to the assumptions around the residual benefits, assumptions that are subject to changes in the national economy that are difficult to predict with accuracy so far into the future.

Regional communities along and adjacent to the Inland Rail corridor would benefit through more efficient and effective rail access to metropolitan and international markets. While the purpose of Inland Rail is primarily for interstate intermodal freight such as moving shipping containers, whitegoods, steel and other commodities, Inland Rail will also support minerals, regional freight and agriculture. Inland Rail will enable farmers to move grain and cotton more efficiently to capital cities and ports for export.

The economics of Inland Rail	
Demand	The non-bulk, intermodal freight task between Melbourne and Brisbane is expected to grow from approximately 5 million tonnes in 2015 to approximately 12 million tonnes in 2050 without Inland Rail, and to approximately 13 million tonnes with Inland Rail.
Cost	\$9.9 billion at P50 <sup>7</sup> , \$10.7 at P90 <sup>8</sup> . The costs have been independently validated, and on a cost per kilometre basis, compare favourably with other nationally significant rail and road projects.
Jobs	Creates an annual average of 800 jobs during construction and 600 operational jobs each year.
Benefits	\$22.5 billion at a discount rate of 4%, and \$7.2 billion at a 7% discount rate.
Impacts on GDP	Increases economic activity in Queensland, New South Wales and Victoria, adding \$16.4 billion (\$2015) over the period 2015 to 2075 to the Australian economy.
BCR	2.62 (4% discount rate), 1.02 (7% discount rate), 0.55 (10% discount rate) under the base case. The BCR depends on the assumptions used. A range of sensitivity tests were conducted.

<sup>7</sup> P50 and P90 are respectively the project costs with sufficient contingency to provide a 50% and 90% likelihood that these costs will not be exceeded.

<sup>8</sup> P50 and P90 are respectively the project costs with sufficient contingency to provide a 50% and 90% likelihood that these costs will not be exceeded.

Inland Rail is also expected to be the catalyst for complementary private sector investment both in Sydney and Melbourne as well as in regional hubs in areas adjacent to the rail corridor.

While the economic analysis indicates that Inland Rail will deliver a net economic benefit to Australia, the expected operating revenue over 50 years will not cover the initial capital investment required to build the railway—hence, a substantial public funding contribution is required to deliver Inland Rail. However, the business case demonstrates that operating revenues would cover operating costs (including maintenance), meaning that once delivered, Inland Rail would not require on-going taxpayer support. The ability for Inland Rail to cover its operating costs holds even under a worst case scenario of less than expected demand, greater competition from road transport and increased costs.<sup>9</sup>

---

<sup>9</sup> Inland Rail Programme Business Case – Table 10.2 page 209.

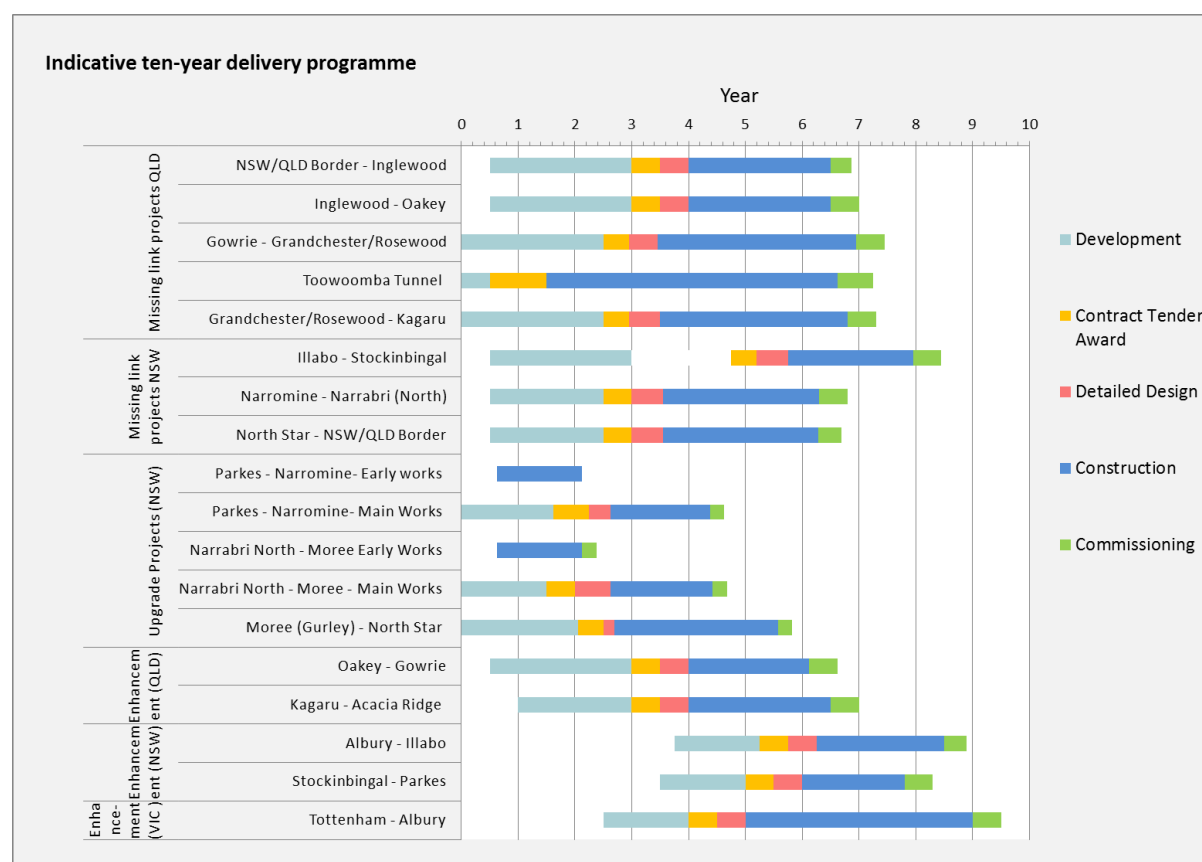
## DELIVERY OF INLAND RAIL

Inland Rail can be delivered in 10 years, and the business case recommends a staged delivery to ensure that the benefits of Inland Rail begin to be realised from the earliest possible date.

The 10-year delivery programme was developed consistent with the request from the Australian Government. Subject to approvals and funding, Inland Rail could be delivered over eight-years, if required sooner, or if a shorter delivery schedule provided a cost and benefit advantage.

Delivery of Inland Rail (assuming a 2015 commencement date)	
Timeframe	Over 10 years from 2015–16. <sup>10</sup>
Cost profile	Based on the current 10-year schedule, total annual draw down would peak at around \$3.5 billion in the middle years of the programme, although opportunities to smooth capital flow remain.
Construction	Staged delivery to realise the benefits of Inland Rail as soon as possible while smoothing capital draw down.

A summary of the indicative delivery schedule (based on 10-years) follows.



<sup>10</sup> Subject to approvals and funding, Inland Rail could be delivered over eight-years, if required sooner.

## FUNDING PROFILE AND SCHEDULING BASED ON A 10-YEAR DELIVERY PLAN

Should the Australian Government decide to proceed with a 10-year programme, a suitable forward funding profile<sup>11</sup> could be as follows:

<b>Funding required</b> 12	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
<u>P50 \$m</u>	191.6	628.4	858.4	2053.1	3392.4	1995.2	578.1	135.0	13.2	2.3
<u>P90 \$m</u>	209.6	677.2	925.1	2212.5	3655.9	2150.1	623.0	145.5	14.2	2.5

Inland Rail will require significant, if not total, upfront funding from Australian Governments. Private sector funding or financing opportunities are unlikely given the high upfront capital costs of building the corridor, the significant time before revenues are generated, and the operating cash flows that will be generated over the first 20–30 years of Inland Rail. The forecast operating cash flows would only support minimal private sector capital (around 5% of the capital cost), and private funding would require significant guarantees and availability payments from the Australian Government to cover demand and revenue risks, at a cost that would be more expensive than the Australian Government using its own balance sheet. The lowest cost long-term solution to the taxpayer is to have Inland Rail funded from the Australian Government's balance sheet.

While Inland Rail would require significant public capital to construct, given it is expected to cover its operating costs once operational, it is likely to be suitable for future asset recycling, even under a worst case scenario of less than expected demand, greater competition from road transport and increased costs. Inland Rail is expected to be financial viability as an ongoing commercial concern.<sup>13</sup>

### Risks

While the Implementation Group believes Inland Rail should proceed, it appreciates that there are risks in doing so. Effective governance will be critical.

Inland Rail is a complex project delivered over 1,700 kilometres, requires a substantial investment over 10-years, and crosses multiple jurisdictions. It is infrastructure for the long-term, and it is impossible to accurately predict all social, demographic and economic factors that will occur over the next century. Consequently, a conservative approach to the development of the business case was taken.

Successful delivery of the Inland Rail programme will require the support of successive governments—a sustained commitment over three federal electoral cycles, and multiple state election cycles. Should the

<sup>11</sup> Funding profile is based on a 10-year delivery commencing in the 2015-16 financial year.

<sup>12</sup> P50 and P90 are respectively the project costs with sufficient contingency to provide a 50% and 90% likelihood that these costs will not be exceeded. The costs in this table reflect the funding required going forward and do not include the \$41.2m allocated to date, which forms part of the total cost of the program. Of the funding required, \$258m remains available as at August 2015, from the \$300m existing commitment.

<sup>13</sup> Inland Rail Programme Business Case – Table 10.2 page 209.

political commitment to completing the project change at any point over its 10-year duration, there is a significant risk of creating stranded assets and not being able to recover the investments already made.

However, the Implementation Group notes that, over the years, the Inland Rail project has received significant support from all major political parties.

The freight forecasts underpinning the Inland Rail business case are robust, but are forecasts nonetheless. Consequently, the business case tests 30 different scenarios that may impact demand. The most likely single scenario to significantly reduce demand for Inland Rail would be from governments significantly changing road access policy with the introduction of B-triples or super B-doubles for inter-capital freight on the Hume, Pacific and Newell highways. Nevertheless, the economic analysis indicates that under this scenario, delivering Inland Rail would still create a net economic benefit to the nation (with a BCR of 2.3 at a 4% discount rate).

While the demand risks are important to highlight, they are common to major infrastructure projects. The Implementation Group believes that the independent validation of the potential markets and forecast demand estimates provides confidence that the Inland Rail business case is robust.

In the Implementation Group's view, management of the policy risks that may impact on the attractiveness of Inland Rail require a consultative and cooperative approach between the Australian, New South Wales, Victorian and Queensland governments.

Costs are also a potential source of risk to the successful delivery of a major infrastructure project. The capital cost estimates (including assumptions relating to escalation and risk) underpinning the Inland Rail business case have been closely scrutinised and independently validated. However, the Implementation Group notes that further refinement to the project costs will occur as detailed, on-the-ground design commences.

The evidence-base developed and considered by the Implementation Group during 2014–15 reflects that an infrastructure project of the size of Inland Rail requires careful consideration to ensure that it is the best solution at a cost that is justifiable, and that the risks to governments can be managed and mitigated.

## NEXT STEPS

While substantial validation has occurred on the demand and revenue forecasts that underpin the business case, the assumptions will still be subject to changes in the national economy that are difficult to predict with accuracy.

Significant work on Inland Rail has been undertaken in the past; however, the current Inland Rail business case represents the most comprehensive assessment to date, with independent validation of the key elements. The information presented in both this report and the 2015 business case follows substantial due diligence to ensure that the merits and risks of this potential investment are clearly understood.



The question is not whether Inland Rail represents a sensible investment, rather what would be required in its absence to support a productive national economy. The Implementation Group is satisfied that Inland Rail represents a necessary, cost-effective and industry-supported response to the challenge of the growing national freight task.

Without Inland Rail, there is a real risk of locking eastern Australia into a predominantly road-based solution for its future freight task. Logistics companies would necessarily adapt to favour a road only transport task and consequently, potentially lock out future efforts to attract freight to rail. An early commitment to an eastern rail network that is competitive with road freight would be an important signal to the market and the freight industry that would allow private sector investment to be progressively directed towards complementary projects that leverage the enhanced logistics benefits of Inland Rail.

The Implementation Group recommends that the Australian Government adopt the broad alignment as per Figure 1 on page xviii, but recognises that more planning and stakeholder engagement will be required on some sections before the detailed corridor can be settled. For example, the alignment between North Star (NSW) and Toowoomba (QLD) requires further refinement to account for floodplain constraints. This work is underway.

Between Gowrie and Grandchester, the 2003 Queensland Government alignment should be adopted with minor variations (representing a change from the alignment developed by ARTC in 2010), and the existing rail line from Melbourne to Illabo (NSW) should be used at the present time. New track via Narrandera and Shepparton or elsewhere could be investigated once Inland Rail was operational and freight demand demonstrates that it is economically viable to justify further investment.

To identify the detailed alignment and identify the individual parcels of land needed requires planning consent and environmental approvals. While obtaining environmental and planning approvals are an immediate priority, and preparation for this work is underway, the complexity of Inland Rail means that completion of this task will take two to three years. It will occur in parallel with the reference design.

Intergovernmental Agreements (IGAs) will be required with the relevant state governments to progress Inland Rail. The IGAs will necessarily need to include arrangements for preserving the corridor, acquiring the necessary land and obtaining the necessary approvals in each state. The Implementation Group has identified a broad framework on what should be included and considers that settling the IGAs between governments should be a priority.

An improved rail link to the Port of Brisbane would complement Inland Rail by providing a dedicated direct connection to the Port for commodities. The Implementation Group recommends that further work is undertaken over the next 12 months with the Queensland Government to examine corridor options and establish the timing to enable a corridor to be protected for when it is required.

Inland Rail is a complex project. Effective governance will be critical to ensuring that it delivers the intended outcomes and is delivered cost effectively. There are two principal governance elements – construction and operation of the railway. The delivery model has been developed with ARTC as the delivery agent at the request of Government, and while this is a viable option, it is not the only option. One alternative may be a dedicated delivery authority.

An important aspect is that there is an effective programme management office that has effective oversight with the necessary skills to take and be accountable for the many detailed decisions that will occur as the project is delivered. The Implementation Group recommends that the Government establish a programme delivery office for Inland Rail that has the necessary skills (including commercial, financial and technical), supported by a governance structure that is accountable for outcomes and delivery on-time and on-budget. A further consideration is the balance sheet impact from funding the project (regardless of the delivery model). This is a matter for further consideration by the Australian Government and is subject to further advice from the Department of Infrastructure and Regional Development.

Regardless of who delivers Inland Rail, integration with the existing interstate network operated by ARTC is also considered essential to deliver the service expected by rail users. For this reason, the Implementation Group considers that there is strong merit in Inland Rail being operated as part of the ARTC network as an integrated interoperable asset.

The 2015 Inland Rail Programme business case developed by ARTC is the most comprehensive assessment of a rail solution to the eastern Australia freight challenge, and is the culmination of a body of detailed work spanning 20 years that has been independently validated. As the Government considers how to proceed with Inland Rail, the Implementation Group notes that decision makers need to carefully evaluate:

- the evaluation and independent validation of the costs, benefits and revenue forecasts of solutions;
- network integration, interoperability and the operating model (including access arrangements and the degree of vertical integration or separation);
- the ability to provide the required service both at a cost that is affordable to the taxpayer, and to users through long-term access fees; and
- the real costs, including upfront taxpayer contribution and the risk transfer to the taxpayer over the longer term.

Referral of the business case to Infrastructure Australia is recommended. This would enable confirmation of the economic and strategic merits of the Inland Rail business case and a comparison with alternative solutions to the freight challenge. It would also enable the Australian Government to identify and schedule sufficient funding in the 2016 Budget so that Inland Rail can be delivered over the next decade.

Figure 1: Melbourne to Brisbane Inland Rail alignment 2015

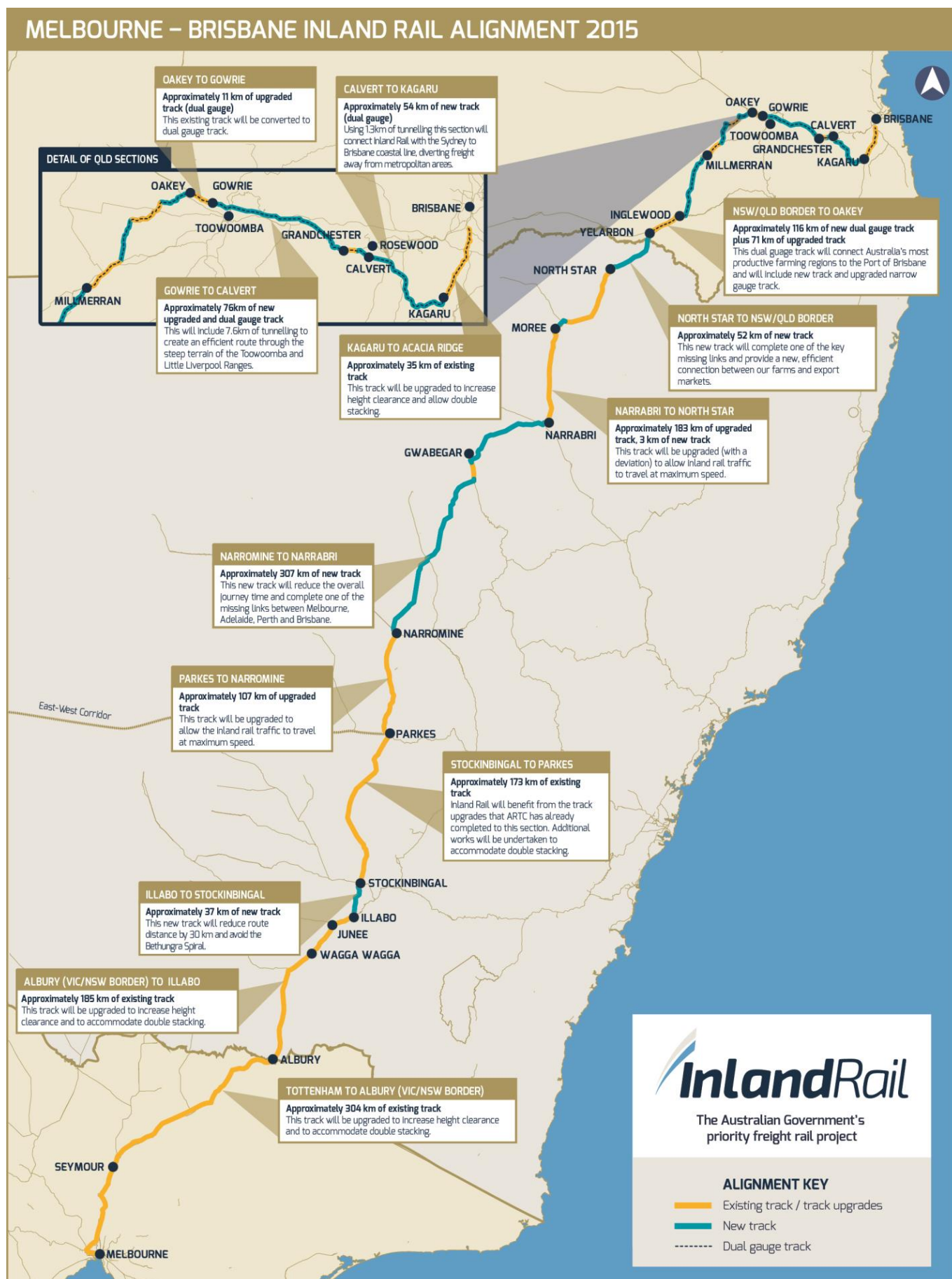
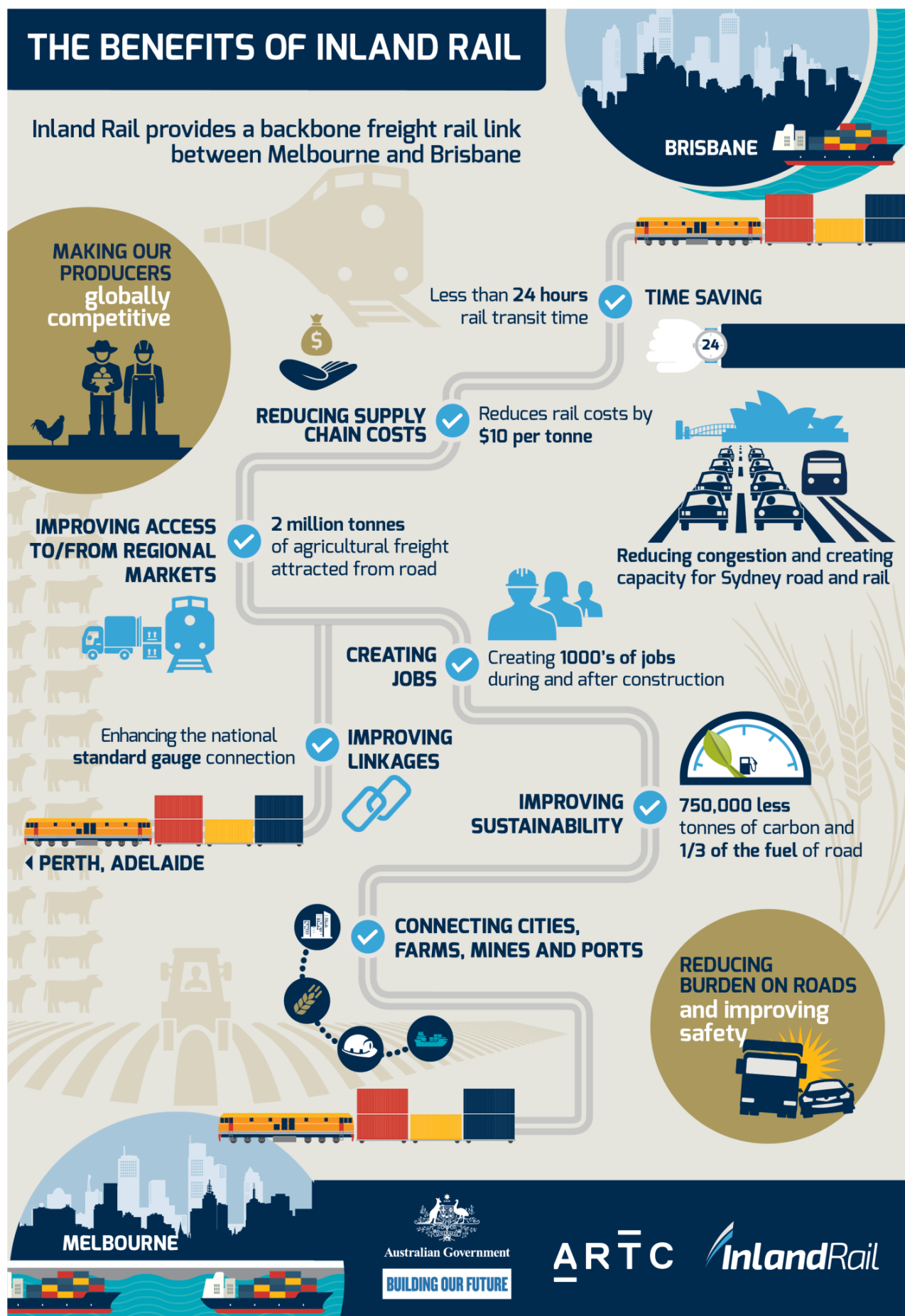


Figure 2: The benefits of Inland Rail



## KEY FINDINGS AND RECOMMENDATIONS

The Inland Rail Programme Business Case developed by ARTC represents the most detailed assessment of the benefits, costs and potential delivery strategies of a proposed new rail corridor between Melbourne and Brisbane.

The business case demonstrates that Inland Rail would provide a net economic benefit to the nation, and would play a major role in meeting eastern Australia's freight challenge.

Accordingly, the Implementation Group sets out below its key findings and recommendations.

The Implementation Group recommends that the Australian Government:

### **Inland Rail**

R4.1 Construct an inland railway between Melbourne and Brisbane that delivers on the stated needs of customers, namely, a terminal-to-terminal transit time of less than 24 hours with a service reliability equivalent to that provided by road transport operators and which connects to, and is interoperable with, existing networks.

R4.2 Construct an inland railway to a standard that provides immediate interoperability with the east-west line (Parkes to Perth), namely, double-stacked trains, capable of travelling at 115 km/h with an axle load of 21 tonnes.

R4.3 Construct an inland railway with a design capable of being progressively upgraded to support longer (up to

3,600 m) and heavier (up to 30 tonne axle load) trains to meet the stated future needs of users, as and when required by the market (noting that all greenfield construction to be to the heavier axle load [up to 30 tonne] from the outset).

- R4.4 Agree to the Inland Rail alignment as determined in 2010 and refined in the 2015 business case (subject to final planning and environmental approval processes being completed), and in particular that:
- the alignment from Melbourne–Parkes should pass via Albury on the basis that it represents better value for money and uses a greater proportion of already upgraded existing track than a route that passes through Shepparton (noting that establishing a rail connection between Shepparton and Narrandera could be reviewed once Inland Rail is operational and freight demand demonstrates that it is economically viable to justify further investment.);
  - the preferable route between Gowrie and Grandchester is the 2003 Queensland Government adopted alignment (subject to minor modifications to be agreed with the Queensland Government); and
  - in relation to the segment between North Star and Toowoomba, the Implementation Group considers that further hydrological and



- geotechnical assessments are required which may result in the final detailed alignment varying to the east or west.
- R4.5 Note that the independent validation shows that ARTC's cost estimate has been produced in accordance with good practice and represents a reasonable assessment of the likely cost of Inland Rail based on the scope of works as currently known.
- R4.6 Note that while the independently validated and rigorous BCA undertaken for Inland Rail indicates the economic viability of the programme, the BCA analysis should be periodically reviewed as the programme continues and updated to account for the Australian Bureau of Statistics (ABS) freight movement survey data (due to be released during 2015).
- R4.7 Make the strategic decision to support the step-change in the development of the national interstate network that Inland Rail represents, and by doing so, release the positive national commercial and social benefits rail can deliver in meeting eastern Australia's future freight challenge.
- R4.8 Accept the Inland Rail Programme Business Case developed by ARTC, in consultation with key stakeholders, as the most detailed assessment of the role an inland railway can play in meeting the eastern Australia's future freight challenge.
- R4.9 Provide the Inland Rail Programme Business Case developed by ARTC to Infrastructure Australia for assessment.
- R4.10 Publicly release the Inland Rail Programme Business Case developed by ARTC for transparency and accountability.
- R4.11 Should it decide not to proceed with Inland Rail, undertake further work on alternative options for addressing the Melbourne to Brisbane freight challenge, with a particular focus on road transport.

### **Property acquisition, land tenure, planning and environmental approvals**

Property acquisition, land tenure, planning and environmental approvals are threshold issues fundamental to commencing Inland Rail's construction. Without a planned and coordinated approach to acquisition and the necessary approvals that start as soon as possible, there is a risk of creating a potential source of delay.

The Implementation Group recommends that the Australian Government:

- R5.1 Commence obtaining planning and environmental approvals as soon as possible, ideally in 2015.
- R5.2 Agrees to use the following model for property tenure as the basis for negotiations between governments:
- in New South Wales, that the delivery body (at this stage ARTC) acquires the land (including any partial interests such as easements) for the new corridors in freehold

(by private treaty or through New South Wales compulsory acquisition provisions), and that the land ultimately be incorporated into the New South Wales ARTC lease; and

- in Queensland, the Department of Transport and Main Roads (DTMR), at the request of the delivery body, continues to acquire land for the corridor and tunnel (stratum), with ultimate land tenure incorporated into an extension of ARTC's lease.

- R5.3 Agree that, to obtain the necessary expertise to efficiently and effectively progress land acquisitions: in New South Wales, ARTC uses its in-house acquisition team and outsources the valuation, negotiation and surveying functions; and in Queensland, ARTC utilises the DTMR in house-property team for agreements (subject to agreements between governments).
- R5.4 Agrees that ARTC engage with the New South Wales and Queensland governments to explore incorporating the relevant parts of the existing Country Rail Network corridors in New South Wales and Queensland Rail corridors (that relate to Inland Rail) into ARTC's existing leases, and to ensure the efficient management of Inland Rail, all related leases have aligned end dates.
- R5.5 Agree that this report form the basis for government-to-government negotiations to underpin IGAs to be entered into between the

Commonwealth and the New South Wales and Queensland governments for matters including, but not limited to, compulsory acquisition of land, registration of plans and exemption from stamp duty.

### **Funding strategy**

Inland Rail will require significant, if not total, funding by Australian Governments as it will not generate the financial returns required to make the project attractive to the private sector without significant risk transfer to the Commonwealth that would come at a cost to the taxpayer well beyond Government funding Inland Rail from its balance sheet.

The Implementation Group recommends that the Australian Government:

- R6.1 Seeks further advice on how it may effectively use its balance sheet to fund construction given the Implementation Group has determined private sector financing would be an expensive alternative when compared to direct funding by the Australian Government – it is unlikely to materially reduce Australian Government funding requirements, and no fully funded private solution for Inland Rail was identified.
- R6.2 Makes an early and clear decision on its funding support for the Inland Rail programme to provide the private and public sector with the planning certainty required to encourage complementary private and public sector and infrastructure investment.

## Port of Brisbane link

The Port of Brisbane link is necessary for meeting the freight needs of south-east Queensland and realising the regional benefits of Inland Rail. While it is not required immediately, preparation for the link and the timing of its construction is critical. Further work is required with the Queensland Government to determine the optimal timing for the construction of the Port of Brisbane link (including upgrading the existing line, determining its precise alignment and optimal engineering solution).

The Implementation Group recommends that the Australian Government:

- R7.1 Agrees that the Port of Brisbane link proceeds as a project component that is separate from, but complementary to, Inland Rail and, as a next step, work with the Queensland Government, the Port of Brisbane and ARTC to:
- settle the need for, and timing of, upgrades to the existing line;
  - determine the detailed alignment and optimal engineering solution for the Port link;
  - identify the optimal timing for commencing construction of the Port link; and
  - identify opportunities to minimise the capital costs of the Port link.

## Inland Rail delivery strategy

While ARTC is a logical delivery authority for Inland Rail, it is not the only option. It is essential that regardless of the delivery authority, Inland Rail must be integrated into the rest of the national network to provide seamless and open access.

The Implementation Group recommends that:

- R8.1 The Australian Government should commit to delivering Inland Rail over 10 years; that it adopt ARTC's indicative schedule as a reasonable approach to construction; and make available the required funding from the 2016–17 Budget onwards.
- R8.2 Should the Australian Government wish to further investigate the potential for increasing the affordability of Inland Rail, by constructing it over a period of eight years, ARTC be asked to undertake further work to quantify the value for money that could result from a shorter construction period.
- R8.3 Establish a governance structure for the delivery of Inland Rail that includes commercial, legal, financial and technical skills as well as providing appropriate accountability.



## Expenditure strategy for the initial \$300 m

The expenditure strategy for the remainder of the \$300 million will depend on whether the Australian Government decides to proceed to full construction of Inland Rail in the immediate future (with funds being made available from the 2016–17 Budget onwards).

The Implementation Group recommends that:

R9.1 Should the Australian Government decide to commence construction of Inland Rail in the **immediate future** (with a funding commitment identified in the 2016–17 Budget onwards), the balance of the existing Australian Government \$300 million commitment be utilised to:

- preserve the corridor in planning regimes;
- prepare the environmental impact assessment and obtain necessary approvals;
- commence priority land acquisition with the remainder of the available budget (for example, the remaining components of the Rosewood to Kagaru section in Queensland);
- prepare the full reference design for the whole alignment; and
- commence greenfield construction in line with the delivery schedule and available funding.

R9.2 Alternatively, should the Australian Government choose to commence construction of Inland Rail **at a later time** (with further funding not included

in the 2016–17 Budget), the balance of the existing Australian Government \$300 million commitment be utilised to:

- preserve the corridor in planning regimes;
- prepare the reference design, environmental impact assessment and obtain necessary approvals; and
- commence small parts of the priority brownfield construction with the remainder of the available budget (the New South Wales brownfield sections of Parkes–Narromine and Narrabri–North Star provide an early opportunity as these sections are on an existing corridor).

R9.3 Alternatively, should the Australian Government decide **not to proceed** with Inland Rail, the Implementation Group recommends that the balance of the existing Australian Government \$300 million commitment be utilised for alternative rail upgrades across the national network.

R9.4 If the Australian Government was prepared to commit additional funding now (above the \$300 million) to enable some early construction (with the bulk of the funding for Inland Rail being made available at a later date), segments of the alignment between Gowrie and Kagaru could be commenced as early greenfield projects. Two options are either Rosewood (Calvert) to Kagaru (Southern Freight Rail Bypass) or the Little Liverpool Range section.

# 1. INTRODUCTION

## PROJECT CONTEXT

Inland Rail is a proposed interstate railway that would directly connect two of Australia's largest cities (Melbourne and Brisbane) via an inland alignment with the primary purpose of transporting freight and facilitating improved connections in eastern Australia as well as between south-east Queensland, Perth and Adelaide.

Inland Rail would provide a backbone rail link between Melbourne and Brisbane to serve future freight demand and stimulate growth for interstate and regional rail freight (particularly for agriculture and resources) as well as manufactured goods such as steel, paper, food and beverage products (such as dairy, beer and manufactured food products), and general consumer goods. It would also provide a focal point for prioritising the development of local and regional road and rail networks. Importantly, Inland Rail would also reduce the long-term pressure on Sydney from freight trains transiting Sydney's network when travelling on the Melbourne to Brisbane route.

Inland Rail's service offering would deliver 98% reliability<sup>14</sup> (equivalent to that offered by road), a terminal-to-terminal transit time between Melbourne and Brisbane of less than 24 hours, and the availability of freight when the market wants it (see Figure 3 below).

Figure 3: Key Inland Rail service offering characteristics



The key technical characteristics underpinning Inland Rail include:

- train lengths of 1,800 metres with future-proofing for 3,600 metres;
- axle load of 21 tonnes at 115 km/h, and 25 tonnes at 80 km/h, with future-proofing for 30 tonnes at 80 km/h;
- 7.1 metre clearances for double-stack operation; and
- full interoperability with the interstate mainline standard gauge network, with dual-gauging in Queensland to provide connectivity to that state's narrow gauge regional network, and standard gauge connections to the ports of Melbourne, Port Kembla, Sydney, Newcastle, Brisbane, Adelaide and Perth.

<sup>14</sup> Reliability is defined as the percentage of goods delivered on time by road freight, or available to be picked up at the rail terminal or port when promised. It does not refer to punctuality of services.

The Inland Rail service offering has been developed and tested in close consultation with users to ensure that it meets their current and future needs.

This report responds to the Australian Government's request for advice on implementing Inland Rail and should be read in conjunction with ARTC's 2015 Inland Rail Programme Business Case. The report also presents the Implementation Group's findings and recommendations.

## THE IDEA FOR AN INLAND RAILWAY

The idea for extending the Australian rail network to provide an inland railway connecting Brisbane to the southern and western states has been around for at least one hundred years. For example, in 1915, the then Prime Minister Andrew Fisher proposed a ‘Strategic Railway’ primarily for defence purposes.<sup>15</sup>

Since that time, an inland railway has been much studied, with many suggestions made for improving the efficiency of Australia’s rail freight capacity between Melbourne and Brisbane.

For example, in 1979, it was suggested that there was a need for an inland rail line connecting Brisbane, Sydney, Melbourne and Adelaide with the aim of providing a rail system directly linking the five mainland state capitals (which, at the time, was home to 60% of Australia’s population).<sup>16</sup>

Subsequently, in 1986, a Melbourne–Parkes–Brisbane rail route was suggested along with a Queensland Government proposal for a new rail tunnel under the Toowoomba Range to service coal exports (which should be wide enough for standard gauge line and high enough for double-stacking).<sup>17</sup>

In 1999, the Australian Government funded a \$300,000 pre-feasibility study into a Melbourne–Brisbane inland railway as part of a Melbourne–Darwin link based on a national trunk railway concept developed by Dr Ken Davidson<sup>18</sup> and promoted by Mr Everaldo Compton of Australian Transport and Energy Corridor Limited.<sup>19</sup>

As a result of separate but related studies and community consultation dating back to 1996, the Queensland Government protected a new Gowrie to Grandchester rail corridor in 2003, able to provide both freight and passenger services with provision for a 6 km tunnel through the Toowoomba range.<sup>20</sup>

A comprehensive study into the future freight demand and options for a Melbourne–Sydney–Brisbane rail corridor was announced in 2005 by the then Minister for Transport the Hon Warren Truss MP.<sup>21</sup>

The findings of this study were reported in the *2006 North-South Rail Corridor Executive Report*<sup>22</sup> (the 2006 Report), which found that an inland railway should generally follow the Far Western Sub-Corridor through Parkes in western New South Wales.<sup>23</sup> The 2006 Report was to provide a basis for future

---

<sup>15</sup> The *Report of the Resolutions, Proceedings and Debates of the Premiers’ Conference Held at Sydney, May 1915; Together with Appendices*, Victorian Parliamentary Paper No. 24 records that the Prime Minister Fisher presented the Commonwealth proposal for a ‘Strategic Railway’ to the Premiers Conference <[www.parliament.vic.gov.au/papers/govpub/VPARL1915No24.pdf](http://www.parliament.vic.gov.au/papers/govpub/VPARL1915No24.pdf)>. Although the Strategic Railway proposal put to the Premiers did not include a link to Melbourne, the Prime Minister had earlier advocated that ‘with a little extra outlay by the Victorian Government’ Brisbane could be brought 300 miles nearer to Melbourne (‘The Strategic Railway’, *The Advertiser* (Adelaide), 10 March 1915, p 6, <http://trove.nla.gov.au/ndp/del/article/5451104?searchTerm=&searchLimits=1-publictag=BOGD+PM+Fisher>).

