THE CASE FOR INLAND RAIL

Summary of the 2015 Business Case
Dear readers

Over the past 18 months, the Australian Rail Track Corporation has been working with PricewaterhouseCoopers to develop a detailed business case for Inland Rail – the long awaited freight rail connection between Brisbane and Melbourne.

As Inland Rail will require a major funding commitment and will have far-reaching implications for the logistics, farming and resources sectors as well as road and rail commuters, I thought it was important to share the findings of our work with you.

Why do we need Inland Rail? Every day our freight task grows – freight volumes are forecast to more than double by the year 2050. Put simply, our existing transport network won’t cope with this increase in freight without further investment.

The existing coastal line is heavily constrained with passing through the congested Sydney network, long transit times, and cannot accommodate highly efficient, long double-stacked trains. A new, standard-gauge rail connection is essential to meet Australia’s growing freight challenge.

Inland Rail is the safe, sustainable solution to the freight challenge and will transform the way we move freight around the country. This new 1700km freight rail line will bypass the congested Sydney network and the circuitous north coast line, connecting Melbourne to Brisbane via Australia’s four richest farming regions in Victoria, New South Wales and Queensland.

It will enhance the national freight rail network – connecting our capital cities, farms, mines and ports, creating jobs, reducing supply chain costs and making Australian exports more competitive.

This sustainable solution will slash Australia’s fuel bill, moving our consumer goods and exports with as little as one-third of the fuel that it would take to move the load on our highways.

It is also the safest solution. A typical train travelling on Inland Rail will have the capacity of 108 B-Double trucks. This will help avoid a huge burden on our nation’s highways and avoid up to 15 serious crashes each year. Over the lifetime of this asset that’s 1500 serious crashes.

Inland Rail is part of an integrated solution. Until now, the natural geographic constraints and slow transit times of the coastal rail line have meant that rail could never be completely competitive with road on the east coast. Once Inland Rail is constructed, rail and road will do their part in sharing the freight load, with rail taking the heavy long haul freight, and road taking the short haul freight.

This road competitive service will reduce transit times to less than 24 hours, with reliability, freight availability and pricing to meet growing customer needs.

Inland Rail will include approximately 1100km of major upgrades and enhancements and 600km of new tracks. By making the most of existing tracks we minimise the impact to the community and provide value for money.

The following pages provide a summary of the key aspects of the Inland Rail Business Case, which is currently with Infrastructure Australia for review. If you would like to read the full Business Case it can be found at www.inlandrail.com.au.

I look forward to your comments, which can be sent to our Inland Rail team via inlandrailenquiries@artc.com.au.

Sincerely,

John Fullerton
CEO, ARTC
THE CASE FOR INLAND RAIL

The Inland Rail Business Case developed by ARTC provides the most detailed assessment to date of why Inland Rail is needed and how it can be delivered.

The purpose of the Business Case is to:

- Identify the problem and vision for the east coast corridor
- Confirm the scope, opportunities and costs
- Provide a 10 year delivery schedule
- Present demand estimates
- Analyse economic and financial implications
- Identify governance arrangements to support the effective delivery of Inland Rail

The Business Case has been developed to meet the requirements of relevant jurisdictional frameworks and aligns with Infrastructure Australia’s Reform and Investment Framework Guidelines.

The Business Case, prepared by PricewaterhouseCoopers with support from ACIL Allen Consulting, outlines the benefits and costs of Inland Rail and demonstrates that it will provide a net economic benefit to the nation.
Inland Rail is a nationally significant transport initiative. It provides a strategic opportunity to make a decisive step change in the capacity and capability of the national freight rail system.

**Strong benefit cost ratio**
While the cost to build Inland Rail is estimated at $10 billion over ten years, the long-term benefit to Australia is an economic benefit cost ratio of 2.62.

**Boosts the Australian economy**
Inland Rail is expected to increase Australia’s GDP by $16 billion during its construction and first 50 years of operation.

**Creates jobs**
It’s expected to deliver 16,000 new jobs at the peak of construction, and an average of 700 additional jobs per year over the entire period.

**Improves connections within the national freight network**
Inland Rail enhances the National Land Transport Network by creating a rail linkage between Parkes in New South Wales and Brisbane, providing a connection between Queensland and the southern and western States.

