

## Project business case evaluation summary

# Shepparton Corridor Upgrade – Stage 3

### Location

Shepparton to Seymour, Victoria

### Geography

Smaller Cities and  
Regional Centres

### Category

Regional connectivity

### Total Capital cost

\$400 million (P90, 2021, nominal)

### Indicative timeframe

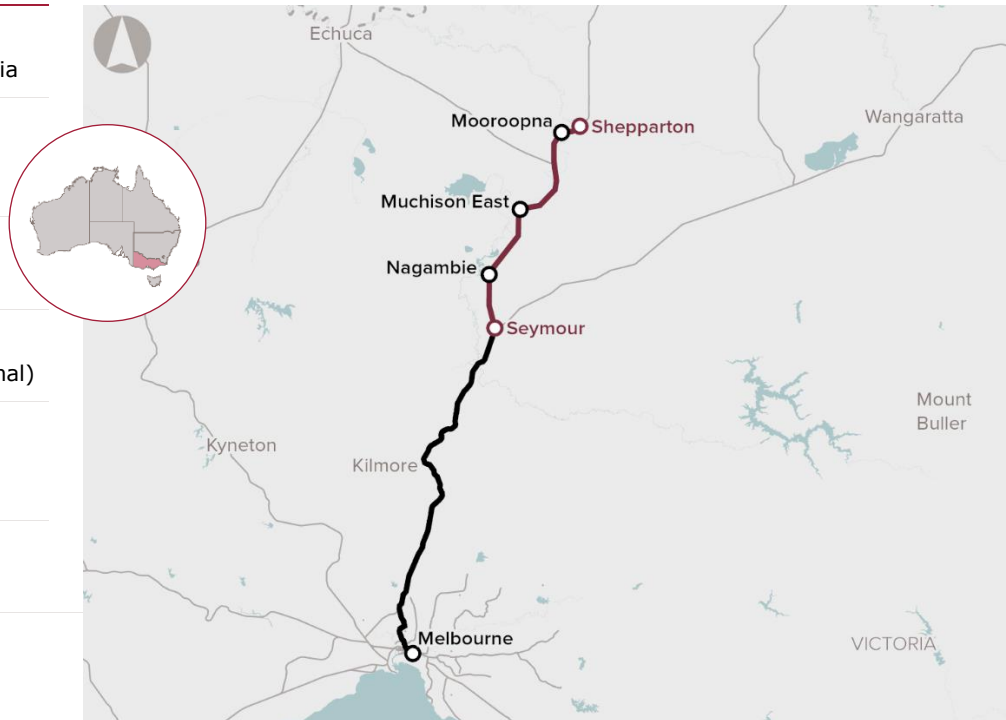
Construction Start: 2021  
Project completion by: 2023

### Proponent

Victorian Government

### Evaluation date

14 October 2021



## 1. Evaluation Summary

Infrastructure Australia has evaluated the business case in accordance with our Statement of Expectations, which requires us to evaluate project proposals that are nationally significant or where Commonwealth funding of \$250 million or more is sought. The Shepparton Corridor Upgrade - Stage 3 (SCU3) proposal is jointly funded by the Commonwealth Government, providing \$320 million of funding (80% contribution) and the Victorian Government providing the remaining \$80 million (20% contribution). Due to the proposal's Australian Government funding status, it has not been considered for inclusion on the *Infrastructure Priority List*.

The SCU3 proposal is part of a broader three stage upgrade under the Regional Rail Revival Program (RRRP). Stage 1 of the Shepparton Corridor Upgrade is now complete and supported the delivery of one additional daily return service between Shepparton and Melbourne, increasing the total number of daily rail services to five. Stage 2 of the Shepparton Corridor Upgrade, which is currently under delivery, aims to support greater network resilience and will enable the operation of a modern VLocity fleet between Shepparton and Melbourne.

The problems identified by the proponent on the Shepparton Rail Line includes single line track sections, sub-optimal signalling and shared tracks with metropolitan trains, which result in inadequate, infrequent and sometimes unreliable train services.

The SCU3 proposal involves track, signalling and stabling upgrades that will enable VLocity trains to travel at up to 130 kilometres per hour and allow an additional four weekday return services between Shepparton and Melbourne. The proponent's business case reports a net present value (NPV) of -\$339.1 million, with a benefit -cost ratio (BCR) of 0.27<sup>1</sup>. We acknowledge that projects located in regional areas may exhibit lower BCR's because of low population densities. This results in relatively lower transport movements, thereby impacting on the potential scale of benefits driven by transport movements that can be captured in standard transport project cost-benefit analysis. Nevertheless, the proposal will help improve rail transport travel times, frequency, and transport reliability as well as provide passenger amenity benefits.

