

Project business case evaluation summary

North East Rail Line Upgrade

3 December 2019



Proponent

Australian Rail Track Corporation

Location

Victoria

Capital cost

\$198.3 million (P90, outturn)

Indicative timeframe

Detailed design: Q4 2019

Construction: Q1 2020

Project completion by: Q2 2021

1. Evaluation Summary

Infrastructure Australia has evaluated the business case for the **North East Rail Line Upgrade** and concluded that the project, as it is currently presented, **should not be included on the Infrastructure Priority List** at this time.

Infrastructure Australia recognises the importance of **good-quality regional rail transport** to give people genuine travel choices and equitable service levels. However, while the underlying rail service problems may be locally or regionally significant, the current cost of the problems are not nationally significant. Furthermore, while the business case states that the costs of the project are slightly higher than its benefits, **our analysis found that the benefits to the community were materially overestimated**. There are also **key risks** for the **delivery phase** of the project that could lead to cost overruns.

We would welcome a revised business case for a solution which achieves a better balance of the expected costs and benefits. This might require coordination with rail service operators to consider the costs and benefits of introducing additional rail services and new rolling stock.

The North East Rail Line is a 316 km passenger and freight **rail line between Melbourne and Albury**. Approximately **1,800 people travel along the line each day via 10 scheduled services** (five in each direction), but **passenger demand has fallen in recent years**. This is **partly due to the poor punctuality, reliability and comfort of the rail service**, which has **resulted from a lack of investment to provide a track standard** which matches that of other regional Victorian passenger lines. At the same time, **the capacity and condition of the Hume Highway have improved significantly over the years**, presenting **strong competition to the passenger rail services on this corridor**.

Overview	Context	Problem	Options	Proposal	Strategic Fit	Economic, social and environmental value	Deliverability
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The proposed North East Rail Line Upgrade focuses on capital improvements to improve track quality, thereby reducing delays through higher average travel speeds and improving punctuality and ride quality for passengers. The project involves removing mud holes, upgrading tracks and signalling, and improving drainage. Ultimately, it could enable faster travel speeds and the operation of faster and newer rolling stock in the future. However, the business case does not propose additional rail services, new rolling stock or faster timetabled travel times, and the project will not benefit freight services.

While there is strategic merit in improving the quality of infrastructure and passenger amenity, the project would only reduce the likelihood of delays, rather than actually decreasing the scheduled time of rail trips. The proponent's stated net present value (NPV) for the project is -\$4 million, with a benefit-cost ratio (BCR) of 0.98 (using a 7% real discount rate and P50 cost estimate). Although we concur with the business case that the project's costs will exceed the benefits, our analysis found that the business case overestimated the benefits and it is likely that the estimated costs will far exceed the social, economic and environmental benefits.

2. Context

The 316 km North East Rail Line connects Melbourne to Albury and is part of the Sydney–Melbourne rail corridor. The standard-gauge rail line is leased by the Australian Rail Track Corporation (ARTC) and is used by regional and interstate passenger trains (V/Line trains to Albury, and NSW TrainLink XPT services to Sydney), as well as interstate freight trains (Pacific National and SCT). As part of the Inland Rail project, elements of the line will be upgraded, but these are not expected to improve the passenger service quality as proposed by this project. The southern section of the corridor has also been identified as a potential route for high speed rail on the east coast of Australia.

In the early 2000s, the Victorian Government upgraded other regional passenger lines in Victoria as part of the *Regional Fast Rail Program*. However, due to the lease arrangements, this program did not include the North East Rail Line, resulting in the rail line having a lower level of investment in comparison to other regional lines.

During 2016 to 2017, the Victorian Government and Australian Government identified a need to also upgrade the North East Rail Line to a similar standard of service as the other regional lines. In response, the Australian Government committed \$235 million to the project in March 2018, based on the proponent's estimated costs of the upgrade.

