

# Dorset Road Extension



**PURPOSE OF EVALUATION**  
Proposal seeking funding



**EVALUATION OUTCOME**  
Not recommended for the  
Infrastructure Priority List at this  
time

**ASSESSMENT  
FRAMEWORK  
STAGE**



**LOCATION**

Melbourne, Victoria

**GEOGRAPHY**

Fast-growing cities

**SECTOR**

Transport

**OUTCOME CATEGORY**

Efficient urban transport networks

**PROPONENT**

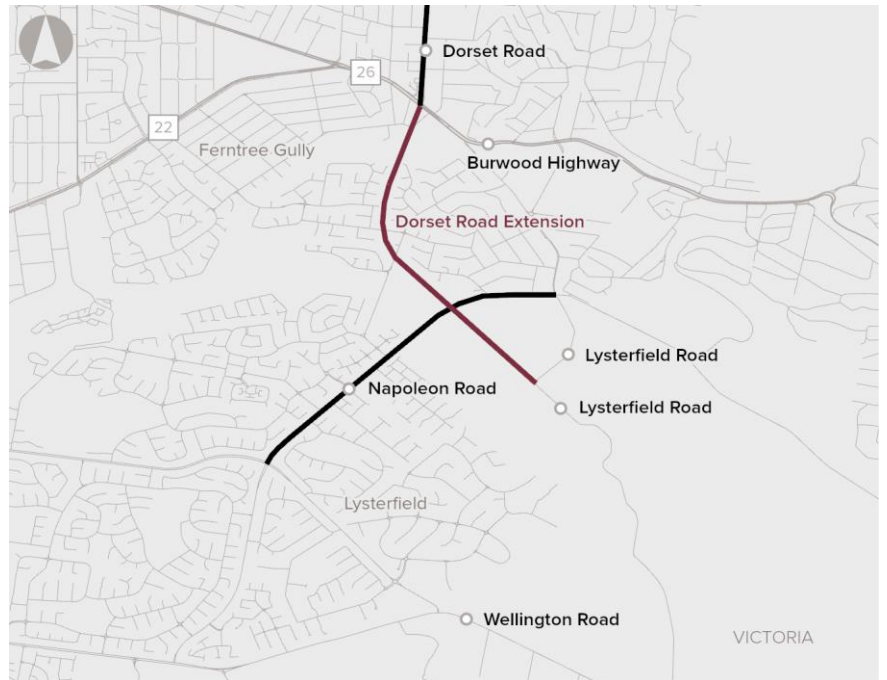
Victorian Government on behalf of the  
Australian Government

**INDICATIVE DELIVERY TIMEFRAME**

Construction start: Q1 2024  
Completion by: Q2 2026

**EVALUATION DATE**

8 September 2022



**CAPITAL COST**

\$396.1 million (P50, outturn)  
\$413.5 million (P90, outturn)

**FUNDING COMMITTED/SOUGHT (P90)**



## Review summary

Infrastructure Australia has evaluated the business case for the **Dorset Road Extension** in accordance with our Statement of Expectations, which requires us to evaluate project proposals that are nationally significant or where Australian Government funding of \$250 million or more is sought. As a result of our assessment, Dorset Road Extension has not been added to the *Infrastructure Priority List* as an Investment-ready proposal.

Dorset Road is a 13km primary arterial road that provides continuous north-south connectivity between Maroondah Highway, Croydon and Burwood Highway, Ferntree Gully. Terminating at Burwood Highway, further north-south connectivity between the areas of Ferntree Gully and Lysterfield/Rowville is provided via several discontinuous route options comprising primary and secondary arterial roads along with major council roads.

Population growth in the Knox and Maroondah Local Government Areas, which Dorset Road intersects, and the lack of connectivity has resulted in increased congestion, with traffic diverting onto residential streets and a higher

incidence of crashes compared to the Greater Melbourne weighted average crash rate. The population in the Knox municipality has increased by 16% over the past 20 years and is expected to increase a further 20% by 2036, although this is relatively modest compared to the Melbourne average. The business case reports that the configuration of the road network is not capable of accommodating the existing and future demand within the proposal area.