<sup>1</sup> Using a 7% real discount rate and P50 capital cost estimate, evaluated over a 50-year period

The SCU3 works are proposed to be delivered via an amendment to the Stage 2 scope and alliance contract. The proponent has identified that the alliance partner has the capacity to deliver the works required for SCU3.

The business case risk assessment identifies delayed availability of rolling stock; inadequate fleet maintenance capacity and planning approvals as significant risks to successful delivery. While the risk assessment provides high-level mitigation strategies, more robust mitigation measures could be considered, particularly with regard to provision of VLocity rolling stock that enables provision of the additional train services between Shepparton and Melbourne.

## 2. Context

The City of Shepparton is 182 kilometres to the north-east of Melbourne in the Goulburn Valley, Victoria. The population of Shepparton has grown steadily over the past decade to a population of approximately 65,000 in 2019 and is forecast to increase at a rate of 0.89% per annum to approximately 77,700 people in 2036.

The Shepparton Rail Line is part of the Seymour/Hume rail corridor and is shared by the Australian Rail Track Corporation, V/Line passenger and private operator freight services. Shepparton station is the main station used by residents of the City of Greater Shepparton and is currently serviced by five return train services during weekdays to Melbourne (previously four services, with a fifth service added as part of SCU Stage 1 in 2019) and three return services during weekends. This provides a total of 62 train services, or 31 return train services, per week.

The Shepparton Corridor Upgrade is being delivered in 3 stages. SCU1 is complete and included a stabling upgrade at Shepparton Station for one locomotive-hauled set; an extra 29 coach services between Shepparton and Seymour to connect with train services; and the delivery of one additional daily return train service between Shepparton and Melbourne.

The SCU3 proposal builds on the Stage 1 and 2 works by improving the reliability of services through track and signalling upgrades and operational improvements, enabling an additional four weekday return services. This provides for an increase to nine return services each weekday between Melbourne and Shepparton and enables VLocity trains to travel up to 130 kilometres per hour.

## 3. Problem description

The current Shepparton Rail Line features several infrastructure constraints including but not limited to single line track sections, sub-optimal signalling and shared tracks with metropolitan trains. These infrastructure constraints are resulting in inadequate, infrequent and sometimes unreliable train services. The business case focuses on resolving asset constraints rather than responding to land use changes or population growth.

There are four stations on the corridor between Seymour and Shepparton, at Shepparton, Mooroopna, Murchison East and Nagambie. The proponent estimates daily usage of 318 passengers in 2031 under the base case and 329 return users in the central project case. This is estimated to increase to 353 passengers per day in 2031 under the base case and 365 passengers per day under the project case. The business case does not identify the total trips between Shepparton and Melbourne. As a result, we are unable to determine the mode share of rail within the overall trips.

The business case identifies that the current train timetable offers a limited frequency and unsuitable schedule of train services for Shepparton residents to travel to and from Melbourne. For example, both inbound and outbound train services can feature significant wait times of up to 3 hours between some train services, while the last train to depart Melbourne for Shepparton leaves at 7:08 pm.

Over the period 2014-2019, while V/Line has been meeting its reliability performance targets, punctuality was poor. Punctuality levels (i.e. on-time train services) have fluctuated in recent years, with only 78 per cent of services arriving on time in the first quarter of 2018. The punctuality of Shepparton services has also been frequently below V/Line's target of 92 per cent since 2015.

The business case provided quantitative rather than monetised data to demonstrate the scale of the problem. As detailed in the *Infrastructure Australia Assessment Framework*, defining, quantifying and monetising the problem can provide proponents with the ability to explore and match feasible options that best address the scale of the problem.

#### 4. Options identification and assessment

As presented in the business case, the proponent considered three potential strategic interventions to address the problem:

1. Provide coach services to Shepparton to align with rail services terminating in Seymour. This option involves no changes to rail services or infrastructure.
2. Improve the frequency and speed of rail services; and
3. Improve rail service frequency and speed as well as passenger amenity.

While the business case provides limited information on the extent of investigating a broader range of options, this is appropriate as it is the third stage that builds on the previous stages and investments.