3. Problem description

There is relatively poor punctuality, reliability and passenger comfort on the North East Rail Line, compared with other regional Victorian passenger lines. While the ARTC continues to outperform its freight and passenger track performance metrics under its current lease agreements, there is a gap between these standards and community expectations. Due to the poor condition of the track, passengers on the North East Rail Line experience issues with the ride quality, comfort and reliability of V/Line services, which has contributed to an 11.8% per annum decline in demand from 2013 to 2018. Many travellers also choose to use the Hume Highway which is an attractive alternative to the rail line because of its faster travel times.

V/Line has self-imposed speed restrictions of up to 35 km/h on some sections of the North East Rail Line, and 15 km/h restrictions along the entire 82 km section between Broadmeadows and Seymour due to poor track quality. These restrictions are due to mud holes and tight rail alignments, and apply to over 60% of the rail line. Together, these impact on travel times and ride quality. However, these issues do not impact on the performance of freight rail services.

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Since 2016, the reliability¹ of the V/Line passenger services on the North East Rail Line has averaged around 93%, compared with V/Line's network-wide target of 96%. In terms of punctuality², 74% of services have been on-time, versus a network-wide target of 92%. The 4 hour 25 minute timetabled service between Melbourne and Albury is delayed, on average, by about 12 minutes per service.

4. Options identification and assessment

The project scope was developed to deliver capital upgrades that would best meet the project objectives of improving travel time, ride quality and punctuality for passenger rail services. Designing to a fixed funding commitment, the proponent did not undertake a formal options identification process for the project, and did not consider alternative options to achieve the project objectives.

To determine the optimal scope for the rail infrastructure upgrade, ARTC engaged with other stakeholder organisations via a project steering committee. This committee assessed and prioritised discrete elements to best achieve the project objectives within the committed funding. The ARTC then engaged Monash University's Institute of Rail Technology (IRT) to undertake an independent review of the scope. The IRT found that the project scope is appropriate to meet the project objectives within the funding commitment. However, this review did not consider the project's value for money. It only assessed whether the project scope could be delivered within the funding envelope.

Defining a scope based on a fixed funding value is not the most efficient way to identify and assess options to address a problem, and can lead to poorer value for money. Infrastructure Australia recommends using quantitative analysis, such as rapid cost-benefit analysis, to achieve the best balance of benefits versus costs. This could have led to significantly lower capital costs to achieve similar benefits, or a slight cost increase to achieve substantially more benefits from the project.

Infrastructure Australia's Assessment Framework also recommends considering at least two project options (plus a base case) in the detailed economic appraisal for a business case to ensure that the best option is identified. For this project, only one option was assessed.

5. Proposal

The project scope includes:

- track rehabilitation works (including the removal of mud holes and ballast renewal) to improve track drainage, stability and geometry for better passenger ride quality and comfort
- replacement of signalling infrastructure and power supply to improve reliability and resilience
- structural improvements, including resurfacing, realignments and turnout upgrades to improve punctuality.

The project will require additional maintenance to sustain the higher track standard. The proponent has therefore included additional maintenance costs, over and above the base case, in the project's cost estimate.

The North East Rail Line upgrade primarily aims to improve rail services connecting Melbourne with regional Victoria by meeting the following key objectives:

- reducing the number of V/Line self-imposed passenger service speed restrictions, which applies to approximately 197 km (62%) of the line

¹ Reliability is a measure of the scheduled services that are run.

² Punctuality is a measure of on-time running performance.

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- reducing the number of temporary speed restrictions applied by ARTC in response to track condition issues, which, together with V/Line's self-imposed speed restrictions, leads to 12 minutes of average delay for passenger services
- improving ride quality for passenger services.

While the project is expected to reduce the likelihood of delays, it would not improve the scheduled journey time between Melbourne and Albury. This means that the project cannot claim any savings in the scheduled journey time for each passenger trip.

The upgrade would also raise the track standard to Class 2³ and enable the use of modern and faster rolling stock in the future. However, the business case does not include the costs and benefits of higher speed VLocity and XPT trains, or more frequent train services.

6. Strategic fit

The project is part of the \$1.75 billion *Regional Rail Revival Program*, a joint initiative between the Victorian Government and Australian Government. The program builds on the outcomes of the previous *Regional Fast Rail Program* and involves an upgrade to every regional passenger train line in Victoria, including the North East Rail Line.