<sup>16</sup> Laird, P 2012, *An Inland Railway Notes to accompany presentation by Philip Laird of the University of Wollongong to the Symposium hosted by Parkes Shire Council on 22 June 2012*.

<sup>17</sup> *ibid* (Laird 2012).

<sup>18</sup> Dr Ken Davidson 2014, *A Chronology of the Melbourne–Brisbane Inland Railway*, paper provided to the Chair of the Inland Rail Implementation Group, April 2014.

<sup>19</sup> Richard Webb 2009, *Commonwealth Involvement in Reform of the Rail Freight Industry*, Parliamentary Research Paper no. 19 2008-09, [http://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/rp/rp0809/09rp19#inland](http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp0809/09rp19#inland)

<sup>20</sup> *op cit* (Laird 2012).

<sup>21</sup> The Hon Warren Truss MP, Minister for Transport and Regional Services, 17 September 2005 Media Release, 022WT/2005.

<sup>22</sup> North-South Rail Corridor Study Executive Report, 30 June 2006, Ernst & Young, Hyder Consulting, ACIL Tasman available at <[http://investment.infrastructure.gov.au/publications/reports/north\\_south\\_corridor.aspx](http://investment.infrastructure.gov.au/publications/reports/north_south_corridor.aspx)>

<sup>23</sup> The Far Western Sub-Corridor links Melbourne to Brisbane via Parkes, Dubbo and/or Narrmone, Coonamble, Burren Junction, Narrabri and/or Moree, North Star, Goondiwindi, Warwick and/or Toowoomba.

Australian Government and state infrastructure planners tasked with long-term transport planning for the north-south rail corridor.

By 2007, the House of Representatives Standing Committee on Transport and Regional Services<sup>24</sup> had recognised that:

*‘...it is time that Australia made a national commitment to sharply raise the standard of the rail network to provide a fast, modern, flexible and efficient system’.*

In 2007, the then Transport Minister, the Hon Mark Vaile AO, announced that the Government would commission a \$15 million engineering and scoping study to determine the best alignment for an inland railway so it could be taken through the statutory planning and approval process and then into detailed engineering design and construction.<sup>25</sup>

Following the federal election in 2007, the then Minister for Infrastructure, Transport, Regional Development and Local Government, the Hon Anthony Albanese MP, announced in 2008 a study to determine the optimum alignment as well as the economic benefits and likely commercial success of a new standard gauge inland railway between Melbourne and Brisbane. This work culminated in the 2010 *Melbourne–Brisbane Inland Rail Alignment Study: Final Report 2010*<sup>26</sup> (the 2010 Report), a scoping and feasibility study, which determined the optimum alignment of the inland railway within the Far Western Sub-Corridor and made findings about a range of matters that would impact on the delivery of this major infrastructure project. These findings included the prospect that Inland Rail would in time be economically viable, and that it would be appropriate to re-examine the project between 2015 and 2020.

On 6 August 2010, funding of \$300 million was pledged by the former Australian Government to commence pre-construction work in 2014.

In September 2013, the Australian Government, reflecting its election *Policy to Deliver the Infrastructure for the 21st Century*<sup>27</sup> announced that \$300 million would be dedicated to finalise plans, engineering design and environmental assessments for the Melbourne–Sydney–Brisbane Inland Rail to facilitate construction. The Australian Government noted that better infrastructure underpins key services, such as transport and logistics, and that investment in infrastructure will drive productivity and facilitate an efficient economy.

---

<sup>24</sup> *The Great Freight Task: Is Australia's transport network up to the challenge?*, House of Representatives 2007, pp 128–129.

<sup>25</sup> *Vaile to start scoping study for inland rail route*, June 15 2007 available at: <http://www.loydslistdcn.com.au/archive/2007/jun/15/vaile-to-start-scoping-study-for-inland-rail-route>

<sup>26</sup> *Melbourne–Brisbane Inland Rail Alignment Study*, Final Report 2010, Australian Rail Track Corporation.

<sup>27</sup> The Coalition, September 2013.

## THE INLAND RAIL IMPLEMENTATION GROUP

To progress Inland Rail, in late 2013, the Deputy Prime Minister, the Hon Warren Truss MP, established the Inland Rail Implementation Group (the Implementation Group) to provide high level leadership for the implementation of Inland Rail. The Implementation Group is chaired by former Deputy Prime Minister, the Hon John Anderson AO, with senior representatives from the Australian, New South Wales, Queensland and Victorian governments and ARTC.

Over the last 18 months, the Implementation Group has acted to fulfil its Terms of Reference. The following provides an overview of the activities that were undertaken in relation to each term of reference:

1. Determine and manage the Inland Rail Programme implementation strategy, including as a priority the determination of the alignment and reservation of land along the route.
  - The Implementation Group has worked closely with ARTC during 2014 and 2015 to develop a strategy to deliver an inland railway that meets the current and future needs of users, based on the Australian Government's commitment to deliver the project in 10 years. Building on from the work undertaken by ARTC in 2010, the Implementation Group has sought, and had independently validated, expert advice on a range of key matters in order to provide robust advice to the Australian Government. The Implementation Group has made recommendations to the Australian Government about Inland Rail's service specification, demand, its costs and benefits, property acquisition, land tenure, and planning and environmental approvals. The Implementation Group notes that a preferred broad alignment has been determined; however, land acquisition cannot commence as this is reliant upon all necessary planning and environmental approvals—a process which can take up to 24 months. The planning and environmental approval process may result in the alignment varying and, as a result, land acquisition at this stage would be premature. These matters are detailed in Chapter 4 of this report.
2. Determine Inland Rail construction priorities and monitor achievements against milestones and budget.
  - Working closely with ARTC, the Implementation Group has set out in Chapter 8 of this report, a comprehensive Inland Rail delivery strategy (including a detailed construction schedule) that would see Inland Rail delivered in 10 years, should the Australian Government decide to proceed.
3. Ensure effective engagement with the community and stakeholders.
  - The Implementation Group undertook significant community and stakeholder consultation during 2014 and 2015, in conjunction with ARTC and the Department of Infrastructure and Regional Development. In particular, this process was instrumental in developing and testing a service specification for Inland Rail that potential rail users indicated would meet their

needs. An overview of this process is set out below (see the next section of this report). In addition, key matters raised in consultation are addressed throughout this report, and ARTC's consultation activities are detailed in Chapter 6 of the business case.

4. Negotiate intergovernmental agreements (IGAs) and/or other formal agreements required to support the delivery of Inland Rail.
  - The negotiation of IGAs is critical to delivering this major infrastructure project, which spans three states and involves four governments. The Implementation Group has made a number of recommendations about the matters that will need to be covered in agreements between the Australian Government and each of the New South Wales, Victorian and Queensland governments. Should the Australian Governments commit to delivering Inland Rail within 10 years, IGAs will need to be in place as soon as possible. The Implementation Group considers that this report should form the basis from which government-to-government negotiations can commence. The Implementation Group's recommendations in relation to IGAs are set out in Chapter 5 of this report.
5. Examine funding and financing options and engage with private sector investors and those with significant interests along the line that will benefit from its construction.
  - Funding and financing major infrastructure projects like Inland Rail represents a significant challenge for governments. While the Implementation Group sought independent expert advice on options for bringing private sector financing to Inland Rail, it became clear that there would be limited opportunities without significant risk transfer and greater cost to the Australian Government than direct funding. Consequently, there is a role for the Australian Government to provide capital funding for this project. At the time of writing, further advice is being sought by the Department of Infrastructure and Regional Development on funding structures for Inland Rail that limit the impact on the Australian Government's balance sheet. The Implementation Group's recommendations on funding and financing Inland Rail are set out in Chapter 6 of this report. ARTC has undertaken significant engagement with private sector interests along the proposed line and developed a register of those interested in supplying services. This work is detailed in Chapter 6 of the business case.
6. Regularly report and advise the Deputy Prime Minister on the status of the Inland Rail Programme.
  - The Implementation Group has provided regular advice to the Deputy Prime Minister on the status of the Inland Rail Programme over the last 18 months, culminating in this report.

In addition, the Deputy Prime Minister requested that a dedicated freight route be examined to connect Inland Rail to the Port of Brisbane. While Inland Rail focuses on inter-capital freight, the Port of Brisbane extension would provide an efficient, complementary link for international trade, including agricultural and coal exports and, in the longer-term, a port-rail shuttle. The Implementation Group has treated this link as complementary to Inland Rail. The Group's finding and recommendations about a Port of Brisbane extension are set out in Chapter 7 of this report.



## A CONSULTATIVE APPROACH

The Implementation Group has actively engaged with a broad range of stakeholders including Inland Rail's potential users as well as the individuals, communities and others who would live and work along the alignment to understand the breadth of issues associated with Inland Rail, and to inform this report to the Australian Government.

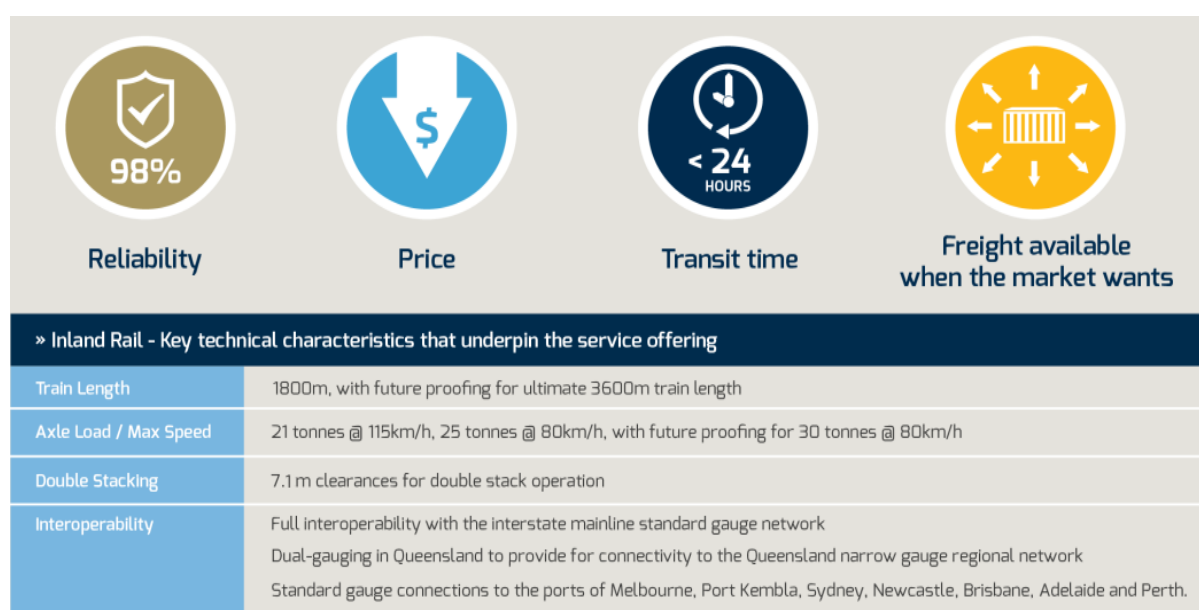
Significantly, as a result of the consultation process, the service offering developed by ARTC in 2010 was substantially modified to include the specifications desired by rail users. The following features were included as a result of the consultation:

- 98% reliability—equivalent to that delivered by road;
- train lengths of 1,800 metres with future-proofing for 3,600 metre train lengths;
- axle load of 21 tonnes at 115 km/h, and 25 tonnes at 80 km/h, with future-proofing for 30 tonnes at 80 km/h;
- 7.1 metre clearances for double-stack operation; and
- full interoperability with the interstate mainline standard gauge network with dual-gauging to provide connectivity to the Queensland narrow gauge regional network.

The Inland Rail service offering has been developed and tested in close consultation with users to ensure that it meets their current and future needs.

These features are set out in Figure 4 below. More information about the Inland Rail service specification is in Chapter 4 of this report.

Figure 4: Summary of Inland Rail's key features and service offering





The Implementation Group was aware of the strong community and stakeholder interest in Inland Rail and welcomed submissions from March to 30 June 2014. The submission process enabled stakeholders to provide their views on Inland Rail, the route (as presented in the 2010 Report) and any unresolved matters for the Group's consideration.

Thirty-six submissions<sup>28</sup> were received from local government councils, individuals including landholders, companies, industry associations, community groups and a union.

The key themes that emerged from the submissions included:

- general support for Inland Rail and that it is needed to meet demand;
- localised impacts of Inland Rail on residential communities and land, including Gowrie Junction and high-value agricultural land;
- the alignment, and standards to which Inland Rail should be built;
- staging of Inland Rail to minimise impacts on the minerals sector; and
- opportunities for private sector engagement.

While the submission process formally closed on 30 June 2014, the Implementation Group has continued to accept submissions and input, and has received a total of 41 formal submissions. A list of non-confidential submissions can be found at: [www.infrastructure.gov.au/rail/inland/submissions](http://www.infrastructure.gov.au/rail/inland/submissions)

The Implementation Group also held:

- **Stakeholder forums** in Sydney in:
  - May 2014, to advise key industry and local government stakeholders about the Australian Government's commitment to delivering Inland Rail, explain the role of the Implementation Group and actions it has undertaken, and provide stakeholders with the opportunity to discuss issues relating to the delivery of Inland Rail; and
  - October 2014, to provide stakeholders with an update on the work of the Implementation Group, as well as to test the proposed service specifications for Inland Rail with the rail operators and logistics firms that are likely to use the railway.
- **Roadshow meetings** in a range of locations<sup>29</sup> in June 2014 and February 2015 to brief local community and industry leaders about the current status of, and plans for, Inland Rail and to seek feedback about the next stages and priority projects. It also provided an opportunity for ARTC and Implementation Group representatives to understand the unique local opportunities of each region.

---

<sup>28</sup> As at 30 June 2014.

<sup>29</sup> Roadshow meetings were held in 2014 in Ipswich (2 June), Toowoomba (2 June), Narrabri (4 June), Dubbo (5 June), Parkes (6 June), and in 2015 in Wagga Wagga (4 February) and Wodonga (5 February).

- **Industry briefings** in Sydney and Brisbane in September 2014 and Toowoomba in August 2015 to provide insight into the intent, challenges and performance specifications expected from Inland Rail. The briefings also provided participants with ideas about potential opportunities to be involved in the delivery of Inland Rail. Over 400 representatives from Australian and international rail and construction companies, consultants and suppliers attended the briefings.

In addition, members of the Implementation Group held meetings with key stakeholders including industry, community groups, the Food Bowl Inland Rail Alliance and local governments on request.

Extensive one-on-one meetings were also undertaken by ARTC with local government representatives, peak bodies, potential rail customers and key state and federal government agencies. ARTC has reported that generally these groups were very supportive of Inland Rail. Local councils and regional businesses indicated the strong regional development potential and enhanced connectivity that Inland Rail would bring.

In addition to the consultation undertaken directly by the Implementation Group, both the Department of Infrastructure and Regional Development and ARTC have dedicated Inland Rail webpages, including email contacts, to provide up-to-date information on the programme.

Key issues arising from the consultation process are discussed in detail in relevant chapters throughout this report.

*“...Local councils and regional businesses have talked about the strong regional development potential and enhanced connectivity that Inland Rail will bring. Farming and mining exporters have commented that Inland Rail will create competition in the logistics supply chain, driving down costs and making them more competitive in world markets. Motoring organisations and councils have identified the potential to reduce the burden on regional road networks and improve road safety outcomes.”*

Spokesperson for Woolworths Ltd, 2014

## ENSURING A RIGOROUS BUSINESS CASE

The Inland Rail Programme, as a proposed nationally significant infrastructure investment, falls squarely within the seven key themes for action identified in Infrastructure Australia's 2008 *Report to the Council of Australian Governments*<sup>30</sup> to develop a National Freight Network so that more freight can be moved by rail and road.

Infrastructure Australia (IA) is an independent statutory agency that advises the Australian Government and infrastructure investors and owners on Australia's nationally significant infrastructure priorities now and into the future. In particular, it assists governments to develop a strategic blueprint for unlocking infrastructure bottlenecks.

The Implementation Group has worked with ARTC to ensure that the business case for Inland Rail addresses requirements of IA guidelines for nationally significant projects. The business case is intended to provide a clear national perspective, improve linkages between jurisdictions, and focus clearly on the national interest in promoting productivity.

As work on the business case proceeded, it became clear that a more comprehensive approach was required than had been originally anticipated. While the pre-feasibility study undertaken by ARTC in 2010 provided a base from which further development could commence, a number of changes since then led to the need for more analysis and validation. For example, the inclusion of future-proofing along with aspects of Inland Rail that were underestimated or not included in the 2010 design specifications triggered the need for a major review of cost estimates. Given changes in Australia's economic circumstances since 2010, there was also a need to review and independently validate demand estimates, and seek initial expert advice on the feasibility of bringing private sector finance to Inland Rail.

To this end, the Implementation Group's consideration of all aspects of Inland Rail has been informed by advice from a range of technical and other experts. Independent validation has also been undertaken on the underlying modelling underpinning the business case, including on demand, market take-up, revenue and financial estimates, ARTC track engineering standards (based on a comparative review with North American standards), cost estimates (including direct and indirect costs, escalation rates and contingency allowances) and the feasibility of bringing private sector finance to Inland Rail.

In addition, Inland Rail's specifications were tested with users and refined to deliver a service offering in line with users' current and future needs. In this way, the Australian Government, should it proceed with construction, can be confident that the business case has been developed with the required level of rigour to successfully address Australia's freight rail challenge now and for future generations.

---

<sup>30</sup> Available at <[www.infrastructureaustralia.gov.au/coag/index.aspx](http://www.infrastructureaustralia.gov.au/coag/index.aspx)>

In addition, the Implementation Group was mindful of the 2014 Productivity Commission report,<sup>31</sup> which emphasised selection of the right public infrastructure projects as the most important aspect of achieving good outcomes for the community, and avoiding highly inefficient outcomes where investment in public infrastructure is a drain on the economy, lowers productivity, and crowds out more efficient projects.<sup>32</sup> In particular, the Productivity Commission<sup>33</sup> recommended a rigorous benefit-cost analysis (BCA) for all projects above \$50 million as a useful tool for guiding project selection, improving the transparency and quality of decision-making. In supporting this recommendation, the Australian Government's response noted that a BCA is the most appropriate tool to determine the merit of infrastructure projects,<sup>34</sup> and that poorly chosen infrastructure can reduce productivity and financially burden the community for decades.<sup>35</sup>

As a consequence, the Implementation Group put a strong emphasis on developing a robust and detailed business case suitable for submission to Infrastructure Australia.

A summary of the BCA for Inland Rail documented in the business case is set out in Chapter 4 of this report.

---

<sup>31</sup> *Public Infrastructure*, Productivity Commission Inquiry Report, Vol 1, No 71, 27 May 2014, available at: [www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0003/137280/infrastructure-volume1.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0003/137280/infrastructure-volume1.pdf) p 75.

<sup>32</sup> *ibid* (Productivity Commission 2014 p 75).

<sup>33</sup> *ibid* (Productivity Commission 2014 p 75).

<sup>34</sup> *Productivity Commission Inquiry Report into Public Infrastructure*, Australian Government response, Commonwealth of Australia, November 2014 p 8.

<sup>35</sup> *ibid* (Australian Government response 2014 p 1).

## 2. WHAT IS THE PROBLEM?

### FREIGHT PRODUCTIVITY AND NATIONAL WEALTH

The Australian logistics industry contributes approximately 8.6% directly to national gross domestic product (GDP),<sup>36</sup> and is integral to national and individual prosperity by facilitating the movement of goods between producers and from producers to consumers.

The importance of freight to the nation's economy means that impending constraints must be regarded as a priority issue of national significance.<sup>37</sup> Infrastructure Australia estimated that in 2005–06, the margin between the producer price and purchaser price of goods in Australia was 15.6%.<sup>38</sup> As freight costs typically comprise a large proportion of this margin, it follows that an efficient freight network will contribute to more competitive pricing of Australian goods and maximise exports to world markets. The Australian Logistics Council suggests that a 1% gain in efficiency in logistics results in cost savings of \$2 billion.<sup>39</sup>

As stated by the Bureau of Infrastructure, Transport and Regional Economics (BITRE):

*'freight productivity growth also benefits other transport system users, for example, by reducing the number of vehicles on road and rail networks, thereby reducing accident exposure risk for other road users, and reducing noxious and greenhouse emissions per unit of freight moved'.<sup>40</sup>*

The need for efficient internal freight networks has also been recognised at the state level. For example, New South Wales has published its *Freight and Ports Strategy*,<sup>41</sup> which seeks to identify where government intervention is justified to enhance productivity and economic efficiency through addressing problems with the operation of markets and institutions, and balancing competing interests and impacts. This and other similar state-based strategies in Queensland (*Moving Freight*<sup>42</sup>) and Victoria (*The Freight State*<sup>43</sup> – which forms part of the context for network planning the [new] Victorian Government will be undertaking) set out a range of actions to provide a state transport network that allows the efficient flow of goods to their markets.

Delivering a high performance national freight industry is a particular challenge given Australia's unique geographic and demographic characteristics. Australia's remoteness from other countries, its geographic size and dispersed population, along with the 'thinness' of our markets, add to the price of our imports as well as locally manufactured goods. This places greater emphasis on the need for efficient internal freight networks to ensure Australia is globally competitive.<sup>44</sup>

---

<sup>36</sup> *The Economic Significance of the Australian Logistics Industry*, Australian Logistics Council, 2014.

<sup>37</sup> *National Land Freight Strategy A place for freight*, Standing Council on Transport and Infrastructure 2012, p 5.

<sup>38</sup> *Freight network background paper*, Infrastructure Australia (February 2010).

<sup>39</sup> *op cit* (Australian Logistics Council 2014).

<sup>40</sup> *Truck Productivity: Sources, Trends and Future Prospects*, BITRE, 2011Report 123, Canberra, ACT, p xiii.

<sup>41</sup> *NSW Freight and Ports Strategy*, New South Wales Government, November 2013, p 10.

<sup>42</sup> Available at <[www.tmr.qld.gov.au/movingfreight](http://www.tmr.qld.gov.au/movingfreight)>

<sup>43</sup> Available at <[www.dtp.vic.gov.au/transport/publications/victoria-the-freight-state](http://www.dtp.vic.gov.au/transport/publications/victoria-the-freight-state)>

<sup>44</sup> *Meeting the 2050 Freight Challenge*, PricewaterhouseCoopers, 2009 p 4.

Due to network capacity constraints, Access Economics estimated that between 2002 and 2007 Australia lost market share of the mineral market equivalent to 1.6% of national income.<sup>45</sup> A similar situation was observed as a result of port congestion in Queensland and New South Wales, with shipping delays being linked to reduced exports and revenue losses that were estimated to have cost more than \$2 billion between 2005 and 2010.<sup>46</sup>

BITRE has forecast significant growth in Australia's freight task over the coming decades. Key transport links are already experiencing constraints resulting from inadequate infrastructure. Many local and regional roads were not designed to cater for higher productivity vehicles, and much of the current rail infrastructure was built in the 19<sup>th</sup> and early 20<sup>th</sup> centuries. Future growth will increase the demand for transport services at a local, state and national level, placing freight corridors under severe pressure and compounding the inefficiencies that already exist.<sup>47</sup> The performance of long-distance transport along corridors such as Melbourne to Brisbane is particularly sensitive to the cumulative effect of local infrastructure deficiencies.

The Australian domestic freight task is undertaken largely by road or rail. Australia-wide, the rail freight sector moves more freight further than any other transport mode in Australia, and rail accounts for almost half of domestic freight activity (in terms of tonne-kilometres), up from around 36% at the turn of the century.<sup>48</sup> Rail handles 40% more by volume of the freight task than the trucking sector.<sup>49</sup>

With trucks moving about 80% of the total non-bulk task, the trucking industry dominates almost every major freight route.<sup>50</sup> The introduction of larger freight vehicles, such as B-doubles, has increased truck productivity over longer distances, allowing road to compete even more effectively against rail. For example, 'the average load carried by articulated trucks has more than doubled, from 9.7 tonnes per vehicle kilometre in 1971 to over 20.7 tonnes per vehicle kilometre in 2007, and the average distance travelled by articulated trucks has increased almost 90% to over 90,000 kilometres per annum'.<sup>51</sup>

Further road freight productivity gains may be achieved in the future through greater network access for B-triples and other higher productivity vehicles. However, BITRE modelling suggests that these gains are unlikely to be of the magnitude delivered by the introduction of B-doubles for two reasons: the proportionately smaller network over which B-triples would be allowed to operate; and the smaller proportionate increase in average gross mass.<sup>52</sup> Consequently, to meet Australia's future freight challenge, productivity improvements in all modes will be required.

---

<sup>45</sup> Minerals Council of Australia, Submission to Infrastructure Australia, October 2008, p ii and 'Infrastructure 2008 – can the domestic supply chain meet global demand?', Report by Access Economics Pty Ltd for Minerals Council of Australia, 26 May 2008, p ii.

<sup>46</sup> *National Ports Strategy*, Infrastructure Australia (December 2010).

<sup>47</sup> *op cit* (PwC 2009 p v).

<sup>48</sup> *Trainline 2*, BITRE.

<sup>49</sup> *Freightline 1*, BITRE.

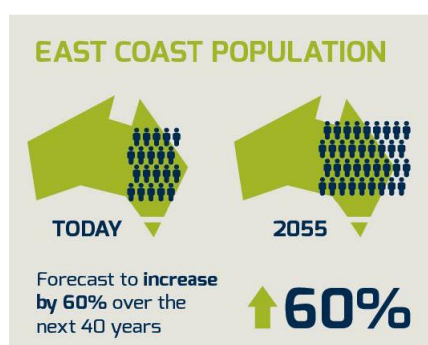
<sup>50</sup> *The Great Freight Task: Is Australia's transport network up to the challenge?*, House of Representatives (HoR) 2007, p 7.

<sup>51</sup> *op cit* (BITRE, 2011 p xiii).

<sup>52</sup> *ibid* (BITRE 2011 p 56). Note the Bureau's modelling suggests a 10% increase in vehicle mass produces the largest potential future increase in fleet-wide average loads of the scenarios it tested p 61.

The Melbourne to Brisbane transport corridor supports the most significant population, employment and economic areas in Australia and contributes billions of dollars in exports annually. The east coast of Australia comprises 18 million residents, nine million jobs and contributes \$1.1 trillion in gross state product each year. Export trade through east coast ports is estimated to contribute approximately \$260 billion in exports annually. The key freight sectors underpinning resources, jobs and export markets for the east coast are also nationally significant, comprising more than 80% of total interstate freight in Australia. Agricultural and other goods travelling within the corridor are valued at \$34 billion per annum, and thermal coal resources in southern Queensland are about 8.4 billion tonnes and contribute up to \$700 million in revenue annually.<sup>53</sup>

Strong population growth projections along the east coast are underscored by the increasing concentration of population in the area. Forecasts indicate that the region's share of the total population will increase from 81% in 2008 to 90% by 2050.<sup>54</sup>



The population centres that would be served by an inland railway are likewise forecast to experience significant population growth over the 20 years from 2006. Melbourne is forecast to grow by 40% to a population of around 5.04 million, Sydney by 31% to around 5.4 million and Brisbane by 52% to around 2.7 million.<sup>55</sup> Overall, the eastern Australian population is forecast to increase by 60% over the next 40 years.<sup>56</sup>

The most recent detailed transport demand estimates and forecasts for the non-urban elements of the Melbourne to Brisbane corridor (excluding intra corridor freight movements) are those developed in 2006 by BITRE.<sup>57</sup> For 1999, it was estimated that the non-urban road network supported approximately 5.7 million car and bus passenger journeys, and 15.6 million tonnes of freight along the corridor (that is, intra-corridor). At the same time, the non-urban north-south rail network supported 0.3 million-passenger journeys, and 3.1 million tonnes of freight.<sup>58</sup>

The relative significance of the Melbourne–Brisbane corridor is further highlighted by more recent BITRE modelling suggesting interstate road freight travelling to and from Victoria, the Australian Capital Territory, New South Wales and Queensland comprises 60 billion tonne-km (tkm) per year (or 84% of total interstate freight in Australia),<sup>59</sup> and is expected to be around double by 2030.<sup>60</sup>

<sup>53</sup> Inland Rail Programme Business Case, pp 59–60.

<sup>54</sup> op cit (PwC 2009 p 12).

<sup>55</sup> *National Land Freight Strategy*, Discussion Paper, Australian Government, Infrastructure Australia p 24.

<sup>56</sup> ABS Population Projections Australia, 2006–2011, 2008 (Series B forecasts updated).

<sup>57</sup> *Demand Projections for AusLink Non-Urban Corridors: Methodology and Projections*, Working Paper 66, BITRE, 2006, Canberra, ACT.

<sup>58</sup> A further 3.7 million tonnes was estimated to be moved in 1999 by coastal shipping.

<sup>59</sup> Figures derived from *Road freight estimates and forecasts in Australia: interstate, capital cities and rest of state*, BITRE Research Report 121 (2008 and 2030 forecasts) Tables T2.1, T2.4, T2.5 and T2.6, based on actual data to 2007 and forecasts from 2007 to 2030.

<sup>60</sup> Op cit (BITRE Research Report 121 (2008 and 2030 forecasts), p 27).



## THE CHALLENGE OF MOVING FREIGHT ALONG THE MELBOURNE–BRISBANE CORRIDOR

The following deficiencies currently undermine the performance of the Melbourne–Brisbane corridor, or will impact on Australia’s ability to respond to the future freight task:

- road capacity will not be able to serve the future mix of freight and non-freight vehicles without significant investment or decrease in the levels of service;
- the current rail network cannot provide a road competitive freight service;
- the availability of rail paths and ability to accommodate higher productivity trains will limit the capacity of rail to serve future demand in the corridor; and
- there is limited scope for shipping to assist in handling of the freight task.

Also, projections based on data from the ABS 2006 census indicate that by 2026, more than 30% of the current driver workforce will have reached the age of 70 years,<sup>61</sup> creating potential for a driver shortage unless sufficient numbers of younger people train as drivers.

The following emerging problems have been identified:

- rail network constraints restrict rail’s ability to provide an efficient and attractive alternative to road;
- heavy reliance on road on the Melbourne–Brisbane corridor increases the risk of supply chain exposure to cost shocks;
- lack of resilience on networks exposes supply chains to disruptions;
- lack of an efficient freight network is constraining regional economic growth; and
- growing long distance road freight movements are reducing community amenity.

The problem is also illustrated through an investment logic map (see Figure 5). The business case (Chapter 3) also provides a detailed discussion of the challenges facing the movement of freight between Melbourne and Brisbane based on the above themes.

A whole-of-corridor response to these challenges would primarily benefit of the non-bulk, intermodal freight moving between Melbourne and Brisbane and beyond (e.g. to and from northern Queensland). This freight market consists mainly of inputs to industry and household consumables, and in the past, this market has grown faster than the growth of the economy as a whole, but is now moving towards the GDP growth rate as domestic heavy manufacturing declines and more goods are imported through our ports.

---

<sup>61</sup> ABS (2008). Labour force, Australia, detailed, quarterly. Cat. No. 6291.0.55.003. Australian Bureau of Statistics. <<http://www.abs.gov.au/ausstats/abs@.nsf/mf/6291.0.55.003>>. It is noted that ageing also affects rail drivers, however, it takes more drivers to move the equivalent amount of freight on road than it does by rail.



It is estimated that the current (without Inland Rail) Melbourne–Brisbane non-bulk, intermodal freight market is approximately 4.8 million tonnes per year, and is expected to grow by about 3% per annum, reaching approximately 11.9 million tonnes per year by 2050.<sup>62</sup> Without Inland Rail, the amount of freight travelling by road between Melbourne and Brisbane in 2050 will be approximately 7.1 million tonnes, 2.3 million tonnes more than what would be on road with Inland Rail in operation. This equates to over 200 additional B-double trucks per day.

Adopting Inland Rail as one whole-of-corridor solution would also benefit other significant freight markets. Inland Rail would:

- allow the diversion of existing rail freight moving between Brisbane and Adelaide or Perth via Sydney, and the diversion of freight currently moved between Brisbane and Parkes by road for loading onto double stacked east-west rail services. The current total contestable market for these freight flows is estimated to be approximately 2 million tonnes per year, rising to almost 3.9 million tonnes in 2040;<sup>63</sup>
- provide access to more productive regional rail services, providing benefits for the bulk and non-bulk domestic and international supply chains. It is estimated that Inland Rail could capture nearly 7 million tonnes of agriculture products in 2025, rising to almost 9 million tonnes in 2050;<sup>64</sup> and
- be a catalyst for additional coal exports from south-east Queensland to the Port of Brisbane by providing a more direct and cost effective route over the Toowoomba Range. With complementary investment in branch lines, it is expected that this market could grow from the current movement of approximately 8 million tonnes to around 19.5 million tonnes per year.

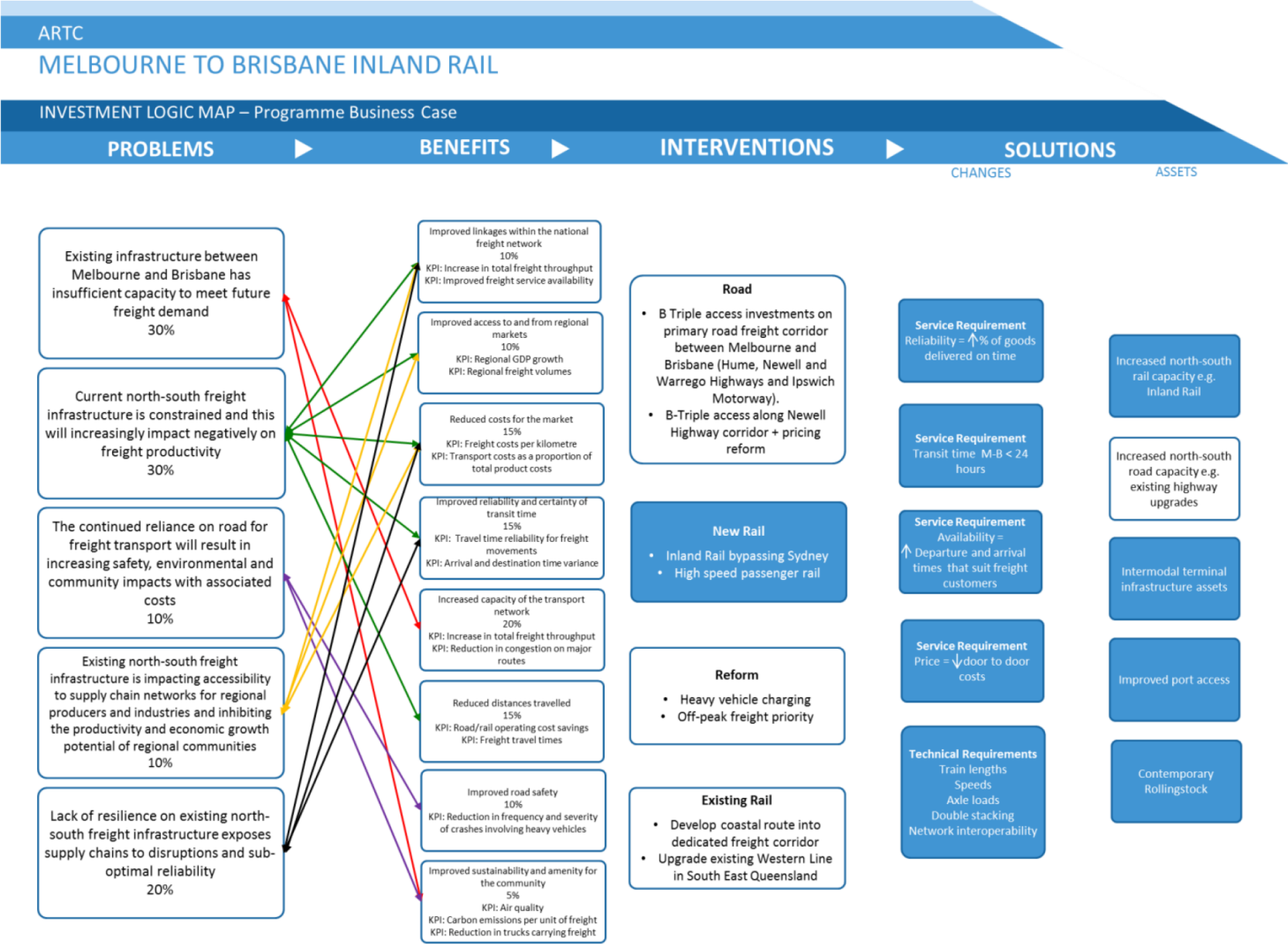
---

<sup>62</sup> Inland Rail Programme Business Case, Table 7.2, pp 132.

