

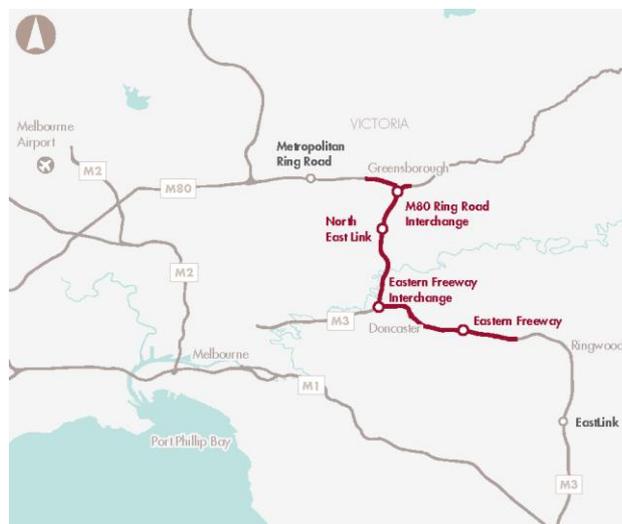
Project Evaluation Summary

North East Link

Proponent Victorian Government
Evaluation date 18 October 2018

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1. Summary

Infrastructure Australia has added the **North East Link** project to the Infrastructure Priority List as a **High Priority Project**.

The North East Link will be a critical transport link in Melbourne’s north eastern suburbs, completing the orbital road network between the M80 Ring Road and the M3 Eastern Freeway/EastLink. The North East Link will attract cross-city and orbital traffic from arterial roads in the north east, which currently carry over 340,000 orbital trips per day.

Growing cross-city and orbital freight and passenger trips between the north east, north, east, and outer east, are straining the road network capacity of the north eastern suburbs. Further population growth, along with the future expansion of major industrial precincts in the north and south east, will generate even higher traffic volumes, making local road congestion worse. Infrastructure Australia considers this congestion problem to be nationally significant, with the North East Link identified as a Priority Initiative on the Infrastructure Priority List (IPL) prior to its listing as a High Priority Project.

The project proposes to ease arterial road network capacity constraints in the north east by building a continuous freeway-standard road between Melbourne’s south east and north from the M3 to the M80. The project would draw traffic away from arterial roads and reduce pressure on the M1 Monash Freeway, providing faster and more reliable journey times for cross-city trips while improving amenity and quality of life for residents in the north east by reducing traffic on local roads. These factors contribute to the strong strategic case for the project, which aligns with the findings in the *Victorian Infrastructure Plan (2017)* and *Victoria’s 30-Year Infrastructure Strategy (2016)*.

The Victorian Government states the project’s benefit-cost ratio (BCR) is 1.3 (excluding wider economic benefits), with a net present value (NPV) of \$2.2 billion (7% real discount rate). Infrastructure Australia identified limitations in the proponent’s cost-benefit analysis which are likely to overstate the reported BCR, but also found unquantified benefits. The project is expected to deliver large economic benefits, including \$7.8 billion in travel time and reliability improvements, and \$420 million in environmental and safety gains. However, the project’s tunnelled sections are driving the high estimated capital costs of \$8.2 billion (in present value terms), resulting in a marginal economic case.

2. Strategic context

Melbourne's north east is home to approximately 20% of the city's population. Suburbs in the north and north east will need to accommodate a significant proportion of the city's population growth over the next 30 years.

The arterial road network in the north eastern suburbs caters for a high volume of traffic, including a mix of local and regional trips, carrying commuters and commercial trips between employment and activity centres in the north, east, and south east, and to and from Melbourne Airport. Currently, around 10% of the total Victorian freight task, totalling 46 million tonnes, travels through the road network of the north east, with between 8,100 and 9,000 trucks passing through the M80/Greensborough Road interchange each day.

Each day, these roads, including Rosanna Road, Para Road and Fitzsimons Lane, together carry around 250,000 trips between the north east and inner Melbourne, and around 340,000 orbital trips. The orbital trips include those between the north and east, and between the north east and the north, inner east, east, and outer east. Orbital trips are forecast to reach 440,000 per day by 2036. The north east's arterial road network is constrained in its capacity to carry high volumes of freight and passenger traffic, leading to worsening travel times and reliability for users.

Without the project, trips between the M80 and the Eastern Freeway are estimated to take between 50 and 55 minutes by 2036 during the southbound AM peak and the northbound PM peak. With the project, traffic modelling predicts the same trips can be completed up to 30 minutes faster (a 65% improvement). Diverting traffic away from arterial roads would also improve travel times along the existing arterial road corridor by up to 15 minutes in the peak, an improvement of around 30%.