The options analysis tested infrastructure, non-infrastructure, regulatory and public transport options. This analysis found that creating a new north-south transport connection was estimated to deliver the most benefits, and was selected as the preferred option despite having the highest expected cost and highest disbenefits. The rationale for how response options meet objectives or address key risks, and the subsequent ranking of options is not articulated in the business case. Additionally, no information is provided in the business case explaining why the non-infrastructure options were assumed to take longer than the preferred option.

As the preferred option, the Dorset Road Extension proposes to:

- improve network efficiency by improving the level of service at intersections
- improve community satisfaction by increasing capacity of the corridor and reduce delays
- improve road safety by reducing the risk of crashes and conflict between road users.

The Dorset Road Extension is estimated to have a benefit-cost ratio (BCR) of 0.64 and a Net Present Value (NPV) of -\$117.4 million, indicating that the cost of the proposal outweighs the quantified benefits.<sup>1</sup>

While the proposal is intended to improve connectivity, the economic appraisal does not quantify journey time reliability and network resilience benefits, which would have provided greater certainty on the benefits of the proposal and likely resulted in a higher BCR. However, we do not consider them to be significant enough to return a net benefit to society.

The Dorset Road Extension is proposed to intersect with the Napoleon Road Upgrade proposal, which is being planned concurrently. The proponent has assessed the two proposals independently with some preliminary investigation of aligning the timing and scope of the proposals. This investigation found that the costs of Napoleon Road Upgrade could reduce by an estimated \$37 million if the Dorset Road Extension is considered and implemented jointly with the Napoleon Road proposal. This finding suggests further options analysis is warranted to confirm the most efficient configuration option has been selected.

Additionally, the Victorian Government is also progressing proposals for Wellington Road Upgrade and Dorset Road (North) Upgrades, all in the same geographic area. However, different transport demand modelling approaches have been used for the different proposals and the economic appraisals have been undertaken independently. Due to their proximity, complexity and high level of interdependencies, we recommend further analysis as an integrated program of work is needed to provide greater certainty that costs, and risks are minimised and the benefits attributed to each proposal are properly recognised.

In summary, we recommend that lower cost options are considered to extend Dorset Road, as part of an integrated program of work, to return better value for society.

## Proposal description

The preferred option involves:

- a 3km extension of Dorset Road from Ferntree Gully to Lysterfield Road, with two lanes in each direction
- three new signalised intersections at Ormonde Road, Napoleon Road and Lysterfield Road
- upgrades to the intersection at Burwood Highway/Dorset Road
- crossings over Ferny Creek and Monbulk Creek
- active transport facilities along the route of the extension.

Construction of the package is estimated by the proponent to create a total of 2,179 new jobs, of which 627 would be directly employed and 1,552 would be generated by flow-on impacts of expenditure.

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<sup>1</sup> Based on a 7% real social discount rate, P50 capital cost estimate and evaluated over a 30-year period.

