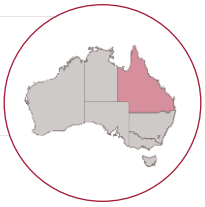
Australian Government | Infrastructure Australia

Business case evaluation summary

Coomera Connector Stage 1

Location
South East Queensland

Geography
Smaller cities and regional centres

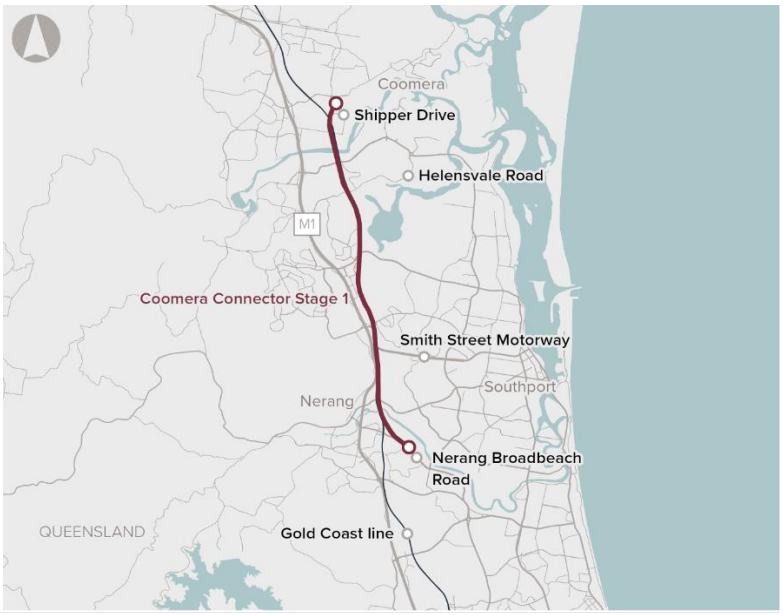


Category
National Connectivity

Capital cost
$2,163 million (P90, outturn)

Indicative timeframe
Construction Start: 2022
Project completion: 2026

Proponent
Queensland Government



Evaluation date
18 February 2022

1. Evaluation Summary

Infrastructure Australia has evaluated the business case for the **Coomera Connector Stage 1** project in accordance with our current 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. This project has received an Australian Government funding commitment of up to $1.07 billion (50% of the project cost). As the project is fully funded, it is not eligible for inclusion on the *Infrastructure Priority List*[1].

The M1 Pacific Motorway is the primary road connection between northern NSW and Brisbane. It experiences high levels of congestion due to the volume of freight, commercial, tourist and commuter traffic. Sections of the motorway are also used for local trips. Ultimately, the Coomera Connector is being planned as an alternative route to the motorway for trips with origins or destinations between Loganholme and Nerang, aiming to improve regional productivity and relieve pressure on the M1. The Coomera Connector will form part of the response to the nationally significant *M1 Pacific Motorway capacity* problem, which is currently recognised on the *Infrastructure Priority List*.

The Coomera Connector Stage 1, a new four lane high-speed (100 km/hr posted speed) motorway between Coomera and Nerang, is the first stage of the new connection and is forecast to carry up to 57,000 trips per day between Shipper Drive in Coomera and Nerang–Broadbeach Road in Nerang, reducing forecast trips on the M1 from 195,000 to 175,000 (or by around 10%).

The proponent's business case states that the economic, social and environmental benefits of the project are expected to exceed its costs, with a net present value (NPV) of $1,524 million and a benefit cost ratio (BCR) of 1.9[2]. The proponent's analysis aligns with the requirements of the Infrastructure Australia Assessment Framework, and we agree with the proponent that the benefits of the project are likely to exceed the costs.