The proponent undertook an assessment of the strategic intervention options using a multi-criteria analysis that considered several themes, including but not limited to project benefits, risks, costs and timing, to identify the third option as preferred. However, it is unclear how the assessment weightings and calculative process was applied across these themes to arrive at the final option rankings. As such, the ranking of options could have been underpinned by a stronger justification and evidence-based approach.

The business case also presents two scalable, reduced scope, lower-cost rail solutions, including:

- Scalable option 1, including the Automatic Train Control (ATC) power signalling, stabling expansion and passing loop extension at Murchison East, which enables the increase in daily return services, but maintains current operating speeds (97 kilometres per hour).
- Scalable option 2, including Class 2M track upgrades, which enables the increase in average speed to 123 kilometres per hour (130 kilometres per hour maximum).

The above scalable options were discounted based on the options not addressing the key problems or delivering the required benefits. The proponent provided limited information on how these options, and other low-cost options, were assessed and discounted from further consideration. The proponent identified opportunities for Class 1 track upgrades, Electronic Train Ordering (rather than ATC) and Shepparton Station upgrades that will be further investigated in the next phase, with any changes in scope from the business case being subject to relevant State and Federal government approvals.

The business case presents a detailed assessment of one shortlisted option which included a detailed cost-benefit analysis (CBA). The *Infrastructure Australia Assessment Framework* recommends using rapid CBA and multi-criteria analysis of earlier stage options, to develop a shortlist of 2-3 detailed options for consideration in the business case. We recommend that in future submissions the proponent consider the use of these quantitative methods of shortlisting options and the use of detailed CBA for analysis to support identification of a preferred option.

#### 5. Proposal

The main elements of the SCU3 proposal include:

- implementing ATC power signalling between Seymour and Shepparton and replacing the current manual train order system. This enables remote operation of all sidings, crossing loops, and stabling yards from a central control centre
- upgrading the existing Class 3 track between Seymour and Shepparton to Class 2M track, including curve realignment to enable VLocity trains to operate at the target 130 km/h speed. This is an increase of approximately 30 km/h compared to existing operating speeds and will result in a 6-minute travel time saving, when compared to the base case
- expansion of stabling at Shepparton, adding one additional stabling road to accommodate three six-car VLocity sets to reduce operational costs and constraints of empty running to provide the additional daily services between Shepparton and Seymour

- extending the passing loop at Murchison East to allow two VLocity trains to cross, which is required to increase the number of daily services. This scope was originally part of SCU2, however due to budget constraints is now part of SCU3.

## 6. Strategic fit

The proposal is part of the Regional Rail Revival Program (RRRP), a joint initiative between the Victorian Government and Australian Government. The RRRP is a \$4 billion dollar program designed to improve reliability and resilience in Victoria's regional rail network and to support regional economies.

The business case identifies that investment on the Shepparton Rail Line (the Shepparton Corridor) is also aligned with the Government's overall Regional Network Development Plan (RNDP). The RNDP is a state-wide plan for regional public transport and guides the short-, medium- and long-term priorities needed to modernise the network. The RNDP committed to delivering a minimum of five services, five days a week to the outer regional train lines of Warrnambool, Bairnsdale, Albury-Wodonga, Echuca, Swan Hill and Shepparton.

While SCU1 supported the delivery of an additional return service between Shepparton and Melbourne, increasing the number of rail services to five in total, and fulfilling the RNDP commitment, the SCU3 proposal will extend on this commitment, by helping to improve the reliability of services through track upgrades and improving the timetabling and frequency of services by delivering four more weekday services.

SCU2 is currently underway and will include new stabling and ancillary facilities at Shepparton for up to two six-car VLocity sets; platform extensions at Mooroopna, Murchison East and Nagambie stations to meet V/Line standards; 59 level crossing upgrades between Donnybrook and Shepparton; and implementation of speed controls at around 11 occupation crossings.

SCU2 will support greater network resilience and will enable the operation of a modern VLocity fleet between Melbourne and Shepparton, resulting in decreased journey times, and increased levels of customer comfort and satisfaction. The SCU3 proposal will further enhance the line by improving travel times, reliability, timetabling and frequency of train services.

## 7. Societal impact (social, economic and environmental value)

The proponent's economic appraisal indicates a BCR of 0.27 and a negative NPV of -\$339.1 million, at a 7 per cent real discount rate using a P50 capital cost estimate. This means that the proposal results in a net economic cost to the Australian economy. We have considered the sensitivity of the appraisal to the discount rate and growth scenario and note that:

- Using a 4% discount rate results in a NPV of -\$314.1 million and BCR of 0.47
- Using a 10% discount rate results in a NPV of -\$326.6 million and a BCR of 0.18
- Using a high-growth scenario, at 7% discount rate, results in a NPV of -\$142.3 million and a BCR of 0.69. The high growth scenario assumes a 12% increase in all journey to work car trips travelling out of Shepparton, increasing rail boardings at Shepparton by 2.5 times.