The 2017 Victorian Infrastructure Plan identified the North East Link as a "state-shaping infrastructure project" that is needed to achieve state government objectives for employment and economic growth. It is also nominated as a high priority infrastructure project in Victoria's 30-Year Infrastructure Strategy, which was released by Infrastructure Victoria in 2016. The North East Link was listed as a Priority Initiative on the IPL in March 2018. The project is consistent with a number of the Australian Government's Smart Cities Plan objectives relating to urban renewal, and improving capital and labour productivity, urban infrastructure efficiency, road network resilience, and amenity.

3. Problem description

Three key problems were identified in relation to transport connectivity in the north east corridor:

- Melbourne's poor orbital connectivity is constraining the economic potential of the city and Victoria:
 - Businesses in Melbourne's north, east and south east lack access to large labour markets in the rest of Greater Melbourne
 - Movement between businesses and their customers and suppliers is highly constrained
 - Arterial roads in the north east are unable to cater to growing and competing travel demands
 - Congestion is constraining bus services, which are the main form of public transport in the north east
 - Inequality and disadvantage is expected to grow with congestion, which limits access to opportunities.
- Inefficient freight movement between Melbourne's north and south east is limiting supply chain competitiveness and hindering the growth of high value industries:
 - The lack of access for freight vehicles in the north east impacts on competitiveness
 - Congestion and poor reliability arising from the freeway network 'gap' reduces freight productivity
 - Inefficient cross-city access through the north east and lack of links that can accommodate high productivity vehicles puts pressure on other routes, such as the M1
 - Growth of industrial precincts in the north and south east will increase freight constraints and costs.
- Congestion and heavy vehicles on neighbourhood roads is harming liveability and community wellbeing:
 - Access to destinations is restricted for residents due to capacity constraints on local and arterial roads
 - Limited public and active transport impact on liveability, health, wellbeing, and community dislocation
 - High traffic volumes and freight are reducing local amenity and quality of life for residents
 - Sustainable and productive growth in the north and north east is put at risk by low accessibility and amenity, which could deter household and business investment and curtail land use planning options.

The project's estimated benefits indicate that the current and expected costs of problems leading to longer travel time alone could amount to around \$1 billion per year on average over the 59-year project evaluation period.

4. Proposal

The project would create a Managed Motorway connection from the M80 Metropolitan Ring Road in the north to the M3 Eastern Freeway in the south through:

- A new 11 kilometre roadway between the M80 at Greensborough and the M3 at Bulleen
- Approximately 2.3 kilometres of upgrades to the M80 between Greensborough and Plenty Road
- Three-lane twin tunnels (5 kilometres) travelling from Lower Plenty Road to south of the Veneto Club in Bulleen
- Five interchanges at the M80, Grimshaw Street, Lower Plenty Road, Manningham Road, and the M3
- Upgrades to the Eastern Freeway between Springvale Road and Chandler Highway with up to eight new lanes
- Around 10.6 kilometres of bus lanes between Doncaster and Hoddle Street ('the Doncaster Busway').

The project also includes new walking and cycling paths, upgraded and new noise barriers along the Eastern Freeway, and a Freeway Control Centre for controlling traffic and managing operations.

The project includes the systems and infrastructure to enable tolling, operation as a Managed Motorway, and integration with connecting roads. Modernisation of the Eastern Freeway is a core element of the project to ensure the freeway integrates effectively with the North East Link and keeps pace with increasing traffic volumes and changing travel demands. The proponent has stated that the North East Link will be tolled.

5. Options identification and assessment

The proponent developed five strategic options to address the identified transport problems: network upgrade, demand and productivity management, public transport and freight, bypass freeway, and connected freeway (the North East Link). The proponent undertook a qualitative strategic assessment based on the criteria of *benefits, cost, time, risk and impacts* which identified strategic option 5 (the North East Link) as the preferred solution. The proponent then identified and considered four broad corridor options for the project:

- A. Follow the Greensborough Highway and connect with the Eastern Freeway near Bulleen Road (11km plus an upgraded Eastern Freeway)
- B. A direct connection from the M80 to EastLink via Lower Plenty Road and Reynolds Road (24km)
- C. Provide a direct connection from the M80 to Eastlink via Ryans Road and Reynolds Road (26km)
- D. Connect with EastLink south of Ringwood and travel east (40km).

The proponent evaluated the corridor options against the four project objectives relating to improving accessibility for businesses and households, freight and supply chain efficiency, and access, amenity and safety in the north east. The options were also assessed against guiding principles relating to minimising disruption and impacts on communities, environmental and cultural assets, and efficient resource use. A preferred corridor option was identified using a three-tiered qualitative approach:

- *Stage 1: Strategic Merit Test (SMT)* – an assessment of a corridor's alignment with the project objectives
- *Stage 2: Rapid appraisal* – an initial indicative assessment of the scale of a corridor's benefits and costs
- *Stage 3: Detailed appraisal* – a more detailed assessment of a corridor's benefits and costs.

