

# Final Business Case Evaluation Summary

## M1 Pacific Motorway Extension to Raymond Terrace



July 2022

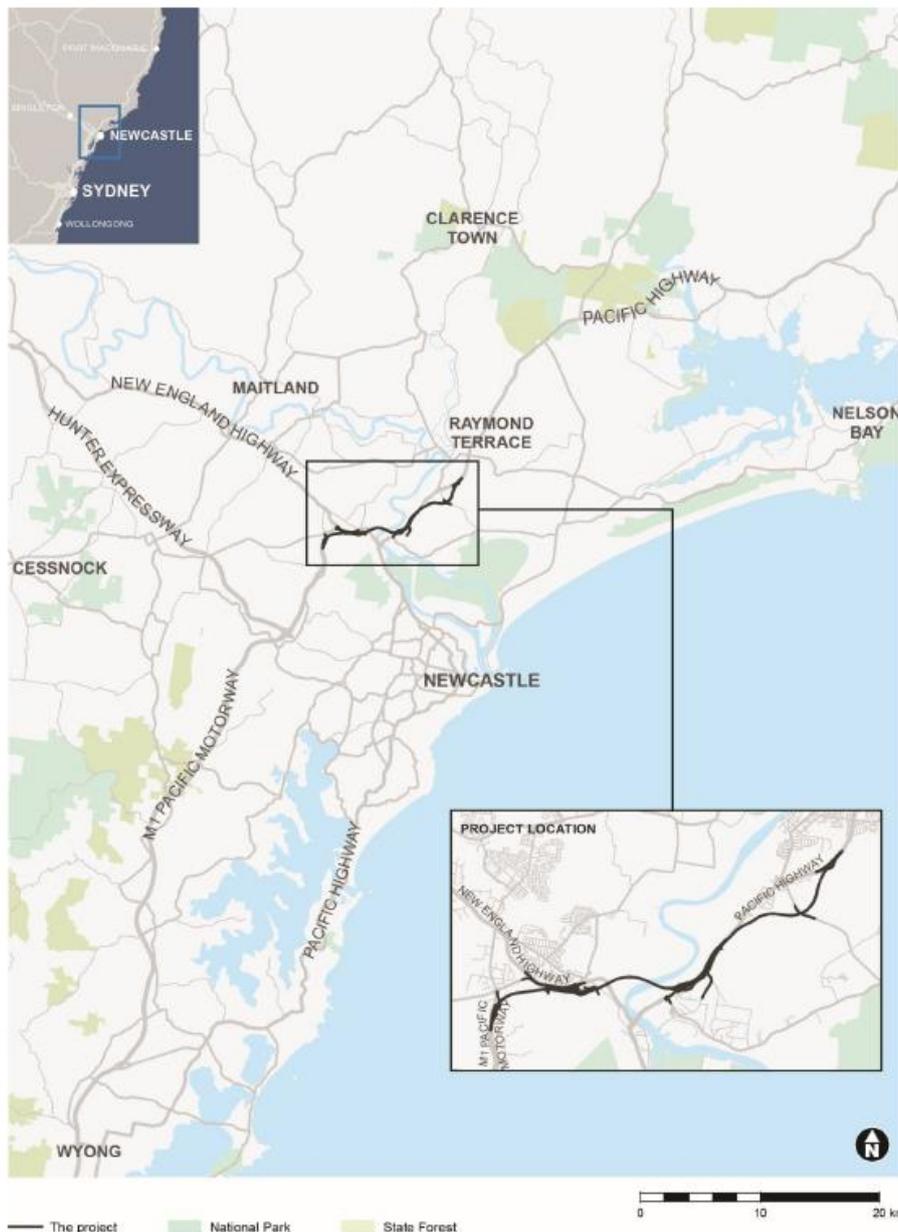
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## About this report

The M1 Pacific Motorway Extension to Raymond Terrace project (M12RT) is a proposed 15km extension of the M1 Pacific Motorway from Black Hill to the A1 Pacific Highway at Raymond Terrace (Figure 1). The project is one of the final major upgrades to provide a high-standard motorway connection between Sydney and Brisbane as part of Australia’s National Land Transportation Network.

**Figure 1: Regional Context of the Project**



Source: Transport for NSW 2021, *M1 Pacific Extension to Raymond Terrace Environmental Impact Statement*.