Overall, the project demonstrates strong strategic fit and societal impact, as well as having appropriate deliverability planning. However, we note there are a range of environmental impacts that have the potential to be material even after mitigations. These include biodiversity impacts,

[1] The *Infrastructure Priority List* only identifies those proposals which are seeking investment.
[2] Using a 7% real discount rate and P90 capital cost estimate

impacts to sensitive aquatic ecosystems (which are classified as a matter of national environmental significance), and impacts to the koala population and habitat, coastal swamp oak, and noise and amenity impacts.

2. Context

The M1 Pacific Motorway is part of the National Land Transport Network (NLTN) and provides the only high-speed north-south route connecting Brisbane and the Gold Coast. It services and connects major transport hubs and industrial precincts, including the Gold Coast and Brisbane International Airports, and the Port of Brisbane. It carries large volumes of regional movements as well as local traffic due to a lack of alternative crossings for the Logan, Nerang and Coomera Rivers. The section between Loganholme and Nerang carries more traffic than any other, with the capacity being exceeded during peak periods.

The transport network in northern Gold Coast is being placed under increasing pressure due to recent and future population growth, with approximately 600,000 additional residents in Logan and the Gold Coast between 2016 and 2041 (representing approximately 32% of the overall population growth within south east Queensland). Increasing congestion will continue to impact travel speeds and travel times along the M1. Within the area surrounding the Coomera Connector Stage 1 there will be an increase of approximately 280,000 people between 2016 and 2041, compared to an increase of 120,000 jobs (full time equivalent). This misalignment is expected to increase the number of trips using the M1 to access employment in other areas.

The Coomera Connector Stage 1 project is part of a wider program of work which includes upgrades to the broader M1 Pacific Motorway and other corridors, including the Gold Coast Rail Line. Even with the inclusion of committed and funded projects, transport demand will continue to grow beyond the capacity of the M1 and congestion, travel times, reliability and job accessibility will worsen. Ultimately, the Coomera Connector will extend from Loganholme to Nerang to connect the fast growing residential and employment centres in Logan and the Gold Coast.

3. Problem description

The M1 Pacific Motorway is one of the busiest roads in Australia, carrying in excess of 150,000 vehicles per day, including over 12,000 heavy vehicles. The section between Eight Mile Plains and Tugun cannot accommodate current traffic volumes and, as a result, experiences frequent and prolonged periods of congestion and nationally significant impacts on productivity. Without new transport infrastructure, the existing network will become even more congested and travel times will increase significantly for local and interstate travel.

The proponent's analysis indicates that a morning peak trip from Coomera town centre to Southport will increase by 150% from 23 minutes in 2016 to 58 minutes in 2041 and a trip from Brisbane to Southport will increase by 77% over the same period. By 2041, the Coomera River crossing is forecast to be 50% over capacity during peak periods with 246,700 average weekday daily traffic (AWDT) movements, and the Nerang River crossing will be 20% over capacity with 170,300 AWDT movements. Freight trips will be impacted by this congestion, with an indicative freight route from the NSW border to the Port of Brisbane in the AM peak forecast to increase by 47 minutes, or close to 50%, over the period 2016 to 2041.

Analysis of origins and destinations of trips demonstrates that planned enhancements to the parallel M1 Pacific Motorway and Gold Coast Rail Line alone will not be sufficient to address the underlying problems.

A large volume of local traffic uses the M1 for short trips, for example, 75% of vehicles that enter the M1 between Exit 49 (Pimpama) and Exit 66 (Smith Street) also exit within these 17 kilometres. Projected population growth in the northern Gold Coast will exacerbate this problem. As the only high-speed north-south route, the M1 is extremely susceptible to incidents and peak congestion, impacting national freight efficiency, intra-regional commuters, tourists and local commuters both on the M1 and on adjacent roads. In 2019 there were 3,853 incidents, approximately 10 per day that caused significant disruption to M1 users.

