

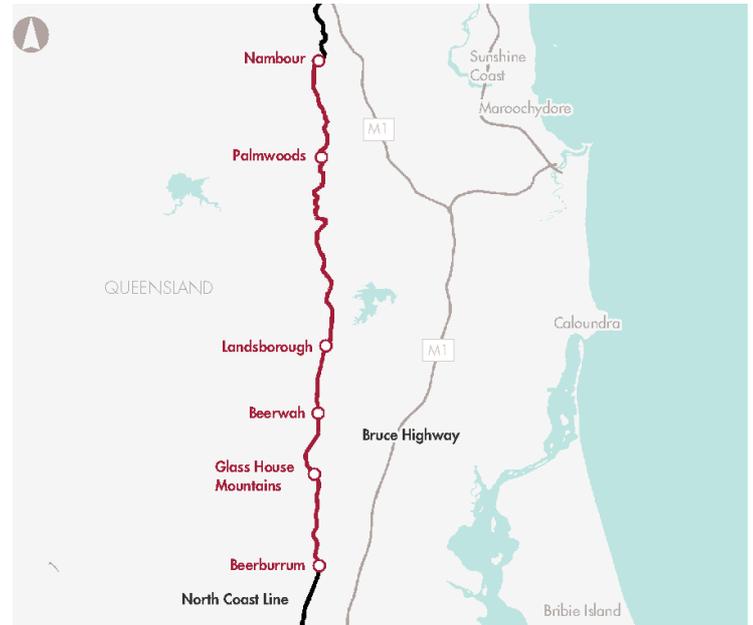
Project Evaluation Summary

Beerburrum to Nambour Rail Upgrade

Proponent Queensland Government
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1. Summary

Infrastructure Australia has added the **Beerburrum to Nambour Rail Upgrade** project to the Infrastructure Priority List as a **Priority Project**.

The North Coast Line is Queensland’s major north–south rail corridor, facilitating freight and passenger movements between Queensland’s eastern coastal population centres, and is a part of the National Land Transport Network. It also has an important role in carrying commuter traffic between Brisbane and the Sunshine Coast.

The configuration of the 39 kilometre section of the North Coast Line between Beerburrum and Nambour hinders its ability to effectively meet current and future rail demand. Without improvements, more of the transport task in this corridor would shift onto the roads, significantly increasing traffic on the already constrained Bruce Highway. The Beerburrum to Nambour Rail Upgrade was a Priority Initiative on the Infrastructure Priority List prior to its listing as a Priority Project.

The proposed Beerburrum to Nambour Rail Upgrade project involves duplicating 20 kilometres of rail line from Beerburrum to Landsborough, extending existing passing loops between Landsborough and Nambour, route realignments, level crossing removals, station improvements, and supporting works. The project will address capacity constraints on this section of the corridor by nearly doubling the capacity for freight paths and increasing the frequency and reliability of passenger services, easing pressure on the Bruce Highway. The project would also enable future public transport improvements within the Sunshine Coast.

The proponent’s reported net present value (NPV) for the project is \$262 million, with a benefit cost ratio (BCR) of 1.5 using a 7% real discount rate and P50 cost estimate. Infrastructure Australia is confident that the benefits of the project will exceed its estimated costs, and that the project will provide a net benefit to the Australian economy.

2. Strategic context

With a track length of 1,680 kilometres largely running in parallel to the Bruce Highway and the Queensland Coast, the North Coast Line is Queensland's major north–south rail corridor and an important part of the National Land Transport Network, connecting coastal population centres from Brisbane to Cairns. The line caters for heavy haulage single commodity trains, containerised freight, cattle trains, high speed tilt trains and commuter services.

The *Northern Australia Infrastructure Audit* indicates that the northern Queensland population is expected to grow at an average rate of 1.9 per cent per year to 2031. This population growth would in turn drive higher levels of economic activity and an associated increase in the freight task along Queensland's north–south corridor.

Population growth in the Sunshine Coast will also drive an increase in passenger demand in the corridor between Brisbane and Nambour. The *South East Queensland Regional Plan 2017* indicates that the Sunshine Coast's population is expected to grow by 2.0 per cent per year from over 303,000 in 2016 to 495,000 by 2041. The regional plan also identifies the need for the supply of an additional 87,000 dwellings to accommodate the Sunshine Coast's population growth from 2016 to 2041. Greenfield sites in the southern end of the Sunshine Coast, such as Beerwah East and Caloundra South, are expected to accommodate over a third of this growth, with the remainder distributed throughout the region's existing urban centres through consolidation.

The North Coast Line currently takes an inland route through the Sunshine Coast region, reflecting the historical concentration of population and economic activity in the region. However, the region's economic activity centre and population has since shifted eastward to the coast, which is not currently well served by public transport. As a result, the Bruce Highway carries substantial local traffic within the Sunshine Coast, being one of two major roads that traverse the length of the region from Caloundra in the south to Maroochydore in the north. Upgrades to the rail line between Beerburrum and Nambour will enable a future expansion of rail services in the Sunshine Coast region.