The economic analysis considers the impacts of the proposal as incremental impacts relative to SCU1 and SCU2. The proponent's economic analysis shows that the majority of benefits include reduced train crowding costs at \$38.9 million and improved train amenity at \$40.0 million in discounted present value terms. These benefits make up 62% of total benefits and we note that they do not align to the proponent's main problem statements, including 1) significantly constrained and unreliable transport options for residents; and 2) inconveniently timed services undermine efforts to attract rail users.

The value of quantified benefits<sup>2</sup> that better align with the proponent's main problem statements include generalised travel time savings of \$5.0 million; reduced wait time benefits of \$9.2 million; and increased reliability benefits of \$6.2 million, which totals to \$20.4 million.

Travel time savings are relatively small as increased travel speeds will only provide approximately 6 minutes of savings. We acknowledge that the economic benefits of infrastructure projects in regional locations can be low in comparison to more urban areas. This is because regional locations

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<sup>2</sup> Present value 2020/21 using a 7% real discount rate over a 50-year appraisal period

typically have lower population densities, resulting in less transport movements and thereby impacting on the potential scale of user benefits. The increase in rail frequency could facilitate other potential benefits, not quantified in the economic appraisal, such as the proposal's capacity to contribute to a more productive and resilient regional economy as well as broader social benefits and development opportunities for the Shepparton region.

In addition to the observations made above, our review identified some limitations with the analysis, including:

- **Unconstrained benefits:** the CBA uses linear extrapolation to determine the magnitude of benefits beyond 2046 (the final year modelled). The proponent has tested for potential capacity issues in 2071 by assessing and comparing peak loads at Nagambie. While the proponent's analysis identified no capacity constraints over the evaluation period, it would be more prudent to constrain incremental benefits to better account for any other uncertainties and risks to proposal benefits beyond the modelled time-period.
- **Freight impact:** the proponent's CBA model doesn't consider any benefits and costs associated with the freight services. While the business case states current freight services will not be impacted, it does not monetise or provide clarity on the net impact of the proposal on future freight volumes.
- **Rolling stock amenity benefits:** the CBA includes significant amenity benefits of \$40.0 million. The proponent has stated that amenity benefits are achieved through improved train vehicle quality from new VLocity train rolling stock, providing improved customer experience.

The proponent's quantified amenity benefits appear overstated since new rolling stock (already funded and in delivery) will already be operational on the rail corridor as part of the SCU2 project. This should be included in the base case of the SCU3 economic appraisal. Although some additional rolling stock is planned to deliver additional train services under SCU3, a proportion of the passengers will already be experiencing amenity benefits from the new trains delivered as part of SCU2.

- **Additional rolling stock funding:** while the economic appraisal considers the benefits and costs associated with additional VLocity rolling stock, we note that this is not included in the total capital cost estimate. The majority of SCU3 benefits are dependent on the successful funding and delivery of additional VLocity rolling stock required for operation of the four additional weekday return services delivered under SCU3. The procurement of rolling stock is currently unfunded and subject to a separate business case and therefore a potential risk for achieving the stated benefits under SCU3.
- **Sensitivity analysis:** the proponent's sensitivity testing does not consider proposal specific related risks such as delay of VLocity rolling stock acquisition or potential construction delay issues, driven by potential planning issues and SCU2 alliance delivery issues.

Overall, given the observations identified, we agree with the proponent's analysis that the proposal's estimated costs will exceed the estimated economic benefits.

The table below presents a breakdown of the proponent's stated benefits and costs.

### Benefits and costs breakdown

Proponent's stated benefits and costs	Present value (\$M, 2020/21) @ 7% real discount rate	% of total
<b>Benefits</b>		
<b>Public transport user benefits</b>		
Generalised travel time	\$5.0	3.9%
Reduced crowding	\$38.9	30.6%
Reduced wait time at stations	\$9.2	7.2%
Farebox resource cost correction	\$2.0	1.6%
Improved amenity	\$40.0	31.4%
Increased reliability	\$6.2	4.9%
Road-user benefits	\$2.1	1.6%
Externalities	\$2.1	1.6%
Option and non-use benefits	\$10.2	8.0%
Residual value of assets	\$10.2	8.0%
<b>Total Benefits<sup>1</sup></b>	<b>\$127.3</b>	<b>(A) 100%</b>
Total capital costs (P50)	\$312.6	67.0%
Operating & maintenance costs	\$153.7	33.0%
<b>Total Costs<sup>1</sup></b>	<b>\$466.3</b>	<b>(B) 100%</b>
<b>Net benefits - Net present value (NPV)<sup>2</sup></b>	<b>-\$339.1</b>	n/a
<b>Benefit-cost ratio (BCR)<sup>3</sup></b>	<b>0.27</b>	n/a

Source: Proponent's business case

(1) Totals may not sum due to rounding.