**Better access to and from our regional markets**
It will make it easier for freight to move from farms, mines and ports to national and overseas markets. Two million tonnes of agricultural freight will switch from road to rail, with a total of 8.9 million tonnes of agricultural freight more efficiently diverted to Inland Rail.

**Reduces costs for the market**
Rail costs for intercapital freight travelling between Melbourne and Brisbane will be reduced by $10 per tonne.

**Better transit time and reliability**
Inland Rail offers less than 24 hour transit time between Melbourne and Brisbane terminals and 98 per cent reliability matching current road levels.

**Increased capacity of the transport network**
Inland Rail will increase capacity for freight and passenger services by reducing congestion along the busy coastal route and allow for growth in passenger services particularly in the Sydney region.

**Reduced distances travelled**
With Inland Rail, the rail distance between Melbourne and Brisbane is reduced by 200km and the distance between Brisbane and Perth and Brisbane and Adelaide is reduced by 500km.

**Improves road safety**
Each year, there will be up to 15 fewer serious crashes, avoiding fatalities and serious injuries.
Improves sustainability and amenity for the community
Carbon emissions will be reduced by 750,000 tonnes and truck volumes will be reduced in more than 20 of our regional towns. Road congestion on some of Australia’s busiest highways will be reduced, including the Ipswich Motorway, and the Hume, Newell and Warrego Highways.

Provides an alternative north-south freight link
Inland Rail will provide a second link between Queensland and the southern states, making Australia’s national freight rail network less vulnerable to disruptions, for example from extreme weather events.

Promotes complementary supply chain investments
Inland Rail will be a catalyst for complementary private sector investments, such as fleet upgrades, new metropolitan and regional terminals and integrated freight precincts.

1 Estimated for 2049-50 once Inland Rail is fully developed.
WHAT IS THE CHALLENGE?

*Freight volumes on Australia’s east coast are forecast to more than double by 2050 – our existing road and rail networks won’t cope with this increase in freight without further investment.*

Australia is heavily reliant on efficient supply chains to provide competitive domestic freight links and gateways for international trade. Freight transport services between major population centres, particularly our capital cities, deliver millions of tonnes of freight each year and provide for the distribution of goods throughout the country. Efficient and effective domestic supply chains that are internationally competitive against import chains, support economic growth and help keep down the cost of the products we buy. It is estimated the transport and logistics sectors of the Australian economy contribute 14.5 per cent of Gross Domestic Product (GDP), with Australia’s supply chain worth an estimated $150 billion every year. Efficient transport of Australian exports to world markets maximises the economic returns to the Australian economy.

Productive ports, freight networks and other critical infrastructure are the key to efficient supply chains and to Australia’s competitiveness. Better infrastructure has a critical role in lifting our nation’s wealth and prosperity and the effective operation of national freight is integral to the wellbeing of all Australians. Inefficient infrastructure networks are one of the key reasons why Australia’s productivity has declined and a key driver of the cost of living pressures affecting Australians.

Australia’s east coast comprises 70 per cent of the country’s population, 78 per cent of Australia’s national employment and generates 75 per cent of the nation’s GDP. With the population estimated to grow by 60 per cent over the next 40 years increasing pressure will be placed on freight infrastructure and services.

Relying on road for freight transport will result in increasing safety, environmental and community impacts

Currently 74 per cent of all intercapital freight between Brisbane and Melbourne is carried by road. Increasing the size and number of trucks on our highways to facilitate growing freight volumes will have significant safety, environmental and community consequences. This is because:

- Trucks use almost three times as much fuel as trains, to do the same job
- Road accidents causing death or serious injury are nearly three times more likely in comparison to rail
- Trucks emit 750,000 more tonnes of carbon emissions than trains doing the same job

*BY 2030 WE WILL NEED TO MOVE MORE THAN 32 million tonnes OF FREIGHT ON OUR HIGHWAYS AND RAILWAYS BETWEEN MELBOURNE AND BRISBANE.*

THAT’S THE EQUIVALENT OF ALMOST **1.2M** B-DOUBLE TRUCKLOADS OF FREIGHT EVERY YEAR.
The existing rail line between Melbourne and Brisbane is constrained by passing through Sydney and can’t accommodate double stacking

There are limited options for rail freight on this route to bypass incidents, which mean that incidents have the potential to impact freight along the entire length of the route.