The evaluation found corridors A and C to most strongly align with project objectives. Both options were found to have the potential to significantly improve the transport network and benefit communities. Corridor A was selected as the preferred option as it was identified as more effectively meeting the project objectives and guiding principles.

While the approach to corridor development and selection highlighted some of the key advantages and disadvantages for each option, it is not best practice as it relied on subjective assessment of qualitative criteria. Quantified benefits and costs would enable a definitive conclusion that the best option was selected or that the option will provide the highest net benefits.

Nevertheless, Infrastructure Australia notes that, of the four options, the preferred corridor is likely to best maintain the Urban Growth Boundary, which is a key element in Victoria's strategy to manage Melbourne's expansion. This

option is also the most likely to support the existing “green wedges”, which are the non-urban areas of Melbourne beyond the boundary. On this basis, corridor A is the most likely of the four to minimise urban sprawl and the associated environmental problems. Infrastructure Australia recommends that best practice business cases should consider in detail a minimum of two options, in addition to the base case, for transparency and comparability.

6. Economic evaluation

The proponent’s stated BCR for the project is 1.3, excluding wider economic benefits, with a NPV of \$2.2 billion (using a 7% real discount rate and a P50 costs). The project is expected to deliver high levels of social, economic and environmental benefits, including \$7.8 billion in travel time and reliability improvements. However, this is offset by large capital costs of \$8.2 billion (in present value terms), driven by the high costs of the project’s tunnelled sections.

The proponent has estimated that the project could generate an additional \$890 million in wider economic benefits (WEBs), resulting in a NPV of \$3.1 billion and a BCR of 1.4. However, the methodology for quantifying WEBs in Australia is still under development. A rigorous, complete methodology is needed to manage the risk of double counting benefits. As a result, WEBs has been considered as an upside sensitivity.

Infrastructure Australia identified two limitations in the proponent’s analysis which are likely to impact on the BCR. Potential downside risks which could reduce the estimated project BCR are as follows:

- The project is expected to deliver vehicle operating cost (VOC) savings for road users by allowing higher travel speeds. However, the estimated household savings are likely to be too high due to the proponent applying higher VOC assumptions that are inconsistent with the Infrastructure Australia Assessment Framework
- The analysis included benefits from avoided perceived congestion in the core BCR, which is inconsistent with Victorian Government guidelines. Infrastructure Australia also recommends excluding this type of benefit from the core results as the evidence base is not yet sufficiently mature to allow their quantification with confidence.

However, the proponent has not quantified a number of benefits, which could raise the project’s estimated BCR:

- Road maintenance cost savings resulting from diverting heavy vehicles from local and suburban arterial roads
- With the Doncaster Busway and a new freeway-standard connection through the north east, the project is expected to make the public transport network more resilient by reducing the impact of road disruptions to the on-time running of buses
- Resilience benefits for the overall transport network from the North East Link reducing the impact of disruptions have also not been fully captured
- Cycleway improvements included as part of the North East Link should deliver active transport related health and environmental benefits.

In addition, we identified limitations that could have a positive or negative impact on the BCR:

- The growth profile of the North East Link demand forecasting assumptions may be too optimistic. A lower growth profile would delay the onset of congestion on the North East Link, but would also result in fewer users receiving the project’s benefits in early years. The net impact on the BCR is uncertain.
- The North East Link transport modelling assumes the delivery of a range of currently unfunded and uncommitted projects in the base case. Infrastructure Australia recommends the use of a ‘do-minimum’ base case, which excludes such projects, for the CBA. A do-minimum base case is likely to capture increasing base case road network congestion, providing more user benefits in the project case, and thereby raising the BCR. However, complementary projects, such as feeder roads and supporting public transport projects, would increase project benefits, and their exclusion from the base case could potentially lower the BCR.

Overall, Infrastructure Australia considers that the project is likely to deliver economic benefits that marginally exceeds its costs. The economic benefits include social and environmental benefits such as avoided accidents and reduced pollution. If the additional benefits identified are quantified, the expected net benefits of the project should be higher. This would better reflect the North East Link project’s strong strategic merits in addressing a nationally significant urban congestion problem and improving connectivity in Melbourne’s north eastern suburbs.

A breakdown of the benefits and costs reported in the proponent’s business case is set out in the following table.