<sup>63</sup> *ibid*, p 118.

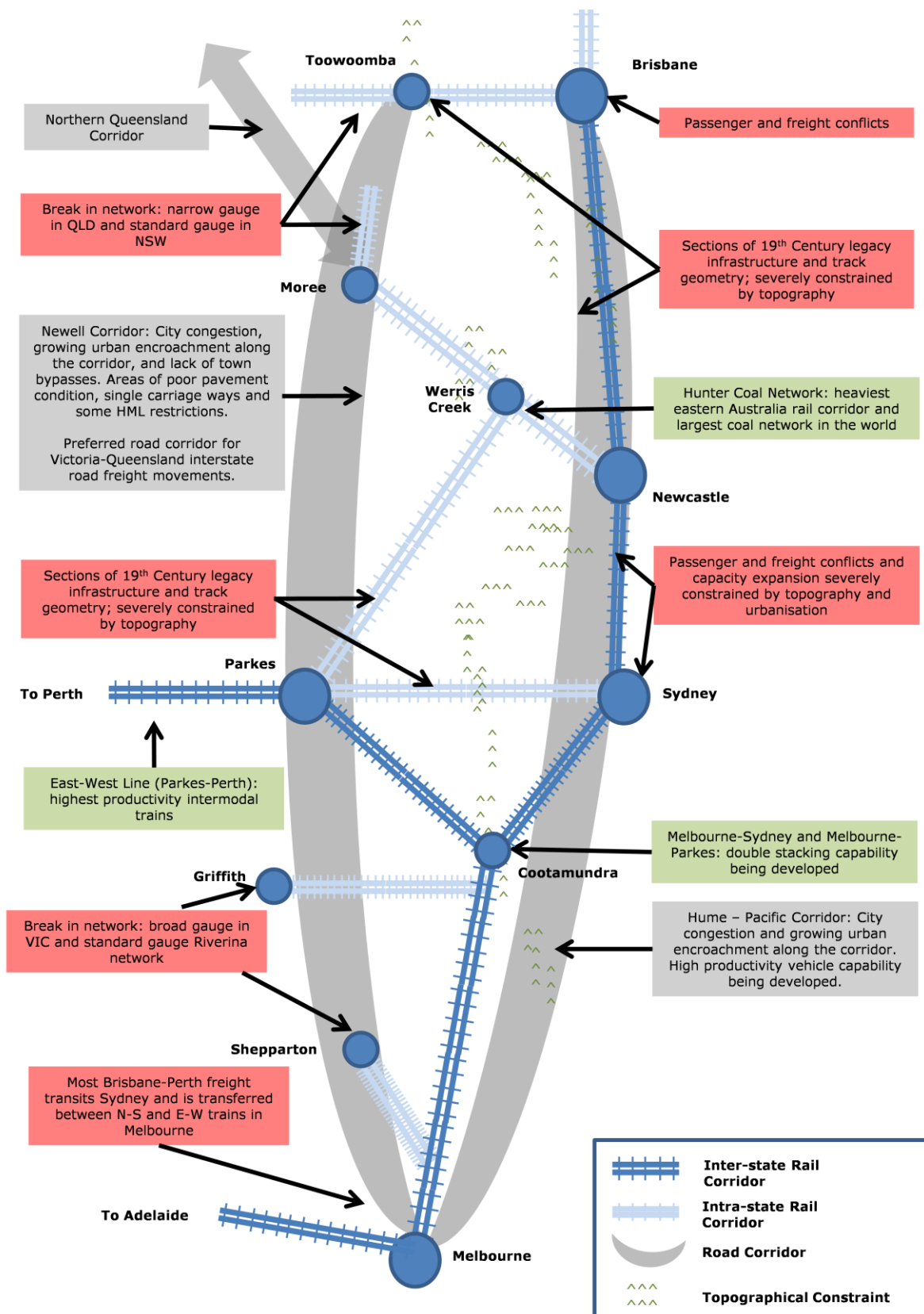
<sup>64</sup> *ibid*, Table 7.5, p 134.

Figure 5: Inland Rail investment logic map



As discussed, the existing north-south corridor has a range of constraints for both rail and road. A summary of key characteristics of the Melbourne–Brisbane rail and road network are illustrated in Figure 6 below.

Figure 6: Summary of key characteristics of the Melbourne–Brisbane road and rail network



## RECENT INVESTMENT

### Rail

Recent investment in rail along the north-south corridor includes upgrading the Northern Sydney Freight Corridor (NSFC), at a cost of \$1.1 billion, to reduce congestion and travel times and improve reliability for freight and almost \$1 billion invested by ARTC in the Southern Sydney Freight Line (SSFL) to separate freight and passenger trains in south-west Sydney. Outside of Sydney, \$154 million (combined Australian Government and ARTC) has been invested in the Sydney to Melbourne line to upgrade ballast and improve track quality, \$784 million was invested between Melbourne and Albury through the North East Rail Revitalisation Programme that included standardising the rail gauge (combined Australian Government, ARTC and Victorian Government funding), and \$99.2 million (Australian Government funding) for the first stage of a north coast curve easing project to cut transit times and increase reliability of services. This investment will continue to play a role and provide a benefit given that Inland Rail utilises the existing north-south interstate rail line between Melbourne and Illabo (NSW) and reliable rail freight connections into and out of Sydney will still be required.

### Road

The Australian Government is providing \$5.6 billion to complete the upgrade of the Pacific Highway (New South Wales) and \$6.7 billion for new and existing Bruce Highway (Queensland) programmes. Duplication of the Hume Highway was completed in 2013. The Australian Government has also committed \$405 million to the NorthConnex project in Sydney, which when completed will result in a continuous four-lane divided road between Newcastle and Melbourne. State governments are also investing in infrastructure along the corridor. For example, the New South Wales Government has set out a plan to be delivered over 20 years to improve the Newell Highway (the main Melbourne–Brisbane road route used by freight companies), and highlights recent investment including \$10 million for a first tranche of overtaking lanes, a second tranche (a further \$10 million commitment) announced in May 2013, and a third tranche (currently in planning) announced in 2014–15 with a commitment of \$14.4 million.<sup>65</sup> In addition, the New South Wales Government has recently announced \$500 million to upgrade country roads.<sup>66</sup> Further, the Australian Government announced in March 2015, the provision of \$61.4 million for the Newell Highway through the National Highway Upgrade Programme, which will enable the construction of heavy-duty pavement on the Newell Highway, including a widened centreline, between Mungle Back Creek and Boggabilla in NSW.

Despite this investment, the existing freight networks along the north-south corridor continue to face problems. The existing rail corridor cannot meet the growth in demand. The number of paths available for freight trains will be unable to accommodate future freight demand between Melbourne and Brisbane as well as between Melbourne, Sydney and Brisbane. There will be ongoing geographical and capacity constraints along the east coast rail network, and coal and agricultural freight travelling between south-east Queensland and the Port of Brisbane will be constrained by the number of train paths available.

<sup>65</sup> *Newell Highway Corridor Strategy*, Transport for NSW, New South Wales Government, May 2015 pp 13–14 available at <http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/newell-highway-final-corridor-strategy.pdf>

<sup>66</sup> *\$6 billion boost for regional infrastructure*, NSW Government, 25 November 2014, available at <https://www.nsw.gov.au/news/rebuilding-nsw-regional>

South-east Queensland is poorly connected to the national network, lacking a direct connection to the west. In addition, the existing coastal rail route between Sydney and Brisbane has limitations, much of its infrastructure is sub-optimal<sup>67</sup> and it is not considered feasible to invest in the line to handle future high productivity trains.

The Newell Highway will continue to face significant capacity constraints for road freight in the medium to long term. A large number of heavy vehicles use the Newell Highway comprising, on average, between 26% and 52% of all traffic on the route. Several sections of the highway are currently operating at 55% to 70% of capacity, with some sections (for example Dubbo) approaching 70–85% of road capacity and unstable flow conditions.<sup>68</sup> Under these conditions, minor increases in traffic will result in operational problems including a restricted selection of desired speed and manoeuvrability and a noticeable decline in the general level of comfort and convenience relative to roads using a lower proportion of capacity.

If these problems are not overcome, national productivity and economic growth will be constrained, with environmental and safety outcomes becoming increasingly suboptimal. The inability of road and rail to handle future demand between Melbourne and Brisbane in an efficient manner will reduce reliability, and increase supply chain costs, accidents, and vehicle emissions as a result of stop-start conditions. The forecast increases in population and employment in the north-south corridor, as well as the increased freight task, will exacerbate these problems over time. Without investment in rail capacity, freight between Melbourne and Brisbane will be forced to travel by road. The key problems forecast for freight are summarised below in Table 1.

**Table 1: Key emerging freight problems in Australia**

Mode	Key emerging problems
Road	<ul style="list-style-type: none"> <li>• Lane capacity along the north-south corridor will be unable to accommodate future freight and other vehicle demand without deteriorating transit time and reliability.</li> <li>• The shared nature of road travel between freight and other users will create increasing conflicts in the future as demand for both increases in line with population and GDP growth.</li> </ul>
Rail	<ul style="list-style-type: none"> <li>• The number of paths available for freight trains will be unable to accommodate future freight demand between Melbourne and Brisbane as well as Melbourne–Sydney–Brisbane.</li> <li>• The ability to accommodate higher productivity trains (longer, higher axle load, and double-stacked) and is limited in some sections of the corridor.</li> <li>• Lack of redundancy and resilience on rail freight networks expose supply chains to disruptions.</li> </ul>
Sea	<ul style="list-style-type: none"> <li>• High loading and unloading costs at multiple ports and long transit times relative to road and rail make coastal shipping generally unsuitable for shorter distance journeys on the north-south corridor and time sensitive inter-capital container freight.</li> </ul>

<sup>67</sup> The existing coastal route is constrained to train lengths of 1,500 metres, has tight radius curves and was never established as an interstate route. Rather, it was established as a rail link between coastal and river communities in the colonial era. Without a complete rebuild along a new alignment, it is not sufficient for the growing interstate trade task and could not deliver a road competitive transit time.

<sup>68</sup> Inland Rail Programme Business Case, p 74-75; see also NSW Government, 'Draft Newell Highway Corridor Strategy 2014

Resolution for the north-south corridor will require a cooperative approach involving the Commonwealth, Victorian, New South Wales and Queensland governments over the longer term.

## Findings

The Implementation Group finds that:

- F2.1 Without Inland Rail, the amount of freight travelling by road between Melbourne and Brisbane in 2050 will be approximately 7.1 million tonnes, 2.3 million tonnes more than what would be on road with Inland Rail.
- F2.2 Key transport links are experiencing increasing capacity constraints and congestion as a result of inadequate infrastructure.
- F2.3 Current investment in road and rail is insufficient to address Australia's future freight task.
- F2.4 Further population and freight growth along the north-south corridor will increase the demand for transport services at a local, state and national level, placing freight corridors under severe pressure and compounding the inefficiencies that already exist.
- F2.5 If capacity constraints and congestion resulting from inadequate infrastructure are not overcome, national productivity and economic growth will be constrained with environment and safety outcomes also becoming increasingly sub-optimal.
- F2.6 Resolution of the freight task between Melbourne–Sydney–Brisbane requires a cooperative approach between the Commonwealth, New South Wales, Victorian, and Queensland governments that looks to the longer term and crosses electoral cycles.

### 3. POTENTIAL SOLUTIONS TO ADDRESS THE PROBLEM

The Implementation Group considers that addressing Australia's growing freight task and the current inefficiencies along the Melbourne–Brisbane corridor will be vital to Australia's prosperity.

The movement of Australian freight is a task currently shared predominantly between road and rail, with coastal shipping and air playing more minor roles. Until the early 1960s, railways dominated all but the shortest land-based freight tasks.<sup>69</sup> Since then, extensive improvements in road vehicle productivity and road infrastructure quality, the reform of regulations restricting road freight carriage and the growth in interstate trade has broadened the range of freight tasks that road freight now undertakes.

Both road and rail, along with sea and air, continue to play important roles in Australia's diverse freight task. Each mode has attributes that render it more suitable, and generally less costly, for particular transport tasks. For example, road transport provides flexibility for urban goods distribution while the scale of economies of rail over longer distances and for bulk commodities advantages it, over road, for these tasks.<sup>70</sup>

There is a middle ground where both road and rail are used for carrying some goods, in some cases competing for freight and in other cases being used together as part of integrated logistics operations.<sup>71</sup> Intermodal freight is an example of an area where road and rail are complementary (in the sense that if demand for one falls demand for the other also falls), with road transport providing local pick-up and delivery to and from rail terminals. However, such intermodal road-rail freight tasks can often be substituted by road-only freight services. Inter-capital non-bulk freight is an example of where road and rail, and to an extent sea, compete for certain freight traffic.<sup>72</sup>

While the Australian freight task will continue to be a shared one, the balance between modes of transport is, and will continue to be, influenced by a range of factors including government policies and investment decisions which directly affect modal competitiveness. The challenge for governments and the economy is to make the best use of the advantages offered by each mode in the most cost effective manner (including external costs like safety and environmental impacts).

The Implementation Group has examined a range of alternative transport solutions including maritime, air and road solutions along with potential rail solutions (including further upgrading of the existing east coast line and constructing an inland railway) that have the potential to address Australia's current and future freight challenge.

The Implementation Group considers that while Australian shipping and air will continue to play a role in the interstate freight market, they are not viable alternatives to rail. The Implementation Group considers that without Inland Rail, road is the only mode capable of addressing the bulk of the future freight task—with consequent direct and indirect costs.

---

<sup>69</sup> *Road and rail freight: competitors or complements?*, BITRE Information Sheet 34, p 1 available at: [www.bitre.gov.au/publications/2009/files/is\\_034.pdf](http://www.bitre.gov.au/publications/2009/files/is_034.pdf)

<sup>70</sup> *ibid* (BITRE Information Sheet 34 p 1).

<sup>71</sup> *ibid* (BITRE Information Sheet 34 p 1).

<sup>72</sup> *ibid* (BITRE Information Sheet 34 p 1).



## MARITIME FREIGHT

Australian ports handled 101.5 million tonnes of coastal freight during 2012–13, a 1.9% increase on 2011–12 and an average annual decline of 2.2% over the five years to 2012–13.<sup>73</sup> Of the domestic freight that is carried by coastal shipping, bulk commodities, such as aluminium ores, iron ore and petroleum, account for over 70% of domestic coastal shipping movements (by volume).<sup>74</sup>

Factors that drive the cost of shipping include the freight volume to be carried and the distance to be travelled, with competitiveness rising in line with volumes and distance. In addition, the cost of compliance with regulatory schemes can affect the competitiveness of shipping as a means of freight transport.<sup>75</sup>

Nevertheless, sea freight has been examined as a potential alternative to Inland Rail through two different types of service—a dedicated service between the Melbourne and Brisbane (coastal shipping), and through utilisation of spare capacity on vessels calling at Melbourne and Brisbane as part of an international voyage.

## DEDICATED SEA FREIGHT SERVICES

The market testing undertaken in the development of the Inland Rail solution indicates there are no significant bulk commodity supply chains between Melbourne and Brisbane that are contestable to rail and shipping services.<sup>76</sup> Consequently, if shipping is to be a viable modal alternative in the corridor, it will need to compete in the general or intermodal freight markets.

The Inland Rail service offering (see Chapter 5) represents the service characteristics that would be required to shift non-bulk, intermodal freight from road to rail. A key element of this service offering is a competitive terminal-to-terminal transit time of less than 24 hours. Accordingly, for coastal shipping to be a substitute for Inland Rail, a similar transit time would also be required to handle the same volume of freight.

The Implementation Group considers that shipping cannot compete with road and rail in this regard. For example, at 20 knots, a regular shipping service between Melbourne and Brisbane would take approximately two days to make the voyage between the two ports.<sup>77</sup> This is approximately 16 hours longer than the existing coastal rail terminal-to-terminal transit time, and over a day longer than the design specifications for Inland Rail.

In addition to the longer transit time, a shipping solution also has a number of door-to-door time disadvantages over existing road and rail services. For example, the freight cut-off and availability times

---

<sup>73</sup> BITRE 2014, *Australian Sea Freight 2012-13*, Canberra, ACT, p.vii.

<sup>74</sup> BITRE 2014, *Freightline 1*, p.5.

<sup>75</sup> The Australian Government's proposed reforms to coastal shipping may address some of these issues, but it will not solve the north-south freight problem due to transit times and the reliability of shipping capacity. Unlike the east-west corridor, the circumstances of the north-south freight task are not as conducive to greater competition from coastal shipping.

<sup>76</sup> The coastal shipping licencing data indicate a small volume of petroleum and methanol products is already being moved from Melbourne to Brisbane.

<sup>77</sup> The ANL AANA service provides a Melbourne to Brisbane transit time of between 4 and 5 days due to the port call at Sydney.

are likely to be longer (due to higher volumes that would be exchanged per port call, and pick-up and delivery times are likely to be longer as new interstate intermodal rail terminals are likely to be co-located with customers).

Therefore, it is expected that if a commercially viable shipping service could be established for non-bulk, intermodal customers, shipping is more likely to reduce demand for rail on the existing coastal line and do little to reduce the demand for road freight services along the Melbourne–Brisbane corridor.

In relation to demand, modelling for the business case (see Chapter 7) forecasts that the total volume of inter-capital intermodal freight that will be moved by road and coastal rail in 2030 will be approximately 7 million tonnes. At an average of 14 tonnes per TEU,<sup>78</sup> this would represent a market of 500,000 TEUs per year.<sup>79</sup> As these full containers need to be returned empty, this represents a shipping task in 2030 of 1 million TEUs per year to be moved between Melbourne and Brisbane.

Assuming a 1,000 TEU-sized ship is the smallest that would be economically viable to make the two-day voyage between Melbourne and Brisbane, the number of services required to meet *total* intermodal, interstate demand would be 1,000 services per year in 2030 or approximately 20 one-way services per week. This represents ten departures a week each from Melbourne and Brisbane and is likely to be an attractive frequency for customers. These estimates, however, are based on the scenario of shipping capturing the interstate market in its entirety.

For the purposes of exploring the potential for shipping to be an alternative solution to Inland Rail, it is assumed that the current market share for the coastal route (less than 20%) represents the upper bound for the ability of shipping to compete with road.

On that basis, in 2030, the proportion of the market potentially captured by shipping would be 200,000 full and empty TEUs. Assuming a 1,000 TEU capacity vessel as above, 200 services per year would be required to handle demand—the equivalent of four one-way services a week. This is significantly less frequent than the expected 17 one-way services a week for Inland Rail.

Relative to the proposed Inland Rail solution, the poor service frequency and the significantly longer transit time indicates that a dedicated shipping solution between Melbourne and Brisbane is unlikely to be successful in meeting the needs of a significant proportion of the market. This conclusion is based on assumptions that are in favour of the shipping case, that is, bullish market take-up and a conservative ship size.

---

<sup>78</sup> TEU stands for Twenty-Foot Equivalent Unit. The dimensions of one TEU are equal to that of a standard 20 foot shipping container, at 20 feet long and 8 feet tall.

<sup>79</sup> Noting that a significant proportion of the interstate road freight task is palletised but not containerised. For the purpose of the analysis of the suitability of shipping as an alternative to Inland Rail, it is assumed that containerisation is the preferred method for carriage by sea.

## USE OF INTERNATIONAL SHIPPING

The issue of service frequency (but not transit time), however, could be addressed through the utilisation of available capacity on international container ships visiting Melbourne and Brisbane as part of their journey along the Australian coast. In effect, this is the situation that applies today, with no Australian licensed general cargo ships in operation in the interstate trades. Assuming Australia's coastal shipping regulation continues to provide for this opportunity, there are limitations on the ability for shipping to meet the needs of customers on the Melbourne–Brisbane corridor.

To an international shipping operator, the carriage of international containers provides the greatest average return per slot on the ship, and the deployment of vessels and capacity is designed to optimise costs against the service as a whole 'string' as the ship travels to ports around the world on its service swing. However domestic customers on the Melbourne–Brisbane corridor would be subject to increased service risks associated with the use of foreign vessels that generate most of their revenues from international cargoes. Regardless of the higher frequency of services relative to a dedicated shipping service, and the potential for competitive pricing, the use of spare international capacity has the weakness of not necessarily providing the reliability that is required by most domestic customers.

It is also possible that excess capacity may not be available in all directions, potentially resulting in delays in the return of the domestic customer's container until excess capacity becomes available in the opposite direction. In this circumstance, the domestic customer would need to find alternative land transportation to return containers, potentially reducing the benefit of shipping as an alternative corridor solution.<sup>80</sup>

Lastly, in relation to infrastructure constraints, assuming shipping is only attractive to time insensitive freight, each of the ports would be required to handle an additional 125,000 TEUs of loaded and empty containers in 2030.

This additional port task is not expected to be significant with respect to available seaside port capacity as it is only the equivalent of four additional weekly port calls, and only a small fraction of the expected international container task at Brisbane and Melbourne in 2030. It should be noted, however, that the shipping task would represent an additional impact on the landside port infrastructure, and in the medium to longer term the distance from the ports to the majority of customers is expected to increase as new industrial centres are developed on the fringes of cities.

In summary, shipping is unlikely to be a strong alternative to Inland Rail, as it does not provide the level of service (transit time<sup>81</sup> and service availability) required by the majority of the Melbourne–Brisbane interstate market. It is important to note that shipping still has a role to play, especially due to its strengths in transporting high volume and long distance cargo around the coast. Shipping, however, will not solely

---

<sup>80</sup> Under this service scenario, if the return of the empty container by a land generates a trip that otherwise would not have been undertaken, the utilisation of excess international shipping would have significantly less impact on reducing demand on the Melbourne–Brisbane corridor.

<sup>81</sup> Although not discussed, it should be noted that PUD time for shipping is likely to be longer than rail, further reducing shipping's door-to-door reliability.

solve the freight problem. With Australia's freight task continuing to grow, shipping must be used in conjunction with other modes such as inland rail in order to meet Australia's future transport needs.

### **Finding**

- F3.1 The Implementation Group finds that shipping is unlikely to be a viable standalone alternative to Inland Rail as it does not provide the level of service (transit time and service availability) required by the majority of the Melbourne–Brisbane interstate market.

## AIRFREIGHT

In Australia, air tends to be used as a means of freight transportation for low density, high value products such as medical equipment and products, computer components, gems and precious stones, as well as time critical products such as seafood, newspapers and express parcels.<sup>82</sup>

Domestic airfreight accounts for less than 0.01% of total domestic freight movements in Australia by weight. The majority of these movements are comprised of newspapers and parcels between major cities, on either dedicated freight flights or on existing passenger flights.<sup>83</sup>

Total domestic airfreight movements at Australian airports reached 506.73 thousand tonnes in 2010–11, an increase of 25.1% compared to the previous year.<sup>84</sup>

Sydney was the busiest domestic airport in terms of cargo movements (135.65 thousand tonnes in 2010–11, up 19.1% compared to previous year) followed by Melbourne (128.91 thousand tonnes, up 19.3%) and Brisbane (82.66 thousand tonnes, up 27.3%).<sup>85</sup>

Airfreight is highly specialised due to the inherent constraints on aircraft size and the nature of the goods that can be carried, for example, providing an efficient service in areas that require high speed delivery to remote areas. The Implementation Group considers that airfreight, therefore, has a limited role in the transport task of bulky or heavy goods on the Melbourne to Brisbane corridor, but will continue to play a crucial role for small, high-value and time-dependant goods. As such, it is not a viable alternative for addressing Australia's freight task on the Melbourne to Brisbane corridor into the future.

### Finding

F3.2 The Implementation Group finds that airfreight is not a viable standalone alternative for Inland Rail as it has a limited role in the transport task of bulk or heavy goods, but will continue to play a crucial role for small, high-value, time-dependent goods as well as those to remote areas.

---

<sup>82</sup> 'Freightline 1 – Australian Freight Transport Overview' 2014. BITRE, Department of Infrastructure and Regional Development p 6.

<sup>83</sup> *ibid* (Freightline).

<sup>84</sup> 'Avline 2010-11'. BITRE p v.

<sup>85</sup> *ibid* (Avline p 13).

## ROAD FREIGHT

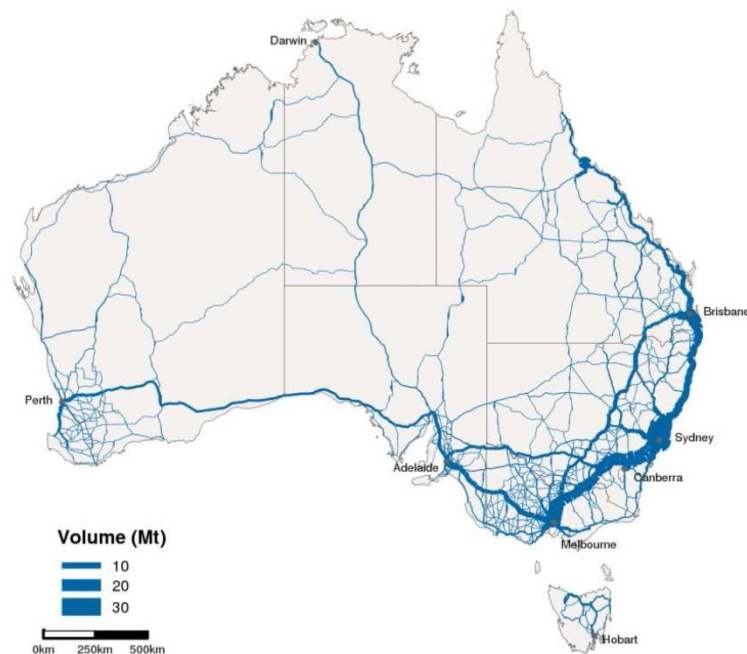
Transport in Australia is highly reliant on its road network, which is vast. In 2007, Australia had a total of 900,083 km of roads<sup>86</sup> and is the most intensive user of road freight in the world on a tonne-kilometre (tkm) per person basis.<sup>87</sup>

Australian road freight transport has traditionally been best at servicing markets that have dispersed origins and destinations. While rail carries a larger volume of freight overall, road transport is the main mode of transport for the majority of commodities produced or consumed in Australia.<sup>88</sup>

The significance of road freight volumes particularly on the Hume Highway (between Sydney and Melbourne), Pacific Highway (between Sydney and Brisbane) and Newell corridor highways (between Melbourne and Brisbane) is demonstrated in Figure 7 below.

The north-south road corridor will face significant local and regional capacity constraints for road freight in the medium to longer term. For example, increased congestion is expected in and around some town centres on the Newell corridor, between Sydney and Raymond Terrace on the Pacific Highway, and on the 'last-mile' of the metropolitan networks.

Figure 7: Inter-regional road freight task 2000–01



Source: Freightline 1 — Australian freight transport overview, BITRE p 4.

As the principal market in which road and rail compete is for carriage of non-bulk freight between capital cities,<sup>89</sup> road transport is a potential alternative solution to Inland Rail.

<sup>86</sup> *Key Infrastructure Statistics* BITRE 2013, p 9.

<sup>87</sup> *The True Value of Rail Report*, Deloitte Access Economics, Australasian Railway Association, August 2011, p14 available as

<sup>88</sup> op cit (Freightline 1 p 4).

<sup>89</sup> *Key Infrastructure Statistics* BITRE 2013, p 5.

## Use of B-doubles

The introduction of B-doubles on the Australian road network has led to significant productivity gains in the road freight sector. Under the current heavy vehicle regulatory environment, it is likely that B-doubles will remain the primary means of competition against rail for the movement of inter-capital, non-bulk freight.

## Other considerations

There is a mix of local traffic, private vehicles and freight vehicles on the Hume-Pacific and Newell corridors. This mix reduces the reliability of traffic flows as a result of the different average travel speeds between cars and heavy vehicles, creates difficulties overtaking heavy vehicles, and increases accident rates. Conflicts between cars and heavy vehicles also increase stop-start traffic conditions resulting in higher vehicle emissions and operating costs. According to the Australasian Railway Association, rail freight is up to nine times safer than road freight, 10 times more fuel efficient and causes up to 10 times less emissions than road freight.<sup>90</sup>

Currently in New South Wales, between 1,200 and 4,000 vehicles per day use the Newell Highway on various rural sections, and over 20,000 vehicles per day use the highway in urban centres such as Dubbo.<sup>91</sup> The highest linear growth in demand on the Newell Highway between 1996 and 2005 was recorded near Gil Gil Creek Bridge in Moree Plains Shire (2.7%) and the average annual daily traffic volume in this section is expected to double by 2031.<sup>92</sup>

The number of trucks on the Newell Highway ranges from about 700 to 1,200 per day (2011 estimate).<sup>93</sup> The highest growth in daily truck movements is expected to occur in the northern and southern sections of the Newell Highway—around 80%—with around 2,000 trucks per day on these sections of highway in 2031.<sup>94</sup>

Conflicts between local traffic, private vehicles and freight vehicles on the Newell and Hume-Pacific corridors will increase in line with significant forecast growth in population, employment and the freight task in the north-south corridor.

There is also evidence that:

- conflicts between cars and heavy vehicles increase the number and severity of road accidents with 20% of all crashes between 2007 and 2011 along the Newell Highway involving heavy trucks resulting in a number of direct and indirect costs on society. Heavy vehicles on most of the Newell Highway currently represent between 35 and 45% of vehicle movements;<sup>95</sup>

---

<sup>90</sup> Australasian Railway Association Inc, submission to the National Freight Plan, March 2010, p 7 available at: [www.infrastructureaustralia.gov.au/public\\_submissions/nfpl/files/10-010\\_Australasian\\_Railway\\_Association\\_National\\_Freight\\_Network\\_Plan\\_Submission.pdf](http://www.infrastructureaustralia.gov.au/public_submissions/nfpl/files/10-010_Australasian_Railway_Association_National_Freight_Network_Plan_Submission.pdf)

<sup>91</sup> op cit (Newell Highway Corridor Strategy, May 2015, p 72).

<sup>92</sup> op cit (Newell Highway Corridor Strategy, May 2015, p 144).

<sup>93</sup> op cit (Newell Highway Corridor Strategy, May 2015, p 146).

<sup>94</sup> op cit (Newell Highway Corridor Strategy, May 2015, p 146).

<sup>95</sup> op cit (Newell Highway Corridor Strategy, May 2015, p 72). The range in the proportion of heavy vehicles usage in 2011 was 26% (Tocumwal to Finley) and 52% (Moree to Boggabilla).



- the overall truck task along the Newell Highway is expected to increase by up to 80% by 2031;<sup>96</sup>
- when compared with rail, road freight results in additional environmental costs from air pollution, greenhouse gas emissions, water pollution and nature and landscape costs; and
- congestion costs such as reduced travel speeds and reliability in urban areas resulting from container traffic between Melbourne and Brisbane is estimated to be around \$60 million per year for Melbourne to Brisbane inter-capital freight alone. A recent study has indicated that the cost<sup>97</sup> of road congestion in Melbourne, Sydney and Brisbane is forecast to reach around \$33 billion by 2031.

Australia's current annual expenditure on roads is now above \$20 billion, and in recent years road spending has outstripped road taxes and charges revenues.<sup>98</sup> As mentioned in Chapter 2, the Australian and state governments are investing in road infrastructure along the north-south corridor. This investment, however, will be insufficient to eliminate all current and developing deficiencies along the full length of the corridor, leaving trucking productivity exposed to the cumulative effects of the remaining deficiencies.

Figures provided by the New South Wales Government in 2010<sup>99</sup> for the cost of construction of above ground dual-carriageway indicate costs can range from \$1.7–\$5.3 million per km. Project costs can be highly variable, depending on a broad range of factors including environmental factors, geographic region and condition, location, type of pavement, need for structures such as bridges, and size of the project. Other projects show significantly higher per kilometre costs:

- a project completed in 2009 to duplicate approximately 67 km of the Hume Highway to a four-lane divided road cost around \$11.9 million per km;<sup>100</sup>
- a project completed in 2010 to provide 9.9 km of new dual carriageway on the Pacific Highway (Cooperook to Moorland) cost around \$20.4 million per km;<sup>101</sup> and
- the Kempsey Bypass project completed in 2013 cost around \$42.6 million per km (including 3.2 km of bridging over the Macleay River floodplain and grade separated interchanges at South Kempsey and Frederickton).<sup>102</sup>

While the extent of road upgrades required on the Newell corridor is not known, it is reasonable to conclude that it could be upgraded incrementally over time. However, such an approach would likely take longer than the 10-year construction programme for Inland Rail, and be vulnerable to changes in investment priorities over that time.

<sup>96</sup> op cit (*Newell Highway Corridor Strategy*, May 2015, p 146).

<sup>97</sup> “*Australian Infrastructure Audit: Our infrastructure challenges report – Volume 1*”, Infrastructure Australia, April 2015, p 9.

<sup>98</sup> op cit (Infrastructure Australia, July 2014 p 4).

<sup>99</sup> General Purpose Standing Committee No 4 Budget Estimates Hearing in the Legislative Council, Question on Notice, September 2010, [www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/fc955a9a1e201e40ca2577ba007e4489/\\$FILE/101012%20Answers%20to%20QoN%20-%20Roads%20-%20additional.pdf](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/fc955a9a1e201e40ca2577ba007e4489/$FILE/101012%20Answers%20to%20QoN%20-%20Roads%20-%20additional.pdf)

<sup>100</sup> NSW completed road projects available at [http://investment.infrastructure.gov.au/publications/historical/pdf/NSW\\_Completed\\_Projects\\_January\\_2015.pdf](http://investment.infrastructure.gov.au/publications/historical/pdf/NSW_Completed_Projects_January_2015.pdf)

<sup>101</sup> ibid (NSW completed road projects).

<sup>102</sup> ibid (NSW completed road projects).

It is also noted that the completion of a minimum four-lane divided highway between Sydney and Brisbane on the Pacific Highway is expected to have had an out-turn cost of more than \$15 billion based on past expenditure and estimates of the cost of sections yet to be completed (understood to be partly in 2010 dollars and partly unescalated).<sup>103</sup>

Historically, there has also been difficulty attracting private sector funding particularly for large, incremental road projects. Despite some limited private financing of toll roads, a lack of secure funding streams (either hypothecation of registration charges and fuel taxes, or direct user charging) is a major impediment to the ability of governments to negotiate financing of road investment and is likely to have resulted in a sub-optimal rate of network expansion and upgrading.<sup>104</sup>

Other potential sources of improved road freight productivity that would support a road-based solution over Inland Rail include:

- driver-assist technologies that present the opportunity to contribute to improved traffic flow, motorist safety and also benefit industry, and ultimately consumers, by substantially reducing labour, insurance and operating costs;<sup>105</sup> and
- B-triple and other higher productivity vehicle access to the Hume and Pacific Highways (noting that these highways are, or will be, developed to a standard to accommodate these vehicles, whereas a substantial upgrade of the Newell corridor would be required as an alternative B-triple corridor).

## Finding

The Implementation Group finds that:

F3.3 While road transport will continue to contribute to Australia's freight task, unless substantial additional investment is made in road infrastructure, it will be unlikely by itself to meet the longer term needs for Australia's freight task.

F3.4 Should the Australian Government decide not to proceed with a rail solution, further investigation of road transport is required to determine its capacity to manage the future north-south freight task. In particular, the following should be investigated:

- road's capacity to provide a point-to-point freight service between Melbourne and Brisbane; and
- the effect of the introduction of B-triples on the 'last mile' and, in particular, the need for associated infrastructure (for example, trailer parks).

---

<sup>103</sup> NSW Government Pacific Highway submission to Infrastructure Australia, November 2011.

<sup>104</sup> *op cit* (Standing Council on Transport and Infrastructure 2012 p 34).

