Infrastructure Australia

Project Business Case Evaluation

Project name	Murray Basin Rail Project
Rating	Priority Project
Date of IA Board rating	9 December 2016

Location	Victoria
Proponent	Victorian Government
Project timeframe	Delivered in four stages between 2015 and 2018

Evaluation Summary

Capacity on the Murray Basin rail network is constrained by the mixture of broad and standard gauge lines, a 19 tonne axle load limit, and declining levels of service due to a long-term underspend on maintenance. This results in fragmentation of the network, reducing its accessibility and flexibility. As a consequence, transit times for rail freight are longer and less reliable than road, and costs to business are higher. Increasing rail freight costs have resulted in an increase in road freight in the Murray Basin region, which has detrimental impacts on grower returns, regional amenity and the environment.

The upgrade of the Murray Basin rail network was previously listed as a Priority Initiative on the Infrastructure Priority List (2016).

The proponent proposes a package of rail network improvements including axle load upgrades from 19 to 21 tonne and standardisation of the existing broad gauge rail network in the Murray Basin Region. The project would also see the re-instatement and upgrade of the standard gauge rail line between Ararat and Maryborough.

The proponent's economic evaluation of the project indicates a net present value (NPV) of $323.6 million and a benefit-cost ratio (BCR) of 1.7 based on P50 capital costs and a real discount rate of 7%, excluding wider economic benefits (WEBs), which are not expected to be significant. Infrastructure Australia considers that, while some of the identified benefits may be overstated, the project's benefits overall are likely to exceed its costs.

Infrastructure Australia considers that, from a strategic perspective, there is merit in using rail to move substantial volumes of bulk freight over long distances where it is economically viable to do so. This approach is consistent with current strategic planning principles for freight transport.

1. Strategic Context

The Murray Basin region is a major producer of agricultural and mining commodities. The region, which covers most of north-west Victoria and extends into New South Wales and South Australia, is a nationally significant producer of grain, mineral sands and other agriculture products:

- Grain: including wheat, barley, canola and lentils. In 2013–14, total grain production in Victoria was around 7 million tonnes with a total value exceeding $2 billion. Although production varies seasonally, on average, the Murray Basin region grows 70% of Victoria's grain;
- Mineral sands: In 2013–14, Victoria produced 790,000 tonnes of mineral sands and, in 2012–13, the net estimated market value of mineral sands was $1 billion; and
- Other products such as fruit and vegetables, wine, nuts and meat and livestock.

The majority of this production is destined for markets beyond the region. However, access to large domestic and international markets is constrained by the capacity and the condition of the regional rail network. This, together with improvements in road freight productivity, has resulted in an increased road mode share of the freight task. Infrastructure Australia considers that there is strategic merit in using rail to move substantial volumes of freight over long distances where it is economically viable to do so.

2. Problem description

The Murray Basin Rail Project seeks to address fragmentation of the regional rail network and capacity constraints throughout the network. Capacity is constrained by its current axle load limit, as well as the declining levels of service due to a historical underspend on maintenance.

Victoria's freight rail network is restricted to a 19 tonne axle load limit, which is considerably lower than the 23 tonne limit on the national standard gauge network. Lower axle loads increase the number of rail movements required to complete a given freight task. The level of service of the network has also deteriorated over time due to limited and infrequent maintenance works, with no lines in the Murray Basin region currently operating at their design speed.

These underlying problems increase rail freight costs to business and reduce our international competiveness. In particular:

- Declining rail service levels result in longer and less reliable freight transit time, increasing rail freight costs.
- The fragmented network increases costs for mineral sands miner Iluka. Mineral sands mines are located near the broad gauge network, while its processing facility in Hamilton is located on the standard gauge network. Heavy mineral concentrates are transported by truck to a standard gauge line, which increases costs.
- The broad gauge rail network only has access to the ports of Melbourne and Geelong, potentially limiting competition between ports for the freight transported on the broad gauge network. Port operators may have limited incentives to offer competitive rates, higher quality of service or infrastructure upgrades to broad gauge users.
- In Australia, there are limited opportunities for broad gauge rolling stock to operate across multiple networks; this lack of interoperability may create disincentives for new entrants or existing operators to invest in broad gauge rolling stock.
- The increasing mode share of road transport for the freight task has a detrimental impact on regional communities, reducing amenity and increasing road traffic accidents and pollution. It may also lead to an increase in maintenance expenditure for local governments. The increased use of road transport may also exacerbate road congestion around ports.