Strategic Fit	The case for action, contribution to the achievement of stated goals, and fit with the community.
<b>Case for change</b>	<p>Population growth and limited north-south arterial connectivity in the Knox municipality have placed pressure on the local road network, manifesting in long and unreliable journeys. There are high volumes of traffic ‘rat running’ through local streets, compromising community wellbeing and local amenity. Additionally, a complex road network with long traffic delays increases the likelihood of crashes. Based on historical crash data through the Glenfern-Lysterfield Road corridor, crash risk will increase if the problem is not addressed.</p> <p>The business case identifies population growth as one of the key drivers of the proposal. However, the Knox municipality is expected to grow by 20% over the next 16 years, compared to an expected growth of 46% for Greater Melbourne over the same period, according to Victoria in Future (VIF2019) estimates.</p>
<b>Alignment</b>	<p>The proposal aligns with Victorian Government legislation (<i>Transport Integration Act 2010</i>) and strategies such as <i>Plan Melbourne</i>, <i>Department of Transport Strategic Plan (2021-2025)</i>, <i>Growth Corridor Plans</i>, <i>Victorian Road Safety Strategy (2021-2051)</i>, <i>Victoria’s Infrastructure Strategy (2021-2051)</i>, <i>Toward Zero (2016-2020)</i> and <i>Victoria’s Climate Change Strategy (2021)</i>. However, this proposal is not specially mentioned in these strategies.</p> <p>The proposal also aligns with several <a href="#">2019 Australian Infrastructure Audit</a> challenges and opportunities, such as <i>rapid growth in Melbourne has put legacy infrastructure under increasing strain</i>, and recommendations from the <a href="#">2021 Australian Infrastructure Plan</a> (i.e. Recommendation 4.1 – <i>maximise the overall benefits of transport investments by aligning transport programs with place-based objectives</i>).</p>
<b>Network and system integration</b>	<p>Future infrastructure proposals in the area are expected to complement the Dorset Road Extension proposal by reducing the end-to-end travel time of users. Three proposals are identified in the business case:</p> <ol style="list-style-type: none"> <li>1. Napoleon Road Upgrade</li> <li>2. Wellington Road Upgrade</li> <li>3. Dorset Road (North) Upgrade<sup>2</sup>.</li> </ol> <p>The service need and problem definitions for each proposal are closely interlinked and the ability of each proposal to deliver solutions would be compromised if the others do not go ahead.</p> <p>The Dorset Road Extension intends to extend Dorset Road so that it will directly intersect with Napoleon Road. The business case treats the Napoleon Road Upgrade as the primary interfacing proposal. There are strong interdependencies in terms of network functionality, proposal timing and land acquisition. If Dorset Road Extension proceeds, the business case identifies that the Napoleon Road Upgrade can proceed with a shorter length as it is still expected to deliver a similar scale of benefits but at a lower cost.</p> <p>Secondary interfacing proposals include the Wellington Road and the Dorset Road (North) Upgrades. The Dorset Road (North) Upgrade involves widening to the existing stretch of road at the northern end of Dorset Road. Since both proposals take place on Dorset Road, there are expected to be strong network resilience benefits and efficiencies once the upgrade and the extension are completed. Wellington Road is a key east-west arterial road, located to the south of Dorset and Napoleon Roads. The proposed Wellington Road Upgrade may exacerbate already limited north-south connectivity in the area by redirecting traffic towards Dorset Road.</p> <p>The Dorset Road Extension will also intersect with the Urban Growth Boundary (UGB)<sup>3</sup>, which places limits on Melbourne’s urban development. In order to proceed with</p>

<sup>2</sup> The Dorset Road (North) Upgrade project is in the planning stage and is expected to upgrade Dorset Road between Hull Road and Maroondah Highway in Croydon. This is located approximately 11kms from the location of the Dorset Road Extension proposal.

<sup>3</sup> The UGB around Melbourne was established to manage outward expansion in a coordinated manner. The current UGB was reaffirmed as the outer limit for growth in *Plan Melbourne 2017-2050*. It can only be changed by majority vote in both houses of Parliament. See: <https://vpa.vic.gov.au/metropolitan/more-information/urban-growth-boundary-key-facts/>

construction of the proposal, a change in the UGB is not necessarily required, although it may precipitate an adjustment after it is completed. At this stage, there is no information available to suggest that changes to the UGB are planned.

Due to the high level of complexity, proximity and interdependencies between these upgrades, we recommend that further analysis is undertaken to determine if the proposals should be assessed as an integrated program. This would provide confidence that costs are minimised, and benefits are maximised.