<sup>105</sup> Improving Urban Mobility Through Technological Advance of Motor Vehicles, 2014, Clifford Winston, Searle Freedom Trust Senior Fellow Brookings Institution p4 available at: [www.newcitiesfoundation.org/wp-content/uploads/PDF/Research/Cities-on-the-move/Improving-Urban-Mobility-Through-Technological-Advance-of-Motor-Vehicles-Clifford-Winston-New-Cities-Foundation-Cities-On-The-Move.pdf](http://www.newcitiesfoundation.org/wp-content/uploads/PDF/Research/Cities-on-the-move/Improving-Urban-Mobility-Through-Technological-Advance-of-Motor-Vehicles-Clifford-Winston-New-Cities-Foundation-Cities-On-The-Move.pdf)

## RAIL SOLUTIONS

Rail freight is suited to high-volume, bulk commodities over both long and short distances. Accordingly, rail has traditionally dominated the freight market for bulk agricultural and mining commodities but has also been the main mode of choice on the east-west corridor for intermodal trade for over a decade. Rail also plays a specialised role in servicing ports and other dedicated facilities where operators favour rail over road.

It has been long recognised that there is unfulfilled potential for rail to provide a greater contribution to Australia's freight task. For example, in 1989 a Parliamentary Committee noted 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 ... rail has been starved of funds and rendered inefficient ...'*<sup>106</sup>

The north-south corridor linking Melbourne–Sydney–Brisbane is nearly 2,000 km long, with the ability to run long 1,500 metre trains between Brisbane and Sydney and 1,800 metre trains between Sydney and Melbourne, but its market share is well below what it should be.<sup>107</sup> Despite ARTC delivering a \$3 billion upgrade<sup>108</sup> to east coast freight rail lines over the last five years, rail carries around 26% of the Melbourne–Brisbane freight task by tonnes, with an even smaller percentage of the freight task carried between Melbourne–Sydney and Sydney–Brisbane.

Figure 8: Current market share of inter-capital freight



By contrast, where significant improvements have been made to rail, for example, in the east-west corridor, rail now wins around 80% of the interstate land freight in and out of Perth (see Figure 8: Current market share of inter-capital freight). This corridor is competitive with road on transit time, reliability and price, and it supports the most efficient intermodal train configuration in the country with 1,800 metre long double-stacked trains over an approximate 3,000 km corridor. An express service train can travel from Melbourne to Perth in 45 hours.<sup>109</sup>

The success of rail on the east-west corridor counters the view of potential users that rail is uncompetitive with road freight on the basis of transit time, cost and reliability. For a rail solution to successfully address the future Melbourne–Brisbane freight task it must be able to demonstrate its competitiveness with road on these grounds.

<sup>106</sup> Cited in *A competitive interstate rail freight and passenger network*, Conference on Railway Excellence, Laird P, University of Wollongong 2014.

<sup>107</sup> *Rail Freight's new future — what it means for Australian business*, ARTC CEO John Fullerton speech to the Victorian Transport Association, March 2013 p 4.

<sup>108</sup> *Better Service Better Reliability Better Value* (ARTC Factsheet) available at <[http://www.betterforbusiness.com.au/docs/ARTC-Fact-Sheet\\_Business.pdf](http://www.betterforbusiness.com.au/docs/ARTC-Fact-Sheet_Business.pdf)>

<sup>109</sup> Op cit (Fullerton, p 3).

Rail also needs to better understand the end customers' needs along with its impact on supply chains.<sup>110</sup> Infrastructure Australia has recently found that, "*freight rail will need to play a growing role in the movement of goods between ports and inland freight terminals, and in the movement of containerised and general freight over longer distances*".<sup>111</sup>

Any decision by the Australian Government to provide significant investment in rail infrastructure would necessarily need to result in a re-balancing of modal share to justify expenditure. There is potential for the greatest shift to occur in inter-capital non-bulk freight, the principal market in which road and rail compete, although road transport would continue to play a significant role. But, even with a significant increase in the *proportion* of freight carried by rail, the *absolute volume* of freight carried by road is likely to remain stable or increase slowly. As a result, there will not be a material loss of volume for existing carriers operating road transport networks.

Also, moving more freight by rail has broader benefits—rail is safer, has better environmental outcomes, is more fuel-efficient and can help eliminate road congestion and lead to a reduction in road accidents and their ongoing impact on Australian families.<sup>112</sup> Rail also has the potential to contribute to a lower carbon economy.

The Implementation Group has considered two east coast focussed alternatives as possible solutions—enhancing the existing east coast railway and a constructing a new inland railway.

## ENHANCING THE EXISTING EAST COAST RAILWAY

The existing east coast railway runs between Melbourne and Brisbane via Sydney. It offers a starting point for considering rail as a potential solution to Australia's growing freight task through upgrading the existing coastal rail line.

The coastal rail line was constructed with nineteenth century design and engineering standards, with some sections comprising strings of branch lines built to 'steam age' alignment and joined together in the early twentieth century.<sup>113</sup>

In 1989, the Maitland to Brisbane line was considered in a report for the NSW State Rail Authority as a candidate for closure, and in 1994 was noted by the National Transport Planning Taskforce to be the 'weakest link' of all interstate lines in Australia.<sup>114</sup>

On the Sydney–Brisbane line, the Australian and New South Wales governments are investing \$1.1 billion in the 155 km NSFC between North Strathfield to Broadmeadow (near Newcastle). This corridor is the most acute bottleneck on this line at present and suffers from congestion, particularly

---

<sup>110</sup> op cit (Fullerton p 3).

<sup>111</sup> Op cit (Infrastructure Australia, April 2015, p 9).

<sup>112</sup> op cit (Fullerton p 3).

<sup>113</sup> *A competitive interstate rail freight and passenger network*, Conference on Railway Excellence, Laird P, University of Wollongong 2014.

<sup>114</sup> *Sydney–Brisbane Land Transport*, Philip P Laird, University of Wollongong, 2007 p 5 available at <[www.patrec.org-PATREC/ART](http://www.patrec.org-PATREC/ART)>

during peak passenger periods where freight services are restricted to operating outside those times (6:00 am–9:00 am and 3:00pm–6:30pm on weekdays).

The NSFC programme provides for increases to freight capacity, reduced travel times and improved reliability for freight but will remain a shared passenger/freight line. The first stage of the NSFC works is expected to be completed by the fourth quarter of 2016.<sup>115</sup> Stages 2 and 3, currently unfunded, would provide for further capacity increases for areas within and beyond the metropolitan area by further separation of freight from passenger services.

To the south of Sydney, the recently completed 36 km, \$1.1 billion SSFL provides for a separation of freight and passenger services between Sefton and Macarthur, and connects with Port Botany via the Port Botany Line. The SSFL/Port Botany Line is expected to reach capacity between 2025 and 2030, dependent upon the commencement date of Inland Rail and assuming a number of other factors, including that the Moorebank Intermodal Terminal reaches full operational capacity in 2030.

Consequently, the difficulty of moving freight trains through the metropolitan network will only increase as freight and passenger needs grow. Removing freight services that transit through Sydney on the Melbourne to Brisbane route (through Inland Rail) would free up the available paths for the growing intra-corridor freight task.

Beyond the NSFC and SSFL, much of the existing coastal railway infrastructure remains sub-optimal. Between Sydney and Brisbane, the track does not support trains of greater than 1,500 metres in length or double-stacking, and to achieve this capability would require substantial investment in constructing or upgrading numerous bridges and tunnels along its length.

The coastal route is expected to be subject to capacity constraints in terms of the number of paths available for freight trains in northern Sydney from around 2049–50. Consequently, services between Sydney and Brisbane will remain inefficient relative to what can be achieved between Melbourne and Sydney, and what is being achieved on the east-west corridor. In the words of one commentator, despite the recent enhancements to the north coast line, ‘the present track infrastructure will simply not cope’<sup>116</sup> given its excess length and curvature.

Capacity constraints are likely to result in suppressed demand (for example, where no additional train paths can be accommodated on rail), service delays (such as poor on-time performance at ports and intermodal terminals), and/or deteriorating quality of both rail and road services throughout the network (as road will need to handle a greater proportion of the task).

Continued strong coastal population growth indicates that the passenger task conflicts with the freight task along the coastal route and will progressively worsen. The limitations to increased rail productivity on this route (for example, alignments and double-stacking) are greater than on coastal highways where

---

<sup>115</sup> *Addressing Sydney's Freight Rail Bottleneck*, Department of Infrastructure and Transport available at: [http://investment.infrastructure.gov.au/publications/reports/pdf/Sydney\\_Freight\\_Rail\\_Bottleneck\\_Factsheet.pdf](http://investment.infrastructure.gov.au/publications/reports/pdf/Sydney_Freight_Rail_Bottleneck_Factsheet.pdf)

<sup>116</sup> Submission to Infrastructure Australia re the north-south corridor available at: [http://www.infrastructureaustralia.gov.au/public\\_submissions/published/files/93\\_smasuniversityofwollongong\\_SUB.pdf](http://www.infrastructureaustralia.gov.au/public_submissions/published/files/93_smasuniversityofwollongong_SUB.pdf)

significant investments have been made, and indicate that road will be the preferred means of transport for freight in that corridor.

Expansion of the existing rail line to deliver services as efficient and effective as those on the east-west corridor is likely to be costly, and while there may be capacity for improvements from such enhancements, a route distance and transit time approaching the Inland Rail service offering is unlikely to be achieved without substantial investment. For example, a high-level assessment of the topography of the coastal corridor indicates multiple locations where significant tunnelling and bridge works would be required to shorten the route and allow for high productivity trains. Significantly, a tunnel to cross the Great Dividing Range at the New South Wales and Queensland boarder would require a tunnel similar to that proposed at Toowoomba. The cost of achieving a comparable service offering would likely be far in excess of that for an inland railway.

Even if this investment was made to deliver the current service offering that customers want, the Implementation Group questions whether the coastal line could be reasonably future-proofed to meet the future needs of customers due to inherent geographical and locational constraints, which could be more easily avoided by freight travelling inland directly between Melbourne and Brisbane. In the absence of significant investment that is likely to cost more than Inland Rail, the coastal route will always have limitations of gradient, a route distance via the coast 300 km longer than Inland Rail, be limited to single-stacked 1,500 metre trains, and is unlikely to have a dedicated freight rail line between Sydney and Newcastle.

The New South Wales Government has indicated in its Freight and Ports Strategy<sup>117</sup> that identifying a new Outer Sydney Orbital corridor is of key strategic significance to both the road and rail task. It has implications as a corridor for a rail route that could ease freight congestion through Sydney and on Sydney freight networks. Its primary function, however, would be to address freight capacity constraints for other significant supply chains such as intrastate and export freight tasks. It would also have limited potential to provide significant transit time savings for Melbourne to Brisbane freight as the missing link between northwest NSW and southern QLD would still be required, or the existing coastal line would need to be upgraded.<sup>118</sup> An outer Sydney orbital would certainly complement, but not replace, Inland Rail.

The Implementation Group considers that while the existing east coast rail line currently offers a viable service, it would be neither cost nor time competitive with Inland Rail, even with significant further investment, and would not meet future demand.

Therefore, a coordinated north-south strategy is required for moving commodities and other goods in relation to centres of freight production and consumption, both east and west of the Great Dividing Range. An inland railway, with key freight route links (road and rail) and intermodal terminals connecting

---

<sup>117</sup> 'NSW Freight and Ports Strategy', November 2013 available at < <http://freight.transport.nsw.gov.au/documents/tfnsw-freight-and-ports-strategy-low-res.pdf> > op cit (New South Wales Government, November 2013).

<sup>118</sup> See further information on the rail component of the Outer Sydney Orbital corridor in 'NSW Freight and Ports Strategy', November 2013 available at < <http://freight.transport.nsw.gov.au/documents/tfnsw-freight-and-ports-strategy-low-res.pdf> >

the coast could be an important part of the long-term solution for providing the national freight task in this corridor.

### **Finding**

F3.4 The Implementation Group finds that the existing east coast rail line would be neither cost nor time competitive with road for the Melbourne to Brisbane intermodal freight task, even with significant further investment and is not a viable alternative to Inland Rail.



## THE AUSTRALIAN RAIL TRACK CORPORATION'S 2010 BASELINE SOLUTION

The 2010 pre-feasibility study conducted by ARTC determined an optimal alignment between Melbourne and Acacia Ridge in Brisbane comprising the following key segments:

- Melbourne to Parkes: 670 km of existing track and 37 km of greenfield track from Illabo to Stockinbingal bypassing Cootamundra and the Bethungra spiral;
- Parkes to North Star: 307 km of upgraded track and 291 km of greenfield alignment from Narromine to North Star; and
- North Star to Brisbane: 271 km of greenfield construction, 119 km of existing track upgraded from narrow to dual gauge and 36 km of the existing coastal route.<sup>119</sup>

A summary<sup>120</sup> of the proposed track types is set out below (Table 2).

Table 2: Proposed track types 2010

Track type	Length (km)	Percentage (%)
Existing track	706	41
Upgraded track	307	18
Upgraded narrow gauge track	119	7
New track	599	34
<b>Total</b>	<b>1,731</b>	<b>100</b>

The 2010 study estimated that the total cost of the Inland Railway would be \$4.7 billion (at P90 in 2010 dollars). Inland Rail was not expected to achieve economic viability until between 2030 and 2035, as a positive economic return was based on demand being around 25 million tonnes per annum.

In 2010, it was anticipated that Inland Rail would take eight years to complete, including three years of pre-construction activity. It was also anticipated that some sections could be prioritised for earlier construction, as they would complement other proposed network investments.

The 2010 Report concluded that Inland Rail would approach economic viability in the medium term, and that it would be appropriate to consider the project again as new information became available and the initial coastal railway upgrades could be assessed in terms of capacity, reliability and demand growth achieved. It also concluded that it would be appropriate to undertake this re-assessment between 2015 and 2020.<sup>121</sup>

The 2010 Report noted that in addition to servicing freight travelling between Brisbane and Melbourne, the coastal rail line also serves Sydney and other large coastal economic centres. The shared urban and freight networks near Sydney have led to congestion, reducing reliability and increasing travel times for both passengers and freight. Following completion of Stage 1 of the NSFC Program, capacity through

<sup>119</sup> op cit (ARTC 2010 p 42).

<sup>120</sup> ibid (ARTC 2010 p 42).

<sup>121</sup> op cit (ARTC 2010 p xviii).

northern Sydney is expected to be provided until at least 2050. The inland rail line will reduce congestion externalities on these parts of the coastal rail line.

Changes since 2010 have led to the need for more analysis and validation of the work undertaken in 2010. For example, following community consultation undertaken by ARTC during 2014, it became apparent that the 2010 Inland Rail service offering did not include certain design aspects (such as future-proofing) required to meet the needs of Inland Rail's potential customers. Also, the 2010 study underestimated or did not include some Inland Rail components such as improvements for double-stacking on existing track, signalling costs including the Advanced Train Management System, fire and life safety requirements for tunnels and escalation. This triggered the need for a major review of cost estimates.

In addition, the 2011 Queensland floods and a range of other environmental, heritage and social factors have indicated the viability of the 2010 Toowoomba Range alignment should be further considered, necessitating further work on this section of the alignment.

Given changes in Australia's economic circumstances since 2010 (for example, the forthcoming cessation of domestic car manufacturing in Australia), there was also a need to review and independently validate demand estimates, and seek expert advice on the feasibility of private sector financing for the project.

Further, in undertaking its work, the Implementation Group was mindful of the Productivity Commission's recent findings,<sup>122</sup> supported by the Australian Government, which emphasised the use of robust BCA as a tool to aid selection of the right public infrastructure projects. A robust BCA can be used to derive good outcomes for the community, avoiding public infrastructure that acts as a drain on the economy, lowering productivity, and crowding out more efficient projects.<sup>123</sup>

## STRATEGIC OPTIONS ASSESSMENT

The Implementation Group also considered the strategic options assessment set out in ARTC's 2015 Programme Business Case as only one additional factor in guiding its consideration of whether or not Inland Rail would be the optimal solution to address the eastern Australian freight challenge.

Options assessed by the Programme Business Case included progressive road upgrades, upgrading the existing east coast railway and an inland railway. These options were subjected to a rigorous assessment consistent with Infrastructure Australia's Reform and Investment Framework Guidelines (see Chapter 4 of the business case for detailed information). The assessment was conducted against seven equally weighted criteria:

- i. capacity to serve east coast future inter-capital regional/bulk freight market needs;
- ii. foster economic growth through improved freight productivity and service quality (including improved reliability and resilience);

---

<sup>122</sup> *Public Infrastructure*, Productivity Commission Inquiry Report, Vol 1, No 71, 27 May 2014, available at: [www.pc.gov.au/\\_data/assets/pdf\\_file/0003/137280/infrastructure-volume1.pdf](http://www.pc.gov.au/_data/assets/pdf_file/0003/137280/infrastructure-volume1.pdf) p 75.

<sup>123</sup> *ibid* (Productivity Commission 2014 p 75).

- iii. optimise environmental outcomes;
- iv. alleviate urban constraints;
- v. enable regional development;
- vi. ease of implementation; and
- vii. cost-effectiveness.

Overall, constructing an inland railway ranked highest with an average high likelihood of improving outcomes across all criteria, while progressive road upgrades and upgrading the existing east coast railway both had an average medium overall ranking across all criteria. In relation to individual criteria, progressive road upgrades outranked an inland railway only in relation to ease of implementation and ranked equally with an inland railway in relation to enabling regional development outcomes. An inland railway was found to be the superior option across all other criteria.

The challenge for governments is whether an inland railway is the best solution to increase Australia's capacity to manage the future growth in the freight task along the north-south corridor, which will be compromised without further investment in the right infrastructure.

If the Government wants an effective rail network that provides a viable solution for north-south freight, then Inland Rail appears to be a logical choice. This fundamentally leaves open the question of when. If Inland Rail is not built, it is clear that the north-south road network will be left to service alone the growth in the freight task beyond 2050.

### **Finding**

The Implementation Group finds that:

- F3.5 As a solution to meeting Australia's future freight challenge, an inland railway would bring significant and positive national benefits by boosting national productivity and economic growth while promoting better safety and environmental outcomes.
- F3.6 While road, through the introduction of higher productivity vehicles (including B-triples), can provide a significant level of support for the freight task, there is a fundamental threshold question for Australian Governments as to whether it seeks rail to be a viable mode (in conjunction with road) for the north-south freight market to provide users with competition and a genuine choice between modes. If the government wants an effective rail network that provides a viable solution for north-south freight, then Inland Rail appears to be a logical choice.

## 4. INLAND RAIL

The proposal for Inland Rail would directly connect Melbourne and Brisbane, Australia's two largest freight, production and consumption areas, via an inland rail line with the primary purpose of transporting freight and facilitating improved connections along the east coast corridor, as well as between south-east Queensland, Perth and Adelaide.

As indicated in the Introduction, Inland Rail would provide a backbone rail link between Melbourne and Brisbane to serve future rail freight demand and stimulate growth for interstate and regional/bulk rail freight (particularly for agriculture and resources). It would also provide a focal point for prioritising the development of local and regional road and rail networks. Inland Rail would also reduce the long-term pressure on Sydney from freight trains transiting Sydney's network when travelling on the Melbourne to Brisbane route.

Inland Rail offers the potential to benefit a range of users and customers including inter-capital freight transporters, resource exporters (particularly coal from south-east Queensland and agricultural exporters) and the broader community (for example, through reduced road congestion).

The primary freight market that Inland Rail would serve (non-bulk, intermodal) would directly benefit from a reduction in freight costs of \$10 per tonne.<sup>124</sup> The community would also benefit from Inland Rail as one Melbourne–Brisbane intermodal train would carry the equivalent freight of around 110 B-double trucks.<sup>125</sup> Without Inland Rail, it is estimated that the trucking sector would need to carry approximately 2.3 million more tonnes of intermodal freight along the corridor in 2050—the equivalent of almost 81,000 B-doubles per year, or over 200 B-doubles per day travelling along the entire corridor.<sup>126</sup>

On the basis of extensive consultation undertaken with the potential users of Inland Rail and the further work undertaken during 2014–15 that is outlined in the remainder of this Chapter, the Implementation Group finds:

F4.1 During 2014, customers identified that their needs would shift to longer and heavier trains in the future, and it is the ability to future-proof the Inland Rail corridor that provides a superior, long-term high productivity solution over other options such as upgrading the existing coastal line or the road network to allow for end-to-end B-triple access between Melbourne and Brisbane.

The Implementation Group considers that the Inland Rail Programme Business Case developed by ARTC represents the most detailed assessment of the benefits, costs, and potential delivery strategies of a proposed new rail corridor between Melbourne and Brisbane. The business case demonstrates that Inland Rail would provide a net economic benefit to the nation, and would play a major role in meeting eastern Australia's future freight challenge.

---

<sup>124</sup> In current prices. Inland Rail Programme Business Case, p 31.

<sup>125</sup> Based on ARTC's reference of 1,800 metre trains, where 40% are double stacked.

<sup>126</sup> Based on an average of 28 tonnes per load carried.

## DEMAND ANALYSIS

Over the last 18 months, the future demand for freight transport in eastern Australia has been assessed to determine whether or not Inland Rail is an appropriate solution to meet future need. The detail of this work, including methodology, scenarios analysed and key assumptions, is set out in Chapter 7 of the business case. As the demand estimates are critical to determining capacity requirements and the economic and financial assessment of Inland Rail, the estimates were independently validated to ensure their robustness.

The main categories of freight in the north-south corridor expected to comprise the market for Inland Rail are manufactured and processed (non-bulk) products, agricultural products and coal.

The base case demand scenario assumes there is no Inland Rail and freight is transported by road (the Newell, Hume or Pacific Highways, or regional roads) and existing rail lines (the coastal route via Sydney or branch and regional lines). The network supporting these freight tasks is assumed to be developed into the future based on currently committed and funded investment decisions, and that road funding on the Newell and Hume-Pacific corridors assume continuation of historic road investment levels, with a similar level of deterioration in road performance over that time.

Other key assumptions included that there would be no changes to road user charging policies, no price or tax on carbon, and no investment or access decisions that would allow B-triples and super B-doubles on the Newell or Hume-Pacific corridors. Nonetheless, the business case does include in its analysis, sensitivities for circumstances where road user charging and high productivity vehicles such as B-triples are introduced.

Table 3 provides the estimated base case non-bulk, intermodal Melbourne–Brisbane freight task to 2070 and illustrates that without Inland Rail, rail's market share will peak around 2060 at approximately 44% and then decline towards current levels.

**Table 3: Base case non-bulk, intermodal Melbourne–Brisbane freight task (thousands tonnes)<sup>127</sup>**

Task	2014-15	2024-25	2029-30	2039-40	2049-50	2059-60	2069-70
Coastal Rail	1400	2135	2551	3553	4816	6458	5911
Road	3409	4149	4626	5865	7130	8382	12444
<b>Total</b>	<b>4809</b>	<b>6284</b>	<b>7177</b>	<b>9418</b>	<b>11946</b>	<b>14840</b>	<b>18355</b>
<i>Rail market share</i>	<i>29%</i>	<i>34%</i>	<i>36%</i>	<i>38%</i>	<i>40%</i>	<i>44%</i>	<i>32%</i>

Source: Table 7.2, Inland Rail Programme Business Case, p 131.

Table 4 below provides the estimated non-bulk, intermodal freight task with Inland Rail, and is based on the initial operation of 1,800 metre trains and the introduction of 3,600 metre trains in 2038-39. Modelling indicates that the relative benefits of Inland Rail over the coastal route will attract all

---

<sup>127</sup> Figures have been rounded.

Melbourne–Brisbane freight to Inland Rail (although a small volume may travel as through freight on Melbourne–Sydney and Sydney–Brisbane trains for operational reasons).

Modelling also indicates that from the commencement of Inland Rail operations, a significant proportion of the Melbourne–Brisbane non-bulk, intermodal task will be diverted from road to Inland Rail, rising from approximately 0.8 million tonnes in 2025 to over 2 million tonnes in 2050.

The commercial benefits of Inland Rail are also expected to have stimulatory effect for non-bulk, intermodal freight demand along the corridor, with the total freight task increasing by an additional 0.2 million tonnes over the base case in 2025, rising to approximately 0.8 million tonnes in 2050.

Taking into account the stimulatory effect of Inland Rail, and the diversion of existing freight from road and the coast rail route, Inland Rail’s market share for the non-bulk, intermodal freight task between Melbourne and Brisbane is expected to continue to rise to 62% in 2050—22 percentage points higher than coastal rail’s market share in the base case scenario. By 2070, Inland Rail is expected to have captured approximately 40% more market share than would the coastal route in the base case.

**Table 4: The non-bulk, intermodal Melbourne–Brisbane freight task with Inland Rail (thousands tonnes)**

<b>Task</b>	<b>2014-15</b>	<b>2024-25</b>	<b>2029-30</b>	<b>2039-40</b>	<b>2049-50</b>	<b>2059-60</b>	<b>2069-70</b>
Coastal rail	1400	1	0	0	0	0	0
Inland Rail	-	3195	4008	5674	7906	10522	13986
Road	3409	3323	3495	4286	4865	5500	6061
<b>Total</b>	<b>4809</b>	<b>6519</b>	<b>7503</b>	<b>9960</b>	<b>12771</b>	<b>16022</b>	<b>20047</b>
<i>Inland Rail market share</i>	<i>0%</i>	<i>49%</i>	<i>53%</i>	<i>57%</i>	<i>62%</i>	<i>66%</i>	<i>70%</i>
<i>Diverted from coastal rail</i>	<i>-</i>	<i>2134</i>	<i>2551</i>	<i>3553</i>	<i>4816</i>	<i>6458</i>	<i>5911</i>
<i>Diverted from road</i>	<i>-</i>	<i>826</i>	<i>1131</i>	<i>1579</i>	<i>2265</i>	<i>2882</i>	<i>6383</i>
<i>Induced freight</i>	<i>-</i>	<i>235</i>	<i>325</i>	<i>543</i>	<i>825</i>	<i>1184</i>	<i>1692</i>

Note: Although the table indicates no Melbourne–Brisbane freight on the coastal line from 2029-30, it is possible that a small proportion of this freight task will be carried by Melbourne–Sydney–Brisbane or Brisbane–Sydney–Melbourne trains due to operational or commercial requirements. It should also be noted that the existing Melbourne–Sydney and Sydney–Brisbane lines will continue to support rail services between these origin-destination pairs. Figures have been rounded.

Source: Department of Infrastructure and Regional Development calculations based on Table 7.2, Inland Rail Programme Business Case, p 131.

In addition to the non-bulk, intermodal Melbourne–Brisbane freight task captured by Inland Rail, the proposed alignment of the line will allow it to service complementary freight flows within the corridor. These include non-bulk, intermodal freight flowing between Brisbane and Adelaide and Perth, agricultural products along the corridor—particularly in northwest NSW and southwest Queensland where producers are currently poorly serviced by rail—coal from southwest Queensland, and potentially steel, and regional containerised exports.

The estimated complementary freight tasks upon which Inland Rail Business Case is based are shown below at Table 5.

While the coal task in 2025 represents over half of the total demand for Inland Rail by volume, the primary purpose of Inland Rail remains supporting non-bulk, intermodal freight with this task, representing approximately 55% of total demand when measured in net tonne kilometres (7,000 million ntk out of a total of 12,660 million ntk in 2025).<sup>128</sup> By 2050, the non-bulk, intermodal task will represent approximately 67% of the total Inland Rail task when measured in this way.

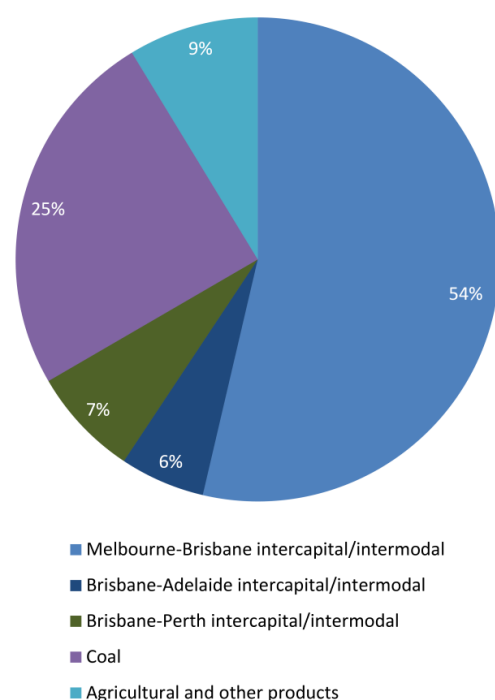
**Table 5: Complementary Inland Rail freight tasks (thousands tonnes)**

Task	2024-25	2029-30	2039-40	2049-50
Brisbane–Adelaide Intermodal	560	690	997	1412
Brisbane–Perth Intermodal	878	1034	1398	1815
Total East–West Intermodal	1438	1724	2395	3227
Coal	12900	19500	19500	19500
Agricultural products	6750	7129	7954	8873

Source: Table 7.1 Inland Rail Programme Business Case, p. 129.

The key findings of the demand analysis indicate:

- Inland Rail is expected to increase rail's share of the Melbourne–Brisbane inter-capital freight market by 33 percentage points (from the current 29% without Inland Rail) to 62% by 2050;
- Inland Rail will also significantly increase rail freight's share of the Brisbane–Adelaide and Brisbane–Perth markets as and Inland Rail via Parkes will shorten the current distance via Sydney by up to 543 km;
- Inland Rail is expected to take all of the Melbourne–Brisbane non-bulk, intermodal rail freight from the coastal route and free up capacity through Sydney for freight and passengers;
- overall north and southbound net tonne kilometres (ntks) of freight transported along Inland Rail in 2050 will comprise 67% inter-capital/intermodal freight, 25% coal, and 9% agricultural and other products<sup>129</sup> (see Figure 9: Forecast Inland Rail freight task in 2050 (% of ntk));
- Inland Rail is expected to take significant volumes of agricultural freight from existing regional rail lines.<sup>130</sup> For example, in 2025, approximately 4.2 million tonnes of NSW grain is estimated to traverse Inland Rail to travel to the Port of Newcastle and Port Kembla. Additional freight will divert from



**Figure 9: Forecast Inland Rail freight task in 2050 (% of ntk)<sup>129</sup>**

<sup>128</sup> Inland Rail Programme Business Case, Table 7.1, p 129.

<sup>129</sup> Note: the % figures add up to 101% due to rounding.

<sup>130</sup> *ibid*, pp 127-8.



road and rail to Inland Rail (including 0.6 million tonnes of grain from Northern New South Wales and 0.4 million tonnes of containerised cotton from Narrabri). In addition, 0.2 million tonnes of goods between travelling between Parkes and Brisbane are expected to divert from road to rail in 2025; and

- thermal coal from the Surat and Clarence-Moreton basins is expected to benefit from some train operating cost savings and Inland Rail upgrades will induce further coal—around 19.5 million tonnes per annum of coal are forecast.<sup>131</sup>

The Implementation Group notes that a demand sensitivity analysis has also been undertaken to understand the impact of changes in key variables and assumptions on the demand for Inland Rail. For example, under a higher oil price scenario (US\$200 per barrel in \$2015) than assumed in the base case (US\$130 per barrel), high price elasticity scenarios and significant increases in road user charges would see the demand for Inland Rail increase.

The sensitivity testing indicates the most significant potential impact on demand for Inland Rail would be a scenario where the Inland Rail track operator charged on the basis of maximising revenues rather than maximising demand (as assumed in the core Programme Business Case). This scenario would reduce demand for Melbourne–Brisbane non-bulk, intermodal freight by approximately 71%, and reduce total demand for Inland Rail by 16%. While this scenario is a possibility, the Implementation Group notes that it is one that does not take into consideration market forces and the leakage that would occur to other modes should Inland Rail not be price competitive.

Other factors that could result in decreased freight demand on Inland Rail and therefore represent potential risks to the ability of Inland Rail to realise its expected benefits are:

- the introduction of B-triples or super B-doubles (higher productivity vehicles) for inter-capital freight on the Hume and Newell highways would reduce the price competitiveness of Inland Rail relative to road (total volumes reduced by 9% by 2050, with demand from non-bulk, intermodal goods incurring a 32% reduction);
- combined higher road user costs and higher productivity vehicles would reduce the total demand for Inland Rail (by 22% in 2050 for non-bulk, intermodal goods reduced ) as the increase in road user charges would not compensate for the efficiency gains from super B-doubles between Melbourne and Brisbane;
- a low oil price scenario (US\$50 [\$2015] per barrel) by 2030 would decrease road operating costs where fuel comprises a larger proportion of total operating costs and would result in a 2% decrease in total rail freight; and

---

<sup>131</sup> The forecast is based on a long term US\$75 Newcastle benchmark coal price, noting that the analysis indicates that there is considerable uncertainty regarding future thermal coal prices (with forecasts ranging from US\$65–US\$86 per tonne for Newcastle benchmark coal). The mid-point of US\$75 has been used as a base case or middle-case coal price scenario.

- if no capital investments are made to the Western line or Brisbane metropolitan rail network to enable coal train lengths to increase from 650 metres to 1,010 metres, coal volumes would be restricted to 8 million tonnes per year as a result of reaching the cap of 87 coal paths.

The business case assumptions relating to potential markets, demand and market take-up were independently validated on behalf of the Department of Infrastructure and Regional Development. The advice noted there is limited freight data to provide certainty with respect to freight moving along the Melbourne to Brisbane corridor, particularly with respect to road freight via the Newell road corridor. In the absence of any data to contrary, the base case estimate for the current Melbourne–Brisbane interstate market is considered reasonable, and the estimates of potential coal volumes from the Surat Basin are also considered robust, with the most likely realised demand to be at the lower end scenario given the long run price for thermal coal.

Reducing the risks associated with the demand estimates further would require a detailed field survey of existing Melbourne–Brisbane interstate customers. This would require significant resources (public funds and time) to undertake.<sup>132</sup> However, the Implementation Group considers that the sensitivity testing of the demand modelling and the flow-on impact of the benefit-cost analysis is sufficiently wide enough to understand the implications of potentially lower or higher realised demand.

Given the Inland Rail service offering has been thoroughly tested with potential users, the validation of the demand estimates provides the Implementation Group with confidence that Inland Rail is an operationally robust solution to eastern Australia’s freight challenge.

Lastly, it has been brought to the Implementation Group’s attention that the demand estimates for Inland Rail are higher than those for Melbourne–Brisbane non-bulk inter-capital freight derived in the 2014 Western Interstate Freight Terminal (WIFT) Study undertaken by the Victorian Government. The Group has noted the difference in the estimates for the two studies and considers that they are accounted for within the bounds of the demand sensitivity testing.

## Findings

The Implementation Group finds that:

- F4.2 Based on independent demand analysis, Inland Rail would increase rail’s share of the Melbourne–Brisbane inter-capital freight market by 33 percentage points (from the current 29% without Inland Rail) to 62% by 2050. Inland Rail would also increase rail freight’s share of the Adelaide–Brisbane and Brisbane–Perth markets.
- F4.3 Inland Rail is expected to take essentially all of the Melbourne–Brisbane rail freight from the coastal route (excluding intra-corridor freight), divert a significant volume of freight off road, and stimulate additional economic activity.

---

<sup>132</sup> The Implementation Group notes that the forthcoming results of the Australian Bureau of Statistics survey of road freight are likely to provide some additional insights into the characteristics of the eastern Australia freight market.

- F4.5 Coal currently being exported is expected to benefit from some train operating cost savings, and Inland Rail upgrades will likely induce some additional coal (particularly from the Ipswich to Rosewood region east of Oakey) to use the Inland Rail route.
- F4.6 Total inland route tonnages on Inland Rail, including agricultural and intermodal freight and excluding coal, are estimated to be 11.4 million tonnes in 2025 and 20 million tonnes in 2050.

## SERVICE SPECIFICATIONS

The future freight task along north-south corridor requires a solution that responds to forecast demand and the stated needs of the consumers that would use it.

In its 2010 study, ARTC developed proposed service specifications and design standards<sup>133</sup> for Inland Rail, and canvassed a range of potential future-proofing design aspects such as higher operating speeds and increased axle loads.

During 2014, ARTC consulted with rail operators, freight forwarders, end users, Queensland coal companies as well as one-on-one consultation with its customers to test the proposed service specifications. This consultation included an industry survey, extensive one-on-one interviews with current customers of the national freight rail network and debate at two forums of a Key Stakeholder Reference Group.

ARTC has reported to the Implementation Group that stakeholder feedback emphasised the importance of an inland railway being future-proofed in relation to key design characteristics including train length, axle load, maximum speed and capacity for double-stacking. Feedback from stakeholders has been incorporated into a revised service offering to increase Inland Rail's ability to provide a freight service competitive with road transport.

ARTC's technical service specifications for Inland Rail are summarised below in Figure 10.

Figure 10: Summary of Inland Rail's outcomes and key technical characteristics



<sup>133</sup> op cit (ARTC 2010 p 28).