These problems are likely to reduce the competiveness of industry within the Murray Basin, reduce grower returns and impact on the amenity of regional communities.

3. Project overview

The initiative proposes a package of rail network improvements, including axle load upgrades and standardisation of the existing broad gauge rail network, which services export-producing regions of North West Victoria, the Riverlands region of South Australia and the Wentworth region of New South Wales. The initiative would also see the reopening of the standard gauge connection from Maryborough to Ararat.

The objectives of the project are to:

- Enhance competition between the ports of Portland, Geelong and Melbourne for Victorian exports;
- Improve transport efficiency through gauge standardisation and axle load upgrade;
- Unlock private investment in the region's supply chains; and
- Minimise conflict between passenger and freight-related rail services.

The project will deliver:

- Gauge standardisation and upgrade to 21 tonne axle loads for the:
    - Mildura rail line from Gheringhap to Yelta;
    - Mildura rail line from Maryborough and Dunolly (currently dual gauge);
    - Sea Lake rail line from Dunolly to Sea Lake;
    - Manangatang rail line from Korong Vale to Manangatang;
- Re-instatement and upgrade of the standard gauge rail line between Ararat and Maryborough; and
- Conversion of the rail line between Gheringhap and Maryborough to dual gauge.

4. Options identification and assessment

The options assessment was completed in two stages. A strategic options analysis was conducted to evaluate a range of supply, demand and productivity interventions to address the identified problems. A range of more specific project options was then assessed by the proponent.

The proponent assessed four strategic options, based on four themes:

- Strategic Option A: Producer Focus, targeting the ability of export industries in the Murray Basin to compete more effectively in international markets;
- Strategic Option B: Maintenance Focus involves improving the condition of the existing transport network;
- Strategic Option C: Network Infrastructure Focus addressing connectivity and performance issues across the greater part of the logistics chain, in particular through capital investment; and
- Strategic Option D: Existing Infrastructure Focus seeks to improve the capacity and performance of existing infrastructure routes.

The options were assessed against a number of qualitative criteria. Strategic Option C - "Network Infrastructure Focus" - was the preferred option as the proponent indicated that only this option addressed the project objectives sufficiently and was advanced for more detailed project options analysis.

Following the strategic options analysis, the proponent developed four project options consistent with Strategic Option C:

- Project Option 1: gauge standardisation and axle load upgrade of the Mildura line north of Donald, new standard gauge rail line between Litchfield and Minyip and closure of the broad gauge rail line between Donald and Dunolly.
- Project Option 2: gauge standardisation of the Mildura line (from Dunolly to Yelta), Manangatang line, Sea Lake line, and between Maryborough and Dunolly, and dual gauging of the line between Gheringhap and Maryborough.
- Project Option 3: gauge standardisation of the Mildura line (from Dunolly to Yelta), Manangatang line, Sea Lake line and between Maryborough and Dunolly, and re-instatement and upgrade of the standard gauge rail line between Ararat and Maryborough.
- Project Option 4: A combination of both project option 2 and 3 including gauge standardisation of the Mildura line (from Dunolly to Yelta), Manangatang line, Sea Lake line and between Maryborough and Dunolly as well as re-instatement and upgrade of the standard gauge rail line between Ararat and Maryborough and dual gauging of the rail line between Gheringhap and Maryborough.

Each of these project options includes standardising and upgrading current 19 tonne axle load broad gauge rail track to 21 tonnes. A 23 tonne axle load upgrade was not considered as part of the business case, as the proponent

indicated that this would significantly increase costs and would introduce additional risks to the project (such as the potential need to upgrade bridges and culverts). However, the sleepers used as part of the project will be suitable for a further upgrade to 23 tonne axle loads should that be required in the future.

These options were evaluated using a multi-criteria analysis, which qualitatively assessed the project against the project objectives, and quantitatively assessed capital costs, maintenance costs and the BCR for each of the options. Although Option 4 did not have the highest BCR and was the highest cost option, it was selected as the preferred option as it more closely met the objectives of the project.

5. Economic evaluation

The proponent's economic evaluation of the project indicates a NPV of $323.6 million and a BCR of 1.7 based on P50 capital costs and a real discount rate of 7%, excluding wider economic benefits (WEBs), which are not expected to be significant.