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

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

The proponent's reported capital costs and funding is presented in the following table.

Capital costs and funding	
Total capital cost	\$400.0 million (P90, nominal) \$365.87 million (P50, nominal)
Australian Government funding contribution (committed)	\$320 million (80% funding)
Victorian Government funding	\$80 million (20% funding)

## 8. Deliverability

Rail Projects Victoria (RPV) is the delivery agency for the Shepparton Corridor Upgrades. RPV has experience in managing large, complex infrastructure projects from inception and project development through to operational delivery.

The proponent assessed a range of procurement and packaging options to deliver the project. This review found that delivering the full scope of SCU3 as a variation to the existing SCU2 Project Alliance, which was established in November 2020, would offer cost efficiencies; design synergies; and reduction in risks associated with complex interface issues between SCU2 and SCU3 works.

The Murchison East Loop Extension component of SCU3 has already been awarded to the SCU Alliance and works are currently underway. Delivery of the stabling extension and track and signalling upgrades of SCU3 by the SCU Alliance will be subject to market pricing and value for money considerations. The proponent states that, in the event evaluation of proposals does not demonstrate value for money outcomes, RPV will seek approvals for alternative packaging and procurement approaches, which may involve new market tender processes. This presents a risk to the delivery timing of the proposal that we recommend be incorporated into the risk register with appropriate mitigation measures established.

The business case identifies a range of risks associated with the proposal. The risk assessment profiled significant risks associated with the delayed delivery of VLocity rolling stock and insufficient capacity for fleet maintenance. These two risks are significant given that the delivery of four additional return train services depend on the delivery and operation of the rolling stock.

The risk assessment also identifies potential planning and approvals risks associated with the requirements for a Statement of Environmental Effects (SEE) and Cultural Heritage Management Plan approvals. Although the majority of works will be within an existing corridor, we recommend that the proponent develop a more robust risk mitigation strategy to manage these risks. Construction is planned to commence in late 2021 with completion planned in late 2023. Construction milestones are subject to applicable government planning approvals, which as identified present a risk to the proposal.

The business case states that SCU3 will allow for maintaining existing freight service volumes. However, as acknowledged by the proponent, further investigation and planning work is required to understand the demands, impacts and infrastructure needs of future freight volumes on the network. We agree this work should be progressed to consider potential impacts on realising the benefits of the SCU3 proposal.

A Project Management Plan (PMP) or post-completion review plan was not provided by the proponent. However, the business case states that a PMP will be developed to cover a wide range of topics, including but not limited to more detailed governance structures for the project. As part of the planning and development of any major capital infrastructure project, we recommend that all proponents develop comprehensive PMP's to appropriately manage procurement and delivery.

Infrastructure Australia also encourages the proponent to undertake and publicly release a post-completion review to assess the extent to which expected benefits and costs have been realised. This will help to inform future proposals and should assess project costs and outcomes for customers, against the expectations set out in the business case.

### **Consideration of COVID-19**

The COVID-19 pandemic has significantly affected the use of infrastructure. Infrastructure Australia has been working collaboratively with the Australian Government to provide advice on a staged response for managing, and recovering from, the impacts of the COVID-19 pandemic.

One critical element of our advice is to maintain a pipeline of nationally significant infrastructure investments. Nationally significant infrastructure projects are long-term investments, typically considering a 30-year view of the project's social, environmental and economic impacts. Infrastructure Australia continues to take a long-term view and consider the sensitivity of key planning assumptions using the best data available to us.

As noted in the 2019 Australian Infrastructure Audit, we must continue to evolve the way we plan for Australia's infrastructure to embrace uncertainty. There are still many uncertainties regarding the long-term impact of the COVID-19 pandemic on infrastructure use.

We will continue to collaborate with industry, the community and governments at all levels to understand the impacts of the COVID-19 pandemic on infrastructure decisions in Australia.