INLAND RAIL

Inland Rail Business Case Briefing Paper No. 2

Business Case assumptions and key findings

August 2020

ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

Table of Contents

Tables

Figures

Introduction

This paper contains information drawn from Inland Rail's 2015 *Programme Business Case* (the Business Case). The Business Case, prepared for ARTC by PricewaterhouseCoopers, was published in 2015. Infrastructure Australia subsequently included Inland Rail as a Priority Project on the *Infrastructure Priority List*. The section in this short paper on the distinction between economic and financial analysis is taken from the report of the 2010 *Inland Rail Alignment Study* (2010 IRAS).

1 Key findings of the Business Case

Following are five key findings from the Business Case:

1. Demand: Potential for significant rail share uplift: Rail share of the Melbourne-Brisbane intercapital market increasing from 26% currently to 62% share by 2049-50 with significant volumes of grain and induced South-East Queensland coal.

2. Financial: Financial viability on an operations basis: access revenues sufficient to cover ongoing operations and maintenance costs and totalling $2.0 - $2.5bn Net Present Value (NPV) over 50 years of operation and 5.6% pre-tax, nominal discount rate – based on public sector comparator.

3. Economic appraisal: Positive net economic benefits over the long term: positive net economic benefits with Benefit Cost Ratio (BCR) of 2.62 (4% real discount rate). In other words, the benefits to society over the life of Inland Rail will be more than two-and-a-half times its costs.

The Business Case analysis found that Inland Rail will be resilient in terms of its economic value under a range of scenarios. These scenarios represent a full range of risks to the project.

The effects of changes in a variety of parameters were assessed: a package of upside scenarios including road pricing, a 10% reduction in capital costs and a high coal price brought the BCR to 4.06. Conversely, a package of downside scenarios including B-triple access on the Hume, Pacific or Newell Highway corridors, a 30% increase in capital costs and a low coal price (implying reduced coal haulage) resulted in a BCR of 1.37; in other words in this 'downside' situation the benefits of Inland Rail would still be 37% higher than its costs.

4. Economic impact: Driver of jobs and economic activity: Expected to generate $16bn in net Gross Domestic Product (GDP) over construction and first 50 years of operation, creating 16,000 jobs at the peak of construction and providing an additional average of 700 direct jobs per annum once operational.

5. Conclusion: The Business Case supports a firm, early commitment to proceed and deliver the project in its entirety so as to create an environment where the private sector can invest with sufficient certainty that the anticipated service outcomes will be realised in the committed timeframes. The finding that access revenues will be sufficient to cover ongoing operations and maintenance costs means that Inland Rail will be cash positive from the start of operations.

2 Inland Rail's demand forecasts

Detailed analysis of the demand for Inland Rail was a key to developing the Business Case. The work analysed separate markets of intercapital demand, regional demand, agricultural demand and coal demand. Intercapital demand is made up of manufactured and retail goods largely transported in containers.

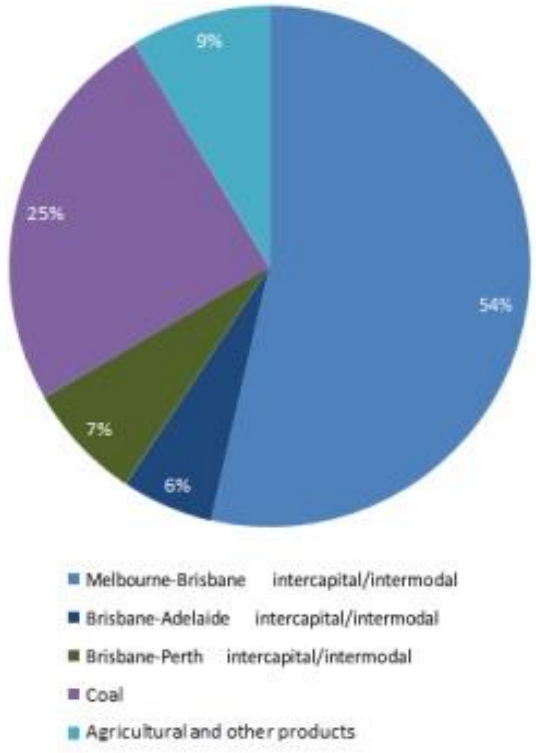
The resulting demand projections were used to:

- estimate the potential revenue of Inland Rail - access charges paid by train operators;
- assess the economic benefits arising from mode shift from road and from the coastal route to Inland Rail;
- determine the appropriate capacity of the railway; and

- determine appropriate service frequency and the impact of this service pattern on capacity utilisation and railway and train operating costs.

Figure 1 shows in percentage terms the combined Inland Rail northbound and southbound volumes by freight type in 2049-50 (net tonne kilometres)

Figure 1 Freight type volumes forecast for Inland Rail in 2049/50



Detailed analysis of the components of demand resulted in the forecasts of combined north and southbound volumes shown in Table1 and Table 2 following. Demand is shown in Table 1 on a net tonnage basis and in Table 2 on a net tonne-kilometres basis. (The net tonnage carried on a train is the payload only; the gross tonnage of a train includes the weight of the wagons.)