We note that different transport demand modelling approaches were used in Dorset Road Extension and Napoleon Road Upgrade business cases. We acknowledge the challenges of forecasting demand given the impacts of COVID and that journey time reliability and network resilience could not be quantified. Any further analysis should use consistent assumptions and transport demand modelling approaches to ensure benefits are attributed to the appropriate proposal and that network resilience benefits can be captured.

## **Solution justification**

Four response options, in addition to a base case, were considered to address the identified network and safety problems:

- creating new north-south transport connections
- upgrading existing roads to improve north-south connectivity (no major roadworks)
- improved public transport options
- restricting 'rat-running' routes.

Based on the options analysis completed, creating a new north-south transport connection was estimated to deliver the most benefits and was selected as the preferred response. This was despite the option having the highest expected cost and highest disbenefits. The rationale for how response options meet objectives or address key risks, and the subsequent ranking of options is not articulated in the business case. Additionally, no information is provided as to why the non-infrastructure options were assumed to take longer than the preferred option. In our view, the application of the method to select the response options is not sufficiently evidenced in the business case.

Based on the preferred response option, to create a new north-south transport connection, four specific proposal options plus a base case were evaluated in detail. These options were informed by stakeholder impact analysis, movement and place assessment, social impacts, environmental impacts, financial appraisal, economic appraisal and risks by option. Option 4 (Extend Dorset Road between Burwood Highway and Lysterfield Road – four-lane road) was estimated to have the highest BCR and it had the highest score from an integrated analysis and options ranking process.

We consider that a broader range of options should have been tested at the response options stage, including combinations of infrastructure and non-infrastructure options.

## **Stakeholder endorsement**

Stakeholder input was sought to develop options and provide feedback on the preferred design option. The proponent's stakeholder engagement plan identifies a comprehensive list of stakeholders including local councils, transport operators, government agencies and statutory authorities, industry bodies, special interest groups, the local Registered Aboriginal Party, local hospitals and healthcare services. Input from local residents, local businesses and road users was also sought.

Consultation to date has not included presenting the proposal options to stakeholders, however the business case reports that the stakeholder input has been used to develop the options. Based on the information provided, community support appears to be mixed. The local community has been highly engaged in consultation on the proposal and there are concerns about the impact to the environment, safety and local amenity.

## **Societal Impact**

**The social, economic and environmental value of the proposal, as demonstrated by evidence-based analysis.**

## **Quality of life**

The proposal is expected to deliver quality of life (QoL) benefits, although they are not substantial given the proposed level of investment. Some of these benefits are quantified in the economic appraisal, including a lower incidence of accidents (12.9% of benefits), reduced noise externalities (1.0%) and improved amenity and placemaking benefits for commuters (0.5%). Other QoL benefits (including health benefits from improved active transport connectivity and placemaking benefits for pedestrians, cyclists and residents)

were not quantified, however it is not expected that they would materially impact the BCR had they been included.

The new north-south link also provides a new route that enables the community to better access services such as education and health. This includes significant business locations in Melbourne's east, including Burwood Highway East, Knox Central, Bayswater Industrial Area and Wantirna Health. However, there is no evidence of significant disadvantage in these areas (Australian Bureau of Statistics (ABS), Socio-Economic Indexes for Areas) that would be materially improved by increasing connectivity to these services.

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**Productivity**

The proposal is estimated to deliver benefits for business-purpose trips as well as light and heavy commercial vehicles accessing industrial precincts in the area. It could also improve broader connectivity to job opportunities in Melbourne. However, our evaluation suggests that these benefits might be overstated.

The economic appraisal assumes that 10% of total travel is business related, with 90% being private. The appraisal notes that this is a conservative assumption that is lower than the Victorian average that 18% of travel is business related (based on the ABS Survey of Motor Vehicle use)<sup>4</sup>, and consistent with assumptions held in the state-wide mandated traffic model. However, the business case assumptions are not directly comparable to the ABS estimates referenced as they are based on travel distances whereas the ABS data is based on travel times. This suggests that travel benefits could be overstated in the economic appraisal, potentially overstating the BCR as a result.