The business case identifies the following service needs:

1. Reduce congestion on the M1 to enable the efficient movement of people and freight between Brisbane and the Gold Coast – without intervention, all four major river crossings in the Loganholme to Nerang corridor are forecast to see daily traffic demands increase beyond their capacity. Minimum speeds will fall to below 25 kilometres per hour (kph) at key locations
2. Improve the resilience and reliability of the transport network – without intervention, travel times on the M1 are forecast to become less reliable by 2041, with times varying by around 9% from the average as opposed to around 5% in 2016
3. Provide a transport network that enables and supports the development of strategic growth areas – without intervention, continued developments will place increasing pressure on the existing road transport network
4. Enable better use of the existing transport network to enhance access and connectivity of communities in the northern Gold Coast – without intervention, several links on the supporting road network (such as the Smith Street Motorway and others) will be over capacity, with peak minimum speeds ranging from 9kph to 23kph.

4. Options identification and assessment

Response options were progressively identified, analysed and progressed through multiple stages:

- The Strategic Assessment of Service Requirements stage identified a range of high-level initiatives that could address the identified service needs, including infrastructure in the existing M1 corridor, utilisation or expansion of the public transport network, or infrastructure in a new corridor. The strategic corridor options assessment considered a longlist of options including infrastructure and non-infrastructure options. A qualitative and quantitative multi-criteria analysis (MCA) was undertaken and based on the findings, five options were taken forward to the next stage
- The Preliminary Evaluation considered the five options in a quantitative MCA framework and progressed four options to the economic appraisal, which found that three options had a BCR greater than 1 (Coomera Connector – BCR of 2.3; M1 Safety and Efficiency Enhancements – BCR of 2.5; and M1 6 Lanes – BCR of 3.7). The M1 Express Lanes + collector–distributor Lanes (M1 Reference Project) had a BCR of 0.8.
- The Business Case brought forward the following options to assess:
    - Coomera Connector Reference Design (Coomera to Nerang)
    - M1 6 Lanes (Coomera to Nerang)
    - Coomera Connector Reference Project (Coomera to Nerang) [3]
    - Coomera Connector Staged Reference Project (Coomera to Smith Street).

The options considered in the Business Case were suitable and an appropriate and robust process was used to select the preferred option, which aligns to the guidance in the Infrastructure Australia Assessment Framework[4]. In summary, we are confident in the proponent's optioneering process in identifying the Coomera Connector Reference Project (Coomera to Nerang) as the preferred first stage in addressing the nationally significant congestion and connectivity problems identified in the study area.

[3] The Coomera Connector Reference Project was developed following a review of the Coomera Connector Reference Design to identify areas where the project could be refined to reduce the initial capital cost, while balancing the functionality of the delivered asset with the timing and cost of future upgrades.
[4] www.infrastructureaustralia.gov.au/publications/assessment-framework

5. Proposal

The Coomera Connector Stage 1 Reference Project will provide a new 16.25 kilometre north-south motorway connecting Shipper Drive in Coomera to Nerang–Broadbeach Road in Nerang. It includes the following high level scope items:

- A new four lane two-way road with a design speed of 110kph and a posted speed limit of 100kph from Shipper Drive in Coomera to Nerang–Broadbeach Road in Nerang.
- Grade separated interchanges at Helensvale Road, Gold Coast Highway (Brisbane Road), Smith Street Motorway and Southport Nerang Road (north facing only)
- Major waterway and wetland bridge structures over Coomera River overflow, Coomera River/Hope Island Road/Saltwater Creek, Coombabah Creek, Coombabah Lakes wetland (Careel Reserve North & South) and Nerang River
- Overpass structures for local roads at the crossings with Ridgevale Drive, Town Centre Drive and Sage Street (Laurel Drive) (future road)
- Realignment of Shipper Drive and upgrade to 4 lanes (2 in each direction), upgrade of intersection of Shipper Drive and Foxwell Road
- Construction of a shared pedestrian/cycle path from Coomera to Nerang-Broadbeach Road with connections into existing and future local active transport networks
- Intelligent transport systems including variable message signs and closed-circuit television
- Property adjustments and property access refinements as required
- Reconfiguration of access and parking at Helensvale and Parkwood station Park ’n’ Rides.