Infrastructure Australia's assessment shows that the project will deliver overall economic benefit. However, a number of benefits may be overstated, in particular:

- The methodology used to estimate transport cost savings for users potentially double counts some of the consumer benefits, which may result in total benefits being overstated.
- The analysis assumed a 100 per cent loading of rail wagons. This may be an unrealistic assumption due to inefficiencies and constraints which may exist elsewhere in the supply chain, and leakage from wagons.
- The avoided cost of road damage arising from fewer heavy vehicle movements might be overstated as it was not offset by the corresponding reduction in heavy vehicle charging from reduced road usage by freight. The objective of heavy vehicle charging is to recover the cost of road damage from users.
- Agricultural production can vary significantly from season to season. The proponent's assumptions around the agricultural freight task do not take this variability into account, which may reduce the project's benefits.

The proponent may have underestimated the following benefits:

- The change in rail access charges arising from higher rail freight volumes has not been quantified. This should offset the higher maintenance costs of the upgraded rail line; and
- The residual value attributed to the project appears to be very low compared to planned capital expenditure.

Despite these limitations and the likelihood that the BCR may be overstated, Infrastructure Australia is confident that the project's benefits exceed its costs, and that there is sound strategic merit in improving rail capacity in the Murray Basin region.

Capital costs and funding

Total capital cost (nominal, undiscounted)	$416.2 million (nominal, P50) $476.5 million (nominal, P90)
Proponent's proposed Australian Government funding contribution (nominal, undiscounted)	$220 million
Other funding (source / amount / cash flow) (nominal, undiscounted)	$220 million from the Victorian Government

Proponent's Stated Benefits and Costs	Present Value ($m, 2015) @ 7% real discount rate		% of total
Benefits			
Transit time savings	$55.5		7%
Transport cost savings	$542.7		71%
Avoided externalities (noise and greenhouse gas emissions etc.)	$86.0		11%
Avoided crash costs	$37.9		5%
Avoided road damage	$35.3		5%
Residual value	$1.9		0%
Total Benefits[3]	**$759.3**	(A)	**100%**
Costs			
Capital costs (P50)	$309.2		71%
Operating and maintenance costs	$126.5		29%
Total Costs[3]	**$435.7**	(B)	**100%**
Net Benefits - Net Present Value (NPV)[1] without WEBs	**$323.6**	(C)	n/a
Benefit-Cost Ratio (BCR)[2] without WEBs	**1.7**	(D)	n/a

Source: Proponent's Business Case

Notes:
(1) The net present value (C) is calculated as the present value of total benefits less the present value of total costs (A − B).
(2) The benefit-cost ratio (D) is calculated as the present value of total benefits divided by the present value of total costs (A ÷ B).
(3) Totals may not sum due to rounding.

6. Deliverability

The project will be delivered by V/Line on behalf of Public Transport Victoria as part of a design and construct agreement. The proposed solution is relatively straightforward, and the design requirement for the project is limited to the detailed design of a few junctions. The recommended solution has a long delivery period to allow works to be staged when funding becomes available and in order to minimise disruption, reduce costs and ensure broad gauge continuity for branch lines while the main sections are closed. The governance arrangements appear to be adequate to ensure that the capital component of the project is delivered.

The Victorian Government committed $220 million to deliver this project in the 2015-16 budget. The Australian Government committed to match Victoria's contribution.

The project requires an increase in maintenance spending, which is not funded as part of the project. This is significantly higher than the historical levels of maintenance costs assumed in the base case. Inadequate maintenance funding is a risk for the realisation of benefits, given the historical underspending on rail maintenance evident over the past 30 years. If the required maintenance does not occur due to a lack of funding, the forecast freight volumes and the expected freight cost savings are unlikely to be realised. Infrastructure Australia encourages the proponent to adopt a robust whole-of-life approach to asset planning and consider governance arrangements.

While the proponent argues that there is no scope for increasing user rail access charges to reduce the level of investment by government, Infrastructure Australia notes that the majority of the benefits related to the project accrue directly to rail users, and encourages the proponent to further consider opportunities for private sector contribution to capital and maintenance costs. In particular, there is evidence that user charge regimes lead to improved maintenance outcomes. There is already some evidence of private investment in the rail network, with Grain Corp's Project Regeneration ($85 million), the Murrayville line upgrade ($1 million plus a levy of $1.00 per tonne) and port redevelopments. An alternative approach would be to develop memoranda of understanding to achieve rate reductions at sites where upgrades are undertaken, and pass on the benefits to grain growers.

A benefits realisation plan, which includes performance reporting requirements, and reporting and monitoring of actual benefits, will be completed by March 2017. Infrastructure Australia encourages the proponent to undertake post-completion reviews during operations, and monitor the benefits arising from the project.