The Final Business Case was prepared by Transport for NSW in 2021. This Business Case Summary has been prepared by Infrastructure NSW, the NSW Government’s independent infrastructure advisory agency.

## Strategic context

### Pacific Highway Upgrade Program

The Australian and NSW governments, since 1966, have had a shared commitment to upgrade the 657km section of the Pacific Highway between Hexham and the NSW/Queensland border, as part of the Pacific Highway Upgrade Program.

The M12RT and the Coffs Harbour bypass are the remaining 'missing links' in the completion of a high standard corridor between Sydney and Brisbane.

### Australian and NSW Government commitments

In 2019-20, the Australian and NSW governments committed \$1.6 billion and \$0.4 billion respectively to the extension of the M1 Pacific Motorway to Raymond Terrace to improve the connection between Sydney and Brisbane.<sup>1</sup> The Australian Government's announcement describes the slowing of traffic at Hexham as a problem for the movement of commuters, freight and tourists.

### Alignment to government strategic plans and directions

The M12RT either contributes to or aligns with many government strategies and plans. Some of these strategies and plans include Future Transport 2056<sup>2</sup>, Greater Newcastle Future Transport Plan<sup>3</sup>, the Hunter Regional Plan 2036<sup>4</sup>, and the Greater Newcastle Metropolitan Plan 2036<sup>5</sup>.

The M12RT has been listed as a priority initiative on Infrastructure Australia's Infrastructure Priority List since 2016<sup>6</sup>.

### Improved road safety

The project's delivery of a high-standard, divided-carriageway motorway connection is aimed at significantly improving road safety and reducing injuries and fatalities in the corridor. This will directly support the *Road Safety Plan 2021: Towards Zero*<sup>7</sup>, which has a target of zero fatalities/injuries by 2056.

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<sup>1</sup> Australian Government 2021, *M1 Pacific Motorway Extension to Raymond Terrace*.

<sup>2</sup> Transport for NSW 2016, *Future Transport Strategy 2056*. Note, an updated version was released in 2020.

<sup>3</sup> Transport for NSW 2018, *Greater Newcastle Future Transport Plan*.

<sup>4</sup> NSW Department of Planning, Industry and Environment 2016, *Hunter Regional Plan 2036*.

<sup>5</sup> NSW Department of Planning, Industry and Environment 2018, *Greater Newcastle Metropolitan Plan 2036*.

<sup>6</sup> Infrastructure Australia 2016, *Infrastructure Priority List – Pacific Motorway (M1) Extension to Raymond Terrace*.

<sup>7</sup> NSW Government 2021, *Road Safety Plan 2021: Towards Zero*

## Project need

The current link between the M1 Pacific Motorway and the A1 Pacific Highway experiences heavy traffic flows and is congested due to the merging of several major roads at Beresfield (Figure 2). This leads to:

- significant congestion in peak and holiday periods, with poor travel times and speeds. The current average speed between Beresfield and Raymond Terrace in the morning peak is 58km/h, and without action, this is projected to drop to 35 km/h by 2048. The average posted speed limit across this route is over 80 km/h
- poor traffic flow at five signalised intersections and a roundabout, including severe queuing and delays
- excessive vehicle manoeuvres and interactions between heavy and light vehicles, contributing to a crash rate above average.

**Figure 2: Convergence of major regional connectors at Beresfield and traffic volumes (2017)**



Source: Transport for NSW, M1 Pacific Motorway Extension to Raymond Terrace Final Business Case.

The performance of the road network is further constrained by:

- heavy vehicle restrictions on Hexham Bridge due to its height, width and load constraints
- heightened flooding risk due to proximity to waterways.

# Project objectives and design

## Objectives

The project has the following objectives:

- Improve travel times on the Pacific Highway for the existing east-west route.
- Reduce the freight transport time and cost for heavy vehicles along the Pacific and New England Highways.
- Provide long-term route reliability along the Pacific Highway.
- Improve safety for all road users.
- Provide more efficient access to facilitate economic growth for employment areas such as Tomago, Beresfield, Black Hill, the Port of Newcastle and Greater Newcastle.