The Coomera Connector Stage 1 will be the first stage of the new north-south road corridor between Loganholme and Nerang. Planning is underway for the remaining 29km between Loganholme and Coomera, however, analysis of potential future stages or the program as a whole has not yet been provided to Infrastructure Australia.

6. Strategic fit

The project has demonstrated strategic fit, aligning to the underlying problems as well as various government policy objectives and strategies at the national, state and local level.

The benefits of the intervention broadly align to the underlying problems. As identified in the problem description, the scale of the congestion resulting from intra- and inter-regional travel on the M1 demonstrate that an intervention on this scale is appropriate. We note there is some misalignment between the project and the identified problem of limited public transport mode share and an increased number of local and intra-regional car trips in the area. Providing a new motorway will result in public and active transport mode shares in the study area to decline slightly relative to the base case by 2041. The proponent should consider potential impacts on other public transport initiatives being developed, such as Gold Coast Rail Line improvements and the Gold Coast Light Rail Stage 4.

The project is expected to generate a range of benefits to various stakeholders, including for road users (private and freight), public transport users and the broader community. Community consultation for the project indicated strong levels of community and local government support, with 80% of the community supporting the project being built as soon as possible to provide an alternative to the M1.

The project aligns with the TMR Strategic Plan, as well as various other government policy objectives and strategies at the national, state and local level. The transport corridor is identified as key regional infrastructure in the ShapingSEQ South East Queensland Regional Plan (2017) and identified in the Gold Coast City Transport Strategy 2031 (2013).

The project is expected to integrate with the surrounding network, including facilitating improvements in traffic speeds on major supporting arterials and improving accessibility for local residents.

7. Societal impact

The economic appraisal in the business case found that all four options were economically viable, with the economic, social and environmental benefits expected to outweigh the costs over the 30-year evaluation period (based on a 7% real discount rate and P90 capital cost estimate):

- Coomera Connector Reference Design (Coomera to Nerang) – NPV and BCR of $1,421 million and 1.7
- M1 6 Lanes (5+1) (Coomera to Nerang) – NPV and BCR of $292.0 million and 1.2
- Coomera Connector Reference Project (Coomera to Nerang) – NPV and BCR of $1,524 million and 1.9
- Coomera Connector Staged Reference Project (Coomera to Smith Street) – NPV and BCR of $980.6 million and 1.7.

The proponent identified the Coomera Connector Reference Project as the preferred option based on the cost estimate, transport outcomes, economic assessment and financial assessment. Consistent with other major road projects, road user travel time savings represent the largest benefit, close to three-quarters of total benefits excluding Wider Economic Benefits (WEBs). We note that there are disbenefits of the project for public transport farebox revenue and environmental impacts, resulting from increased vehicle travel.

The estimated WEBs for this project represent around 30% of conventional benefits, which are high for a project of this nature. However, the proponent reported these 'below the line' (that is, separately from the core analysis and not included in the above figures), which aligns with Infrastructure Australia guidance.

We have considered the sensitivity of the economic appraisal to the discount rate for the preferred option (excluding WEBs) and note that:

- Using a 4% real discount rate results in a NPV of $4,012 million and a BCR of 3.4
- Using a 10% real discount rate results in a NPV of $255 million and a BCR of 1.2

Infrastructure Australia's evaluation found that some benefits in the economic appraisal may have been slightly understated:

- The travel time savings did not include the driver time component of freight travel
- The parameters employed to monetise the environmental cost savings were based on superseded guidance, which overstated the disbenefits (though we recognise that the updated guidance was only released in August 2021)
- The benefits associated with reduced road maintenance were included below the line, which is a conservative approach and understates the 'above the line' benefits.