The capacity of the existing coastal line is suboptimal compared to the highly competitive east-west corridor between Melbourne and Perth.

The longest trains that can run on this track are limited to 1,500 metres, and it would take a very significant investment to bring the coastal line up to the current standard of 1,800 metre trains. Also, the existing line cannot be used by double-stacked container trains because of overhead wiring in the Sydney-Newcastle area and the many tunnels along the route.

Our regional suppliers have limited transport options

Another limitation of the existing route is that it bypasses some of Australia’s most productive agricultural regions.

This limits the ability of our regional suppliers and industries to access efficient transport networks and inhibits the productivity and economic growth for regional communities.

Current rail infrastructure only supports low capacity trains with as little as 15 tonne axle load capacity and in some instances there is simply no rail infrastructure supporting our supply chains. For example, agricultural freight in northern New South Wales can only access the Port of Brisbane by road.
POTENTIAL SOLUTIONS TO THE FREIGHT CHALLENGE

An assessment was carried out to consider potential solutions to Australia’s growing freight challenge. A range of reform and investment options consistent with Infrastructure Australia’s Reform and Investment Framework Guidelines were considered.

Option 1: Reform
Reforms to delay or remove the need for infrastructure investment (relating to demand management, productivity enhancement or deregulation)

Option 2: Progressive road upgrades
Progressive road upgrades (continued investment in the national highway network in the north-south corridor to increase lane capacity)

Option 3: Upgrade the existing coastal railway
Coastal railway upgrades (investment in the coastal route including track duplication and passing loops to expand capacity)

Option 4: Construct a new inland railway
Construction of an inland railway between Melbourne and Brisbane bypassing Sydney

SUMMARY OF RESULTS

Option 1: Reform
While reform options may be lower in cost, they are likely to be challenging to implement and are expected to be ineffective in improving freight supply chain performance or productivity outcomes for Australia.

Option 2: Progressive road upgrades
May be medium term solutions for freight, however are unlikely to meet longer term needs for freight capacity, likely to be high cost, and road capacity would continue to be shared with general traffic.

Option 3: Upgrade the existing coastal railway
Able to deliver improvements in capacity, performance and reliability, however structural limitations of the existing rail alignment and shared track with passenger rail in some locations will constrain future long term capacity.

Option 4: Construct a new inland railway
The ability to provide dedicated freight capacity, avoid urban areas yet foster growth in regional areas and optimise environmental outcomes supports an inland railway overall.
Analysis has shown that constructing a new rail line will reduce the nation’s reliance on road transport, and as a consequence, reduce road congestion, lower carbon emissions, reduce noise, reduce deaths and injuries from road accidents, improve amenity in urban and regional centres and enable mines and agricultural businesses in regional areas to remain productive.

This new rail line, Inland Rail, provides an opportunity to make a step change in the capacity, capability and interoperability of our national freight rail system.

Inland Rail is a ‘game changer’ for the freight industry because for the first time mainland states will be connected to all others by a road competitive, 21st century rail freight network.

With travel speeds of up to 115km/h, train lengths of almost two kilometres, and containers double-stacked, Inland Rail will significantly reduce freight transport costs for industries, provide a real alternative to road transport for interstate freight, be a catalyst for growth for regional businesses, and help to reduce transport-related fuel consumption, carbon emissions and the road toll.

**THE BUSINESS CASE SHOWS THAT INLAND RAIL:**

- Is compatible and interoperable with high productivity train operations in the east-west corridor, to Adelaide and Perth
- Uses and enhances existing rail infrastructure where possible, making the most of recent investments
- Bypasses the congested Sydney rail network
- Improves connections with regional and local rail and road networks
- Maximises value for money, while meeting market needs
- Delivers the service that rail customers want, at a price they are willing to pay
- Provides significant social and environmental benefits
- Will cover its ongoing operating and maintenance costs, once operational
- Is good for the country’s economy – increasing Australia’s GDP by an estimated $16 billion by 2050
- Meets Australia’s strategic, long-term needs
INLAND RAIL

The Route
The route will be approximately 1700km in length - including 1100km of major upgrades and enhancements and 600km of new track via regional Victoria, New South Wales and Queensland. Where possible, existing rail infrastructure will be used to maximise value from recent investments.