## Design

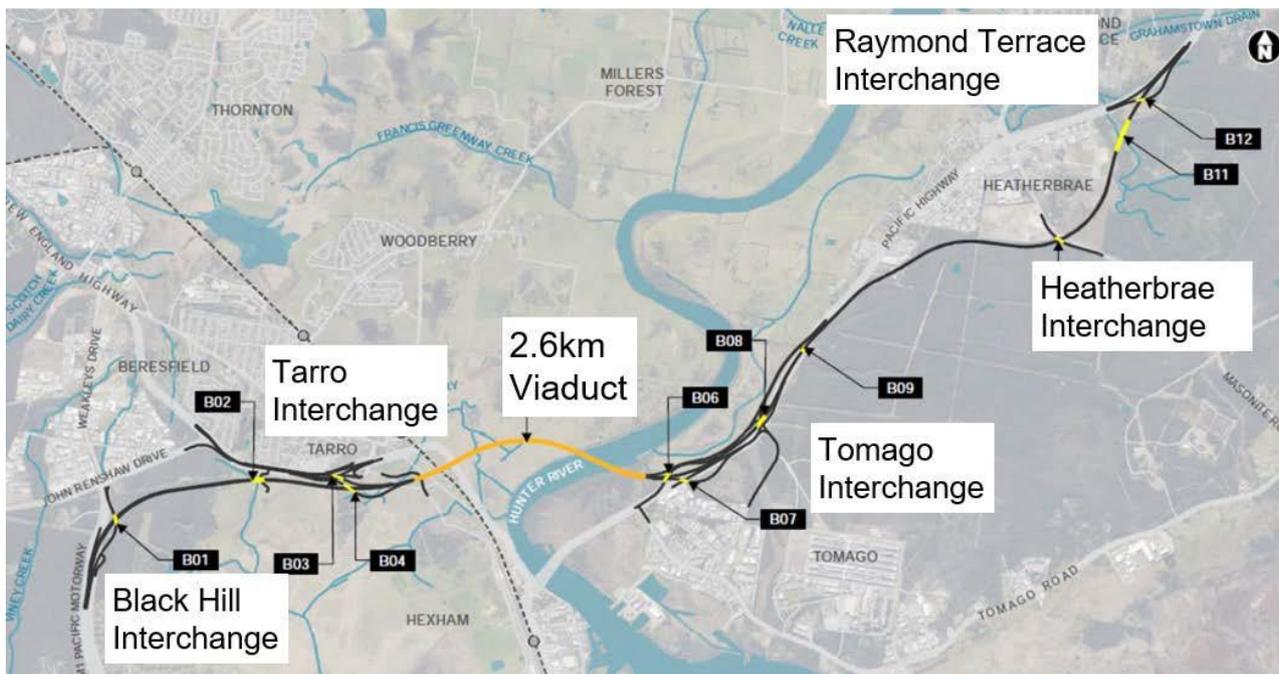
The M12RT will deliver a 15km dual carriageway motorway with 2 lanes in each direction between the northern terminus of the M1 Pacific Motorway at Black Hill and the southern end of the A1 Pacific Highway at Raymond Terrace. The upgrades will bypass Hexham and Heatherbrae.

The project design includes the following features:

- Four interchanges for access to the motorway at Black Hill (connection to the M1 Pacific Motorway), Tarro (connection to the New England Highway), Tomago (connection to the Pacific Highway and Old Punt Road) and Raymond Terrace (connection to the A1 Pacific Highway).
- A 2.6km viaduct over the Hunter River floodplain.
- Bridges over waterways at Tarro and Raymond Terrace and an overpass for Masonite Road.
- High-standard motorway road design that is able to accommodate heavy freight vehicles.
- On and off ramps to the local road network.
- Active transport links for walking and cycling.

Key interchanges with adjoining highways and local roads are illustrated below.

**Figure 3: Extension of the M1 Pacific Motorway to Raymond Terrace – key features**



Source: Transport for NSW, M1 Pacific Motorway Extension to Raymond Terrace Final Business Case.

## Options identification and assessment

The preferred option presented in the Final Business Case has been refined since 2004 through 3 broad stages.

### Early phase option development

Options workshops in late 2004 identified 14 route options for assessment. Early project work included multiple stages of route refinement, option workshops and public consultation in 2005, 2006, and 2008. The concept design of the route was reserved in the Newcastle and Port Stephens Local Environment Plans in 2010.

### Broader network considerations

Transport for NSW commissioned Phase 1 of the Outer Newcastle Study (ONS) in 2017. The ONS included investigation of alternative options to an extension of the M1 Pacific Motorway. The ONS found that the M12RT provided the most benefits compared to any other options.