While the key benefits and costs have been captured, some impacts were not monetised, including active transport benefits, resilience benefits and construction disbenefits. However, these are not expected to be material. For example, construction disbenefits are not expected to be significant due to the largely greenfield alignment of the project.

We note that a sustainability assessment based on the Infrastructure Sustainability Council sustainability assessment approach has been identified and the project is well positioned for an 'excellent' sustainability rating for the design phase.

Overall, the proponent's analysis aligns with the requirements of the Infrastructure Australia Assessment Framework, and the issues identified are unlikely to materially impact the results or outcomes of the economic appraisal.

The following table presents a breakdown of the benefits and costs stated in the business case.

Benefits and costs breakdown

Proponent's stated benefits and costs	Present value ($m,2021) @ 7% real discount rate		% of total
Delivery phase costs (P90)	$1,581.6		95.3%
Operating phase costs (P90)	$64.7		3.9%
Bus network operating costs	$13.3		0.8%
Total Costs[1]	**$1,659.6**	(B)	**100%**
Benefits			
Road user travel time savings - cars	$2,324.8		54.2%
Reduced vehicle operating costs - cars	$704.3		16.4%
Reduced freight travel time and vehicle operating costs	$170.8		4.0%
PT travel time savings	$35.8		0.8%
PT farebox	-$44.2		-1.0%
Environmental cost savings	-$157.0		-3.7%
Greenhouse gas emissions savings	$50.8		1.2%
Residual value	$40.8		1.0%
Crash cost savings	$57.3		1.3%
Total Benefits[1]	**$3,183.6**	(A)	**74.2%**
Net benefits - Net present value (NPV)[2]	**$1,524.0**		n/a
Benefit-cost ratio (BCR)[3]	**1.92**		n/a
Additional and wider economic benefits (WEBs)			
Reliability	$138.8		3.2%
Reduced road maintenance	$47.5		1.1%
WEBs	$920.6		21.5%
Total benefits including additional benefits and WEBs[1]	**$4,290.5**	(A)	**100.0%**
Net benefits including additional benefits and WEBs - Net present value (NPV)[2]	**$2,630.9**		n/a
Benefit-cost ratio (BCR) including additional benefits and WEBs [3]	**2.59**		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	$2,013 million (P50, undiscounted) $2,163 million (P90, undiscounted)
Australian Government funding contribution	$1,070 million
Other funding	$1,070 million (Queensland Government)

The Australian Government and Queensland Government have committed $2.14 billion for delivery (on a 50:50 basis). This is in addition to the $20 million previously provided by both governments for the development of the business case.

8. Deliverability

A delivery model analysis was undertaken to form a view on the contracting strategy for the preferred option. The analysis included an assessment of packaging approaches and possible procurement approaches. Overall, this analysis appears to be appropriate and aligned to state and national infrastructure guidelines.

Several technical, procurement, delivery and commercial considerations informed the packaging and delivery model assessments. They included the committed timeline for delivery, the size of the project, opportunities for innovation, and the likelihood of design changes from planning and environmental approvals processes, as the full length of the Coomera Connector Stage 1 from Shipper Drive to Nerang-Broadbeach Road is subject to approval by the Australian Government under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999.

Initial market sounding was completed with key construction bodies including Queensland Major Contractors Association, Civil Contractors Federation and Infrastructure Association of Queensland. This informed delivery model and work package analysis, with there being a clear preference for:

- Disaggregation of construction packages to provide more opportunities to market and allow for more diversification of risk
- Procurement processes to be structured to facilitate early contractor/tenderer involvement
- Contracts that are based on cost-reimbursable and risk-sharing frameworks.

As a result of these considerations, a hybrid package approach was selected:

- North package: Shipper Drive intersection upgrade and Shipper Drive to Helensvale Road
- Central package: Helensvale Road to Smith Street Motorway – the largest package, which combines the complex interchanges of Gold Coast Highway and Smith Street, the soft soil areas through the Gold Coast Highway to Smith Street section, the interface with Gold Coast Light Rail and the Gold Coast Rail Line, and the areas of the corridor subject to EPBC approvals.
- South package: Smith Street Motorway to Nerang-Broadbeach Road.