INLAND RAIL

Inland Rail Service Offering
The Service Offering is central to Inland Rail and reflects the priorities of freight customers for a road competitive service that offers competitive pricing, 98 per cent reliability, a transit time of less than 24 hours and freight that is available when the market wants.

The Service Offering was developed in consultation with customers, rail users, including rail operators, freight forwarders and end customers, and other key stakeholders.

In defining the performance requirements of industry, the Service Offering also sets out the technical specifications that will deliver on those performance requirements now and into the future.

To request a copy of the Inland Rail Service Offering, please email inlandrailenquiries@artc.com.au.

KEY TECHNICAL CHARACTERISTICS THAT UNDERPIN THE SERVICE OFFERING

<table>
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<tr>
<th>Characteristic</th>
<th>Description</th>
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<tr>
<td>Train Length</td>
<td>1800m with future proofing for ultimate 3600m train length</td>
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<tr>
<td>Axle Load / Max Speed</td>
<td>21 tonnes @ 115km/h, 25 tonnes @ 80km/h, with future proofing for 30 tonnes @ 80km/h</td>
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<td>Double Stacking</td>
<td>7.1m clearances for double stack operation</td>
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<td>Interoperability</td>
<td>▶ Full interoperability with the interstate mainline standard gauge network</td>
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<td>▶ Dual-gauging in Queensland to provide for connectivity to the Queensland narrow gauge regional network</td>
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<td></td>
<td>▶ Connections to the NSW Country Regional Network to provide for standard gauge connections to the ports of Melbourne, Port Kembla, Sydney, Newcastle, Brisbane, Adelaide and Perth</td>
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How the Inland Rail Service Offering stacks up against the existing coastal rail line

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<tr>
<th>SERVICE OFFERING</th>
<th>EXISTING COASTAL RAIL</th>
<th>INLAND RAIL</th>
<th>RAIL SERVICE COMPARISON</th>
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<tbody>
<tr>
<td>Transit time (linehaul)</td>
<td>32-34 hours</td>
<td>&lt; 24 hours</td>
<td>10 hours</td>
</tr>
<tr>
<td>Reliability</td>
<td>83%</td>
<td>98%</td>
<td>15%</td>
</tr>
<tr>
<td>Availability</td>
<td>61%</td>
<td>95%</td>
<td>34%</td>
</tr>
<tr>
<td>Relative price (to road)</td>
<td>85%</td>
<td>57-65%</td>
<td>20-28%</td>
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</table>
Inland Rail link to Port of Brisbane

At the request of the Australian Government, ARTC undertook strategic assessment of possible options for a 24/7 freight rail link from Acacia Ridge to the Port of Brisbane.

This separate project is not as advanced as Inland Rail.

If progressed, the new link would connect Inland Rail to the port via a dedicated freight corridor, avoiding the need for passenger services to share the Brisbane metropolitan network with coal and agricultural trains.

Of the four potential corridors, the analysis identified two potential options for the port link:

- the Eastern Freight Rail Bypass option, which broadly follows the Gateway Motorway, below natural ground level where possible and including two tunnels totalling 9.2 km
- the Long Tunnel option, which incorporates a 17 km tunnel from near Acacia Ridge to a point close to the Port

Extensive consultation and technical and environmental studies are required before a preferred option can be selected. This is now with the Australian Government for consideration.

WHAT DOES THE FUTURE LOOK LIKE WITHOUT INLAND RAIL?

- There will be more trucks on our roads and an increasing number of larger trucks (e.g. B-triples) mixing with passenger cars on our major highways.
- We will need to invest heavily in major arterial and rural roads to cater for the worsening road traffic.
- The increase in the number and size of heavy vehicles on our roads will mean we will need to spend more on maintenance and upgrades.
- There’s likely to be an increase in accidents causing injury or death on our roads due to greater truck volumes.
- As freight volumes increase, so too will carbon emissions and noise pollution.
- Our communities and neighbourhoods will suffer due to road congestion, with more and larger trucks sharing our road networks.
- Without an incentive to invest in rail supply chains, companies will potentially be locked into road-based logistics options.
The Basis of Estimate Report was developed by ARTC drawing on its experience in delivering $10 billion in rail infrastructure projects over the past 10 years.

Additionally, there was an extensive cost verification process by independent industry subject matter experts including PB, Aquaenta, Arup, GHD, SLR and Coffey.