ARTC's service offering would deliver 98% reliability<sup>134</sup> (equivalent to that offered by road), transit time between Melbourne and Brisbane of less than 24 hours, and provision of freight as and when the market wants it. It would also deliver future-proofing for train length, axle load and maximum speed, the capacity for double-stacking and full interoperability with existing interstate and standard gauge regional lines.

More detail about the Inland Rail service specification is set out below in Table 6, and a detailed discussion can be found in Chapter 5 of the business case.

**Table 6: Inland Rail performance specification**

ATTRIBUTE	SPECIFICATION
Reference train	
Intermodal	<ul style="list-style-type: none"> <li>21 tal, 115 km/h maximum speed, 1800 m length (initial).</li> <li>2.7 hp/tonne power/weight ratio.</li> </ul>
Coal / bulk	<ul style="list-style-type: none"> <li>25 tal (initial), 80 km/h maximum speed, length determined by customer requirements within maximum train length.</li> </ul>
Operational specification	
Maximum freight train transit time (terminal-terminal)	<ul style="list-style-type: none"> <li>Target driven by a range of customer preferences and less than 24 hours Melbourne to Brisbane for the intermodal reference train.</li> <li>Flexibility to provide for faster (higher power:weight ratio) and slower (lower power:weight ratio) services to meet market requirements.</li> </ul>
Gauge	<ul style="list-style-type: none"> <li>Standard gauge (1435 mm) with dual standard / narrow (1067 mm) gauge in relevant Queensland sections to maintain narrow gauge connectivity to Brisbane and regional Queensland lines.</li> </ul>
Maximum freight operating speed	<ul style="list-style-type: none"> <li>115 km/h @ 21 tal.</li> </ul>
Maximum axle loads (initial)	<ul style="list-style-type: none"> <li>21 tonnes @ 115 km/h.</li> <li>23 tonnes @ 90 km/h.</li> <li>25 tonnes @ 80 km/h.</li> </ul>
Clearance	<ul style="list-style-type: none"> <li>Vertical as per ARTC Plate F for double stacking (7.2 m above rail).</li> </ul>
Maximum train length (initial)	<ul style="list-style-type: none"> <li>1800 m.</li> </ul>
Braking curve	<ul style="list-style-type: none"> <li>G40 for intermodal reference train.</li> </ul>
Minimum design standards	
<i>General alignment standards</i>	
Design speed	<ul style="list-style-type: none"> <li>115 km/h.</li> </ul>
Maximum grade	<ul style="list-style-type: none"> <li>1:100 target, 1:80 maximum (compensated).</li> <li>1:200 maximum at arrival or departure points at loops.</li> </ul>
Curve radius	<ul style="list-style-type: none"> <li>1200 m target, 800 m minimum.</li> </ul>

<sup>134</sup> Reliability is defined as the percentage of goods delivered on time by road freight, or available to be picked up at the rail terminal or port when promised. It does not refer to punctuality of services.

ATTRIBUTE	SPECIFICATION
Cant	<ul style="list-style-type: none"> <li>Set for intermodal reference train.</li> </ul>
Medium speed alignment standards (mountainous terrain)	
Design speed	<ul style="list-style-type: none"> <li>80 km/h minimum.</li> </ul>
Maximum grade	<ul style="list-style-type: none"> <li>1:100 target, 1:50 maximum (compensated).</li> <li>1:200 maximum at arrival or departure points at loops.</li> </ul>
Curve radius	<ul style="list-style-type: none"> <li>800 m target, 400 m minimum.</li> </ul>
Cant	<ul style="list-style-type: none"> <li>Set for coal reference train.</li> </ul>
Corridor width	<ul style="list-style-type: none"> <li>40 m minimum.</li> </ul>
Rail	<ul style="list-style-type: none"> <li>Minimum 53 kg/m on existing track; 60 kg/m on new or upgraded track.</li> </ul>
Concrete sleepers	<ul style="list-style-type: none"> <li>Rated @ 30 tal.</li> </ul>
Sleeper spacing	<ul style="list-style-type: none"> <li>667 mm spacing (1500/km) – existing track.</li> <li>600 mm (1666/km) – new corridors/track or re-sleepering existing track.</li> </ul>
Turnouts	<ul style="list-style-type: none"> <li>Tangential, rated at track speed on the straight and 80 km/h entry/exit on the diverging track..</li> </ul>
Crossing loops (initial)	<ul style="list-style-type: none"> <li>1800 m in length (clearance point to clearance point).</li> <li>No level crossings across loops or within road vehicle sighting distance from loops.</li> </ul>
<i>Future proofing</i>	
Train length	<ul style="list-style-type: none"> <li>To provide for future extension of maximum train length to 3600 m.</li> </ul>
New structures (greenfield & brownfield)	<ul style="list-style-type: none"> <li>Capable of 32 tal @ 80 km/h minimum.</li> </ul>
Formation strength	<ul style="list-style-type: none"> <li>Formation on new track suitable for 30 tal @ 80 km/h.</li> </ul>
Crossing loops	<ul style="list-style-type: none"> <li>Loops designed and located to allow future extension for 3600 m trains.</li> </ul>

The Implementation Group considers that incorporating future-proofed design aspects into the service specification is critical and would mean that Inland Rail's underlying structures have the capacity to be readily upgradeable as rail user's needs change. The Group further considers that while some future-proofing costs would be incurred early in construction, it also allows for the opportunity to defer some costs until the need arises. As Inland Rail is infrastructure for the next 100 years, its ability to adapt to the needs of users is critical.

In relation to interoperability, the Implementation Group notes that Inland Rail must connect to, and be interoperable with, the Country Rail Network in New South Wales and regional rail networks in Queensland. Having an open access railway is also critical to maximising benefits. Should Inland Rail proceed to construction, interface arrangements would need to be worked through with New South Wales and Queensland government officials.

## **Findings and recommendations**

### **Finding**

- F4.7 The Implementation Group finds it would be more cost-effective to ‘future-proof’ Inland Rail in the design and construction phase of the programme (for example, new structures built for heavier axle loads and double stacking, crossing loops sited to allow for future extension to 3,600 metre trains) rather than retrofit these elements once the line is operational.

### **Recommendation**

- R4.1 The Implementation Group recommends that the Australian Government construct an inland railway between Melbourne and Brisbane that delivers on the stated needs of customers, namely a terminal-to-terminal transit time of less than 24 hours, with a service reliability equivalent to that provided by road transport operators, and which connects to, and is interoperable with, existing networks.

## ARE ARTC'S TRACK ENGINEERING STANDARDS APPROPRIATE FOR THE INLAND RAIL FREIGHT TASK?

To assure itself that ARTC's existing track engineering standards are appropriate for the freight task to be conducted by Inland Rail, the Implementation Group asked the Department of Infrastructure and Regional Development to engage independent consultants to compare these standards with those used in North America (which have been held out as world's best practice).

Engineering standards need to be appropriate for the intended task. The Implementation Group notes that there are significant differences between the North American and Australian freight rail systems as follows:

- the US rail network has an operating length of over 225,000 km (with about 85% constituting freight lines), and is the biggest in the world;
- the Australian rail network comprises an operating length of around 33,404 km,<sup>135</sup> of which ARTC operates over 8,500 km. Inland Rail would comprise 1,710 km of track of which approximately 599 km would be new track;
- the North American rail freight task was 2,876 billion tonne-km in 2012 compared to Australia's 59 billion tonne-km;
- the North American network has evolved to support 32.4 metric tonne axle load services for a broad range of intermodal and bulk supply chains (although this axle load is not used exclusively); and
- the North American railways have a density of traffic that warrants the investments made. This level of density is not expected on the Australian interstate network in the foreseeable future.

The Implementation Group considers that given Australia's much smaller volumes of freight, which are transported over relatively shorter distances, ARTC's existing standards are appropriate for the Australian freight task. The North American model would only be appropriate in Australia at much higher freight volumes, and the anticipated demand for Inland Rail, even under an optimistic scenario, does not justify utilising the North American design.

Specifically:

- the North American and Australian standards do not, in and of themselves, vary significantly and, therefore, will not have a large impact on cost or performance. The study found, however, that some differences indicate a need to update Australian standards to take advantage of improvements in track material and design and construction methods rather than a wholesale change in design philosophy;
- the envisaged gross tonne kilometres for Inland Rail does not justify the design (32.4 metric tonne axle load) selected for North American high tonnage heavy haul routes. These types of axle loads are only used in Australia for heavy haul mineral railroads and would represent significant over-

---

<sup>135</sup> *Australian Infrastructure Statistics*, BITRE, 2013, p 13.



engineering for an intermodal interstate Inland Railway. The envisaged container traffic for the Inland Rail route does not justify the provision of double-stack intermodal trains immediately, however, any construction of new structures (for example, bridges, overpasses or tunnels) should accommodate double-stack clearance as a matter of future-proofing as it would be far less expensive to make the provision now versus future retrofitting while under traffic;

- if heavier trains (the North American 32.4 metric tonne axle load equivalent) were used by Inland Rail, interoperability issues with existing train sets would be created and operators would be required to purchase and maintain standalone new rolling stock to take full advantage of Inland Rail. And conversely, if new rolling stock was purchased by operators it would be unable to be used on much of the existing network;
- the maximum speed for high speed intermodal trains in North America is 112.6 km/h, however, average speeds are significantly less. For example, Burlington Northern Santa Fe's Atchison, Topeka and Santa Fe Railway line (Los Angeles–Chicago) has a maximum operating speed of 106 km/h but average speed for its 'expedited' service is only 58 km/h. This compares to the design speed for Inland Rail of 115 km/h on lighter axles and 80 km/h on heavier axles and an average speed (northbound intermodal) of 72 km/h for the 24 hour reference train;
- the 32.4 metric tonne axle load capability is used relatively rarely by intermodal trains, and generally can be avoided during planning of the train configuration; and
- while double-stacking of containers is becoming increasingly common, the use of this capability is not consistent across the network and is currently less than 70% on lines where it is used extensively.

The Implementation Group finds that the differences between North American and Australian railway standards are not significant, and ARTC's design philosophy is consistent with the North American model in terms of delivering the infrastructure required by customers.

The Implementation Group does not see any significant construction cost advantages in adopting the North American model and considers that there is unlikely to be significant cost savings from buying 'off-the-shelf' North American rolling stock as the cost of purpose built rolling stock from suppliers in Asia has decreased significantly while quality has improved. In any event, the Implementation Group considers that the interoperability of Inland Rail with existing train sets is a fundamental objective that should not be compromised by the use of 'off-the-shelf' North American rolling stock even if its costs were lower.

Should a business case for heavier, faster trains be made for Inland Rail, the current ARTC track design philosophy can achieve such standards without direct reference to the North American model. The anticipated demand for Inland Rail does not justify the heavier design being used in North America, nor does it justify designs for high speed services.

The business case makes provision for double-stacking as part of the base 10-year delivery programme. It also includes provision for 30-tonne axle loads on new structures and new track. The Implementation

Group considers that this is consistent with the independent consultant's advice. The Group also considers that providing for longer trains in the short term may be more beneficial from the outset along with making provision for double-stacking (such as building new tunnels with appropriate clearances) noting that, all else being equal, initial construction is less costly than upgrading when the track is in service.

## **Findings and recommendations**

### **Finding**

- F4.8 The Implementation Group finds that the differences between the North American and existing standard-gauge Australian railway engineering standards are not significant, and ARTC's design philosophy is consistent with the North American model in delivering the infrastructure required by customers given the expected demand volumes.

### **Recommendations**

The Implementation Group recommends that the Australian Government construct an inland railway:

- R4.2 To a standard that provides immediate interoperability with the high performance east-west line (Parkes to Perth), namely double-stacked trains, capable of travelling at 115 km/h at an axle load of 21 tonnes.
- R4.3 With a design capable of being progressively upgraded to support longer (up to 3,600 m) and heavier (up to 30 tonne axle load) trains to meet the stated future needs of users, as and when required by the market.

## CORRIDOR ALIGNMENT

The identification of the preferred alignment for Inland Rail is a threshold issue for the Implementation Group, and one that has been subject to extensive consideration and refinement by ARTC since 2006.

While the 2006 Report found that an inland railway should generally follow an alignment referred to as the Far Western Sub-Corridor, ARTC's 2010 Report built on this work by examining numerous options for the alignment within that corridor. As indicated in Chapter 4, Inland Rail comprises a number of segments that broadly run from Melbourne to Parkes, Parkes to North Star, and North Star to Brisbane. These segments are illustrated below in Table 7 and Figure 11 on the next page.

**Table 7: Inland Rail alignment segments**

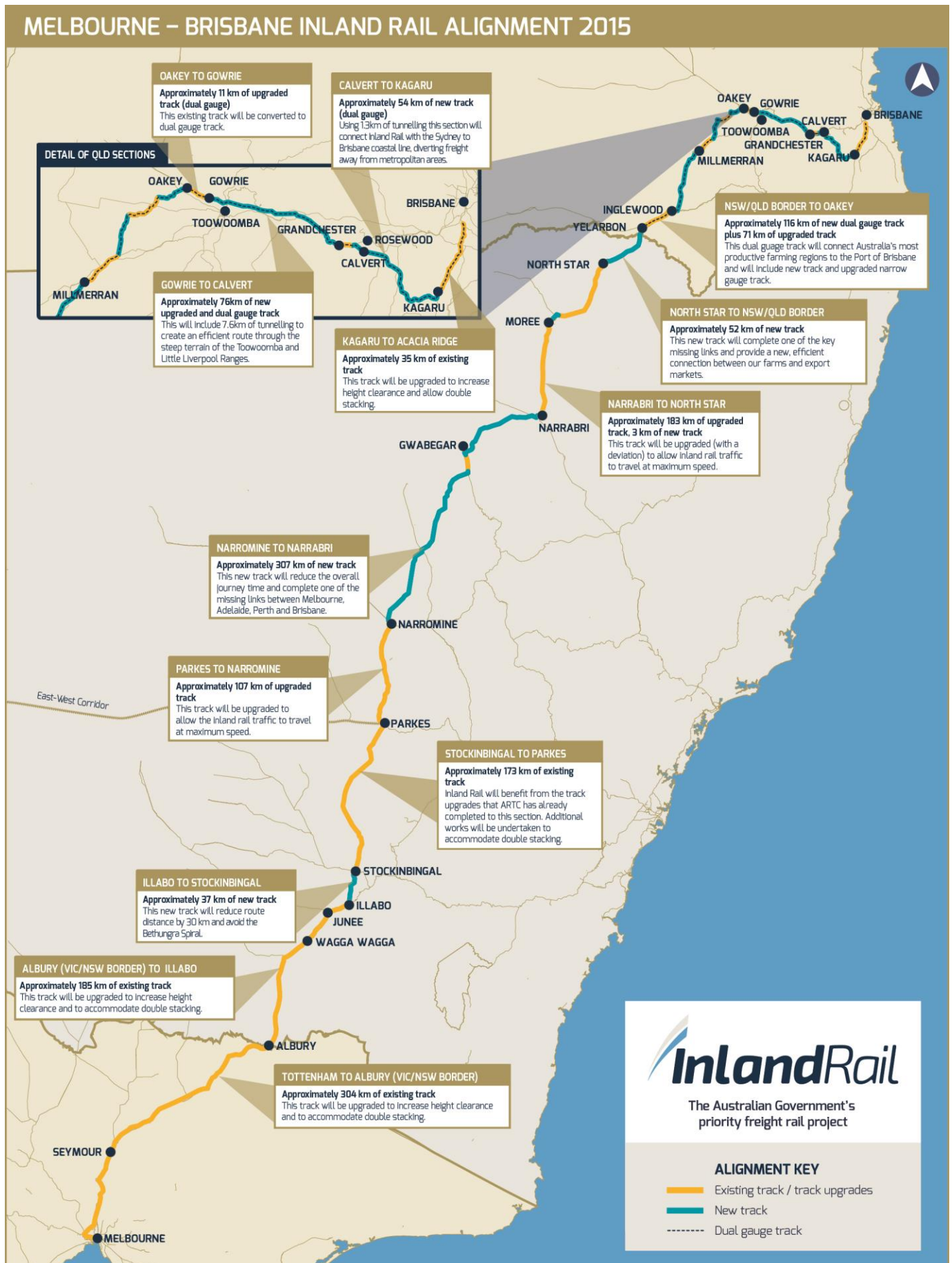
State	Scope of Inland Rail	Category
<b>Vic</b>	Melbourne to Albury	Enhancement for double stacking
<b>NSW</b>	Albury to Illabo	
	Illabo to Stockinbingal	Missing link – new track
	Stockinbingal to Parkes	Enhancement for double stacking
	Parkes to Narromine	Upgrades – priority
	Narromine to Narrabri	Missing link – new track
	Narrabri to North Star	Upgrades – priority
	North Star to NSW border	Missing link – new track
<b>Qld</b>	Qld Border to Inglewood	
	Inglewood to Oakey	
	Oakey to Gowrie	New track – includes priority segments
	Gowrie to Rosewood (Calvert)	
	Rosewood (Calvert) to Kagaru	Enhancement for double stacking
	Kagaru to Brisbane	

The Implementation Group agrees broadly with the alignment identified by ARTC in 2010 including the sections between Narrabri and North Star, Parkes and Narromine, and Rosewood to Kagaru. These sections of the alignment are particularly important, as they have been identified as potential early projects (see Chapter 9), should the Australian Government decide to proceed. Narrabri to North Star and Parkes to Narromine are brownfields projects, which would provide some immediate benefit to regional freight, although in the absence of the complete Inland Rail link, the benefits would be limited given current freight volumes. In relation to Gowrie to Kagaru, this greenfield section of track has the advantage that the broad corridor has been defined and some of the land acquired by the Queensland Government.

While substantial further work has been undertaken by ARTC during 2014 and 2015 to refine the alignment, the final alignment will ultimately be subject to the outcomes of planning and environmental assessments that are to be undertaken if Inland Rail proceeds (see Chapter 6 of this report).

Over the last 18 months, the Implementation Group has carefully considered a number of matters, which are outlined below, along with the Group's recommendations.

Figure 11: Inland Rail alignment



Note: This map is indicative of the broad alignment only. This map does not include the link to the Port of Brisbane.

## *THE ALIGNMENT BETWEEN MELBOURNE AND PARKES: ALBURY OR SHEPPARTON?*

A key decision in ARTC's 2010 study was whether the route from Melbourne to Parkes should run via Albury or Shepparton. The 2010 Report concluded that the route via Albury was preferred as it offered superior outcomes for the key criteria of journey time and capital costs. Although the Shepparton route offered a transit time that would be quicker by about 30 minutes, this route attracted a significant extra capital cost adding—in 2010—over \$900 million to the project relative to the Albury route.<sup>136</sup> Based on the work undertaken in 2014–15, the Implementation Group expects that this cost would now be conservatively between \$1 to 2 billion.

It was also noted in 2010 that the Shepparton route had the potential to capture only a very small amount of additional regional freight, reflecting the dominance of Melbourne as a destination for that freight. The advantages of the Shepparton route were found to fall short of the sizable advantage of the Albury route, namely, that only a small amount of capital expenditure would be required to achieve an almost comparable transit time.

During 2014 and 2015, supporters of the Shepparton route in the food bowl region (the Food Bowl Inland Rail Alliance, a grouping of nine local governments in northern Victoria and southern New South Wales) claimed a number of benefits for this route, including that it will:

- create rail-contestable export demand from the food bowl region, including greater opportunity for competition between export gateways;
- create greater opportunities for access to agricultural export markets, particularly through rail connection to the Port of Brisbane, as well as the Port of Melbourne, Port Botany and Port Kembla;
- improve national freight network reliability and resilience and provision of greater security of logistics chains;
- create benefits for the freight rail industry through establishing a true network, reduce operating costs through shorter route length and transit times, and lesser gradients and curvatures;
- maximise the use of existing intermodal and rail corridor infrastructure;
- derive wider externality benefits through attracting more freight from the food bowl to rail, in particular reduced road damage costs borne by local government; and
- broaden the commercial agricultural opportunities between the states.<sup>137</sup>

The Implementation Group has also taken into account that since 2010, the Ettamogah Rail Hub has announced a major expansion to its services with a new twice-weekly service from Albury to Brisbane. This announcement comes after the Hub secured contracts to shift 100,000 tonnes of freight annually from three major manufacturers in the border region.<sup>138</sup> These contracts improve the economics of

---

<sup>136</sup> op cit (ARTC 2010 p 33).

<sup>137</sup> *Inland Rail, Food Bowl Alignment*, The Food Bowl Inland Rail Alliance p 3 and 5.

<sup>138</sup> *Australian Logistics Council Update*, August 2013, Issue 7, p 7.



utilising the existing track through Wagga Wagga and Albury, which has also received upgrades since 2010, including the ARTC lease and conversion to standard gauge of the former broad gauge track between Seymour and Albury to provide double-track over this segment. The Implementation Group notes that freight from the Narrandera and Griffith region can currently connect to the proposed Inland Rail north of Junee using an existing rail line.

In response to the Food Bowl Inland Rail Alliance's representations and the lack of regional freight data, the Department of Infrastructure and Regional Development engaged an independent consultant to further investigate the merits of the Shepparton and Albury routes. A high-level assessment was undertaken of how much rail freight would need to be generated or consumed in the Riverina and Goulburn Valley food bowls to economically (rather than financially) justify the cost of constructing a new line through Shepparton and Narrandera.

A high-level cost benefit analysis of the Shepparton and Albury options determined that the Shepparton option has a BCR of 0.3 at a 4% discount rate with a net present value (NPV) of –\$629.3 million. At a 7% discount rate the BCA of the Shepparton option is 0.18, and at a 10% discount rate the BCR is 0.11.

Sensitivity testing of key variables indicated it is unlikely that a scenario exists where the Shepparton option would provide a net economic benefit (based on current supply chain patterns). For example, reducing construction costs by half of that used in the base case modelling delivers a BCR of 0.72 and a NPV of –\$115.2 million.

The independent consultants also determined the volume of freight that would be required to deliver a NPV \$0.0 million result (that is, the point of equivalence between the Shepparton and Albury options). It was found that an additional 3.7 million tonnes per annum (MTPA) of regional freight (assuming escalation of existing supply chains) would be required to justify the significant investment needed to construct the rail link between Narrandera and Shepparton as part of Inland Rail.

The Implementation Group finds that the independent analysis indicates the current demand estimates for the food bowl region, including those of the Food Bowl Inland Rail Alliance, are substantially below that which would be required for the Shepparton option to be economically viable. This analysis confirms the findings of the 2010 Report that, while an Inland Rail alignment through Shepparton and Narrandera would provide economic benefit to the region, the capital costs of providing the infrastructure substantially outweigh the expected benefits.

The estimated 3.7 MTPA gap between existing freight demand and that which would be required to 'break even' on the investment indicates that a substantial new supply chain (for example, a significant bulk product such as minerals or construction material extraction) would need to be found to make the Shepparton option viable. Organic growth in existing supply chain volumes is unlikely to bridge the benefit-cost gap.

The Implementation Group finds that, on the basis of all the available information including the independent cost-benefit analysis, that the Albury option provides a better economic outcome for Inland

Rail. The volume of additional freight and the reduction in operating costs generated by the Shepparton option does not justify the extra capital cost involved.

The Implementation Group also finds that adoption of the Albury route for the north-south alignment does not preclude future development of an additional track linking Shepparton with Narrandera through to Parkes. The extension of Inland Rail through the Riverina and Goulburn Valley food bowls, or elsewhere, could occur if in the future there is sufficient demand to economically justify further investment.

### *GOWRIE TO GRANDCHESTER: THE 2003 OR 2010 ALIGNMENT?*

The Gowrie to Grandchester section of Inland Rail, which includes the Toowoomba Range tunnel, is a critical path item for the completion of the overall Inland Rail Programme. Several options exist for this section of the alignment.

In the early 2000s, the Queensland Government undertook corridor studies between Gowrie and Grandchester, and in 2003, defined and acquired some of the land (33 out of 133 properties) required for a future railway corridor, suitable for 200 km/h passenger services as well as freight west from Brisbane (the 2003 Queensland alignment).

In its 2010 Report, ARTC concluded that the 2003 Queensland alignment was not the optimum solution for Inland Rail as achieving journey time-savings from this alignment would be more expensive than could be obtained by improving the alignment of other sections of the inland railway. As a result, the 2010 Report adopted an alternative alignment (the 2010 alignment) between Gowrie and Grandchester that is different from the 2003 alignment.

During 2014 and 2015, the Implementation Group has considered, as a threshold issue for progressing development work for this section of the corridor, which of the 2003 or 2010 alignments should be the preferred option for Inland Rail.

The map at Figure 12 on the following page demonstrates the two options.

The Implementation Group notes that, at the time, the 2010 alignment was recommended as a corridor more closely optimised for freight operations—it included a slightly shorter tunnel and was expected to result in construction cost savings relative to the 2003 alignment. Since then, assumptions underpinning the 2010 alignment have been significantly impacted by the 2011 floods through the Lockyer Valley.

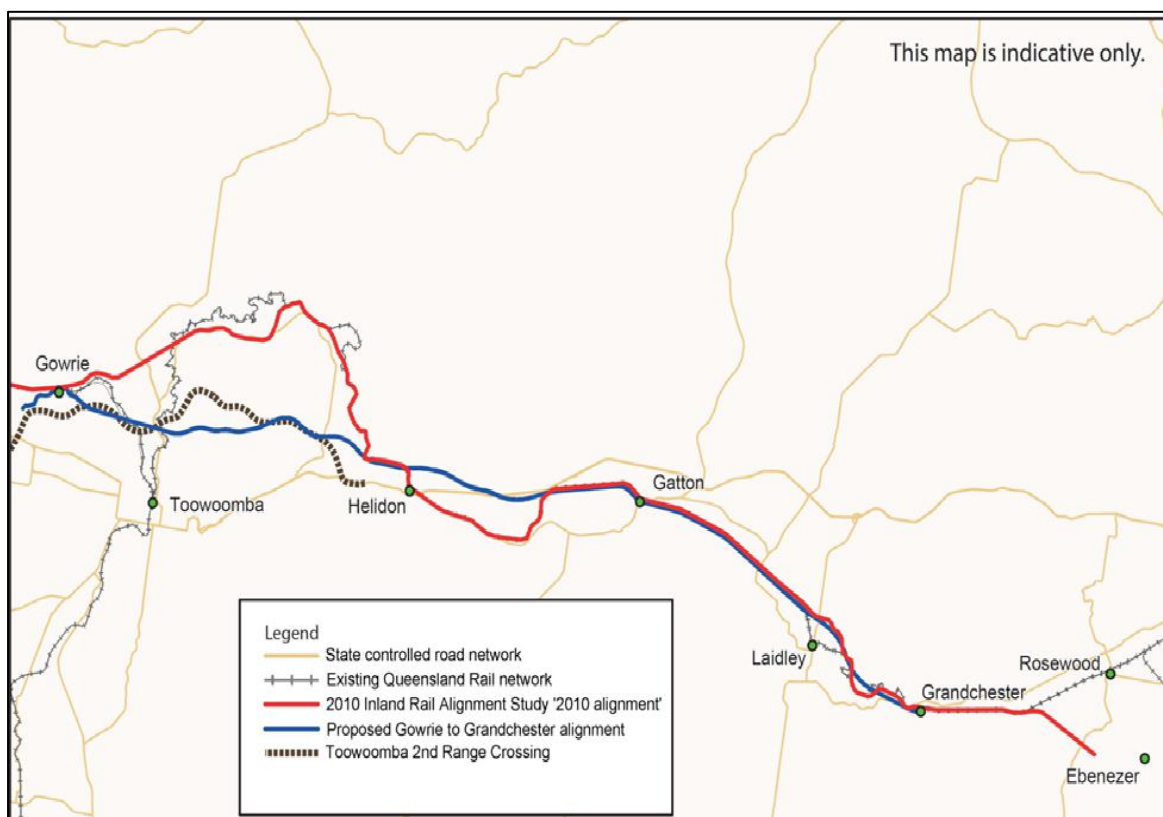
The Implementation Group has considered a range of cost and non-cost criteria in weighing up the choice between the two options. The Group found that in relation to capital costs, the two alignments are of comparable cost, however, on the basis of non-cost criteria, the 2003 alignment is an existing corridor protected under the *Transport Planning and Coordination Act 1994* (QLD).

Reasons for adopting the 2003 alignment include, that:



- it would result in a significant time saving (around two years) relative to proceeding through the statutory processes to formally identify a new corridor for the 2010 alignment and removes a significant element of planning risk;
- substantial elements of the 2003 alignment have already been acquired by the Queensland Government;
- community severance and disruption, noise and dust through Helidon, Murphy's Creek valley and in the vicinity of Gowrie Junction will be minimised by the 2003 alignment; and
- the 2003 alignment is substantially a greenfield development which minimises impacts on the existing operating Queensland Rail corridor.

Figure 12: Inland Rail alignment Gowrie to Grandchester - 2003 and 2010 options



The Implementation Group notes that for the purposes progressing design and costing work contained in the business case, ARTC has adopted the Gowrie to Grandchester alignment identified in 2003 by the Queensland Government (subject to possible minor amendments).

The Implementation Group has found that, given the equivalence of the 2003 and 2010 routes on the basis of cost, it is persuasive that the 2003 route would deliver a two-year time saving in relation to planning requirements, and shorter overall construction length. As a result, the Group agrees in principle to the Inland Rail alignment passing between Gowrie and Grandchester via the 2003 route, subject to possible minor amendments and formal confirmation with the Queensland Government regarding use of the existing protected corridor.

## *NORTH STAR TO TOOWOOMBA SEGMENT*

The Implementation Group agrees with an alignment between North Star and Toowoomba broadly consistent with that identified in the 2010 Report. Further investigation is required however, to account for local issues, for example, where the alignment crosses the floodplain of the Macintyre and Dumaresq river system. Further hydrological and geotechnical assessments may result in the final detailed alignment varying to the east or west.

In addition, a number of other environmental matters that potentially affect this section of the alignment also require resolution. These include, for example, other environmentally sensitive areas that will be affected along the proposed new greenfield sections, including a number of nature reserves and state forests and areas of high value agricultural land.

The Implementation Group anticipates the recommended Inland Rail alignment will continue to be refined throughout the pre-construction phase due to the outcomes of assessments that may require diversion of the route to protect environmentally, historically or culturally significant sites/species.

The Implementation Group considers that future environmental impact statement and community consultation processes will provide a mechanism to resolve matters in this section of the alignment as ongoing development work proceeds on the Inland Rail programme.

The Implementation Group notes, however, that any diversion from the recommended alignment may affect cost and transit time.

## **Findings and recommendations**

### **Findings**

The Implementation Group finds that:

- F4.9 Although there has been significant economic development in the Goulburn Valley and Riverina food bowls since the 2010 Report, demand for an alternative Melbourne–Parkes alignment through Shepparton and Narrandera remains insufficient to justify the additional capital costs of constructing and upgrading new and existing track at this time.
- F4.10 The proposed 2010 alignment from Gowrie to Grandchester was significantly affected by the 2011 floods in the Lockyer Valley, and the 2003 route offers significant non-cost advantages over the 2010 route.

## Recommendations

The Implementation Group recommends that the Australian Government:

R4.4 Agree to the Inland Rail alignment as determined in 2010 and refined in the 2015 business case (subject to final planning and environmental approval processes being completed), and in particular that the:

- alignment from Melbourne–Parkes should pass via Albury on the basis that it represents better value for money and uses a greater proportion of existing track than a route that passes through Shepparton (noting that establishing a rail connection between Shepparton and Narrandera could be reviewed once Inland Rail is operational and freight demand demonstrates that it is economically viable to justify further investment.);
- preferable route from Gowrie and Grandchester is the 2003 alignment (subject to minor modifications to be agreed with the Queensland Government); and
- note in relation to the segment between North Star and Toowoomba, the Implementation Group considers that further hydrological and geotechnical assessments are required which may result in the final detailed alignment varying to the east or west.

## ECONOMIC ANALYSIS

Major infrastructure projects like Inland Rail inevitably involve significant construction costs. An important aspect to assist governments in deciding whether or not to invest in such projects are the benefits to the community as a whole from the investment, and whether the net benefits of the project over the life of the infrastructure are likely to exceed its net cost.

The benefits and costs associated with the Inland Rail Programme have been assessed as part of the economic analysis and are set out in detail in Chapter 9 of the business case.

The economic analysis methodology<sup>139</sup> compares a scenario where there is an Inland Railway to one without Inland Railway, that is, where road and rail freight would use the existing roads and coastal railway over a fifty-year period (to 2074–75). Comparing these two scenarios establishes the net economic benefits to the community that would flow from an inland railway, including external benefits such as environmental impacts and accident cost savings.

### *BENEFITS*

The business case has identified a number of direct benefits of Inland Rail (which can be monetised), including:

- improved productivity and economic efficiency as a result of operating cost savings, shorter transit times, improved reliability, improved availability and avoided incidents on the coastal route and an additional north-south rail option to avoid incidents;
- improved customer outcomes for rail passengers in Sydney and Brisbane because unused freight paths on the coastal route are returned to passenger services, and the increased frequency of services reduces average wait times and crowding;
- safety benefits for the community as a result of removing heavy vehicles from the road network, reducing the distance travelled for rail freight and separating freight and passenger rail;
- sustainability benefits for the community from removing heavy vehicles off the road network and reducing the distance travelled by freight in reduced traffic congestion, fewer emissions of carbon/pollution and less noise; and
- reduced life cycle costs for infrastructure owners/operators on the coastal route and road network as a result of lower freight volumes which reduce maintenance costs and enable investments in capacity to be avoided or deferred.

A summary of the benefits of Inland Rail is set out in Table 8 on the following page and illustrated in Figure 13.

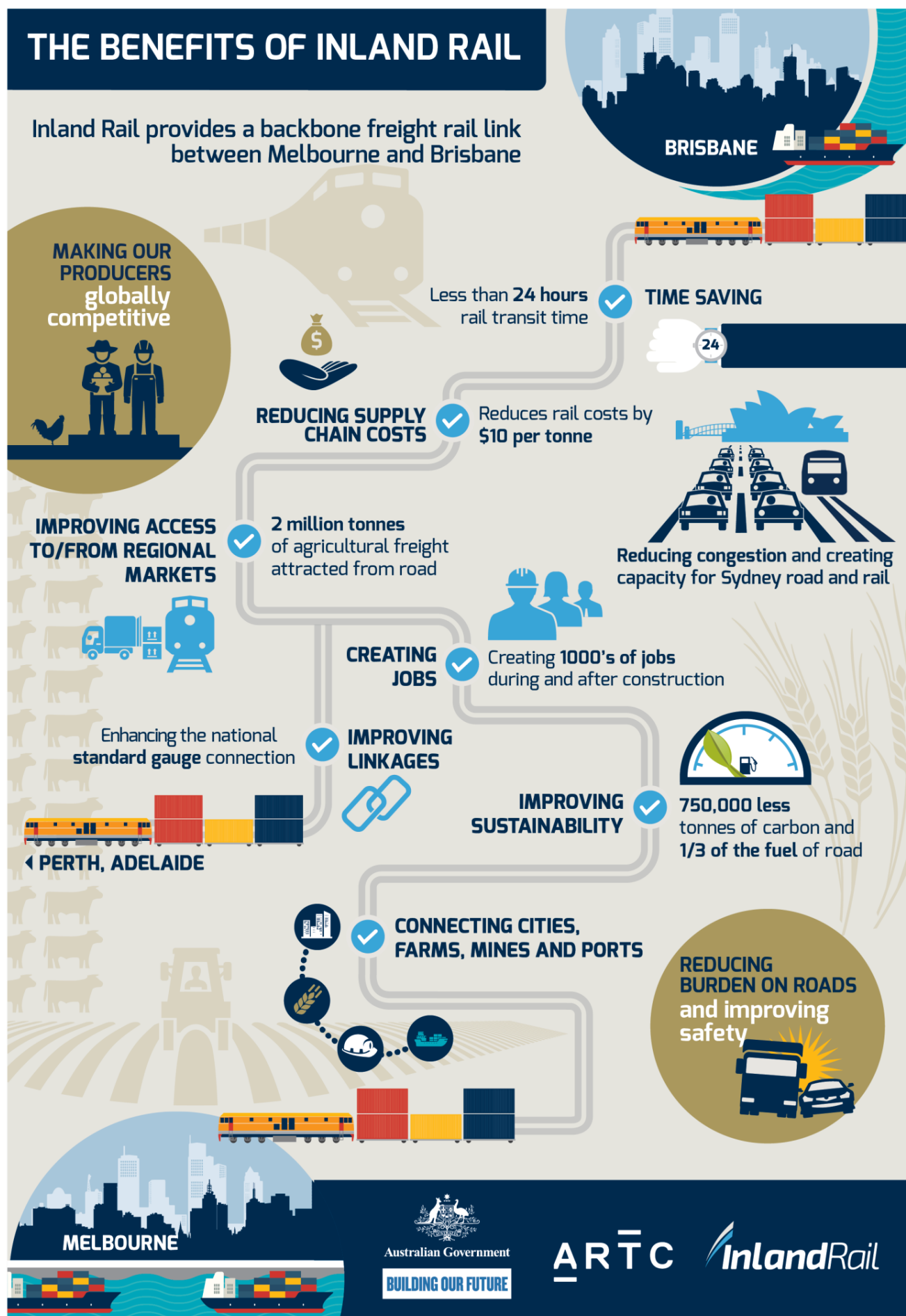
---

<sup>139</sup> The BCA methodology aligns with the Australian Transport Council 2006 National Guidelines for Transport System Management in Australia and the former Infrastructure Australia 2013 submission guidelines for inclusion on the National Infrastructure Priority List. The methodology also aligns with the relevant Queensland, New South Wales and Victorian government guidelines for benefit-cost analysis/economic appraisal.