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**Environment**

The options assessment presents the results of a number of environmental studies including aboriginal cultural heritage and historic heritage, arboriculture, contaminated land, ecology, land use planning and surface water.

The planning and environmental approval pathway required for the delivery of this package has been identified, although no information is provided on the status of these approvals in the business case.

One key environmental constraint is the potential for flooding, given that the greenfield reservation passes through a waterway. The environmental studies also identify a range of ecological issues that arise from this, which the business case acknowledges but states can be minimised through design or otherwise addressed by offsetting. Environmental risk has been captured in the proposal's risk register. Biodiversity offsetting, if required, will increase proposal costs and further reduce the BCR.

The economic appraisal demonstrates that the proposal is estimated to have a marginally positive environmental benefit based on reduced air pollution, water pollution and greenhouse gas emissions.

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**Sustainability**

The proposal's Value Creation and Capture Plan identifies the opportunity for greater reuse of materials (for example, reclaimed asphalt pavement, crushed concrete and crushed glass fines) as a mechanism for value creation. However, an assessment of alternative options for sustainable design has not been completed so it is not clear whether these will be costed and incorporated into the final design.

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**Resilience**

The proposal is expected to improve the resilience of the transport network in the Knox municipality, which is currently impacted by limited north-south arterial connectivity. Potentially significant benefits of increased transport network resilience include enabling road users to circumvent incidents from crashes or other events, although these have not been quantified.

With respect to flooding, the proposal designs were assessed using Austroads guidelines (unreferenced) and found not to contribute to an increase to flood levels. The potential for flooding to disrupt construction is reported as a "Significant" risk pre-mitigation and "Medium" risk post-mitigation. The business case does not expand on how the potential for extreme weather events, including flooding, could impact operation of the road in the future and community resilience.

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<sup>4</sup> <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release#tonne-kilometres-travelled>

**Deliverability**      **The capability to deliver the proposal successfully, with risks being identified and sufficiently mitigated.**

**Ease of implementation**      Prior to construction commencing in Q1 2024, the program allocates 18 months for preconstruction works. These activities mainly relate to positioning the proposal with stakeholders and to meet statutory requirements. The Communications and Stakeholder Engagement Plan identifies the likely need for land acquisitions but states that only preliminary investigations have been made.

In addition, the business case identifies an opportunity for the Dorset Road Extension to be delivered concurrently with the Napoleon Road Upgrade proposal. Separate business cases have been developed for the proposals, but an integrated delivery is recommended if both proposals proceed to the delivery phase. This recommendation was made based on the results of a multi-criteria analysis (MCA). It is noted that if both proposals are implemented, the business case recommends a smaller scope for the Napoleon Road Upgrade than if that proposal was implemented independently. This could reduce costs for the Napoleon Road Upgrade by an estimated \$37 million.

The necessary planning and environmental approvals are not in place, but a plan for gaining these approvals has been included in the business case.

**Capability & capacity**      Major Road Projects Victoria (MRPV) has experience delivering projects similar in scope and complexity to the Dorset Road Extension and is expected to have the required level of skill and expertise to deliver the proposal.

Resourcing capability and capacity constraints in the current heightened market are acknowledged (in particular labour shortages of senior delivery executives, experienced bid directors and design engineers) which is in line with Infrastructure Australia’s [2021 Infrastructure Market Capacity](#) report’s forecast. These industry-wide capacity pressures need to be managed to mitigate impacts to the proposal’s delivery time, scope and costs.

The business case includes role positions and full-time equivalents by financial year, although it does not appear to include a specific resourcing strategy. It also presents a high-level risk assessment (including market response risk, contractor capability risk, and price and schedule uncertainty) and potential implications for delivery of the proposal but does not appear to include proposed mitigations for these risks or analysis of how the sequencing of this proposal would align with other competing projects and programs in the market.