Additional public transport capacity is necessary to accommodate this expected population growth, connecting residents with jobs, educational opportunities, and services within the Sunshine Coast and in Brisbane. Without improvements to the rail network, it is likely that future growth in the passenger and freight transport tasks along the Brisbane to Cairns corridor would be carried out by road transport, resulting in a significant increase in traffic on the already constrained Bruce Highway. This would be exacerbated by the increase in passenger traffic generated within the Sunshine Coast region which would be carried on roads without public transport alternatives.

3. Problem description

The 39 kilometre section of the North Coast Line between Beerburrum and Nambour is constrained in its ability to effectively meet current and future freight and passenger transport demand. The section has a single track configuration with passing loops at stations, poor horizontal and vertical alignments, and level crossings, which reduce train speeds.

There are three overarching problems:

- **Insufficient capacity to meet current and future freight and passenger demand** – Operator-preferred freight paths on the North Coast Line will reach capacity by 2023 and further growth in freight demand will have to be met by road as there will be insufficient available train paths. For passenger services, demand is forecast to exceed capacity by 2021.
- **Competition between freight and passenger services on the North Coast Line** – The priority given to passenger services results in disruptions, service unreliability and increased travel times for freight. Freight services are generally constrained to operating in off-peak periods, resulting in decreased commercial path availability to freight operators who need to meet 'end of supply chain' delivery timeframes.
- **Ageing infrastructure and poor track geometry** – This results in reduced train speeds, extended freight and passenger services delays and constrained freight train lengths.

These constraints on the rail line between Beerburrum and Nambour were identified as a priority in the Queensland Government's *Moving Freight* strategy, and in the *Northern Australia Infrastructure Audit*. The Beerburrum to Nambour Rail Upgrade was listed as a Priority Initiative on the Infrastructure Priority List prior to its listing as a Priority Project.

4. Proposal

The proposal involves the partial duplication of the line, partial line realignment, the construction of additional passing loops, platform upgrades, and supporting works. It comprises the following main scope items:

- Full rail duplication (two new tracks) on an improved alignment between Beerburrum and Glass House Mountains.
- Rail duplication of the section between Glass House Mountains and Landsborough within the existing rail corridor.
- New structures (rail bridges, road bridges, drainage structures and retaining walls) to accommodate the new track infrastructure.
- Extension of existing passing loops at Landsborough, Eudlo and Woombye stations.
- Road realignments to accommodate the new rail corridor and track infrastructure.
- Removing level crossings at Barrs Road and Caloundra Street.
- Expansion of park and ride facilities at Beerburrum, Landsborough, Palmwoods and Nambour stations.
- Duplication of station platforms at Mooloolah, Eudlo, Palmwoods and Woombye to accommodate the proposed operational improvements.

The project will address capacity constraints on this key section of the North Coast Line by nearly doubling the number of freight paths and enabling additional passenger services, which will improve the efficiency of passenger and freight services and ease pressure on the Bruce Highway.

The project will also enable the development of new public transport options for improving connectivity within the Sunshine Coast in addition to improving the region's connection with Brisbane, both of which are necessary to support projected population growth over the next two decades.

5. Options identification and assessment

The proponent assessed a long list of options to address the rail line constraints between Beerburrum and Nambour using a two stage preliminary evaluation process:

- Stage 1: an initial assessment of the options long list
- Stage 2: a technical evaluation of options confirmed through the Stage 1 assessment

Two options were shortlisted in Stage 1 and carried forward to the technical evaluation in Stage 2:

- Option 1: Duplication from Beerburrum to Landsborough on current alignment (existing corridor)
- Option 2: Duplication from Beerburrum to Landsborough on new alignment (protected corridor)

Option 1 was ruled out due to environmental and other physical constraints of the existing corridor. Option 2 was carried forward to Stage 2 along with a new Option 3, developed as a hybrid of Options 1 and 2. Option 3 involves duplication from Beerburrum to Glass House Mountains on a new alignment, and duplication within the existing corridor from Glass House Mountains to Landsborough.

The following two options were taken forward for financial and economic evaluation:

- Option 2 plus sub-options – This involves duplication from Beerburrum to Landsborough on a new alignment.
- Option 3 plus sub-options – This includes duplication from Beerburrum to Glass House Mountains on a new alignment, and duplication from Glass House Mountains to Landsborough primarily within the existing corridor.
- Both options include the extension of the Landsborough passing loop and the Caloundra Street grade separation, Landsborough to Nambour station upgrades, and Mooloolah passing loop.

The two options were assessed against a 'do nothing' base case. Option 3 plus sub-options emerged as the preferred option on the basis of its lower capital and whole-of-life costs, economic merit, and that it yielded similar levels of benefits to the alternative option. Option 3 provided the basis for the Detailed Business Case where detailed operational and engineering analysis was undertaken to confirm the scope of the reference design before a detailed financial and economic evaluation was completed.