Table 8: Benefits captured and measured in the economic appraisal

BENEFIT TYPE	BENEFIT DRIVER	BENEFITS QUANTIFIED
Improved productivity and economic efficiency	<ul style="list-style-type: none"> <li>Intercapital and agricultural freight currently travelling by road would benefit from reduced operating costs as a result of economies of scale in rail relative to road transport.</li> <li>Coastal rail freight would benefit from reduced rail transport costs as a result of higher axle loads, longer trains, lower gradients, longer curves, shorter transit times and avoided incidents and flooding. Freight customers would also be willing to pay for improved reliability and availability with Inland Rail.</li> <li>Coal freight in the Surat and Clarence-Morton Basins would benefit from reduced above rail operating costs as a result of higher axle loads east of Oakey (20 tonne axle load compared to the current 15.75), longer trains (1010 metre compared to the current 650 metre) a more direct alignment in tunnel across the Toowoomba Range that avoids the current crossing where operating speeds are constrained by high gradients and tight curves on a winding track.</li> <li>These benefits would induce additional freight volumes that would not have occurred in the absence of Inland Rail.</li> </ul>	<p>Freight user benefits:</p> <ul style="list-style-type: none"> <li>Operating cost savings.</li> <li>Value of freight time.</li> <li>Improved reliability.</li> <li>Improved availability.</li> <li>Redundancy and resilience to incidents.</li> <li>Induced freight benefits.</li> </ul>
Improved customer outcomes for rail passengers	<ul style="list-style-type: none"> <li>Unused freight paths would be returned to passengers in Sydney and Brisbane during off peak periods (noting that passengers are already given absolute priority in peak periods).</li> <li>Increased frequency of services would reduce the average wait time.</li> </ul>	<p>Passenger benefits:</p> <ul style="list-style-type: none"> <li>Reduced average wait time.</li> </ul>
Improved safety for the community	<ul style="list-style-type: none"> <li>Enhanced road safety from removing heavy vehicles off the road network.</li> <li>Reduced rail accidents from reducing the distance travelled.</li> </ul>	<p>Community benefits:</p> <ul style="list-style-type: none"> <li>Reduced rail and road accidents.</li> </ul>
Improved sustainability for the community	<ul style="list-style-type: none"> <li>Reduced road congestion as a result of removing heavy vehicles off the road network.</li> <li>Reduced environmental costs as a result of removing heavy vehicles off the road network and reducing the rail distances travelled.</li> </ul>	<p>Community benefits:</p> <ul style="list-style-type: none"> <li>Reduced road congestion.</li> <li>Reduced environmental costs and improved residential amenity.</li> </ul>
Reduced lifecycle costs for infrastructure owners/operators	<ul style="list-style-type: none"> <li>Lower volumes on the coastal route and Newell and Pacific Highway reduces ongoing operating and maintenance costs.</li> <li>Lower volumes on the coastal route will enable \$170 million of future investments in capacity on the Sydney freight network (passing loops, track duplication and turnbacks) to be avoided, and \$76 million to be deferred.</li> </ul>	<p>Infrastructure cost savings.</p>

Figure 13: Benefits of Inland Rail





The Implementation Group considers that a more efficient rail link between Melbourne and Brisbane is likely to deliver benefits to producers and consumers on all parts of the network and the economy as a whole. These benefits are expected to include:

- lower prices for consumers as a result of lower inter-capital freight transport costs (predominantly manufactured goods), which reduces the cost of living for households;
- economic growth (that is, Australian Gross Domestic Product and Queensland, New South Wales and Victorian Gross State Product) as increased profits and incomes are multiplied throughout the economy as a result of:
  - increased freight productivity, which reduces distribution costs and increases profits for industries where inter-capital freight is an input or output;
  - improved mine to port accessibility, which reduces transport costs and increases profits for existing mines and agricultural producers, and results in additional exports that would not otherwise have been viable; and
  - local sourcing of resources, which increases demand for Australian labour and materials for construction and ongoing operations for the Inland Rail.
- creation of economic activity and jobs associated with construction and ongoing operation of Inland Rail in Queensland, New South Wales and Victoria;
- support for regional community development as a result of locally sourced resources for construction and operation of Inland Rail;
- enhanced competition between road and rail freight by providing a credible alternative, which will drive further innovation and efficiency; and
- development of freight precincts around Inland Rail terminals as a result of benefits from co-location and clustering of industries (for example, as a result of reduced road transport costs to warehousing, economies of scale and knowledge-sharing opportunities).

In addition, there may also be wider benefits resulting from dynamic impacts on freight industry operating models, locational decisions including regional development impacts and wider economic productivity benefits from efficient supply chains.

If terminal precincts (which are outside the scope of the Inland Rail Programme) and/or improved passenger services on the Sydney metropolitan rail network were incorporated into the project scope, Inland Rail may also offer the following additional minor benefits:

- agglomeration benefits due to industrial uses clustering in a precinct surrounding new terminals;
- the opportunity to bring employment closer to workers, thereby reducing commuting costs; and
- increased output caused by the clustering of industrial uses.



## COSTS

During 2014 and 2015, ARTC undertook a rigorous assessment of the costs of Inland Rail that built on the work undertaken in 2010. The details of the cost assessment including methodology and assumptions are set out in Chapter 8 of the business case.

The Implementation Group accepts ARTC's updated cost estimate based on the refined service offering and performance specification developed following ARTC's consultation with customers and stakeholders during 2014. The revised service offering and specifications now include significant future-proofing design aspects, double-stacking and some items that were either not included or were underestimated in 2010 (such as signalling and escalation) and which resulted in a 2010 desktop estimate of \$4.7 billion (at P90) for the cost of Inland Rail.

ARTC's revised estimates are that Inland Rail would have a base cost of \$6.9 billion (including future-proofing), and with escalation and contingency the costs are \$9.9 billion (at P50) and \$10.7 billion (at P90) without inclusion of the Port of Brisbane link.<sup>140</sup> These costs are summarised in Table 9 below. These costs do not include upgrading the existing line to the Port of Brisbane or construction of a new link to the Port.

Table 9: Inland Rail 2015 cost estimates:

Item	P50 Cost Estimate (\$ billion*)	P90 Cost Estimate (\$ billion*)
Base costs (real)	6.9	6.9
Contingency (real)	1.8	2.5
Escalation component	1.2	1.2
<b>Total out turn cost (nominal)</b>	<b>9.9</b>	<b>10.7</b>

\*rounded to the nearest \$100 million

The Implementation Group notes that ARTC's benchmarking of capital cost per kilometre was undertaken against several similar greenfield and brownfield rail construction projects across Australia, including projects delivered by ARTC and others. The results of ARTC's analysis indicate that Inland Rail is comparable with projects of a similar scope. Table 10 (next page) shows how the Hume Highway and the Pacific Highway duplications, as well as the WestConnex project, compare with Inland Rail.

While it would be possible to significantly reduce costs by removing future-proofing aspects of Inland Rail's design, this would no longer meet customer needs and would mean that Inland Rail could not respond to forecast increases in demand without substantial extra expenditure. It would also be possible to reduce costs by reducing the scope of Inland Rail to construction between Moree and Brisbane, however, this would remove any inter-capital benefit for freight between Melbourne and Brisbane and would not resolve the existing issues with freight transiting through Sydney.

<sup>140</sup> Inland Rail Programme Business Case, Table 8.1, p 154.

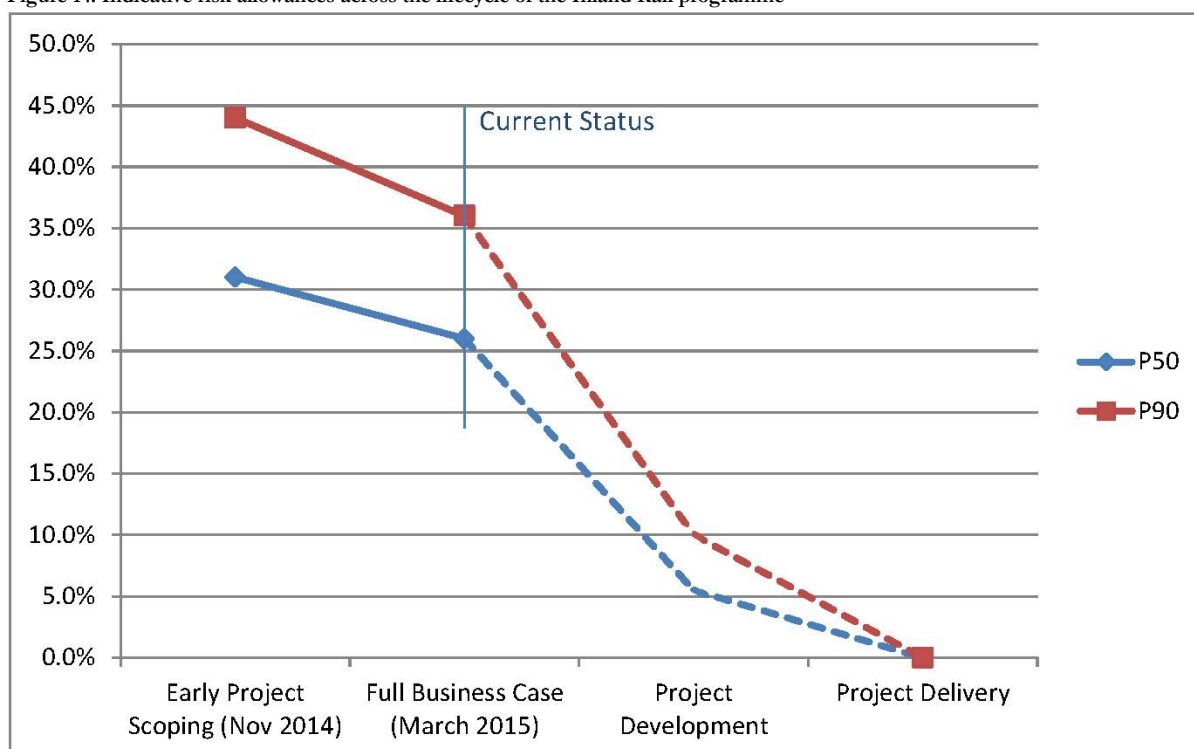
Table 10: Costs of comparable projects to Inland Rail

Project	Description	Cost	Delivery timeframe	Approximate cost/km*
Hume Highway duplication between Melbourne and Sydney	Approximately 810 km of road between Melbourne and Sydney. Staged approach to delivery across a complex programme.	\$15–20 billion (\$2013)	40+ years	\$24.6 m/km
Pacific Highway duplication	Completion of a minimum standards four-lane divided highway between Sydney and Brisbane. Staged approach to delivery across a complex programme.	\$15 billion (\$2010)	1996 – 2020	\$23 m/km
WestConnex	A total of 33 km including a widening of the M4 east of Parramatta, a duplication of the M5 East and new sections of motorway to provide a connection between the two key corridors.	\$14.5 billion (actual)	2015 – 2023	\$439 m/km
Inland Rail	Approximately 1700 km of new and upgraded track to provide a future-proofed rail solution to meet the current and future Melbourne–Brisbane freight task.	\$9.9 billion (P50, \$2015) [\$10.7 billion (P90, \$2015)]	10 years	\$5.7 m/km \$6.3 m/km

\* figures have been rounded

The cost estimates presented in the business case reflect the scoping phase of the programme's development and the associated risk allowances reflect this stage. Both cost estimates and risk allowances will be refined over time. Figure 14 below sets out the indicative P50 and P90 risk allowances across the lifecycle of the Inland Rail Programme.

Figure 14: Indicative risk allowances across the lifecycle of the Inland Rail programme



The Implementation Group notes that the current cost estimates include significant contingency amounts at both the P50 (\$1.8 billion) and P90 (\$2.5 billion) confidence levels. As the programme engineering, design, property and stakeholder requirements are refined over time, greater certainty on risks and, consequently, costs will occur. Activities to improve the reliability of the base estimates and, therefore, reduce risk allowances, could be undertaken to better inform the funding requirements and affordability of the programme. For example, securing the rail corridor to resolve risks associated with major changes to the alignment.

The Department of Infrastructure and Regional Development engaged independent consultants to validate ARTC's cost estimates (including direct and indirect costs, contingency and separately, escalation). In relation to escalation, the costs were separately validated by independent experts and the validation further reviewed by the Bureau of Infrastructure, Transport and Regional Economics.

In relation to the base cost estimate for Inland Rail, the independent experts found that the estimating process for the direct cost component followed good practice and, while some rates were considered to be above market rates in total, this was not expected to increase the base cost by more than \$100 million. The indirect cost component and the estimating rigour were considered reasonable at the current design stage. The contingency allowances of \$1.8 billion (at P50) and \$2.5 billion (at P90) were found to represent 26 and 36% respectively of the base cost, both of which were in the ranges anticipated for major rail infrastructure at the current design stage.

In relation to escalation for the construction programme, the independent validation resulted in a minor upward adjustment at P90 of around 0.8%. This adjustment has been included in the revised costs for Inland Rail incorporated in the programme business case and this report. The bottom-up escalation analysis examined key cost drivers such as labour and material costs and included a sensitivity analysis of those items determined to be most volatile in cost (wages, copper prices as reflected in the cost of electrical cables, and fabricated steel). It was found that even under a high cost scenario for each cost driver (individually and all three together), escalation for the Inland Rail project was relatively insensitive to these factors. Overall, escalation was most sensitive to higher wage growth and least sensitive to copper prices. If all three factors were to escalate in line with the high case scenario simultaneously, the maximum additional escalation in any one year would still be less than 0.5%.

The analysis also found that given the 10-year build, there were a number of factors that could cause an upward spike in construction costs for Inland Rail. These included, for example, a substantial increase in construction activity through new infrastructure projects, resources or major non-residential projects, a global outbreak in materials prices, and lesser competition in the tendering market leading to higher margins and wages. The analysis nevertheless concluded that, while none of these seemed likely in the current market scenario, there remained a risk that unforeseen circumstances and potential economic cycles over the next decade could influence construction costs.

Based on the evidence before it, the Implementation Group has concluded that ARTC's cost estimate has been produced in accordance with good practice and represents a reasonable assessment of the likely cost of Inland Rail based on the scope of works as currently known.

The Implementation Group considers that the most significant risk to cost is the accuracy of the scope capture, which is exacerbated by the geographic extent of the project and the balance between its greenfield and brownfield aspects. In addition, in relation to escalation, there is a risk that, should key conditions (such as significant increases in materials prices or wages) or the Inland Rail construction programme change, there is likely to be an impact on escalation.

The Implementation Group also notes that escalation rates have been calculated to a 10-year programme and that should there be a delay or any substantial changes, this may require recalculation. For these reasons, it would be prudent to monitor key indicators over the course of the 10-year Inland Rail delivery programme and adjust the programme delivery where suitable.

## **Findings and recommendations**

### **Finding**

The Implementation Group finds that the:

- F4.11 2014–15 updated cost estimates for Inland Rail are significantly higher than the 2010 estimates—\$6.9 billion (including future-proofing), and with escalation and contingency \$9.9 billion (at P50) and \$10.7 billion (at P90), without inclusion of the Port of Brisbane link.
- F4.12 The overall size, cost and complexity of Inland Rail is comparable with a number of other large and complex infrastructure programs in Australia.
- F4.13 The most significant risk to cost is the accuracy of the scope capture, which is exacerbated by the geographic extent of the project and the greenfield/brownfield aspects.

### **Recommendation**

The Implementation Group recommends that the Australian Government:

- R4.5 Note that the independent validation shows that ARTC's cost estimate has been produced in accordance with good practice and represents a reasonable assessment of the likely cost of Inland Rail based on the scope of works as currently known.

## RESULTS OF THE BENEFIT-COST ANALYSIS

As noted in the Introduction to this report, the Productivity Commission recently recommended a rigorous BCA for all projects above \$50 million as a useful tool for guiding project selection, improving the transparency and quality of decision-making. The Australian Government noted in response that a BCA is the most appropriate tool to determine the merit of infrastructure projects, and that poorly chosen infrastructure can reduce productivity and financially burden the community for decades.

In 2014 and 2015, ARTC undertook a significant project to determine the BCA for Inland Rail. The findings of this economic assessment are set out in Chapter 9 of the business case.

The Implementation Group is satisfied the work undertaken by ARTC demonstrates that a rigorous process has been undertaken to identify the benefits and costs of Inland Rail.

The Implementation Group accepts that Inland Rail is economically viable, with a positive BCR of 2.62 when measured at the 4% discount rate,<sup>141</sup> meaning that the present value benefits to society from Inland Rail are expected to be around two and half times the present value of costs over the life of Inland Rail. At a 7% discount rate, which gives less weight to future benefits relative to the high upfront capital costs, the BCR is reduced to just above one. At the 7% discount rate, a BCR of around one means that the present value of the benefits to society is roughly equal to the present value of the costs.

A summary of Inland Rail's BCR at the various discount rates follows:

	4% discount rate	7% discount rate	10% discount rate
Economic Benefit-Cost Ratio (BCR)	2.62	1.02	0.55

As with any major project of this nature, the evaluation of financial benefits will depend significantly on the discount rate used. In this context, the Implementation Group considers that it is critical to recognise that a substantial element of the investment in Inland Rail relates to the civil works required to provide the foundation on which the rail track and supporting systems can be laid.

Inland Rail construction works would be permanent in nature, and would likely have a life span of 100 years. By way of example, parts of the proposed network utilise an alignment originally constructed in the nineteenth century. These assets continue to have long-term utility. As a result, parts of the infrastructure will be very long-term in nature and will continue to provide real economic benefit for many generations to come.

From an economic perspective, the business case uses 100 years as the maximum useful life of rail infrastructure, noting that its actual usage will extend over much longer periods via a maintenance plan and replacement of key assets. For example, 2017 will be the centenary anniversary of the completion of

---

<sup>141</sup> Inland Rail Programme Business Case, Table 9.2, pp 176-7.

the east-west continental railway, which currently efficiently and effectively manages the vast majority of the freight task on that corridor.

Sensitivity testing of Inland Rail's BCR for Inland Rail demonstrates that the BCR increases or decreases, if underlying assumptions are changed. ARTC has explored the effect of a range of different scenarios, including changes to costs, which produce BCR results (at a 4% discount rate) ranging from 1.9 (under the revenue maximising rail access price scenario) to 3.6 (under a 30% decrease in capital costs scenario).

A BCR for Inland Rail equal to or above 2.5 would be achieved under a range of circumstances. For example, if the responsiveness of freight operators to price reductions doubled, the BCR would increase to 3.5; or if GDP growth is higher than the base case, the BCR would increase to 2.9. A BCR for Inland Rail above 2.0 is achieved even where, for example, coal prices or GDP growth are lower than forecast.

Doubling the Inland Rail access charge would have the most significant negative impact on demand (with a 71% decrease in Melbourne–Brisbane volumes in 2050), and as a consequence, decrease the BCR to 1.9. While this scenario is a possibility, the Implementation Group notes that it is one that does not take into consideration market forces and the leakage that would occur to other modes should Inland Rail not be price competitive.

While the economic validity of Inland Rail stacks up well against the 30 individual sensitivity tests, the Implementation Group acknowledges that greater variation in risk or opportunity is likely in circumstances where a number of the scenarios occur at the same time. Consequently, packages of upside and downside scenarios were considered based on changes in demand, competition and costs.<sup>142</sup>

The combined package of downside scenarios—representing a combination of weaker demand, greater competition from road transport and higher construction costs—indicates a BCR of 1.4 at a 4% discount rate (0.6 at a discount of 7%), while a combined package of upside scenarios indicates a BCR of 4.1 at a 4% discount rate (1.5 at a discount of 7%).

The full range of scenarios explored by ARTC is set out on pages 181–184 of Chapter 9 of the business case. As noted earlier, Inland Rail would be infrastructure that is long term in nature (100 years), and will continue to provide real economic benefit for generations to come and benefits arising 50 years or more into the future. Use of a low discount rate is considered by some sources (for example the UK Treasury)<sup>143</sup> to be appropriate for long-term economic infrastructure, however, the Implementation Group notes that this is only one factor in the decision-making process. Infrastructure Australia recommends that 4%, 7% and 10% discount rates are modelled in the sensitivity testing in business cases developed as part of the project appraisal process, and the Inland Rail business case has been developed consistent with the Infrastructure Australia recommendations.

---

<sup>142</sup> Inland Rail Programme Business Case, Tables 9.5 and 9.6, pp 186–7.

<sup>143</sup> UK Treasury “The Green Book - Appraisal and Evaluation in Central Government” 2013, pp 26, 27, 98 & 99. <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

The most significant economic benefits flowing from Inland Rail include:

- freight operating cost savings which represent 28% of total benefits due to longer and more efficient container and coal trains that reduce the cost of transporting freight along the corridor. The greatest benefit accrues to diverted road freight given significantly lower operating costs for rail relative to road;
- reduction in freight transit times account for 15% of total benefits as Inland Rail provides a shorter and more direct rail route for inter-capital freight travelling between Melbourne and Brisbane (which bypasses Sydney) relative to the existing coastal route;
- reduced congestion (3%);
- reduced environmental costs (3%) as a result of removing heavy vehicles off the road network; and
- reflecting the long-term nature of Inland Rail benefits and the 100 year life of rail assets, the future stream of benefits beyond the 50 year appraisal period represent 35% of total benefits

The main beneficiaries of Inland Rail include:

- inter-capital freight users as a result of freight operating cost savings, time savings, improved reliability, improved availability and redundancy/resilience to incidents as freight can be transferred to an alternative rail line following flooding or a major incident;
- regional freight as a result freight operating cost savings for coal and agricultural freight and net revenue from exports that would not have otherwise occurred; and
- the broader community as a result of reduced congestion, improved environmental sustainability and improved residential amenity from removing trucks from the roads.

Figure 15: Distribution of Inland Rail benefits by type  
(4% discount rate)

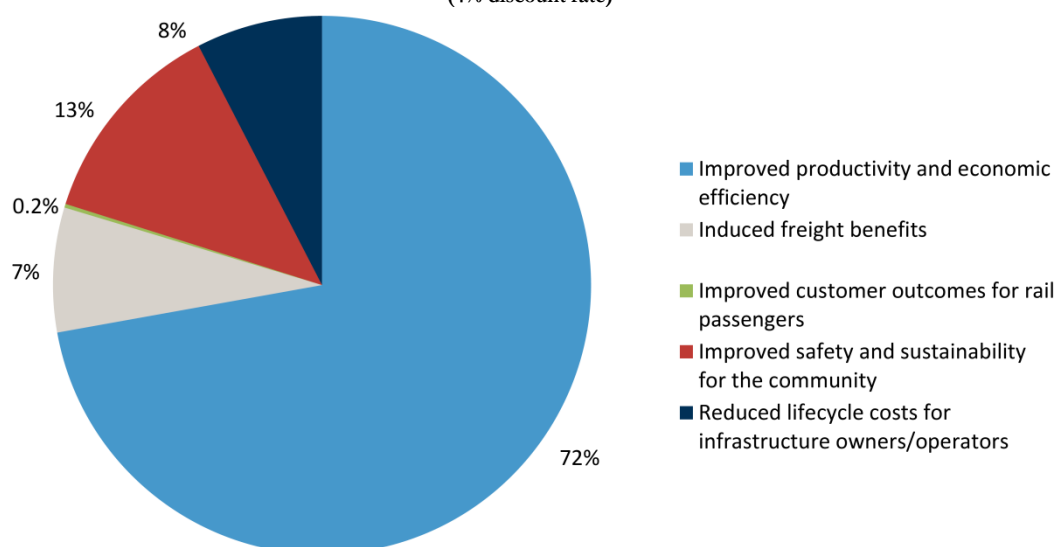




Figure 15 summarises the distribution of total Inland Rail benefits as a proportion of total benefits (at the 4% discount rate):<sup>144</sup>

- 72% arise from improved productivity and economic efficiency;
- 13% arise from improved safety and sustainability for the community; 7% arises from induced freight benefits and 8% from reduced lifecycle costs for infrastructure owners and operators; and
- a small proportion (0.2%) arises from improved customer outcomes for rail passengers.

In addition, modelling has been undertaken to simulate the economy-wide effects of Inland Rail such as flow-on impacts to sectors and regions using the costs and benefits as inputs.

The findings of this work indicate:

- during the construction of Inland Rail, direct capital expenditure is estimated to stimulate economic activity and raise Australia's GDP by around \$1.0 billion and create around 800 Full-Time Equivalent (FTE) jobs each year over the construction period;
- during the operational life of Inland Rail (to 2074–75), it will provide for an average of 600 operational jobs each year, and is estimated to stimulate further economic activity and raise Australia's GDP by a further \$15.4 billion as the direct benefits of Inland Rail begin to accrue and drive cost savings and user efficiencies, and these directly and indirectly benefit freight operators, consumers and industry;
- during construction of Inland Rail, the construction industry will benefit with flow-on effects to the construction industry supply chain to induce additional demand in the financial and business services industries. Industries that are trade exposed such as mining and manufacturing, experience negative impacts over this period as exports contract to accommodate the inflow of foreign capital required to finance construction. As Inland Rail becomes operational, the benefits transition towards the manufacturing and mining sectors through reduced freight input costs;
- during construction, the capital expenditure required for Inland Rail will stimulate activity in Queensland, New South Wales and Victoria. Queensland and New South Wales will receive the majority of the stimulus due to the large share of the Inland Rail corridor developed in each state; and
- Melbourne and Brisbane are estimated to experience the greatest positive economic impact given their relative importance to their respective state economies and the manufacturing and financial sectors that benefit most during Inland Rail's operations are located in these capital cities. During construction, regional areas will benefit from building activity as well as from improved productivity and freight efficiency for the coal industry (e.g. West Moreton) and agricultural industry (e.g. Darling Downs and northern New South Wales). Sydney is estimated to experience a relatively small economic impact from Inland Rail as a supplier to other regions in New South Wales, but it will benefit from a reduction in rail traffic due to Inland Rail.

---

<sup>144</sup> Note the figures in the diagram and in the text slightly exceed 100% due to rounding.

## Findings and recommendations

### Findings

The Implementation Group finds:

- F4.13 The cost-benefit analysis demonstrates that Inland Rail is economically viable at the 4% discount rate with a positive BCR of 2.62, and marginal at the 7% discount rate with a BCR of 1.02, however, the BCR at the 10% discount rate is 0.55.
- F4.14 Inland Rail construction works are permanent in nature, and are likely to have a life span of 100 years. As a result, an investment of this nature merits a low discount rate, particularly for benefits arising 50 years or more in the future.
- F4.15 The most significant benefits of Inland Rail result from:
- freight operating cost savings;
  - reduced freight transit times;
  - reduced congestion;
  - reduced environmental costs as a result of removing heavy vehicles off the road network; and
  - future stream of benefits reflecting the long-term nature of Inland Rail benefits and 100 year life of rail assets;
- F4.16 The main beneficiaries of Inland Rail are:
- inter-capital freight as a result of freight operating cost savings, time savings, improved reliability, improved availability and redundancy/resilience to incidents;
  - regional freight as a result of freight operating cost savings for coal and agricultural freight and net revenue from exports that would not have otherwise occurred; and
  - the broader community as a result of reduced congestion, improved environmental sustainability and improved residential amenity from removing trucks off the road.
- F4.17 Inland Rail will stimulate economic activity in Queensland, New South Wales and Victoria, adding \$16.4 billion (\$2015) to the Australian economy.
- F4.18 Inland Rail will create an average of 800 jobs annually during its 10-year construction programme, as well as new opportunities for the procurement of goods and services, new activities in the farming and mining sectors, new regional businesses and complementary investment from transport operators at a regional level.

## Recommendations

Following detailed consideration of all the evidence before it, the Implementation Group recommends that the Australian Government:

- R4.6 Note that the independently validated benefit-cost analysis undertaken for Inland Rail has been subjected to a rigorous assessment that indicates the economic viability of the programme. Should the Government decide to refer the business case for Inland Rail to Infrastructure Australia, the BCA analysis, in particular, may be subject to further confirmation. For example, ARTC's demand forecasts could be updated once ABS freight movement survey data (due to be progressively released during 2015) become available.
- R4.7 Make the strategic decision to support the step-change in the development of the national interstate network that Inland Rail represents, and by doing so, release the positive national commercial and social benefits rail can deliver in meeting eastern Australia's future freight challenge.
- R4.8 Accept the Inland Rail Programme Business Case developed by ARTC in consultation with key stakeholders, as the most detailed assessment of the role an inland railway can play in meeting eastern Australia's future freight challenge.
- R4.9 Provide the Inland Rail Programme Business Case developed by ARTC to Infrastructure Australia for assessment.
- R4.10 Publicly release the Inland Rail Programme Business Case developed by ARTC for transparency and accountability.
- R4.11 Should it decide not to proceed with Inland Rail, undertake further work on alternative options for addressing the Melbourne to Brisbane freight challenge, with a particular focus on road transport.

## 5. PROPERTY ACQUISITION, LAND TENURE, PLANNING AND ENVIRONMENTAL APPROVALS

ARTC has been tasked by Government at this time to be the delivery body for Inland Rail for this stage of work. While delegating delivery of project construction to ARTC is consistent with the tasking given to ARTC and provides benefits such as network integration, the construction of Inland Rail could equally be delivered by another party. Decisions about the delivery of Inland Rail directly influence how property acquisition and land tenure arrangements are established. Regardless of which entity delivers Inland Rail, strong integration with the existing interstate network operated by ARTC is essential to enable seamless track access, interoperability between segments and ensure above rail operators do not need to purchase specific rolling stock and locomotives to capitalise on the benefits that Inland Rail will provide.

Critical to the delivery of Inland Rail will be the development of Intergovernmental Agreements (IGAs), as these agreements will be required to proceed with corridor protection, corridor acquisition processes and construction activities. The Implementation Group considers that IGAs will need to be in place between the Australian Government and each of the Queensland, New South Wales and Victorian governments to cover, among other things:

- the land tenure model;
- lease terms (including the potential alignment and extension of existing ARTC interstate leases);
- corridor protection and planning approval frameworks;
- processes and responsibilities for land acquisition; and
- access to existing networks that are relevant to Inland Rail.

The recommendations made by the Implementation Group in this section of the report are, subject to agreement by the Australian Government, intended to frame the starting point for government-to-government negotiations that would underpin IGAs. While ARTC is not envisaged to be a signatory to the IGAs, ARTC will have a close interest in the content regardless of its role in delivery, given the interface that is necessary with the existing network and interstate operations. These agreements will set the framework for ARTC's relationship with the states (and, in particular, assistance to be provided by the states), and for any commercial/service level agreement between ARTC and state entities.

The Implementation Group considers that establishment of the required IGAs is a necessary pre-condition for the Inland Rail work programme and that, should the Australian Government decide to proceed with Inland Rail, the negotiation process commence as soon as possible, ideally in 2015.

Delivering Inland Rail will require a complex and extended property acquisition process over the 10-year delivery programme. Chapter 12 of the business case provides detailed information about property acquisition.

While around 65% of the 1,710 km comprising Inland Rail would use existing corridors, the programme includes a significant length of new corridor that needs to be acquired. Approximately 599 km of new corridor will be required in New South Wales (49%) and Queensland (51%), involving 1,068 acquisitions and 1,963 transactions over the 10-year Inland Rail delivery programme (see Table 11 below).

**Table 11: Number of Inland Rail property acquisitions and transactions**

	<b>Total</b>	<b>NSW</b>	<b>Qld</b>
<b>Acquisitions</b>	1,068	545 (51%)	523 (49%)
<b>Transactions</b>	1,963	1,237 (63%)	726 (47%)

While there are currently no proposed property transactions required in Victoria as a result of Inland Rail, the Implementation Group notes that some acquisitions associated with double-stack clearance improvements may be identified as planning work proceeds.

The Implementation Group considers that given the large number of acquisitions/transactions required, a potential risk to delivery of Inland Rail is delay to construction due to land use and ownership. An option for mitigating this risk is advancing and condensing the acquisition programme into an initial three to five year timeframe and would potentially create efficiencies in construction costs.

Overall land acquisition costs are estimated to be around \$0.5 billion.

Planning and environmental approvals are also pre-requisites to the commencement of construction for major projects. Consequently, these approvals are often critically important in setting and meeting project timelines and are significant elements of project and corporate risk strategies.

The Implementation Group considers that given the significance and cost of the land acquisitions involved, establishing clear principles is necessary to guide the process and proposes the following criteria:

- delivery of the best value for expenditure of tax-payer funds;
- land acquisition is undertaken as effectively and efficiently as possible;
- early action is taken to protect the required corridor, along with gaining necessary planning and environmental approvals;
- land acquisition is undertaken in a timely manner to facilitate the Australian Government's commitment to deliver Inland Rail within 10 years; and
- noting Inland Rail is a key piece of national infrastructure, that regardless of the long-term control and management of the rail-line, the asset is preserved in fit-for-purpose condition and remains available as an open access interstate rail corridor for future generations.

Securing the land on which to construct Inland Rail will be a key task that needs to be undertaken as early as possible. The acquisition of land, however, cannot be undertaken until the final corridor for Inland Rail has been locked in, and the detailed alignment cannot be confirmed until all necessary planning and environmental approvals have been obtained—a process which can take a significant length of time (in the order of 24 months). For example, for some large infrastructure projects, timeframes of between 12 and 24 months were required for completion of an environmental impact statement (under Queensland legislation) and environmental assessment (under New South Wales legislation), and up to 12 months to secure additional approvals under other legislation and regulations.

As a result, the Implementation Group considers that if the Australian Government decides to commence construction of Inland Rail, the process for obtaining planning and environmental approvals, corridor preservation and land acquisition needs to start as early as possible, ideally in 2015.

Before land is acquired for Inland Rail, it will also be necessary for the Australian Government to consider and agree an appropriate land tenure arrangement. To assist the Australian Government, the Implementation Group has considered three options for land tenure arrangements in the new corridors. These include ARTC leased/State owned (the model currently used for existing rail corridors in New South Wales, Queensland and Victoria); ARTC leased/Commonwealth owned; and ARTC or other private sector owned.

Under a model where ARTC operates Inland Rail, it will require a form of legal tenure preferably via a lease. ARTC has proposed that if it were to be the operator, in New South Wales, land would be acquired freehold<sup>145</sup> and ultimately folded back into the existing New South Wales Deed of Lease. In Queensland, ARTC proposes that land be acquired by the Department of Transport and Main Roads (DTMR) at the request of ARTC for both corridor and tunnels. Lease and licence agreements would also be required for both construction and environmental purposes.

Constitutional provisions mean that a model involving Commonwealth ownership, while allowing compulsory acquisition under national legislation to be progressed by the Commonwealth, requires approval of the relevant state before the Commonwealth could undertake construction. In addition, the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) would be automatically triggered.

A model involving ARTC or other private sector ownership would provide greatest autonomy for the operator and facilitate disposal of land considered in excess of operational needs, however, it would result in fragmentation of ARTC's rail network in land tenure terms. The ARTC/private operator would also need to rely on state or Commonwealth compulsory acquisition powers.

---

<sup>145</sup> ARTC would attempt to acquire the land through private treaty negotiation in the first instance, and if that is unsuccessful, it would utilise the NSW Government compulsory acquisition procedures.

On balance, the Implementation Group considers that the interests of this nationally significant infrastructure project would be best served by a land acquisition process that provides the greatest legal and commercial continuity and, on this basis, supports a land tenure model that is rail operator (ARTC) leased/State owned. The Implementation Group proposes that this arrangement be supported by adding to existing ARTC leases any relevant existing corridors (such as limited sections of the New South Wales Country Rail Network subject to discussion with, and agreement by, the New South Wales Government) and any necessary agreements between ARTC and the New South Wales and Queensland governments to ensure the efficient and timely acquisition of land on a cooperative basis.