Benefits and costs breakdown by the proponent

Proponent's stated benefits and costs		Present value (\$m, 2017) @ 7% real discount rate	% of total
Benefits			
Travel time savings		\$6,751	62%
Travel time reliability		\$1,059	10%
Reduced perceived cost of congestion		\$1,075	10%
VOC savings (including resource cost corrections)		\$1,968	18%
User tolls		-\$64	-1%
Public transport benefits		\$148	1%
Public transport fares and toll resource cost corrections		\$93	1%
Emission savings		\$153	1%
Crash cost savings		\$339	3%
Other externalities		-\$65	1%
Transport impacts due to induced land use change ¹		-\$713	-7%
Residual value		\$95	1%
Total Benefits²		\$10,840 (A)	100%
Costs			
Capital costs (P50)		\$8,191	95%
Operating costs		\$462	5%
Total Costs²		\$8,653 (B)	100%
Core results	Net benefits - net present value (NPV)³	\$2,187 (C)	n/a
	Benefit-cost ratio (BCR)⁴	1.3 (D)	n/a

Source: Proponent's Business Case

Notes:

(1) The proponent expects the NEL to increase the resident and worker population in the north east, substantially increasing congestion which results in a reduction in the project's transport benefits, primarily through impacts on travel time savings and vehicle operating cost savings.

(2) Totals may not sum due to rounding.

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

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

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

Capital costs and funding

Total capital cost (nominal, undiscounted)	\$15,790 million (P90) \$14,866 million (P50)
Proponent's proposed Australian Government funding contribution	\$1,750 million (this reflects the 2018-19 Budget commitment of the Australian Government, not the amount proposed by the proponent)
Other funding (source / amount / cash flow) (nominal, undiscounted)	Tolling and value capture funding mechanisms are being developed and will be refined.

7. Deliverability

The Victorian Government has established the North East Link Authority (NELA) to oversee the delivery of the North East Link project. NELA is responsible for all aspects of the project.

The proponent identified an Availability Public-Private Partnership (PPP) as the preferred delivery model for the primary package, which consists of the middle section of the project (including the tunnel). The PPP contractor will design and construct (D&C), and operate and maintain (O&M) this section of the North East Link. The proponent has recent experience with Availability PPPs through the delivery of the M11 Peninsula Link (opened in 2013). Market sounding has demonstrated strong interest in delivering the project as an Availability PPP.

The proponent identified a variant D&C model as the preferred delivery model for the secondary packages of the road sections at each end of the link. The scope of the secondary construction packages will be identified following further development of the project commercial framework and further market sounding. While the State is currently assumed to be responsible for O&M on these sections of the North East Link, they may be included in the Availability PPP after construction.

Toll revenue collection and all customer interface activities will be carried out by a State-owned entity. This is intended by the proponent to clearly define the scope of the PPP contractor and lines of accountability, as well as allow for the future consideration of monetisation and divestment options, after toll revenues have matured.

The proponent identified a number of key risks associated with the project, including the geotechnical and construction risks associated with the significant tunnelling component, market capacity and financing risks linked to high capital costs, and risks around environmental approvals and community/stakeholder concerns. A cost review commissioned by the proponent indicates that the cost estimates for the project are reasonable, but may be understated by around 3%. Specifically, the review identified the provision for costs relating to utility relocation and protection works, and estimates of drainage costs, as potentially being understated. The proponent is working to optimise the allocation of risks between the State and the private sector to ensure that each is responsible for the risks that they are best able to manage or mitigate at least cost. In addition, NELA has a Risk and Opportunity Management Plan requiring it to report and attest periodically to external stakeholders.

Development of the project has continued since Infrastructure Australia commenced evaluating the business case in June 2018. A design update was released in September 2018 and the proponent is continuing to develop the tolling strategy and the procurement process. The proponent has developed preliminary plans to guide project delivery and established an indicative timeline that aims to:

- Commence the Environment Effects Statement process in 2018
- Complete the statutory planning and approvals process in 2019
- Commence a competitive market process in 2018 and award contracts in 2020.

Under this timetable, construction of the North East Link would commence in 2020, and open to traffic in 2027. The cost review included a recommendation for the proponent to conduct ongoing risk analysis as the project matures. This is appropriate given that work on the reference design for the project is continuing throughout 2018.

While the project would also reduce pressure on the Monash Freeway, its impacts are already accounted for in the business case of the Monash Freeway Upgrade Stage 2 project, which is a High Priority Project on the IPL. It is not expected to have additional impacts beyond those identified in the Monash Freeway Upgrade Stage 2 project business case and so the delivery of the North East Link is unlikely to delay the need for that project.

Infrastructure Australia encourages the proponent to undertake and publish a Post Completion Review to assess the extent to which expected project benefits and costs have been realised. This will help inform development of future projects. In particular, such a review should assess project costs, and outcomes for users of the North East Link, against the expectations set out in the business case and cost benefit analysis.