**Project governance**      The business case includes a proposed governance framework for delivery. The recommended delivery agency for this proposal is MRPV. MRPV is a special purpose project team responsible for planning and delivering major road projects for Victoria within the Major Transport Infrastructure Authority.

A number of procurement models were considered, with the recommended procurement model following MRPV’s Program Delivery Approach (PDA). The PDA is a standardised approach to procurement, which was commissioned for the Suburban Roads Upgrade Program. The PDA includes a panel of contracts and a two-stage incentivised cost model. This model was selected based on a thorough assessment of several options and the risks associated with delivering the proposal.

At this stage, the business case anticipates that funding for the preferred option will be provided by the Federal Government. The business case seeks \$413.495 million of funding from the Federal Government over four years. So far, \$80 million has been committed to the proposal through the Urban Congestion Fund Program.

**Risk**      The proposal has a risk management strategy in place, which is supported by a comprehensive risk register that details potential risks, from land acquisition to stakeholder engagement, and proposed mitigation measures. This has been used to estimate probabilistic cost contingency estimates with the appropriate level of confidence (i.e. P50 and P90). However, limited information appears to have been included on the planning approvals pathway, and there is also the potential to include additional interface risks to reflect the contracting packages proposed to deliver the proposal.

## Lessons learnt

MRPV host fortnightly knowledge and learning sharing workshops where teams can come together to openly discuss aspects of proposals that worked well and can be implemented on other projects, as well as aspects that could be improved and difficulties that could be avoided on future projects. The business case specifically identifies a number of learnings from the Thompsons Road Upgrade and the Plenty Road Upgrade, such as early engagement with local councils regarding planning permits and installation of CCTV cameras at key intersections.

The business case includes a high-level post completion review strategy with six key performance indicators identified (decrease in volumes on Glenfern Road south of Burwood Highway, travel time delays experienced by users, community acceptance of improvements, reduced local road and street traffic volumes, exposure to crash risk and crash rate frequency). The post completion review would benefit from additional evidence regarding benefit owners (and acceptance), timing of monitoring and reporting, key handover points, and change management approach.

## Economic appraisal results (preferred option)

The economic appraisal was conducted on the three proposal options (options 2, 3 and 4). The preferred option, proposal option 4, was estimated to have the highest BCR of 0.64 and a NPV of -\$117.4 million<sup>5</sup>.

The economic appraisal summary results are presented below for the preferred option at 4%, 7% and 10% discount rates. Detailed results for the 7% discount rate scenario are presented on page 9.

### Economic Appraisal Results

	Discount rate:	4%	7% (central)	10%
<b>Core evaluation results<sup>1</sup></b>	<b>BCR:</b>	0.93	0.64	0.47
	<b>NPV (\$m):</b>	-\$24.3	-\$117.4	-\$161.4
<b>Key benefits measured:</b>	The top three benefits in the CBA are travel time savings, vehicle operating costs and crash cost savings, accounting for 61%, 22% and 13% of the total benefits by present value, respectively. Some proposal benefits have not been quantified: <ul style="list-style-type: none"><li>• improvements in journey time reliability (i.e., more certain journey times in addition to shorter journey times)</li><li>• improvements in network resilience</li><li>• residual value of assets.</li></ul> While the inclusion of these benefits is likely to have resulted in a higher BCR, we do not consider them to be significant enough to return a positive BCR.			
<b>Key observations and issues</b>	The low social benefits associated with the proposal can be attributed to: <ul style="list-style-type: none"><li>• The business case identifies population growth as one of the key drivers of the proposal. However, the Knox municipality is expected to grow by 20% over the next 16 years, compared to an expected growth of 46% for Greater Melbourne over the same period, according to VIF2019.</li><li>• Transport demand modelling in the business case has been based on the Victorian Government's strategic transport model (VITM). The VITM estimates that transport demand growth in the study area is likely to be limited, with the model predicting vehicle-kilometres travelled to grow by only 0.7% per year between 2018 and 2051.</li></ul> More detailed modelling of future demand at a local scale was not considered feasible due to the impact of COVID-19 lockdowns on journeys, and how this would have led to the origin-destination data being unrepresentative of otherwise normal traffic conditions. The proposal is intended to improve connectivity, however the economic appraisal does			