Table 1 Future freight demand (net tonnes)

		2024-25	2029-30	2039-40	2049-50
NET TONNES (000)					
Intercapital/intermodal	Melbourne to Brisbane	3195	4008	5674	7906
	Brisbane to Adelaide	560	690	997	1412
	Brisbane to Perth	878	1034	1398	1815
Regional	Coal (SEQ-Port of Brisbane)	12 900	19 500	19 500	19 500
	Agricultural products	6750	7129	7954	8873
Total		**24 283**	**32 361**	**35 523**	**39 507**

Table 2 Future freight demand (net tonne-kilometres)

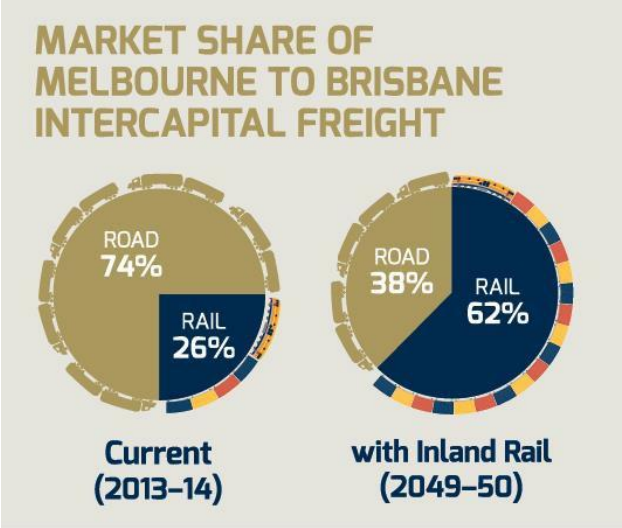
		2024-25	2029-30	2039-40	2049-50
NET TONNE KILOMETRES (MILLIONS)					
Intercapital/intermodal	Melbourne to Brisbane	5527	6934	9817	13 677
	Brisbane to Adelaide	573	707	1021	1447
	Brisbane to Perth	900	1059	1432	1860
Regional	Coal (SEQ-Port of Brisbane)	3873	6292	6292	6292
	Agricultural products	1687	1782	1988	2218
Total		**12 660**	**16 774**	**20 550**	**25 494**

The demand assessment found there would be strong market appetite to leverage the enhanced capabilities of Inland Rail with a significant uplift in rail market share.

Rail's share of the Melbourne to Brisbane market is projected to increase by 36 percentage points to a total of 7.9 million tonnes in 2049–50 [see Table 1], which represents an additional 3.1 million tonnes of freight on rail between Melbourne and Brisbane compared to a future without Inland Rail (which would see total volume in 2049-50 of only 4.8 million tonnes).

An additional two million tonnes of agricultural freight would be attracted from road to rail, particularly grain and cotton from New England, and grain from the Darling Downs.

Significant volumes of existing grain movements (approximately 5.8 million tonnes in 2049–50) to east coast ports would use Inland Rail for part of their journey.



The accompanying graphic shows the projected increase in rail's market share of Melbourne – Brisbane intercapital freight achieved by Inland Rail by 2049-50.

3 Capital cost summary

The Business Case includes detailed estimates of the capital and operating costs of Inland Rail. Table 3 summarises the estimated Inland Rail capital costs (P50 and P90 estimates).

It should be noted that the estimates were not based on any reference design (or subsequent detailed design) that give greater certainty as to construction costs nor could the Business Case foresee changed market conditions that affect forecast costs.

Table 3 2015 Business Case Cost Estimates for Inland Rail

ITEM	P50 COST ESTIMATE ($MILLION)	P90 COST ESTIMATE ($ MILLION)
Base costs (Real 2015)	6926	6926
Contingency (P50-26%, P90-36%)	1811	2490
Escalation component	1152	1241
Total out turn cost	9889	10 657

The base cost estimate includes an allocation for property acquisition.

4 Operating costs

These were estimated both for 'below rail' activities (i.e. costs which are the responsibility of the track owner, such as ARTC) and for 'above rail' (i.e. costs to be incurred by train operating companies). Below rail costs are a component of Inland Rail's financial analysis; knowledge of above rail costs is essential in assessing the impact of use of Inland Rail for customers.

Below rail operating and maintenance costs are shown in Table 4 below expressed as dollars per kilometre for both 10 million gross tonnes and 100 million gross tonnes.

Table 4 Below rail operating and maintenance costs (dollars per kilometre)

ITEM	At 10 MGT ($'000 PER KM)	At 100 MGT ($'000 PER KM)
Operations (Real)	5.70	9.58
Reactive Maintenance (Real)	8.00	31.95
Major Periodic Maintenance (Real)	11.84	81.41

5 The distinction between economic and financial analysis

Investment evaluations conducted from the wider economy or community's perspective are termed economic evaluations whereas those evaluations conducted from the producer's perspective only (e.g. the track operator) are known as financial evaluations. This is an important distinction as the outputs have varying purposes.