In developing the cost estimate over 50 verification and refinement tasks were undertaken to provide a robust cost estimate to inform the Business Case. Refinement of the cost estimate has been possible as further investigation and design work has been completed on key sections of Inland Rail.

A P50 (P90) construction cost of $9.9 ($10.7) billion is estimated for Inland Rail.
THE ECONOMIC CASE

Inland Rail has been assessed on both a financial and an economic basis. Financial analysis assesses a project to determine whether it is financially viable on a commercial basis, economic appraisals assess the total benefits and costs of a project to the community.

Inland Rail will require an investment of approximately $10 billion

It is estimated that Inland Rail will have a construction cost of approximately $10 billion1 over 10 years.

The financial analysis shows that Inland Rail would not generate enough revenue to provide a return on its full construction cost. However it shows that Inland Rail would be cash flow positive once it is operational. In other words, it will receive more than sufficient income from access fees to cover ongoing operations and maintenance costs.

The benefits outweigh the costs, 2.62: 1

Economic analysis shows that investing in Inland Rail has positive net economic benefits. Calculating and comparing the Programme’s benefits and costs shows an economic benefit cost ratio (BCR) of 2.62.

The BCR remains strong under a wide range of variations including revenues and costs either higher or lower than estimated or forecast. Variations in demand, access pricing, capex, GDP growth, the price of oil, the price of coal, and other factors, all demonstrate the strength of the BCR.

A four per cent discount rate has been adopted in preference to a more conventional seven per cent discount rate. The long term nature of the project, which is consistent with international practice for large scale infrastructure projects, together with a review of the 20 year historical Australian Government bond rates supports the application of a four per cent discount rate for Inland Rail.

Distribution of Inland Rail benefits and costs2

1 P90 cost of $10.7 billion (P50 cost of $9.9 billion), with sufficient contingency to provide a 90 per cent likelihood that this will not be exceeded.

2 Discounted at four per cent and excluding residual value of assets.

ONCE OPERATIONAL, INLAND RAIL INCOME WILL BE MORE THAN SUFFICIENT TO COVER ALL ONGOING OPERATIONS AND MAINTENANCE COSTS.
**Inland Rail will boost the Australian economy and create jobs**

Modelling shows Inland Rail will increase Australia’s Gross Domestic Product (GDP) by $16 billion over the 10 year construction period and the first 50 years of operation.

The Programme is expected to deliver up to 16,000 new jobs at the peak of construction, and an average of 700 additional jobs per year over the entire period.

<table>
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<tr>
<th>Inland Rail Costs and Benefits</th>
<th>Present Value at 4% Discount Rate ($ M)</th>
<th>Present Value at 7% Discount Rate ($ M)</th>
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<tbody>
<tr>
<td><strong>COSTS</strong></td>
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<tr>
<td>Capital costs (excluding escalation)</td>
<td>7650</td>
<td>6590</td>
</tr>
<tr>
<td>Operating costs</td>
<td>133</td>
<td>66</td>
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<tr>
<td>Maintenance costs</td>
<td>793</td>
<td>380</td>
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<tr>
<td><strong>Total costs</strong></td>
<td>8575</td>
<td>7036</td>
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<tr>
<td><strong>BENEFITS</strong></td>
<td></td>
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<tr>
<td>Freight user benefits</td>
<td>10 525</td>
<td>4450</td>
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<tr>
<td>Induced freight benefits</td>
<td>1090</td>
<td>528</td>
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<tr>
<td>Improved customer outcomes for rail passengers</td>
<td>32</td>
<td>14</td>
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<tr>
<td>Improved safety and sustainability for the community</td>
<td>1828</td>
<td>776</td>
</tr>
<tr>
<td>Reduced lifecycle costs for infrastructure owners/operators</td>
<td>1106</td>
<td>550</td>
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<tr>
<td>Residual value of assets</td>
<td>7921</td>
<td>833</td>
</tr>
<tr>
<td><strong>Total benefits</strong></td>
<td>22 503</td>
<td>7152</td>
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<tr>
<td><strong>RESULTS</strong></td>
<td></td>
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<tr>
<td>Net present value of costs and benefits</td>
<td>13 528</td>
<td>116.1</td>
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<tr>
<td>Benefit cost ratio</td>
<td>2.62</td>
<td>1.02</td>
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</table>

**INCREASING AUSTRALIA’S GDP BY $16 billion**

**CREATING Thousands of jobs**
DEMAND FOR INLAND RAIL

An analysis of the potential demand for Inland Rail shows there is a strong appetite among freight customers for Inland Rail’s road competitive service.