<sup>5</sup> Based on a 7% real social discount rate, P50 capital cost estimate and evaluated over a 30-year period.

not quantify journey time reliability and wider network resilience benefits. The proposal would benefit from estimating connecting corridor impacts to provide greater insights into the benefits of the proposal.

(1) Costs reported in this table are based on P50 cost estimates.

## Proposal development

An MCA framework was used to short-list alternative options for detailed economic appraisal. The MCA considered an appropriate range of strategic interventions including operational changes, new road links, active transport facilities, minor civil works at intersections, increased bus services and road safety infrastructure.

The MCA included a mix of quantitative and qualitative criteria. Quantitatively, the MCA provided an overall percentage score for how strongly options are expected to deliver the three core benefits (improved transport network efficiency, improved community satisfaction and improved road safety). This score was complemented with ratings for risk (high, medium or low), disbenefits (high, medium or low), interdependencies and interfaces (yes or no), real options analysis workshop required (yes or no), cost (\$m capital and operating costs), time to deliver (months) and an overall ranking.

Concept designs, which will be used to inform the reference design, have been developed by the proponent's technical advisor with input from other relevant parties. The concept designs that have been submitted are preliminary, which meets the requirements of our Assessment Framework Stage 3 criteria. Preliminary construction cost estimates have been developed by an independent cost estimator, which have been further developed into P50 and P90 estimates.

The business case also includes the requisite analyses which are meant to act as inputs into the options analysis process. This includes the initial investment logic mapping, as well as technical, planning and environmental investigations.

### Proposal engagement history





## Detailed economic appraisal results

The following table presents a breakdown of the benefits and costs for the preferred option.

### Benefits and costs breakdown

Proponent's stated benefits and costs	Present value (7%, \$m,2020/21)			% of total for 7% results
	4%	7%	10%	
<b>Costs</b>				
Total capital costs (P50)	\$353.9	\$325.6	\$300.5	98.8%
Operating costs	\$7.0	\$4.0	\$2.4	1.2%
<b>Total costs<sup>1,2</sup></b>	<b>\$360.8</b>	<b>\$329.6</b>	<b>\$302.9</b>	<b>100%</b>
<b>Benefits</b>				
Vehicle Travel time savings	\$207.2	\$130.1	\$86.8	61.4%
Public Transport (Bus) Travel Time Savings	\$5.6	\$3.6	\$2.4	1.7%
Vehicle operating cost savings	\$75.6	\$47.5	\$31.7	22.4%
Amenity benefits	\$1.6	\$1.0	\$0.7	0.5%
Placemaking benefits	\$0.3	\$0.2	\$0.1	0.1%
Environmental externalities	\$3.2	\$2.1	\$1.4	1.0%
Crash cost savings	\$42.9	\$27.3	\$18.5	12.9%
<b>Total benefits<sup>1</sup></b>	<b>\$336.5</b>	<b>\$211.7</b>	<b>\$141.6</b>	<b>100%</b>
<b>Net present value (NPV)<sup>3</sup></b>	<b>-\$24.3</b>	<b>-\$117.4</b>	<b>-\$161.3</b>	
<b>Benefit-cost ratio (BCR)<sup>4</sup></b>	<b>0.93</b>	<b>0.64</b>	<b>0.47</b>	

Source: Proponent's business case

- (1) Totals may not sum due to rounding.
- (2) Costs reported in this table are based on P50 cost estimates.
- (3) The net present value is calculated as the present value of total benefits less the present value of total costs.
- (4) The benefit-cost ratio is calculated as the present value of total benefits divided by the present value of total costs.