The rail line plays an important role in connecting regional communities and providing people with genuine travel choices. However, patronage on the rail line is relatively low and has been falling in recent years. The rail journey between Melbourne and Albury takes approximately one hour longer than by car (about a 33% longer trip time). This is made worse by frequent delays on the rail line and poor passenger comfort due to the quality of the rail track.

Although the project will improve punctuality and ride quality, particularly for V/Line passengers, reducing the existing average delay of 12 minutes over the entire 4 hour 25 minute journey between Melbourne and Albury will have an indiscernible impact on those passenger trips, particularly given the competitiveness of the road option.

7. Economic, social and environmental value

The proponent's economic evaluation of the project states a NPV of -\$4 million, and a BCR of 0.98 using a 7% real discount rate and P50 cost estimate when evaluated over a 25-year period. While the project is expected to reduce travel delays and improve passenger comfort, this is outweighed by higher costs for upfront capital and ongoing maintenance.

The main social and economic benefits of the project are travel time savings for existing V/Line and NSW TrainLink passengers (34% of the total benefits) and reduced vehicle operating costs for passengers that switch from cars to rail (also 34% of the total benefits). Fewer car trips on the road network also improves road safety and reduces pollution. However, users that switch to the passenger rail services would face longer travel times, resulting in additional travel time costs.

Infrastructure Australia's analysis of the economic appraisal concurs with the business case that the costs will exceed the benefits, but we have identified several issues that are likely to reduce the proponent's estimate of the project's benefits. These include:

- Optimistic demand forecasts – the proponent has not undertaken any demand modelling and has assumed a 40% increase in the number of rail passengers using the North East Rail Line if the project goes ahead. This estimate includes new (induced) passengers who would not otherwise travel, and passengers who would switch from cars. Given that the project does not improve the scheduled journey time of rail services, we consider this substantial increase in demand overly optimistic. A lower demand forecast would reduce the estimated benefits of the project.

³ Class 2 track standard is a measure of track smoothness, which reflects the alignment of the rail tracks.

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- Optimistic punctuality improvements for existing passengers – the proponent has assumed that travel speed improvements would reduce unexpected delays rather than result in faster scheduled services. Unexpected or 'unscheduled' delays are typically weighted higher than regular travel time savings in an economic appraisal because of the inconvenience of unexpected events on passengers. The proponent has used a high weighting on all travel time savings, thereby implicitly assuming that all passengers expect minimal delays while travelling on the line. However, unscheduled delays occur frequently on the line, and so it is likely that passengers would expect some delays. Correcting for this would reduce the benefits of the project.
- Optimistic user benefits for new passengers – the proponent has not correctly applied the 'rule of a half' when measuring the benefits for new passengers. Applying the approach recommended in the Australian Transport Assessment and Planning (ATAP) guidelines would mean the benefits for new and diverted passengers would be valued at 6 minutes of travel time, which is significantly lower than the values calculated by the proponent.

Infrastructure Australia's analysis also identified that the incremental fare revenue for new passengers was not included in the analysis. This would add benefits for the project as any patronage growth would increase the fare revenue collected by the Victorian Government.

The benefits and costs presented in the proponent's business case are provided in the table below.

Benefits and costs breakdown

Proponent’s stated benefits and costs	Present value (\$m,2018/19) @ 7% real discount rate		% of total
Benefits			
Travel time savings benefit – existing passengers	\$76.6		34.0%
Amenity from improved ride quality – existing passengers	\$2.1		0.9%
Travel time savings benefit – induced passengers	\$16.8		7.5%
Value of undertaking the trip – induced passengers	\$18.9		8.4%
Amenity from improved ride quality – induced passengers	\$0.4		0.2%
Travel time savings benefit – mode shift passengers	-\$7.0		-3.1%
Vehicle operating cost savings – mode shift passengers	\$76.0		33.8%
Road safety benefits – mode shift passengers	\$10.9		4.8%
Reduced road pollution – mode shift passengers	\$6.9		3.1%
Reduced road maintenance costs – mode shift passengers	\$11.3		5.0%
Reduced rail maintenance costs	\$2.1		0.9%
Residual value	\$10.0		4.4%
Total Benefits¹	\$225.0	(A)	100%
Capital costs (P50)	\$161.6		70.5%
Operating and maintenance costs	\$67.7		29.5%
Total Costs¹	\$229.4	(B)	100%
Net benefits - net present value (NPV)²	-\$4.4	(C)	n/a
Benefit-cost ratio (BCR)³	0.98	(D)	n/a