The North and South packages are smaller packages that aim to facilitate competition and the potential for multiple contractors to be engaged. This packaging approach was designed to group elements which have similar characteristics, interfaces and timing considerations. It also seeks to balance enabling participation across industry and encouraging competition, while minimising interface risk and maximising the potential for innovation for scope elements with greater risk and complexity.

The Early Contractor Involvement – Collaborative Project Agreement delivery model was selected as the preferred delivery model for both the North and Central packages. This model provides a more collaborative risk-sharing approach due to accelerated timeframes and need for interface management through the tender and design phases. In contrast, the Early Tenderer Involvement delivery model was selected for the South package. This approach seeks to be attractive to the market and appropriate for a smaller and less complex package, while driving price certainty. These delivery models will transfer the majority of design and construction risk to the successful contractors for the North and Central packages, and the proponent will retain responsibility for design on the South package.

The delivery model analysis took into consideration lessons learnt from procurement and project delivery of the Pacific Motorway M1 South and M1 North programs, which have similar objectives and challenges. It is also consistent with state and national infrastructure guidelines.

The risk assessment process appears robust and appropriate for a project at the business case stage. Planned and unplanned risks were quantified for the purposes of informing the risk-adjusted cost estimates. The design and cost estimates include significant mitigations and costs (including environmental) and key lessons learnt from similar projects, including on the M1. A probabilistic

risk assessment was undertaken to arrive at P50 and P90 capital cost contingencies. The process adopted to develop the risk contingencies resulted in contingencies of 19.6% for the P50 and 28.1% for the P90. Whilst these contingencies are low, the cost of the risks have been included in the cost estimate.

The proponent referred Coomera Connector Stage 1 to the Australian Government to determine the level of environmental impact and the assessment process that would apply under the EPBC Act 1999. The project was declared a controlled action and the assessment approach would be by Public Environment Report. The environmental assessments have identified the impacts to matters of national environmental significance for the entire corridor for Stage 1. Environmental approvals and conditions under the EPBC Act are required in advance of construction works commencing.

Seven impacts were identified as being significant even following mitigation, and information provided by the proponent indicates that mitigation treatments for these impacts have been included in the cost estimate:

- Management of impacts to the koala population and loss of habitat
- Generation of noise levels exceeding noise criteria for a significant number of sensitive receptors
- Impact to the Coastal Swamp Oak
- Impact to visual amenity due to clearing of road reserve and construction of noise walls
- Impacts of surface water affecting sensitive aquatic ecosystems classified as matters of national environmental significance (Ramsar wetland)
- Air quality impacts during construction
- Impact to Aboriginal heritage within the former Gold Coast Native Title Group determination area in relation to open camp sites, stone artefact scatters and isolated finds, and culturally modified (scarred or marked) trees and potential stone artefacts at the base of those trees. The proponent advises that, subsequent to the development of the business case, the project has received cultural heritage clearance certificates.

At present, the risks appear to have been sufficiently mitigated. The proponent states that it has undertaken extensive assessment of the corridor based on terrestrial, ecological and aquatic surveys to ensure that the level of impact the project will have on the environment is understood, and that appropriate mitigation strategies are developed. There is a risk, however, that further assessments and related approvals associated with significant residual impacts have the potential to delay the project, increase its cost or reduce its benefits (due to scope and design changes).

The business case includes a comprehensive Implementation Plan and a Project Management Plan, which also includes a Benefits Realisation Plan. The Benefits Realisation Plan includes benefit measures and forecast review dates for reporting purposes. The proponent has indicated its commitment to completing a Post-Implementation Review, which is to be conducted within 6 to 12 months of the project reaching practical completion. This will be important to improve outcomes for planned future stages of the program.