The Implementation Group notes that, depending on Australian Government decisions in relation to both the manner of acquisition of land for, and delivery of, Inland Rail, a situation may arise where ARTC acquires the necessary land but a third party delivers the railway. Should this scenario arise, further consideration would need to be given to arrangements for both the ownership and transfer of land along with other financial and legal implications.

To enable property to be acquired as seamlessly as possible across interests potentially involving two state governments and the Commonwealth, it will be critical to have in place the required expertise such as conveyancers, valuers, surveyors and legal expertise.

The Implementation Group has considered a range of options for ensuring this expertise is available, including building up in-house property acquisition capacity within the delivery body, utilising relevant expertise available within ARTC and relevant New South Wales and Queensland Government agencies supplemented by external expertise, or outsourcing the entire property acquisition process.

In considering these options, the Implementation Group has been mindful of the complexity of the property acquisition task that would occur in New South Wales and Queensland over a 10-year period. It will be critical to the programme that acquisitions are timely, coordinated, and conducted in manner that minimises flow-on effects (for example, litigation) that have the potential to delay or disrupt the delivery of Inland Rail.

On balance, the Implementation Group considers that these outcomes can be most effectively achieved by utilising in combination the existing skills across New South Wales (ARTC and Transport for New South Wales) and Queensland (DTMR) with the engagement of external specialist expertise when required as the most efficient and cost-effective option.



## Findings and recommendations

### Findings

The Implementation Group finds that:

- F5.1 Should the Australian Government decide to proceed with Inland Rail, IGAs between the Australian Government and the New South Wales, Victorian and Queensland governments will be required. Government-to-government negotiations should commence as soon as possible, ideally in 2015.
- F5.2 Overall land acquisition costs for Inland Rail will be in the order of \$0.5 billion.
- F5.3 The acquisition of land should start early as possible, but notes that property cannot be acquired until the alignment for Inland Rail has been settled, and the alignment cannot be confirmed until the necessary planning and environmental approvals have been obtained—a process which can take between 12 and 24 months.
- F5.4 In order to minimise the risk of delay to the construction of Inland Rail, the process for obtaining planning and environmental approvals should commence as soon as possible, ideally in 2015.

### Recommendations

The Implementation Group recommends that the Australian Government:

- R5.1 Agree to commence the process for obtaining planning and environmental approvals for Inland Rail as soon as possible, ideally in 2015.
- R5.2 Agree that the following model for property tenure be used as the basis for negotiations between the Australian Government, relevant state governments and the delivery authority (currently ARTC):
  - in New South Wales, that the delivery body (at this stage ARTC) acquires the land (including any partial interests such as easements) for the new corridors in freehold (by private treaty or through New South Wales compulsory acquisition provisions), and that the land ultimately be incorporated into the New South Wales ARTC lease; and
  - in Queensland, the DTMR at the request of the delivery body (at this stage ARTC) continues to acquire land for the corridor and tunnel (stratum), with ultimate land tenure incorporated into an extension of ARTC's lease.
- R5.3 Agree, that under an ARTC-led delivery model, in New South Wales, ARTC uses its in-house acquisition team and outsources the valuation, negotiation and surveying functions, and in Queensland, ARTC utilises the DTMR in-house property team for agreements (subject to agreements between governments), noting this would require revaluation should another third party deliver Inland Rail.

- R5.4 Agree that ARTC engage with the New South Wales and Queensland governments to explore incorporating the relevant parts of the existing Country Rail Network corridors in New South Wales and Queensland Rail corridors (that relate to Inland Rail) into ARTC's existing leases and to ensure the efficient management of Inland Rail, all related leases have aligned end dates.
- R5.5 Agree that this report form the basis for government-to-government negotiations to underpin IGAs to be entered into between the Commonwealth and the New South Wales and Queensland governments for matters including, but not limited to, compulsory acquisition of land, registration of plans and exemption from stamp duty.
- R5.6 Adopt the following principles to guide the land acquisition process:
- delivery of the best value for expenditure of tax-payer funds;
  - land acquisition is undertaken as effectively and efficiently as possible;
  - early action is taken to protect the required corridor, along with gaining necessary planning and environmental approvals;
  - land acquisition is undertaken in a timely manner to facilitate the Australian Government's commitment to deliver Inland Rail within 10 years; and
  - noting that Inland Rail is a key piece of national infrastructure, that regardless of the long-term control and management of the rail-line, the asset is preserved in fit-for-purpose condition and remains available as an open access interstate rail corridor for future generations.

## 6. FINANCING STRATEGY

A key challenge for Government in delivering Inland Rail is funding or financing the programme's large construction cost (\$9.9 billion at P50, \$10.7 billion at P90).<sup>146</sup>

While the Inland Rail programme is economically viable, offering a BCR of 2.62 (at a 4% discount rate), independent financial advice indicates that there are limited opportunities for private sector financing of Inland Rail without significant risk transfer to Government. The size of the market and the forecast revenue is insufficient to recover the capital costs and consequently revenue guarantees and availability payments would be required should private sector financing be utilised. The key reasons for the inability to attract private sector financing to Inland Rail from the outset of the programme include:

- the construction costs are large relative to the value of the operating cash flows
  - the financial returns that will be generated over the first 20–30 years of Inland Rail will be relatively low due to the high capital costs of building the network and the significant time before revenues are generated;
- risk
  - Inland Rail entails significant construction risks;
  - while the business case indicates that revenues will cover operating and maintenance costs, the forecast revenue does not cover the construction costs;
  - Inland Rail is expected to be competitive only when the whole alignment has been completed and investors would want certainty that there are sufficient funds for construction of the whole railway to the proposed specification;
  - the difficulty in prescribing a market value to Inland Rail given construction risk and the highly uncertain nature of cash flows;
  - to close this gap would require significant Australian Government guarantees and availability payments, meaning the downside risk remained with the Australian Government while the upside benefit would be retained by the private sector financier;
- the project has a significant viability gap
  - the forecast operating cash flows would only support minimal private sector capital (around 5% of the capital cost); and
- Inland Rail is a new asset with no proven track record in relation to demand
  - should key assumptions in the demand forecasting change (such as access by B-triples on the Newell Highway or investment in the coastal rail line which improves its competitiveness), significant cash flow support would be required from the Australian Government.

---

<sup>146</sup> P50 and P90 are respectively the project costs with sufficient contingency to provide a 50% and 90% likelihood that these costs will not be exceeded.

In summary, the characteristics of Inland Rail such as the 10-year construction period, the significant time before revenues are realised, and the need for a completion of the project (including track upgrades) in order to capture additional revenues introduce significant risk for private sector investors. Advice indicates that it is these factors that make mechanisms such as an economic public private partnership (PPP) unfeasible. Any PPP is unlikely to bring any meaningful reduction on the Australian Government's balance sheet, and is likely to bring additional risk to the Australian Government through undertakings that would be required by private sector investors.

As a result, private sector financing would be an expensive alternative when compared to direct funding by the Australian Government. Structures involving private sector financing would result in demand and construction risks remaining with the Australian Government, without the commensurate benefits, negating some of the benefits of a typical PPP. Similarly, the requirement for extensive and cross-jurisdictional negotiations with State Governments, network interface, property acquisition and stakeholder management present risks, which at least in part remain with government. The funding raised is unlikely to materially reduce the Australian Government's funding requirement and will limit the ability for the Australian Government to use other mechanisms (for example, equity or concessional loan) to recognise its contributions as an asset on the balance sheet rather than a grant funded through the Budget.

Financing the project through the Australian Government balance sheet is not only more cost effective for Inland Rail,<sup>147</sup> it provides flexibility and does not preclude disposal of the asset or forward selling of revenues once the rail line is operational and there is greater certainty on its operational returns.

At this later stage, Inland Rail's market position in relation to volumes and mode share will be known. Construction risks will be significantly mitigated (but subject to performance risk over the remaining life of the asset). The market value of Inland Rail based on revenues would be quantifiable post-completion and, assuming forecasts are realised, a significant proportion of the theoretical value may be realised at the point of sale. Independent advice notes that there is a ready market for brownfield assets provided volume risks can be quantified and managed. Leveraging this at a mature stage of development is likely to achieve the highest value for the Australian Government.

Public sector funding will be required should the Australian Government decide to proceed with Inland Rail. This funding will need to be provided in the most efficient way possible. A range of alternatives exist, including through traditional Government mechanisms such as grant, equity and concessional loans. In general, the key mechanisms operate in the following way:

- **A grant:** allocates funds to a third party for an expenditure purpose but does not create an asset that is recognised on the Australian Government's balance sheet. While capable of being used as the sole funding instrument, it can be paired with other mechanisms. A grant involves minimal

---

<sup>147</sup> This does not necessarily hold true for other infrastructure projects. It is the specific circumstances of Inland Rail that mean private sector financing is less feasible at this time.

risk for Government as the outlay is capped, and construction and operating risks are retained by the entity overseeing the project.

- **Equity:** this mechanism involves the Government taking an equity stake in the new or existing entity. Equity would be contributed during the construction period when the funds are required for construction works. An equity investment could only be used to fund Inland Rail in its entirety if the project cash flows supported the equity injection at the appropriate rate of return for the investment. That rate of return may be lower than the rate the private sector would use to determine the equity value for their purposes. An alternative is for the project to support the maximum equity investment possible, assuming an agreed rate of return, with any resulting capital shortfall then funded as a grant.
- **Concessional loan:** is a debt instrument provided by the Australian Government at a rate that is lower than the rate that would be offered by private sector debt provided. Relative to private sector debt facilities, more favourable debt structuring assumptions and lower interest rates are likely to permit a higher notional value for the concessional loan instrument than any private sector debt available. A concessional loan could be combined with Australian Government equity and a grant.

There is also the option of building then selling future revenues once construction is complete. This does not fund Inland Rail's construction, nor does it solve the immediate funding challenge for Government, however, it does potentially bring forward the realisation of forecast revenues and could be combined with other options such as equity, grant and concessional loans. The Implementation Group notes that there is no decision to be made on this aspect at this time as Government could consider the option of future sale of revenues during project delivery or post completion. The Implementation Group considers that, ultimately, the funding mechanism to deliver Inland Rail from the Australian Government's balance sheet is necessarily a matter internal to the Australian Government.

The Implementation Group has concluded that there is limited scope for private sector financing, and as a result, there is a strong role for Government to play funding the upfront capital costs of Inland Rail. At the time of writing this report, the Implementation Group is aware that further independent expert advice on alternative mechanisms through which the Australian Government could fund the Inland Rail Programme is being prepared.

While the Implementation Group notes that a private sector financed solution such as a PPP will cost the taxpayer more than Government using its balance sheet, there are nonetheless merits to having private sector participation in the delivery of Inland Rail due to the commercial approach that would be taken, particularly around the management of delivery risks, helping to keep costs down. Conversely, an area where private sector delivery of Inland Rail may not be as beneficial is in managing the interface with the existing rail network. One means of capturing the merits of private sector participation without the downside risk is through a competitive design and construction procurement process as part of the project delivery phase.

## ARTC SCOPING STUDY

The Implementation Group notes that in 2015–16 the Government, through the Department of Finance, is undertaking a scoping study in response to a Commission of Audit recommendation to determine options for the future management, operation and ownership of ARTC. The Australian Government has indicated that recommendations from this study will be considered as part of the 2016–17 Budget process.<sup>148</sup> The Australian Government has not, at the time of writing, taken a decision to privatise ARTC.

This report does not consider the scoping study into ARTC as it is beyond the scope of the Implementation Group's terms of reference. Any potential future sale of ARTC would not preclude the Inland Rail programme from continuing either via a privatised ARTC or another delivery party, however, it would reduce some options for delivery and operations. The Implementation Group notes that it also creates uncertainty in the short-term until ARTC's future is resolved, including in regards to necessary lease negotiations with State Governments.

## Findings and recommendations

### Findings

The Implementation Group finds that:

- F6.1 Inland Rail will require significant, if not total, funding from Australian Governments.
- F6.2 There are limited opportunities for upfront private sector financing of Inland Rail (without significant risk transfer to the Australian Government) because of the long construction period, the significant time before revenues are realised, and the need for a completion of the project (including track upgrades) in order to capture additional revenues.
- F6.3 Private sector financing options would in all probability cost Government more than funding the project from its balance sheet due to the undertakings that would be required by the Government to private sector investors, and would be unlikely to bring any meaningful reduction on the Australian Government's balance sheet.
- F6.4 A number of mechanisms could be used by the Australian Government, alone or in combination, and include grants, equity, availability payments, concessional loans and Australian Government sale of forward revenues as part of a build then sell strategy.

---

<sup>148</sup> 'Smaller government – Transforming the public sector', Media Release MC 20/15 11 May 2015, the Hon Mathias Cormann, Minister for Finance available at <http://www.financeminister.gov.au/media/2015/0511-smaller-government.html>

## Recommendations

The Implementation Group recommends that the Australian Government:

- R6.1 Seek further advice on how it may effectively use its balance sheet to fund construction given the Implementation Group has determined private sector financing would be an expensive alternative when compared to direct funding by the Australian Government, it is unlikely to materially reduce Australian Government funding requirements, and that no fully funded private solution for Inland Rail was identified.

## 7. THE PORT OF BRISBANE LINK

The Deputy Prime Minister requested the Implementation Group examine a dedicated freight route to connect Inland Rail to the Port of Brisbane. While Inland Rail focuses on inter-capital freight, the Port of Brisbane extension would provide an efficient, complementary link for Australia's international trade.

During 2014 and 2015, ARTC undertook a desktop pre-feasibility study into a potential Port of Brisbane link to provide advice to the Implementation Group on if, when and in what form an extension should be designed and constructed. Details about the Port of Brisbane study undertaken by ARTC are set out in Chapter 17 of the business case. This study represents the most comprehensive assessment to date for a potential Port of Brisbane link.<sup>149</sup>

There is currently no 24/7 dedicated freight rail route to the Port of Brisbane (Australia's largest port by volume), which is heavily reliant on the transport of freight by road. Freight shares the passenger rail network through some of Brisbane's most urbanised inner-city neighbourhoods. During peak hours, there are no rail freight services to the Port.

Conflicts on the rail network are increasing as demand for both freight and passenger services grow, pushing business away from rail towards road-based options. Trucks carry most freight into the Port of Brisbane—a situation that is already causing congestion on Brisbane's roads—and this trend is predicted to worsen. Modelling shows that between 2026 and 2031 major roads into and around the Port of Brisbane will be over capacity resulting in serious peak-hour congestion, and trucks will be forced into using local streets.

Without dedicated freight rail access to Queensland's major international gateway, the State's future productivity and competitiveness has the potential to be constrained.

---

<sup>149</sup> The Implementation Group has also noted the October 2014 study by BITRE, which examined a case study for a concept project for a 300 km long dedicated heavy rail freight line from the Surat Basin to the Port of Brisbane, concluded that it would provide the potential for freight movements to avoid major arterials that are becoming increasingly congested and separate freight and passenger train paths on the busy City train network. The proposal examined by BITRE was found to have a very high cost of construction, linked to the scale and complexity of the task of constructing a new railway through difficult terrain as well as an established and well utilised urban rail corridor. The BCR for the proposal examined by BITRE was calculated at 0.23 at a 7% discount rate and, as a result, was found to be financially unviable for the purpose of the concept study. It is important to recognise that the findings of this case study are driven by the data and assumptions used, and it is acknowledged that a full investigation into the project proposals reflecting the latest project definition and market conditions could reach different conclusions. *Final Report A study of the potential for dedicated freight infrastructure in Australia*, BITRE, October 2014 Update.



A Port of Brisbane link has the potential to:

- establish a port-to-port national freight network, with improved freight travel times, capacity and reliability;
- reduce congestion on south-east Queensland's road network by providing an incentive to send goods by rail instead of road;
- support the growth of import and export markets by enabling the port's expansion;
- develop a route to market for increased agricultural produce;
- unlock the potential for increased coal exports;
- remove rail freight from the existing passenger rail line, resulting in faster more frequent and reliable freight trips; and
- resolve conflicts between inner-city residential communities and freight operators.

The first stage of the study conducted in 2014 considered four potential corridors for the port link:

- upgrading the existing rail connection to the Port of Brisbane;
- the Eastern Freight Rail Bypass (EFRB), which broadly follows the Gateway Motorway, below natural ground level where possible and including two tunnels totalling 9.2 km;
- the Long Tunnel option, incorporating a 17 km tunnel from near Acacia Ridge to a point close to the Port; and
- the Electrified Tunnel option, a 26 km electrified tunnel from Larapinta, south of Acacia Ridge, to near the port.

The four options are illustrated in Figure 16 (next page).

Figure 16: Corridor options assessed for the Port of Brisbane extension



All options were designed to be operationally compatible with Inland Rail and to meet higher anticipated demand due to the additional intrastate freight demand from networks other than Inland Rail that will use the port connection.

Supplementary analysis identified two potential options, the Eastern Freight Rail Bypass and the Long Tunnel, with the lowest cost option (the Eastern Freight Rail Bypass) estimated at around \$2.5 Billion (P50, \$2015).<sup>150</sup> Further planning is required before a preferred option (and associated corridor) can be selected.

While a dedicated freight rail link to the Port of Brisbane is proposed to be a single track, double-stacked, dual gauge line with future proofing to allow for double track, a key question considered by the Implementation Group was the potential demand for the link to the Port of Brisbane, as this would inform decisions about when the port link would be required.

ARTC's work indicated that with Inland Rail in operation (single-stack only), the existing freight route to the port is expected to reach capacity in 2023 (assuming the most likely scenario of medium growth) if no investment is made to improve it and if limitations such as peak hour curfews remain in place. Scope

<sup>150</sup> Note, the costs associated with the dedicated rail link to the Port of Brisbane were undertaken on the basis of a desktop assessment and have not had the same depth of analysis or independent validation as the core Inland Rail link between Melbourne and Brisbane (Acacia Ridge).

exists to expand freight operations on the existing corridor, which would delay the need for a new Port of Brisbane link.

Modelling suggested that demand for train trips to the port could be satisfied with staged upgrades to the existing network for several decades (assuming a medium growth scenario and the intensification of freight distribution services around the future Ebenezer intermodal terminal, plus reduced fixed rail operating costs). If logistics operations remained located around the port and Acacia Ridge, this date would be even later; however, this is necessarily subject to policy decisions that are at this time the domain of the Queensland Government.

Port shuttles are potentially the biggest determinant of overall freight demand. Their volume is heavily dependent on fixed costs and Government policies such as those relating to land use. If fixed costs reduced, or if Government land use policy changed (affecting terminal location), port shuttle demand in 2045 would increase by a factor of between four and 18.

Other changes to the existing rail network, such as more frequent commuter services or new Government policy to grow rail mode share, could bring forward the date by which a new route is needed.

The Implementation Group notes that while the business case postulates possible opening dates for the Port of Brisbane extension of 2029–30 and 2040–41, alternative demand scenarios and policy decisions could result in a need for the link at dates earlier or later than these.

The Implementation Group considers that on the evidence, if:

- no investment is made to improve the existing route to the Port of Brisbane and if limitations (such as peak hour curfews) remain in place, the existing freight route will reach capacity by 2023;
- modest investments are made, for example to allow longer trains to use the existing route (1,010 metres compared to 655 metres at present), even under a higher demand scenario, the existing route would meet demand until 2029–30 and 2040–41 under a lower demand scenario; and
- more substantial investments are made to allow for longer trains of 1,500 metres, the capacity of the existing corridor would be extended to meet demand until 2043–44 under a higher demand scenario and 2069–70 under a lower demand scenario.

Nevertheless, the Implementation Group considers that determining the optimum time to construct the new route is not straightforward given the many variables in forecasting demand and the potential for Government policy changes over the coming decades.

While a dedicated freight rail link to the Port of Brisbane (the Port link) produces benefits (for example, operating cost savings to coal and agricultural freight, reduced congestion, accidents and environmental costs), these benefits would not begin to be realised until at least 2029–30 or more likely, 2040–41. The effect of the deferred benefits on Inland Rail's BCR (when combined with the port link) is to reduce it

from 2.4 (Inland Rail alone) to 2.1 (with the port link) at a 4% discount rate. Bringing forward the timing of capital expenditure on the port link further reduces the BCR to 2.0 at a 4% discount rate.

On the available evidence, the Implementation Group considers that the port link will be required and should be built. Determining the optimal timing for its construction however, will be critical given the multiple variables at play. The Group considers at this stage, that the port link should be continued as a separate but complementary project to Inland Rail. While the Implementation Group has concluded that the Inland Rail Programme should commence in the immediate future, it considers that the port link requires further consultation with the Queensland Government to settle the need for and timing of upgrades to the existing line, the detailed alignment for the port link and its optimal timing. Once these matters are settled, work should commence on the detailed planning and environmental approvals required enabling the corridor to be preserved and construction of the Port of Brisbane link to commence at the appropriate time in the future.

## **Findings and recommendations**

### **Findings**

The Implementation Group finds that:

- F7.1 The dedicated rail link to the Port of Brisbane from the Acacia Ridge will be required and should be built, but determining the optimal timing for its construction will be critical.
- F7.2 The Port of Brisbane link would provide a range of additional benefits including operating cost savings to coal and agricultural freight, reduced congestion, accidents and environmental costs.

### **Recommendation**

The Implementation Group recommends that the Australian Government:

- R7.1 Agree that the Port of Brisbane link proceed as a project that is separate from, but complementary to, Inland Rail and, as a next step, work with the Queensland Government, the Port of Brisbane and ARTC to:
  - settle the need for, and timing of, upgrades to the existing line;
  - determine the detailed alignment and optimal engineering solution for the port link;
  - identify the optimal timing for commencing construction of the port link; and
  - identify opportunities to minimise the capital costs of the port link.

## 8. INLAND RAIL DELIVERY STRATEGY

### A 10-YEAR PROGRAMME

During 2014 and 2015, ARTC developed an indicative 10-year delivery programme for Inland Rail with completion by June 2024. The 10-year delivery strategy responds to election policy commitments in 2013 that, if elected, a Coalition Government would task ARTC to work with interested parties to establish a staged, 10-year approach to the construction of Inland Rail, with construction to commence within three years.<sup>151</sup>

The 10-year indicative programme is set out below in Figure 17. Assuming a 2015 commencement date, the proposed 10-year programme would see:

- By June 2022:
  - single-stack service between Melbourne (Tottenham) and Parkes;
  - double-stack service between Parkes and Brisbane (Acacia Ridge); and
  - dual-gauge service between Yelarbon (New South Wales/Queensland Border) and Brisbane (Acacia Ridge) providing through connections from Inland Rail to the Queensland narrow-gauge network.
- By June 2024:
  - double-stack service between Melbourne (Tottenham) and Brisbane (Acacia Ridge).

This staged approach brings forward some of Inland Rail's key benefits. To achieve these outcomes, the programme has been developed on the following basis:

#### Priority projects

- Early commencement of priority construction projects in New South Wales, namely:
  - Narrabri to North Star; and
  - Parkes to Narromine.
- Early commencement of priority development projects in Queensland, namely:
  - Gowrie to Rosewood (including the Toowoomba Range tunnel and Little Liverpool Range); and
  - Grandchester to Rosewood to Kagaru.

While the priority projects could commence over the next 18 months with some benefits starting to be realised from 2016, these benefits will be limited in the absence of the whole of Inland Rail.

---

<sup>151</sup> *Inland Rail-The future of freight*, Media release, the Hon Warren Truss MP, Leader of the Nationals, Shadow Minister for Infrastructure and Transport, 28 August 2013. Other statements also confirm a 10-year delivery timeframe, including that Inland Rail will be completed by 2025 in *Our Plan for regional Australia*, Nationals; and that within a decade, Inland Rail will be needed from Melbourne to Brisbane in *A strong Australia, the values, directions and policy priorities of the next Coalition government*.

## Missing link and enhancement projects

- Focus on missing-link projects (providing standard gauge) in Queensland, namely:
  - Yelarbon to Oakey; and
  - Oakey to Gowrie.
- Focus on missing-link projects (providing standard gauge) in New South Wales, namely:
  - Narromine to Narrabri; and
  - North Star to Yelarbon.
- Focus on the following enhancement project (providing double-stack capability, passing loops) in Queensland, namely:
  - Kagaru to Brisbane.
- Followed by finalisation of the remaining missing-link project in New South Wales, namely:
  - Illabo to Stockinbingal; and
- Then enhancement projects (providing double-stack capability and passing loops) in New South Wales and Victoria, namely:
  - Albury to Illabo (New South Wales);
  - Stockinbingal to Parkes (New South Wales); and
  - Melbourne to Albury (Victoria).

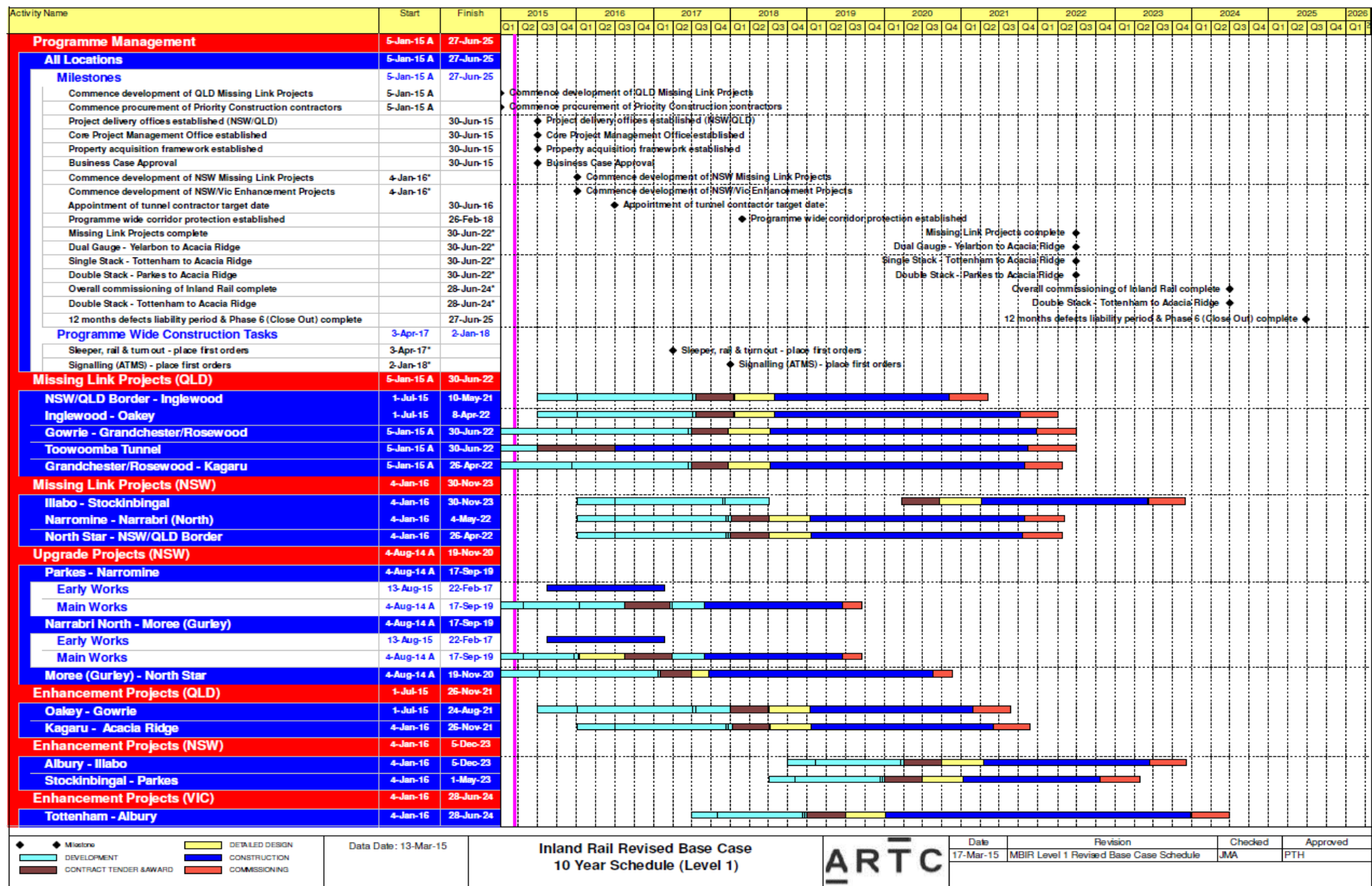
Key non-construction activities for each section would be undertaken early and as per available funding in order to identify and deal with risks early. This includes for each section: concept design, investigations, feasibility design, environmental planning, corridor protection works, and property acquisition (subject to funding).

‘Resource levelling’ would also be undertaken so that resource constraints across the programme are taken into account for specialist activities such as bridge construction, track work, signalling and commissioning. The Implementation Group considers that ARTC has set out a reasonable approach in its indicative programme. It provides some opportunities to stage construction, with a subsequent deferral of some Inland Rail costs to a later time. But, conversely, the disadvantage of a staged approach is the inevitable additional costs that will be incurred for later stages of the project as the costs of construction rise over time, imposing additional escalation costs on the programme.

The Implementation Group considers that until a firm commitment is provided by the Australian Government, it will not be possible to develop a final approach for delivery as this is dependent on an assured funding stream and the years in which the amounts will be available.



Figure 17: ARTC's 10-year indicative Inland Rail Programme





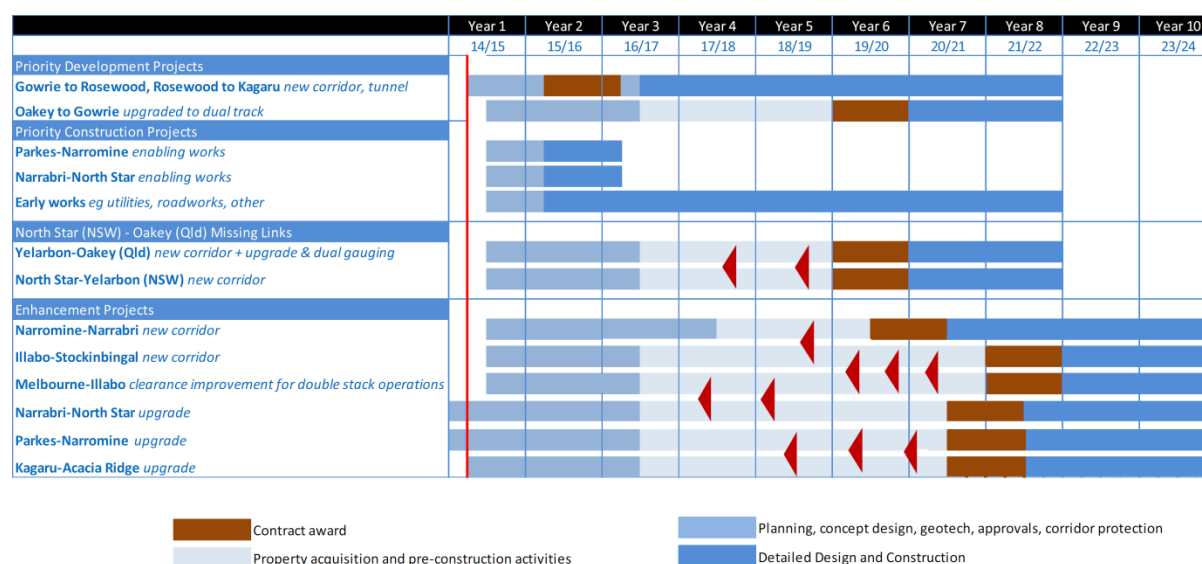
## Alternative Delivery Strategies

The Implementation Group notes that there are other strategies for delivering Inland Rail.

It would be possible to construct the railway over a period longer than 10 years, but the benefits of double-stacking, reduced transit time and increased reliability would not be realised until Inland Rail was completed. An extended staged approach to Inland Rail would have a significant impact on the ability of Inland Rail to pick up market share and a consequential impact on revenues and the economic efficiency of the infrastructure. Due to the nature of railways, standalone segments constructed in the absence of a through link would be stranded assets.

An alternative is a shortened delivery period. The work undertaken by ARTC indicates that subject to funding and approvals, an eight-year delivery is possible. Staging the delivery of Inland Rail over eight years (instead of the 10 year programme requested by the Australian Government) may deliver greater value for money and improve the affordability of the programme through reduced construction out turn cost and reduced overhead and management costs resulting from a shorter delivery schedule. It would also bring forward the full benefits of the programme including additional revenues; however, the Implementation Group considers that this requires further testing to ensure that the benefits of earlier delivery are realised. An indicative eight-year programme of works is set out below in Figure 18.

Figure 18: Alternative Inland Rail delivery schedule (over eight years)



## FUNDING

The Implementation Group also accepts, based on the current work plan, the estimated cash flow required for construction over the life of the Inland Rail Programme. Table 12 below sets out the indicative cash flow required over the 10-year Inland Rail delivery programme. The Group notes that, assuming a 2015–16 commencement of funding for Inland Rail, the bulk of the funding will be required in 2019–20. The Implementation Group understands that funding for the Pacific Highway duplication tapers off around this date as that project approaches completion.

**Table 12: Indicative cash flow for 10-year delivery programme for Inland Rail (based on P50 and P90 out turn cost estimates) commencing 2015–16**

<b>Funding required</b> 152	<b><u>Year 1</u></b>	<b><u>Year 2</u></b>	<b><u>Year 3</u></b>	<b><u>Year 4</u></b>	<b><u>Year 5</u></b>	<b><u>Year 6</u></b>	<b><u>Year 7</u></b>	<b><u>Year 8</u></b>	<b><u>Year 9</u></b>	<b><u>Year 10</u></b>
<b><u>P50 \$m</u></b>	191.6	628.4	858.4	2053.1	3392.4	1995.2	578.1	135.0	13.2	2.3
<b><u>P90 \$m</u></b>	209.6	677.2	925.1	2212.5	3655.9	2150.1	623.0	145.5	14.2	2.5

The Implementation Group notes that the indicative cash flow does not include smoothing. Opportunities exist to smooth the flow of capital as the project progresses and for the flow on implications to be worked through at the time.

The Implementation Group also considers that there is a key strategic risk facing the Inland Rail programme. As an infrastructure project that would be delivered over 10 years, it will cross three federal electoral cycles and require the commitment of successive governments to bring it to completion. As a programme with a total cost of around \$10 billion, should the commitment to completing the project change at any point over the 10-year programme, there is a significant risk of creating stranded assets, potentially resulting in the poor allocation of taxpayer funds and the opportunity loss of creating a step-change in east coast freight transport.

## Findings and recommendations

### Findings

The Implementation Group finds that:

- F8.1 ARTC's indicative delivery schedule for Inland Rail responds to the Government's request for a 10-year delivery programme and sets out a reasonable approach which provides some opportunities to stage construction, with a subsequent deferral of some Inland Rail costs to a later time (noting this would incur additional costs for later stages as the costs of construction is forecast to rise over time, imposing additional escalation costs on the programme).

---

<sup>152</sup> P50 and P90 are respectively the project costs with sufficient contingency to provide a 50% and 90% likelihood that these costs will not be exceeded. The costs in this table reflect the funding required going forward and do not include the \$41.2 million allocated to date, which forms part of the total cost of the programme. Of the funding required, \$258 million remains available from the \$300 million existing commitment.

F8.2 Value for money and affordability may be improved by delivering Inland Rail over eight years through reduced construction out turn costs and reduced overhead and management costs, resulting from a shorter delivery schedule and resulting in bringing forward the full benefits of the programme (including revenue); however, this would require further testing to validate this aspect if the Government sought to pursue a shorter delivery model.

## **Recommendations**

The Implementation Group recommends that:

- R8.1 Should the Australian Government remain committed to delivering Inland Rail over 10 years, that it adopt ARTC's indicative schedule as a reasonable approach to construction, and make available the required funding from the 2016–17 Budget onwards.
- R8.2 Should the Australian Government wish to further investigate the potential for increasing the affordability of Inland Rail, by constructing it over a period of eight years, ARTC be asked to undertake further work to quantify the value for money that may result from a shorter construction period.

## **PROJECT GOVERNANCE**

Inland Rail is currently being developed with ARTC as the delivery agency. While the use of ARTC has facilitated a quick commencement to Inland Rail, avoiding the need to establish a separate delivery authority and, consequently, minimising the overheads that a new authority would incur, it does not preclude a separate authority being established in the future, or for Inland Rail to be delivered or operated by another organisation. The governance structure that is ultimately chosen will depend on how the Government decides to deliver Inland Rail, should the project proceed.

Regardless of the entity that delivers Inland Rail, the Implementation Group considers it essential that there is strong integration with the existing interstate network operated by ARTC to enable seamless track access and interoperability between segments and to ensure that above rail operators do not need to purchase specific rolling stock and locomotives to capitalise on the benefits that Inland Rail will provide.