In 2018, ONS Phase 2 carried out investigations into the future infrastructure requirements due to growth in the Black Hill employment hub. This phase identified the need for an interchange at Black Hill as part of the M12RT.

### Preferred option development

In parallel to the ONS, further refinements, based on community feedback, were made to the 2016 concept design ensuring the proposal provided the best outcomes for road users, the environment and the community.

These changes were incorporated into the project's concept design in the Final Business Case. The project's Environmental Impact Statement (EIS) was released for public consultation in July 2021.

## Economic evaluation

A Cost Benefit Analysis (CBA) of the project options was completed in the Final Business Case. The CBA followed Transport for NSW's economic appraisal guidelines and review processes.

### Costs

The costs for the project have been estimated in accordance with Transport for NSW guidelines. Key elements of the cost estimates include:

- construction costs, including materials and labour
- cost contingency and nominal escalation
- operating and maintenance costs over 30 years.

### Benefits

The M12RT is expected to deliver a range of quantifiable benefits to road users and the community, including:

- travel time savings for private vehicles and trucks
- freight productivity gains
- vehicle operating cost savings including fuel, maintenance and depreciation
- reduction in crash costs
- environmental externality cost savings such as reductions in airborne pollution, greenhouse gas emissions and noise
- reduced impact and cost of flooding events
- residual value of motorway assets.

Qualitative benefits have also been identified. Examples of these benefits include wider socio-economic benefits, pedestrian and cyclist transport safety, and improved access for emergency services.

## The outcomes of the analysis

A discount rate of 7% was used to calculate the present value of future costs and benefits over a 30-year evaluation period. All costs and benefits are presented in 2020-21 dollar terms (June 2021).

The preferred project option has a positive Net Present Value (NPV) of \$1,608 million and a Benefit Cost Ratio (BCR) of 2.2, demonstrating the project benefits are expected to exceed the costs. This supports the rationale for investment by the NSW and Australian governments.

### Sensitivity analysis

Sensitivity tests were completed to account for risk and uncertainty in the CBA and road network assumptions. Key sensitivity tests included an increase in delivery costs, a decrease in anticipated benefits and varying road user characteristics.

For all scenarios, the NPV was positive and the BCR was above 1.

## Deliverability

The M12RT will be delivered by Transport for NSW and its design and construction partners.

### Procurement and timeframe

The M12RT will be procured under separate Design and Construct (D&C) contracts. The following packages were identified:

- Southern package – 10km section from Black Hill to Tomago.
- Northern package – 5km section from Tomago to Raymond Terrace.

The construction of the M12RT is expected to commence in 2023. Final delivery timeframes will be known following engagement with the construction industry to determine the best delivery strategy and construction timeframes.

### Governance

A project control group has been established to oversee the development and delivery, with input from the Transport for NSW Infrastructure and Place Division project advisory group. The project control group will be responsible for the project delivery and benefits realisation.

### Key risks and mitigation

Major risks have been identified through a series of workshops with key stakeholders. These risks include:

- geotechnical conditions
- public utilities relocation
- land contamination
- conditions for planning approval.

Mitigation strategies have been identified to manage each of these risks. A risk management plan has been developed to record and manage project risks.

## The Infrastructure NSW view

In May 2021, Infrastructure NSW undertook a review of the M12RT Final Business Case..

In Infrastructure NSW's view, the Final Business Case demonstrated:

- the overall case for investment is strong and will provide significant benefits for both pass-through traffic and local road users.
- the project's concept design appeared satisfactory, noting it has benefited from many years of refinement and community consultation. The concept design also addressed the challenging site conditions including the Hunter River floodplain, soft soils and access to local communities.
- cost estimates have been developed based on a sound understanding of scope, site conditions and delivery risks and have been benchmarked against actual costs of similar projects.
- the project's delivery timeframe and procurement activities appeared robust and allowed sufficient time to complete the EIS process.
- separating the project into 2 packages of work provide opportunities for participation by both Tier 1 and Tier 2/3 construction firms.

INSW notes that while the project has strong governance arrangements in place, it could benefit from the development of a governance framework that captures all relevant governance documents and complies with the newly introduced *A Guide to the Oversight Framework for the NSW Infrastructure Program*<sup>8</sup>. As the project proceeds towards procurement and delivery, there is a need to scale up the project team's resources – particularly commercial resources.

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<sup>8</sup> Infrastructure NSW 2021, *Oversight Framework for the NSW Infrastructure Program*.