Sources: Proponent's business case

(1) Totals may not sum due to rounding.

(2) The net present value (C) is calculated as the present value of total benefits less the present value of total costs (A – B).

(3) The benefit-cost ratio (D) is calculated as the present value of total benefits divided by the present value of total costs (A ÷ B).

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Taking into account the scale of the downside and upside risks identified in the business case, **Infrastructure Australia considers that the benefits of the project are overstated.** Based on the current evidence available, we estimate that the cost of the project would significantly outweigh its benefits.

Given the importance of rail in serving Australia's regional communities, we **recommend that the proponent explore alternative options, which could involve faster and more frequent services and potential freight benefits, which achieve a better balance of the expected costs and benefits.**

A breakdown of the proponent's reported capital costs and funding is presented in the table below.

Capital costs

Capital costs and funding	
Total capital cost	\$185.0 million (P50, nominal, undiscounted) \$198.3 million (P90, nominal, undiscounted)
Proponent's proposed Australian Government funding contribution	\$235 million ⁴
Other funding	n/a

8. Deliverability

ARTC has set up a **North East Rail Line Project Delivery Team** that would manage the project delivery phase, including finalising the scope and project delivery schedule. The Project Delivery Team would engage with relevant internal ARTC teams to deliver the construction of individual work packages where practicable. They would also engage specialist contractor resources to undertake works when internal teams do not have the capacity or required capability.

The **delivery phase would require a number of track shutdowns to complete the project works.** During a typical financial year, ARTC manages one planned shutdown on the North East Rail Line. Further collaboration would be required with Metro Trains Melbourne and V/Line to ensure the project makes use of other scheduled passenger service shutdowns, and aligns with ARTC shutdowns where possible. If additional passenger service shutdowns are required to complete the scope of works, these will need to be negotiated with the relevant organisations.

The **proponent has not considered private sector funding or increases in fares as desirable or feasible funding sources for the project.**

The **proponent considers that the North East Rail Line Upgrade project has low delivery risk because it involves upgrading existing rail infrastructure,** rather than building new rail infrastructure, and the scope of works is well known. An independent review of the project's cost estimate did not raise any concerns with the unit rates and allowances that have been used. The proponent has identified the following key risks for the delivery phase:

- **unplanned disruption to passenger and freight services from project activities**
- **lack of available and capable industry resources and specialist equipment due to competing projects**
- increased contractor costs due to competing projects
- unanticipated level of cost escalation associated with project delivery due to competing projects
- lack of adequate access to track to undertake the planned work safely, effectively and efficiently
- significant wet weather that may impact on possession works
- lack of cooperation by key stakeholders.

⁴ Includes Escalation and Taxes payable to the proponent

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Infrastructure Australia notes ARTC's experience in delivering similar projects in the past and considers that appropriate mitigations are in place. ARTC's approach to risk management is based on industry standards, and is guided by ARTC's internal Risk Management Policy and Risk Management Procedures. That said, Infrastructure Australia agrees with ARTC that there are key risks for the delivery phase of the project. Many of these risks could lead to cost overruns.

The IRT's review noted that, following the project's completion, ongoing engagement between ARTC and VLine would be required to agree ongoing maintenance requirements for the longer-term performance of the rail line.

If the project proceeds, Infrastructure Australia recommends that the proponent undertake and publish a **Post Completion Review to assess the extent to which expected project benefits and costs have been realised**. This will help to inform the development of future project business cases. In particular, such a review should assess project costs, and outcomes for customers, against the expectations set out in the business case.

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