Strong governance will be required regardless of whether ARTC remains the delivery authority or another party takes on this responsibility. This is particularly important as the financial advice to date indicates a substantial component of Government funding will be required, reducing the incentive for any delivery authority to look for opportunities to reduce expenditure, regardless of whether they are public or private. If Government proceeds with Inland Rail, the manner of funding the programme will also influence the governance structure that is chosen.

It is important to note that the Implementation Group differentiates between overall project governance and the legal status of the entity that delivers Inland Rail. The Implementation Group considers that there

may be financial and legal considerations that warrant a separate legal entity being established, but the overriding consideration is that, given the complexity of a significant infrastructure project like Inland Rail, it will be critical to have a governance structure that delivers the right skills to provide the required oversight and lead the project to completion. These skills would include commercial, legal, financial as well as technical. The mechanism to achieve this, however, is ultimately a matter for the Australian Government. The Implementation Group understands that the Government will be provided with further advice provided by the Department of Infrastructure and Regional Development and other appropriate agencies.

## **Findings and recommendations**

### **Findings**

The Implementation Group finds that:

- F8.3 While ARTC is an option to deliver Inland Rail, it is not the only option.
- F8.4 An option for the Australian Government is the creation of an appropriate alternative structure (such as the establishment of a specific delivery authority) to deliver Inland Rail.
- F8.5 It will be essential to ensure that whatever model is adopted, state governments, and ARTC (if it is not the delivery body) are represented to ensure integration with the rest of the interstate network.
- F8.6 Given the complexity of a significant infrastructure project like Inland Rail, it will be critical to have a governance structure that delivers the right skills to provide the required oversight and lead the project to completion. The mechanism to achieve this is ultimately a matter for the Australian Government.

### **Recommendations**

The Implementation Group recommends that:

- R8.3 The Australian Government further investigate and establish an appropriate governance structure for the delivery of Inland Rail that includes commercial, legal, financial and technical skills as well as accountability. How best to involve the relevant state jurisdictions and ARTC will also require consideration.

## 9. EXPENDITURE STRATEGY FOR THE INITIAL \$300 MILLION

The Deputy Prime Minister has sought advice from the Implementation Group on options for the initial \$300 million in Government expenditure, including opportunities to commence early construction works.

This funding has been provided by the Government as follows:

2013-14 (\$m)	2014-15 (\$m)	2015-16 (\$m)	2016-17 (\$m)	2017-18 (\$m)	<b>Total (\$m)</b>
1.3	29.6	100.0	100.0	69.1	<b>300</b>

To date, of the \$300 million committed for Inland Rail, \$41.2 million has been committed for a range of activities including:

- progressing design and investigation for the Parkes–Narromine and Narrabri–North Star (New South Wales) priority construction projects, and the preparation of tender documentation so that early construction works on these projects are at the ‘ready to tender’ stage by July 2015;
- concept design for the Gowrie–Rosewood–Kagaru (Queensland) priority development project, which includes the new alignment and tunnel through the Toowoomba Range and the Southern Freight Rail Bypass to the south of Brisbane. The Implementation Group notes the Toowoomba Range tunnel is a critical path for the completion of Inland Rail and requires early focus. Construction of the entire section between Gowrie–Rosewood–Kagaru (not just Rosewood–Kagaru) is sensible as it would enable realisation of the full benefit of the investment, noting that its construction would represent an investment of around 50% of the total cost of Inland Rail;
- phase 2 of the Port of Brisbane extension study, to identify a single preferred alignment to the port; and
- preparation of the Inland Rail Business Case (including updated costings and economic analysis).

The total amount committed (\$41.2 million) leaves a balance of \$258.8 million that could be committed for further work on Inland Rail.

The Implementation Group considers that the Inland Rail programme is at a critical juncture in terms of the how best to utilise the balance. The Group recognises that an Australian Government decision as to whether or not to proceed with Inland Rail represents a significant and complex challenge with respect to the scale, timing and financial implications of the project.

The Implementation Group envisages three main scenarios following the Australian Government’s consideration of the report and business case:

1. the Australian Government decides to proceed to full construction in the immediate future (for example, with funds being made available from Budget 2016–17);

2. the Australian Government remains committed to delivering Inland Rail, but defers construction until sufficient funds are available (that is, funds are made available in a Federal Budget process after 2016–17); or
3. the Australian Government decides not to proceed with Inland Rail.

Should the Australian Government decide to proceed with Inland Rail, the Implementation Group considers that the momentum for the project may be lost if a decision is made to commence the project later rather than sooner.

The work to date by the Implementation Group shows that the environmental planning and approvals process is critical to the establishment of Inland Rail because the final alignment cannot be settled, or works commenced on greenfield construction sites until environmental and planning approvals have been received. Consequently, a key priority is the completion of this work, which could take around 18 months to two years.

The Implementation Group considers it essential that the environmental and planning approval processes commence in 2015 to facilitate preservation and acquisition of the corridor and that this work may also trigger land acquisition in some parts of the corridor under hardship provisions. Consequently, a proportion of the \$300 million should be preserved to undertake both the environmental and planning approvals and to acquire land as required under hardship provisions.

While it is critical to get the planning right for Inland Rail, should the Australian Government want to start construction in the next 18 months, the brownfield sections of Parkes–Narromine and Narrabri–North Star provide an opportunity for early works as these sections are on an existing corridor. The Implementation Group notes that the current commitment of \$300 million is not sufficient to complete these sections (which are approximately \$1.0 billion excluding contingency and escalation) but rather small parcels of upgrades could commence within the current commitment.

While the Parkes–Narromine and Narrabri–North Star sections could be taken to market, it is important to note, however, that any serious approach to market would require an indication from Government that it was prepared to provide sufficient funding to not only deliver the Parkes–North Star sections but sufficient funding to complete the full Inland Rail link so that revenues are realised for through traffic. Additionally, while the works on parts of the corridor could commence early, it may not be optimal to have the Parkes–North Star segment completed before the rest of the Melbourne–Brisbane link, as this would result in nil or limited revenues, increasing the financial exposure of the Australian Government. This needs to be balanced against the reality that those works can commence early, enabling the project to start as soon as possible and to build confidence in the project.

Another aspect for early commencement could be the remainder of the land acquisition necessary for the Rosewood–Kagaru section, although again the Implementation Group notes that without a funding commitment to proceed to construction, the acquisition of land could result in ongoing liability for the authority acquiring the land. If the Australian Government was minded to commence early greenfield

construction, segments of the alignment between Gowrie and Kagaru have merit given that the broad corridor has been defined and some land acquisition has occurred. Two options are either Rosewood (Calvert) to Kagaru (Southern Freight Rail Bypass) or the Little Liverpool Range section.

The Implementation Group believes there are considerations for the Australian Government in deciding whether or not to proceed with early construction projects, including:

- minimising the risk of stranded assets if the project does not proceed to completion;
- ensuring that all of the \$300 million is not just spent on planning;
- ensuring that the \$300 million is not spent on upgrades that would be undertaken by ARTC under a business-as-usual scenario; and
- maximising the potential for Inland Rail to be completed if the decision to proceed to construction in the immediate future is not taken.

The ideal solution, if the Australian Government is to proceed with constructing Inland Rail as an immediate priority, is to commit sufficient funds for construction so that key elements can commence, to maximise benefits and to take the project to market.

However, if the Australian Government considers that the cost of Inland Rail is not affordable at present, one approach would be to work with the states to settle the corridor, obtain environmental and planning approvals and protect the alignment so that the project can proceed in the future, should circumstances change. Early advice suggests that getting Inland Rail shovel ready would cost in the vicinity of \$540 million, not including land acquisition, which is in the vicinity of \$0.5 billion. To obtain the necessary approvals and preserve the corridor would take around 24 months.

## **Findings and recommendations**

### **Findings**

The Implementation Group finds that:

- F9.1 An Australian Government decision as to whether or not to proceed with Inland Rail represents a significant and complex challenge with respect to the scale, timing and financial implications of the project.
- F9.2 Recommendations outlining possible alternatives for the remainder of the \$300 million will depend on whether:
- a. the Australian Government decides to proceed to full construction of Inland Rail in the immediate future (with a funding commitment being in the 2016–17 Budget);



- b. the Australian Government remains committed to delivering Inland Rail, but defers construction until sufficient funds are available (that is, funds are made available in a Federal Budget process after 2016–17); or
- c. the Australian Government decides not to proceed with Inland Rail.

- F9.3 While construction of Inland Rail can be staged, due to the nature of railways, standalone segments constructed in the absence of a through link would be stranded assets. Consequently, and in light of the low likelihood of private sector financial interest in the majority of Inland Rail, a firm up-front funding commitment would be needed from the Australian Government before the market can be approached to determine the depth of private sector interest in delivering any particular section of the line.
- F9.4 Early construction could commence on three segments of Inland Rail over the next 18 months, but benefits will be limited in the absence of the whole corridor being completed. Additionally, these segments could not be completed without sourcing significant extra funding.

## Recommendations

The Implementation Group recommends:

- R9.1 That should the Australian Government decide to **commence construction of Inland Rail in the immediate future** (with a funding commitment in the 2016–17 Budget), the balance of the existing Australian Government \$300 million commitment be utilised to:
- a. preserve the corridor in planning regimes;
  - b. prepare the environmental impact assessment and obtain necessary approvals;
  - c. commence priority land acquisition with the remainder of the available budget (for example, the remaining components of the Rosewood–Kagaru section in Queensland);
  - d. prepare the full reference design for the whole alignment; and
  - e. commence greenfield construction in line with the delivery schedule and available funding.
- R9.2 Should the Australian Government choose to **commence construction of Inland Rail at a later time** (with a funding commitment at a date later than in the 2016–17 Budget), the balance of the existing Australian Government \$300 million commitment be utilised to:
- a. preserve the corridor in planning regimes;
  - b. prepare the reference design, environmental impact assessment and obtain necessary approvals; and
  - c. commence small parts of the priority brownfields construction with the remainder of the available budget (the New South Wales brownfield sections of Parkes–Narromine and

Narrabri–North Star provide an early opportunity as these sections are on an existing corridor).

- R9.3 Alternatively, should the Australian Government **decide not to proceed with Inland Rail**, the Implementation Group recommends that the balance of the existing Australian Government \$300 million commitment be utilised for alternative rail upgrades across the national network.
- R9.4 That if the Australian Government was prepared to commit additional funding now to enable some early construction to commence (with the bulk of the funding for Inland Rail being made available at a later date), segments of the alignment between Gowrie and Kagaru could be commenced as early greenfield projects. Two options are either Rosewood (Calvert) to Kagaru (Southern Freight Rail Bypass) or the Little Liverpool Range section.

## 10. INLAND RAIL: OTHER RELATED PROPOSALS AND COMPLEMENTARY PRIVATE AND PUBLIC SECTOR INVESTMENT

### OTHER RELATED PROPOSALS

In addition to Inland Rail, the Implementation Group is aware of complementary or alternative rail options proposed by the private sector: from Y.P.R. (Australia) Pty Ltd, TRAIN, National Trunk Rail (NTR) and ATEC Rail Group. The Group considers that it is important that the Australian Government is aware of these proposals. It will be imperative that any alternative solution to Inland Rail is developed with the same level of rigour and subjected to independent validation.

All information provided in relation to the private sector proposals is publicly available information provided by the companies on various websites.

#### *Port Yamba to Moree rail corridor*

The Port Yamba to Moree Rail Corridor Development plan proposed by Y.P.R (Australia) Pty Ltd<sup>153</sup> involves the development of a new vertically separated rail freight corridor from the Port of Yamba (on the New South Wales north coast) to Moree connecting to Inland Rail. The proposed corridor is said by Y.P.R to allow greater access to major urban and regional centres and link rural regions with overseas markets.

#### *TRAIN proposal*

Nation Building Australia Pty Ltd has a proposal for a Trans Regional Amalgamated Infrastructure Network or TRAIN for short. TRAIN is a proposed network of road, rail and water infrastructure in southern Queensland and northern New South Wales.<sup>154</sup> The TRAIN concept comprises four key projects:

- Mount Lindesay Highway Upgrade
- Cunningham Rail Link Project
- Warwick to Glen Innes Standard Gauge Rail Connection
- Bromelton to Port of Brisbane Road Corridor

Of relevance to Inland Rail is the Warwick to Glen Innes Standard Gauge Rail Connection and the Cunningham Rail Link Project. The Cunningham Rail Link project involves a proposed 120 km rail freight link from Goondiwindi via Warwick and Bromelton to the existing Brisbane–Sydney corridor. The Warwick to Glen Innes proposed rail connection is stated by Nation Building Australia to provide an inland route that complements the existing north-south rail corridor between Sydney and Brisbane.

---

<sup>153</sup> <http://www.ypraust.com.au/project-2-port-yamba-to-moree-rail-corridor-development/>

<sup>154</sup> Nation Building Australia Pty Ltd does not have any Government affiliation. The projects have not been endorsed by Government. The company does not appear to have a current website.

## *National Trunk Rail (NTR) proposal*

The most similar to Inland Rail, is NTR's proposal for an inland railway running from Melbourne to Brisbane. In addition to information available on the web, on 2 September 2014, NTR briefed the Implementation Group on its alternative proposal for an inland railway. Additionally, both the Chair of the Implementation Group and the Department of Infrastructure and Regional Development has had extensive and ongoing discussions with NTR. This report contains only publicly available information about NTR's proposal.

NTR claims<sup>155</sup> a number of benefits for its model, including a slightly shorter alignment of 1,595 km standard gauge from the Port of Melbourne to the Port of Brisbane than the 1,710 km route proposed by ARTC—a 115 km (or 6.7%) difference representing around a one-hour shorter transit time.

NTR also indicates that its proposed inland railway would provide for faster and heavier freight services than that offered by the 2010 ARTC alignment, and benefits to local communities including Shepparton, Parkes, Moree and Toowoomba. The most northern section would pass south of the urban areas of Ipswich and Brisbane before going underground to enter the Port of Brisbane.

NTR has stated that its proposal would require a shorter construction time, return passenger capacity to the Sydney suburban and intercity networks and enable delivery of a rail-based service quality at a level comparable to or better than any existing land transport service.<sup>156</sup> In addition, NTR's proposed alignment is 300 km shorter than the existing coastal line.

A map comparing the proposed NTR and ARTC 2010 Inland Rail alignments is at Figure 18 (next page).

NTR states that it contemplates a 'mainly' greenfield (new) railway, which provides a solution that is not the lowest capital cost solution but one which offers a higher level of service, reliability, capacity and speed of transit.<sup>157</sup>

The Implementation Group and separately, the Department of Infrastructure and Regional Development, have sought additional information from NTR to enable a proper comparison between the NTR proposal and ARTC's model. This included the offer by the Department of Infrastructure and Regional Development of an independent and confidential review of the NTR project costs. The information sought has not been available to the study.

Based on the information that has been provided to the Implementation Group by NTR, and on the independent work undertaken on financing Inland Rail, the Implementation Group is not confident that

---

<sup>155</sup> *National Trunk Railway — The Complete Solution*, Melbourne Brisbane Inland Rail Link (MBIRL) Project Brochure, NTR.

<sup>156</sup> *ibid* (NTR brochure).

<sup>157</sup> *National Trunk Rail Private Sector Proponents for the Melbourne–Brisbane Inland Rail Project* available at: [http://www.google.com/url?sa=t&ret=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.mpsc.nsw.gov.au%2Findex.php%2Fhome%2Fcouncil-publications%2Fdoc\\_download%2F1745-vince-orourke-national-trunk-rail-7mar14&ei=tYbiVLS7IPtB88QXf6LAY&usq=AFQjCNHcV3db\\_bVi3Ilkjrpf0ZgNoCs3vg&bvm=bv.85970519,d.dGc](http://www.google.com/url?sa=t&ret=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.mpsc.nsw.gov.au%2Findex.php%2Fhome%2Fcouncil-publications%2Fdoc_download%2F1745-vince-orourke-national-trunk-rail-7mar14&ei=tYbiVLS7IPtB88QXf6LAY&usq=AFQjCNHcV3db_bVi3Ilkjrpf0ZgNoCs3vg&bvm=bv.85970519,d.dGc)

The Implementation Group understands that NTR has independently referred its proposal for an inland railway to Infrastructure Australia for assessment. In the absence of detailed information on NTR being available to the Implementation Group, it considers that Infrastructure Australia can provide further advice to Government.

Group)<sup>158</sup>

<sup>158</sup> Also available at [http://www.google.com.au/url?sa=t&resrc=je&q=&esrc=s&source=web&cd=10&ved=0CEQFjAJabUKENjdg-S15XGAhWKL7wKHRxsDZoc&url=http%3A%2F%2Fwww.mpsc.nsw.gov.au%2Findex.php%2Fhome%2Fcouncil-publications%2Fdoc\\_download%2F1745-vince-orourke-national-trunk-rail-7mar14&ei=TduAVZ2oMlr8AWc2LXOCQ&usq=AF0jCNHv3db\\_bVj3iIkrfp0Z0NoCs3vg](http://www.google.com.au/url?sa=t&resrc=je&q=&esrc=s&source=web&cd=10&ved=0CEQFjAJabUKENjdg-S15XGAhWKL7wKHRxsDZoc&url=http%3A%2F%2Fwww.mpsc.nsw.gov.au%2Findex.php%2Fhome%2Fcouncil-publications%2Fdoc_download%2F1745-vince-orourke-national-trunk-rail-7mar14&ei=TduAVZ2oMlr8AWc2LXOCQ&usq=AF0jCNHv3db_bVj3iIkrfp0Z0NoCs3vg)

## *ATEC Rail Group - Border Rail Project*

The ATEC Rail Group has proposed a 337 km standard gauge rail link between Moree NSW and Toowoomba Queensland (the Border Rail Project).<sup>159</sup> On the information publically available, the Border Rail Project appears to have an alignment broadly similar to the Inland Rail alignment between Moree and Toowoomba.

The Implementation Group notes that the Border Rail Project is listed as a current Major Project Facilitation project,<sup>160</sup> expiring in December 2016. Major Project Facilitation is provided where the proponent has made the appropriate application and the project is assessed as meeting the eligibility criteria. It endeavours to ensure that Commonwealth approval processes are coordinated with relevant state and territory government approval processes. Major Project Facilitation does not provide any direct funding assistance and does not mean that the Australian Government endorses a particular project.

## **Findings**

The Implementation Group has sought to maintain an open mind to alternative proposals to Inland Rail, and when proposals are brought forward, assess them on their merits.

The challenge for the Australian Government will be to satisfy itself about the relative merits of proposals that compliment or replace Inland Rail.

Key considerations for decision makers in making any assessment could include:

- the availability of a sufficiently detailed and independently verified business case, including independent validation of project costs, revenue forecasts and demand;
- constructability, engineering risk and timing;
- the total cost to the taxpayer, including the extent of public sector funding upfront and over the life of the project, requirements for Government guarantees, availability payments or ongoing subsidies, other contributions and timing of those. This would include the allocation of risks;
- the extent of integration and interoperability with the existing interstate network;
- the operating model—whether the proposal provides for open access and whether the railway is vertically separated or integrated (e.g. does the track operator also own and operate the trains); and
- the proposed service specification and whether it meets the needs of rail users at a price that is affordable.

---

<sup>159</sup> <http://www.ateclimited.com.au/border-rail>

<sup>160</sup> <http://majorprojectfacilitation.gov.au/>



The Implementation Group finds that:

- F10.1 Delivering an inland rail corridor between Melbourne and Brisbane via Parkes is critical to Australia's long-term productivity and national wealth, but to do so will be an expensive exercise. Therefore, it should be an imperative for decision-makers to ensure there is a comprehensive assessment of proposals before supporting (either financially or in-kind) any particular solution.
- F10.2 The Inland Rail Business Case of 2015 is the most comprehensive assessment of a rail solution to the eastern Australia freight challenge spanning 20 years, and is the culmination of a body of detailed work that has been independently validated. On this basis, the Inland Rail Business Case should be considered as the benchmark against which the relative merits of alternative proposals are assessed.
- F10.4 Potential users of the Melbourne–Brisbane rail corridor have made it clear that they consider the line must connect to and be interoperable with the existing interstate rail network. This is because:
- Above rail operators consider it more productive to be able to flexibly utilise the same train assets across the national network to reduce inter-change costs, improve utilisation of train assets, and to more efficiently respond to fluctuations in demand on any particular corridor;
  - Supply chain managers prefer seamless logistics—the benefits of faster transit times cannot be captured if faster trains cannot be integrated into a faster production schedule and/or results in increased storage time and costs. Similarly, the benefits of heavier trains cannot be captured if the 'heavy' containers cannot be carried on the road network; and
  - Interoperability enhances the performance of the existing network as a whole.
- F10.5 The provision of competitive national rail services is critical to enhancing national productivity. The degree of open access and vertical separation would be a key consideration to avoid competing above rail operators being confined to the less productive existing route and therefore reducing the national benefits of the corridor. The Implementation Group considers that this is a key consideration where public funds are being invested, regardless of the quantum.
- F10.6 Detailed assessment of the engineering standard being fit for purpose and the relative upfront and long term costs are essential. A lower capital cost may not deliver the service offering that customers want, and may have a higher maintenance cost over the life of the asset. A higher capital cost may lead to lower maintenance costs but may deliver a service offering beyond that required by most customers at a cost to them that is above what is optimal.



F10.7 The Implementation Group's recommendation for the Australian Government to refer ARTC's Business Case to Infrastructure Australia (IA) would allow for an independent comparative assessment with any alternative proposal to confirm the relative economic and strategic merits.

## COMPLEMENTARY PRIVATE AND PUBLIC SECTOR INVESTMENT

Inland Rail also has the potential to attract both private and public sectors to invest in complementary infrastructure resulting in further economic benefits and contribute to integrated logistics operations along the north-south corridor which, in turn, would further amplify the benefits of Inland Rail.

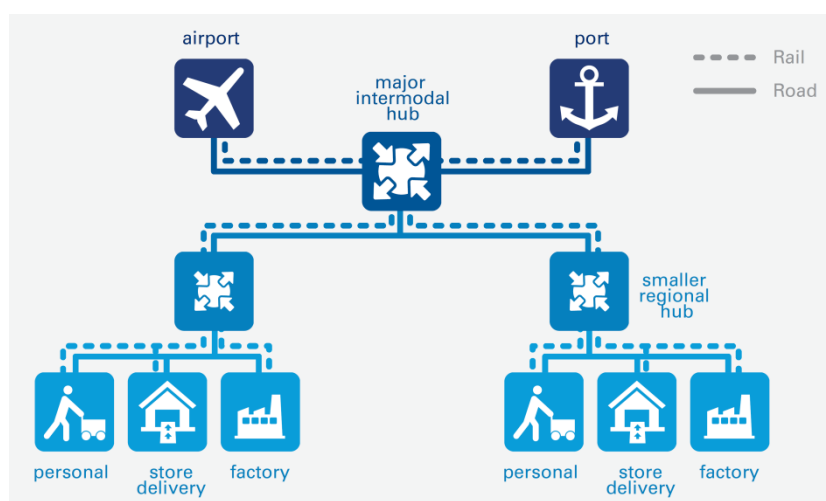
The economic analysis undertaken for the business case has highlighted the importance of investment that is complementary to Inland Rail to unlock its benefits including double-stack terminal capacity in Melbourne and Brisbane and some investment to enable longer coal trains from the Surat and Clarence-Moreton Basins.

The Implementation Group has considered below three key areas where there are opportunities for private or public sector investment including intermodal terminals, complementary road investment, and a new rail link to the Port of Brisbane.

## INTERMODAL TERMINALS

Intermodal terminals are key elements of the freight supply chain network as they enable an optimal mix of modes to provide an overall decrease in transport costs to the supply chain. The role of intermodal terminals in the freight network is illustrated neatly by Infrastructure Partnerships Australia in their report *Meeting the 2050 Freight Challenge* and is reproduced below in Figure 20. Further information about intermodal terminals is also set out in Chapter 5 of the business case.

Figure 20: Role of intermodal terminals<sup>161</sup>



<sup>161</sup> Infrastructure Australia - Meeting the 2050 Freight Challenge. Figure 17, p 66. PricewaterHouseCoopers 2009. <http://www.infrastructure.org.au/content/meetingthe2050Freightchallenge.aspx>. Also reproduced at Figure 5.3 of the Inland Rail Programme Business Case p 107).

The Implementation Group considers that while there is sufficient metropolitan intermodal terminal capacity in the short-term, potential benefits will be maximised if Inland Rail is supported with complementary intermodal terminal capacity particularly in Brisbane and Melbourne, including facilities that support double-stacking and longer trains, such as the proposed Western Interstate Freight Terminal (WIFT). Inland Rail's scope, as currently defined, will link current metropolitan intermodal terminals in Melbourne and Brisbane as well as with regional communities along the corridor.

The Implementation Group considers that there is likely to be sufficient regional intermodal terminal capacity in the short to medium term. The construction of intermodal terminals, however, is beyond the scope of the Inland Rail programme and the remit of the Implementation Group.

There are a number of proponents for new or upgraded regional intermodal terminals along the Inland Rail corridor. Such terminals have the potential to increase Inland Rail's overall catchment area, but if not optimally located may result in non-commercial investment. This can be mitigated with further regional consultations should a decision be made to proceed with Inland Rail; however, the development of regional terminals is by and large a matter for the private sector.

The Implementation Group appreciates the development of future metropolitan and regional intermodal capacity will be dependent on factors not limited to the construction of Inland Rail. For example, while the proposed WIFT currently being considered for Melbourne would support Inland Rail, planning and construction of WIFT would also need to take into account Melbourne–Adelaide–Perth operations.

## ROAD

The Implementation Group is also aware of the recent *North-West Freight Network Report*,<sup>162</sup> a local government sponsored road initiative to improve freight productivity, reduce long-term infrastructure costs, reduce producer transport costs, and facilitate wider road network sustainability in the five contributing north-west shires (Gunnedah, Gwydir, Narrabri, Moree Plains and Warrumbungle).

The North-West Freight Network (the Network) proposes to upgrade certain local roads to facilitate high productivity vehicles (for example for B-triples) through a \$160 million investment programme with a claimed BCR between 0.67 and 1.67 (at a 7% discount rate). The Network is designed to complement Inland Rail to deliver cheaper and safer road and rail freight through upgrading key networks for safe and sustainable access by the most productive road freight combinations, designed as a network so that road and rail complement each other, rather than compete.

The region contains several branch lines, some of which remain in use for grain freight. This mainline network is part of the proposed Inland Rail alignment that would be upgraded and added to so as to create a heavy mainline interstate freight railway between Melbourne and Brisbane.

---

<sup>162</sup> 'The North-West Freight Network' A local government-sponsored programme to bring greater efficiency, productivity sustainability and agricultural investment certainty to the north-west New South Wales road network, April 2015 available at: [http://www.narrabri.nsw.gov.au/files/uploaded/file/Your%20Council/Council%20and%20Committee%20Papers/May%202015/Council/16\\_1\\_b%20North-West%20Freight%20Network%20Report.pdf](http://www.narrabri.nsw.gov.au/files/uploaded/file/Your%20Council/Council%20and%20Committee%20Papers/May%202015/Council/16_1_b%20North-West%20Freight%20Network%20Report.pdf)

The Network is designed to improve rail efficiency directly by producing much lower-cost road freight delivered to the rail head in higher productivity road freight vehicles. The Network stands to create a significant cost effective productivity gain for a region of 50,000 people. By complementing Inland Rail, the Network is part of a wider strategy to drastically reduce the price of freight to the region and therefore drive greater business profitability, growth and diversity. It would also promote a safer and more sustainable road network to reduce the road safety risks to local communities.

## PORT OF BRISBANE LINK

In Chapter 7 of this report, the Implementation Group recommended that the Port of Brisbane link be treated as a separate but complementary project to Inland Rail, as opportunities provided by Inland Rail to grow rail freight operations will not be fully realised until there is a better route to the Port of Brisbane.

In addition, an improved link to the Port of Brisbane supports key Queensland Government policies including the Rail Network Strategy, Queensland Ports Strategy and Moving Freight by providing opportunities to develop regional areas, improve port access, and remove heavy vehicles from the road network.

A dedicated connection between Inland Rail and the Port of Brisbane would create a viable, long-term route to market for the region's agricultural industry, enabling it to compete successfully in the future global marketplace. This would see increased grain production in the key grain growing areas in the Western and Darling Downs and provide additional capacity to transport agricultural produce from northern New South Wales.

It would also provide an efficient route for coal from the southern Surat Basin, complementing the proposed new route to the Port of Gladstone, the world's fourth largest coal exporting terminal. Coal from the southern Surat Basin, where it is uneconomical to access the Surat Basin Rail to Gladstone, and the existing coal mines accessing the Port of Brisbane from the Ipswich and Clarence-Moreton Basins, would continue to travel to the Port via the link.

Once complete, the Southern Freight Rail Corridor (SFRC) from Rosewood (Calvert) to Kagaru will become the fastest and most efficient route for freight from Melbourne and western Queensland to access the Acacia Ridge intermodal terminal. This opens up the opportunity to shift all freight using the Ipswich line, including coal trains, out of some urban areas and onto the new SFRC once it opens. Trains would move onto the SFRC at Rosewood (Calvert), travelling south-east to join the existing interstate railway at Kagaru, before continuing on to the Acacia Ridge terminal and some would continue past the terminal to the Port of Brisbane.

In June 2012, Infrastructure Australia nominated a port connection as Queensland's number one freight priority, and, in 2014, a dedicated freight route to the Port of Brisbane was included on the Infrastructure Priority List, which identified projects of national significance and informs governments about the highest priority projects.

## 11. NEXT STEPS

As a result of its work over the last 18 months, the Implementation Group considers that the business case for Inland Rail provides an evidence base that establishes a sound rationale for the Australian Government to proceed with the project in the immediate future.

Of foremost importance, however, is the Implementation Group's view that the Australian Government makes the decision as soon as possible about whether or not to proceed with Inland Rail. The consultation processes undertaken by the Implementation Group, ARTC and the Department of Infrastructure and Regional Development have indicated that there is considerable demand and support for an inland railway which has generated significant momentum for the project. A delay in deciding whether or not to proceed with Inland Rail risks losing this momentum and potentially locking the eastern Australian freight transport task into a road-only transport solution.

An early decision would provide certainty for potential users of, and investors in Inland Rail, as well as the Government and private sector interests that will seek to make complementary investments in infrastructure that would enhance the benefits and efficiency of Inland Rail—such as intermodal terminals and roads.

This certainty will only be achieved if stakeholders can be assured that the commitment to deliver Inland Rail remains over the course of its 10-year delivery programme. Inland Rail has been supported by successive governments,<sup>163</sup> and the Implementation urges that this support continue to provide the required certainty for stakeholders and enable delivery of this visionary project.

Should the Australian Government decide to proceed with Inland Rail, the recommended next steps are:

- agree to the preferred broad alignment (with the caveats in this report) to avoid further uncertainty;
- referral of the programme business case to Infrastructure Australia;
- public release of the programme business case;
- update the Inland Rail demand forecasts once the Australian Bureau of Statistics' Freight Movement Survey data is available later in 2015;
- undertake the necessary processes to enable Inland Rail to be considered in the 2016–17 Budget, including consideration of appropriate funding structures;

---

<sup>163</sup> For example see “*A Strong Australia, the values, directions and policy priorities of the next Coalition government*” p 100 in which it was stated that “Within a decade, Inland Rail will be needed from Melbourne to Brisbane” and also “*Labor Reaffirms Commitment to Completing the Inland Rail Link*”, Media Release, 27 August 2013, in which it was stated “A re-elected...Labor Government will prioritise completing the necessary preparations so construction of the remaining sections of the Inland Rail Link can commence as soon as possible, with further detailed planning, environmental assessments, and land acquisitions to begin within twelve months” available at: <[http://www.alp.org.au/cm6\\_270813](http://www.alp.org.au/cm6_270813)> and similar statements in “*Only Labor can be trusted to complete Inland Rail*”, Media Release, 28 August 2013 available at: [http://www.alp.org.au/cm30\\_280813](http://www.alp.org.au/cm30_280813)

- timely resolution of the outcomes of the ARTC scoping project currently being undertaken by the Department of Finance, noting the Implementation Group's strong view that delivery of Inland Rail is not contingent upon ARTC remaining a Government Business Enterprise;
- the Australian Government establish the appropriate governance structure for the delivery of Inland Rail that provides the necessary commercial, legal, financial and technical oversight as well as accountability for expenditure. This would include provision for a programme delivery office;
- commence further work in partnership with the Queensland Government, the Port of Brisbane and ARTC to identify the timing and nature of an improved rail link to the Port of Brisbane;
- intergovernmental Agreements between the Australian Government and relevant state governments are progressed as matter of urgency;
- environmental and planning approvals are obtained as a priority; and
- that providing ARTC remain as the delivery agent, ARTC continue to consult with key stakeholders including in relation to property acquisition, procurement outcomes, early project development works packages and environmental and planning approval processes.

Lastly, should the Australian Government decide not to proceed with Inland Rail, that no further funds are expended in Inland Rail and that the balance of the \$300 million be redirected to alternative rail upgrades.

## 12. GLOSSARY

Concept	Description
ABS	Australian Bureau of Statistics
ARTC	Australian Rail Track Corporation
Availability	The percentage of services available with departure and arrival times that are convenient for customers
Axle load	The load transmitted to the track by two wheels of one axle
B-double	A prime mover (truck) towing two semi-trailers. The first semitrailer is attached directly to the prime mover by a fifth wheel coupling. The second semitrailer is mounted on the rear of the first semitrailer by a fifth wheel coupling on the first semitrailer
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
BITRE	Bureau of Infrastructure, Transport and Regional Economics
Brownfield	Upgrade or enhancement of existing infrastructure
B-triple	A combination consisting of a prime mover towing three semitrailers. The first and second semitrailers are connected to the following semitrailer by a fifth wheel coupling permanently located towards the rear of the semitrailer
Bulk (rail)	Freight such as grain, coal or minerals
Cant	The difference in the height of two rails comprising the railway track, cant may also be described as super elevation. It allows a train to travel through a curve at a speed higher than otherwise. Camber on the curve of a road has a similar function
Discount Rate	The factor used to convert future costs and benefits into current equivalents for the purpose of the economic and financial appraisal
Double stacking	Placement of one intermodal freight container on top of another in a specially designed well-wagon
DTMR	Department of Transport and Main Roads (Queensland)
EFRB	Eastern Freight Rail Bypass ( potential corridor for a link to the Port of Brisbane)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
FTE	Full Time Equivalent
Future proofing	Infrastructure that is readily upgradable to account for future needs – in the case of Inland Rail, longer and heavier trains
Standard gauge	Railway track gauge of 1435 mm; used on the ARTC network and for the NSW railway system
GDP	Gross Domestic Product
Greenfield	New development that occurs outside established urban areas where the site or development has not been previously used for urban development. Also applies for railway construction on new alignments
GPS	Global Positioning System
GSP	Gross State Product
IA	Infrastructure Australia
IGA	Intergovernmental Agreement
Intermodal	Freight moving via at least two different modes of transport, for example, rail and road
Interoperability	The ability of different systems or products to work together
MTPA	Million Tonnes Per Annum
Non-Bulk	Containerised freight (shipping containers) or motor vehicles for example
NPV	Net Present Value
NSFC	Northern Sydney Freight Corridor

Ntk	Net tonne kilometres
NTR	National Trunk Rail
Open Access (railway)	A railway that is open to all clients who pay the access fee. The use of the railway is not limited to trains owned by the rail track operator
P50	P50 is the project cost with sufficient contingency to provide a 50% likelihood that this cost will not be exceeded
P90	P90 is the project cost with sufficient contingency to provide a 90% likelihood that this cost will not be exceeded
PPP	Private Public Partnership
Reliability	The percentage of goods delivered on time or available to be picked up at the rail terminal when promised
SFRB	Southern Freight Rail Bypass (potential corridor to the south of Brisbane between Rosewood and Kagaru)
Super B-doubles	A B-double which is capable of carrying four 20 foot containers or two 40 foot containers, and which exceed some regulation dimensions and mass limits
SSFL	Southern Sydney Freight Line
TEU	20 foot equivalent unit, the standard unit measure of shipping container size
Tkm	Tonne-Kilometre
TRAIN	Trans Regional Amalgamated Infrastructure Network (a proposed network of road, rail and water infrastructure in southern Queensland and northern New South Wales)
Vertical integration (railway)	Where the trains (locomotives and rolling stock) are owned and operated by an entity affiliated with the rail track operator
WIFT	Western Interstate Freight Terminal (in Victoria)



### 13. ATTACHMENT A - ARTC 2015 PROGRAMME BUSINESS CASE

Please refer to the separate volume for Attachment A.