6. Economic evaluation

The proponent's economic appraisal of the project indicates that it is expected to have a BCR of 1.5 and a NPV of \$262 million using a 7% real discount rate and P50 cost estimate when evaluated over a 50 year period post completion. Freight and remaining road users are expected to be the major beneficiaries of this project.

Infrastructure Australia's analysis of the economic appraisal identified issues that are likely to impact on the proponent's estimate of the project's economic costs and benefits. The downside risks identified are as follows:

- **Smaller benefits for transport network users** – The proponent estimates that road user benefits will grow from 2036 to 2056. The business case does not provide sufficient evidence to support the ongoing growth of project benefits beyond 2036, particularly given that network congestion is expected to increase. For rail passengers, the proponent has estimated wait time and access time benefits rising sharply between 2026 and 2036. These benefits may be overstated.
- **Lower travel time savings for road users** – Road users who do not divert to rail are expected to receive benefits from lower congestion and other factors associated with reduced road traffic. While the diversion of road users to rail is expected to be modest, transport modelling indicates that the value of time savings for the remaining road users is expected to increase at 6% per annum between 2026 and 2036. This growth appears to be large relative to comparable transport projects and is not sufficiently supported by evidence in the business case.
- **Lower freight demand** – It is likely that the freight benefits reported by the proponent are overstated. The freight demand modelling was based on 2013 population growth projections. An updated series released in 2015 indicated slower projected growth.
- **Construction disruption costs** – Construction disruption costs were omitted by the proponent, but tested in a sensitivity scenario reported in the business case. These are expected to have a minor negative impact.

Infrastructure Australia's analysis also noted that some benefits have not been quantified in the economic analysis. These include:

- **Access price revenue that covers the operating costs of the railway** – The change in rail access charges arising from higher rail freight volumes has not been quantified. This should offset the rail infrastructure maintenance costs associated with higher rail traffic.
- **Benefits of level crossing removals** – Level crossings along the section of the rail line between Beerburrum and Nambour create delays for road users when they are closed. The crossings are also safety hazards, with the risk of collisions between trains and road vehicles at these points. The removal of the level crossings should introduce decongestion and safety benefits. However, these benefits were not quantified by the proponent.
- **Freight service reliability benefits** – The removal of current constraints on the line will reduce the number of unscheduled delays to freight rail services.

Overall, taking these issues into account, Infrastructure Australia is confident that the project will deliver benefits that exceed its estimated costs, providing a net benefit to the Australian economy.

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

Benefits and costs breakdown

Proponent's stated benefits and costs		Present value (\$m, 2016) @ 7% real discount rate	% of total
Benefits			
Public transport user benefits		\$152.4	19%
Farebox revenue		\$27.1	3%
Road user benefits		\$300.9	37%
Freight user benefits		\$261.1	32%
Crash Savings		\$30.7	4%
Environmental (externality) savings		\$25.1	3%
Residual value		\$6.0	1%
Total Benefits¹		\$803.3	100%
Costs			
Capital costs (P50)		\$511.6	95%
Operating costs (train and bus)		\$46.0	8%
Maintenance costs (rail and road infrastructure)		-\$16.3	-3%
Total Costs¹		\$541.3	100%
Core results	Net benefits - net present value (NPV)²	\$262.0	n/a
	Benefit-cost ratio (BCR)³	1.5	n/a

Source: Proponent's Business Case

Notes:

(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.

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

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)	\$722.4 million
Proponent's proposed Australian Government funding contribution	\$577.9 million
Other funding (source / amount / cash flow) (nominal, undiscounted)	\$144.5 million (Queensland Government)

7. Deliverability

The Queensland Government carried out a qualitative and quantitative risk assessment, which was provided to Infrastructure Australia together with a peer review of the cost estimate and risk assessment. The proponent's risk assessment identified technical risks, demand related risks, financial, implementation and governance related risks, along with mitigating strategies.

The peer review found that the cost estimate and risk assessment approach followed established methodology for transport capital estimates. Minor issues were identified in the peer review, but they were not material enough to warrant re-estimation of project costs.

The preferred delivery approach for the project is an 'Early Contractor Involvement / Double Early Contractor Involvement with a Design and Construct Contract'. The proponent has extensive experience in delivering projects of this type. The proponent's Public Private Partnership (PPP) delivery model assessment concluded that there were no commercially viable PPP delivery model options for the project given that revenue, operations and maintenance components are outside of the project scope.

At the stage of finalising the submission, the final funding model for the Beerburrum to Nambour Rail Upgrade project was not confirmed. The submission indicates that the funding model may contain a mix of contributions from various levels of government. During the development of this submission, negotiations have not commenced with the Australian Government or any other levels of government as to the quantum, timing or nature of contribution from these funding sources, as the business case is subject to cabinet approval.

A Benefits Realisation Plan has been developed in accordance with the Department of Transport and Main Roads Benefits Management Framework and Building Queensland's Building Case Development Framework. The Benefits Realisation Plan will be further developed during the implementation phase.

If the project proceeds, Infrastructure Australia encourages the proponent to undertake and publicly release a post completion review to assess the extent to which expected project benefits and costs have been realised, in order to inform future project development.