If we first look at intercapital freight—that’s the hardware, steel, groceries and other consumer goods that travel between our major ports and capital cities before being distributed to retailers—26 percent currently moves between Melbourne and Brisbane via the rail network. By 2049-50, this would shift to 62 percent using rail.

It is estimated that 7.9 million tonnes of intercapital freight will use rail between Melbourne and Brisbane by 2049-50.

Demand from exporters

Additionally, because Inland Rail will travel through Australia’s four richest farming regions and mining regions, it can be expected to draw significant volumes of grain, cotton, chilled beef, coal and other commodities onto rail.

Inland Rail - Net Tonne Kilometres by market – 2050
Assuming completion of Inland Rail in 2024-25

MARKET SHARE OF MELBOURNE TO BRISBANE INTERCAPITAL FREIGHT

Current (2013–14)

Road 74%
Rail 26%

with Inland Rail (2049–50)

Road 38%
Rail 62%
**DELIVERING INLAND RAIL**

**Planning and approvals**

The strategic decision to utilise the existing network as much as possible significantly reduces uncertainty for the Programme. However, Inland Rail consists of more than 500km of greenfield sections where new corridors need to be defined and protected, including sections in Queensland upgraded to dual gauge.

There are no specific planning or environmental approvals currently in place for Inland Rail, although existing rail corridors and some future corridors in Queensland have corridor protection.

The protection of the entire Inland Rail route is a crucial step in enabling Inland Rail delivery as it can preserve land acquisition and provide some planning and land use protection from other development around the rail corridor.

There is no uniform national law or process for securing planning and environment approvals or corridor protection. Each state has its own environment and planning laws, and there are Australian Government approval requirements which overlay state laws. The planning and environment approvals and corridor protection strategy for Inland Rail must therefore be developed in close consultation between the Australian and State governments.

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**By Year 8**

Based on the program in the Business Case, Inland Rail would have through connection for the full Melbourne-Brisbane route and double stacking capability between Parkes and Brisbane within eight years.

**By Year 10**

In ten years, Inland Rail would have double stacking capability along the full Melbourne to Brisbane route.
DELIVERING INLAND RAIL

The planned staged approach to development means that the benefits of Inland Rail will be realised sooner.

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<th>Upgrade</th>
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<td>Parkes-Narromine (NSW)</td>
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<td>Upgrading to interstate mainline standards</td>
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<td>New greenfield plus upgrade to dual gauge (includes Toowoomba and Little Liverpool Range tunnels)</td>
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<td>North Star to Yelarbon (NSW)</td>
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<td>New greenfield standard gauge</td>
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<td>New greenfield standard gauge</td>
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INLAND RAIL COMPLETE

It is important to note that this schedule is indicative. More work will be undertaken to prepare detailed designs and to gain a full understanding of engineering, property and stakeholder requirements. This information will be used to refine the alignment and schedule.
THE BENEFITS OF INLAND RAIL

Inland Rail provides a backbone freight rail link between Melbourne and Brisbane

- **Making our producers globally competitive**
- **Improving access to/from regional markets**
- **Reducing supply chain costs**
- **Creating jobs**
- **Improving linkages**
- **Improving sustainability**
- **Reducing burden on roads and improving safety**

**Time saving**
Less than 24 hours rail transit time

**Reducing supply chain costs**
Reduces rail costs by $10 per tonne

**Improving access to/from regional markets**
9 million tonnes of agricultural freight, including 2 million tonnes attracted from road

**Creating jobs**
Creating 1,000s of jobs during and after construction

**Improving linkages**
Enhancing the national standard gauge connection

**Improving sustainability**
750,000 less tonnes of carbon and 1/3 of the fuel of road

**Reduction in congestion and creating capacity for Sydney road and rail**

**Reducing burden on roads and improving safety**

**Connecting cities, farms, mines and ports**

_Enhancement of the national standard gauge connection_

**Improving access to/from regional markets**

_Melbourne, connecting cities, farms, mines and ports_