5.1 Financial appraisal

Financial appraisals assess the financial viability of a project from the perspective of owners/operators (e.g. in this case, the track owner and operator of the inland railway). Financial appraisals are concerned only with the financial returns delivered to operator stakeholders and do not take into account the costs or benefits derived by other parties and the wider community. Financial costs and revenues include capital, operating and maintenance costs; and operation. In the case of Inland Rail, these will include track access charges for the track operator (assuming separate track and train operations).

The aim of the financial appraisal in the case of Inland Rail is to enable assessment of whether it is viable from the perspective of a single commercial entity, based on financial revenues and costs. The conclusion of the Business Case is that Inland Rail is viable. Excluding capital charges, Inland Rail will be cash flow positive

from commencement of operations with access revenues sufficient to cover ongoing operations and maintenance costs plus a margin.

5.2 Economic appraisal

The Business Case included two complementary forms of economic appraisal:

a) a conventional economic Cost Benefit Analysis (that was used to assess the direct costs and benefits of Inland Rail, as summarised in the Benefit Cost Ratio); and
b) an assessment of the broader economic impacts flowing from the construction and ongoing operation of Inland Rail, in terms of the impacts on Gross Domestic Product and employment.

Cost Benefit Analysis

The Cost Benefit Analysis (CBA) assesses the total costs and benefits of a project to the community. As such, the CBA encompass the costs and benefits accrued and incurred by many different stakeholders, including the project proponents, users, government and the community in general. A CBA takes into account costs and benefits that are not necessarily derived directly from market-based transactions including, in the case of Inland Rail: value of freight travel time, reliability, accidents and congestion costs.

The direct benefits of Inland Rail captured and measured in the CBA include:

- Improved productivity and economic efficiency as a result of operating cost savings, shorter transit times, improved reliability, improved availability, avoided improved redundancy and resilience to incidents on the coastal route.
- Safety benefits for the community as a result of removing heavy vehicles from the road network.
- Sustainability benefits for the community from removing heavy vehicles off the road network and reducing the distance travelled for rail freight resulting in reduced road traffic congestion, fewer emissions of carbon/pollution and less noise.
- 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 time.
- Reduced lifecycle costs for infrastructure owners/operators on the rail 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.

Economic Impact Assessment

In addition to the CBA, the Business Case included a broader economic impact assessment of the impacts of Inland Rail on Gross Domestic Product and employment.

These broader economic impacts were estimated by consultants PricewaterhouseCoopers (PwC) using a methodology called Computable General Equilibrium (CGE) modelling, which is an economic impact analysis tool for simulating the economy wide effects of projects or policies. The economic benefits were simulated using PwC's version of the Monash Multi Regional Forecasting Model (MMRF) model, originally developed at Monash University and widely used by the Australian Government (including the Productivity Commission and the Australian Treasury) to quantify impacts of policy changes and proposed projects on the Australian economy.

The key measures reported in the CGE economic impact assessment are:

- value of production – net value of goods and services in the national, state and regional economies, generally referred to as Gross Domestic, State and Regional Product (GDP, GSP, GRP); and
- employment – the number of additional full-time equivalent jobs in the economy.

CGE analysis is a useful complementary analysis to CBA because it explores the possible wider economy implications by considering how the direct impacts of Inland Rail will provide flow-on impacts to sectors and regions.

6 Economic results

Cost Benefit Analysis

The results of the Cost Benefit Analysis of Inland Rail are given in Table 5 below. It should be noted that the figures below are based on real 2014-15 dollars at 4% discount, and hence do not equate to the P50 and P90 estimate figures provided in Table 3 above.

Table 5 Cost Benefit Analysis summary

Economic appraisal results (incremental to base case, discounted, real 2014-15 dollars)

COST AND BENEFITS	PV@ 4% DR
COST	
Capital costs (excluding escalation)	7650
Operating costs	133
Maintenance costs	793
Total costs	**8575**
BENEFITS	
Freight user benefits	10 525
Induced freight benefits	1090
Improved outcomes for rail passengers	32
Improved safety for the community	1828
Reduced infrastructure lifecycle cost	1106
Residual value of assets (future stream)	7921
Total benefits	**22 503**

RESULTS	PV@ 4% DR
RESULTS	
Net present value of costs and benefits	**13 928**
Benefit cost ratio	**2.62**

CGE Economic Impact Assessment

The CGE analysis estimates that the Inland Rail Program will have a net positive impact of $16 billion[1] on GDP over the 10-year construction and 50-year operating appraisal period and generate an additional 16,000 direct and indirect jobs at the peak of construction (early 2020s). During construction of Inland Rail, direct capital expenditure has a stimulatory impact on the economy as the construction works stimulates the construction sector in each region of Inland Rail. The expansion in the construction sector supports additional flow on demand in the economy through the construction industry supply chain and additional spending on consumer orientated products by the construction workforce.

In the operations phase, Inland Rail is forecast to stimulate further economic activity 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. The economic modelling estimates a positive impact on employment of an average of 700 full-time equivalent jobs each year for 50 years from commencement of full operations. Further details of the regional and sector-based economic impacts estimated in the CGE analysis were included in Appendix A to ARTC's submission to the Senate Inquiry (November 2019)

[1] Present value at 4% discount rate