
Business Case Summary

Singleton Bypass

June 2024



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1 About this report

1.1 Singleton Bypass

This report summarises the Final Business Case (FBC) for the Singleton Bypass that was undertaken by Transport for NSW (TfNSW). The Singleton Bypass Project will provide a 2-lane highway located to the west of Singleton that connects the New England Highway to the north and south of Singleton.

The project is driven by existing congestion and concerns over network capacity, efficiency, and the safety of road users along the New England Highway and in Singleton.

The project aims to:

- ▶ improve road network performance
- ▶ improve customer experience
- ▶ improve amenity in Singleton township
- ▶ reduce fatalities and serious injury crash rates across the proposal area
- ▶ support economic growth
- ▶ improve freight efficiency.

The Australian Government has committed \$560 million and the NSW Government \$140 million to build the Singleton Bypass. The FBC enables the NSW Government to make an informed project investment decision for the funding and delivery strategy of the project, and for approval and release of funds to allow completion of delivery.

The business case summary has been prepared by Infrastructure NSW, in accordance with NSW Treasury's Guidelines for Capital Business Cases. It is based on the final approved business case and does not take into account subsequent decisions on project cost estimates.

2 Strategic alignment and context

2.1 Background and context

The New England Highway forms part of the inland Sydney to Brisbane corridor of the National Land Transport Network. The network is funded by the Federal, State and Territory governments and is recognised for its strategic importance to national and regional economic growth and connectivity. On a regional scale, the New England Highway is a major freight route between the Port of Newcastle and the Hunter Valley. It supports the coal and agricultural industries and employment in NSW. The New England Highway provides safe and efficient access as a major freight and commuter route for the Upper and Lower Hunter.

Singleton is a growing regional town with an estimated population of 23,461 in 2019. Singleton's population growth has been supported by expanding land development in and around Singleton and economic growth associated with the freight and mining industry. The town is an important economic centre for the region with a mix of retail, commercial, education and health services. Efficient and safe access to and from Singleton is critical for the amenity of the town and sense of wellbeing of its residents.

Government commitments

This project will be jointly funded by NSW and Australian Governments. The Australian Government has committed \$560 million towards the project on an 80:20 basis, with the NSW Government providing the remaining \$140 million. A total of \$700 million has been committed by the Australian and NSW Governments.

Alignment with government strategies and policies

The project positively contributes to the strategic direction and vision of several key government policies and strategies. Table 1 below summarises how the project aligns with key national, state and local strategic documents.

Table 1 Government strategy or policy alignment

Region	Government strategy or policy	Project alignment
National	Australian Infrastructure Plan (2016)	The proposed project is expected to address one of the challenges recognised in the Australia Infrastructure Plan. It will remove a pinch point and alleviate congestion along a major freight and commuter transport route.
	National Heavy Vehicle Regulator (NHVR)	While the proposed project does not directly align with the NHVR's key objectives, it aims to achieve efficiency, consistency and safety for heavy vehicles through the construction of the bypass.
	National Land Freight Strategy (2013)	The proposed project contributes to improved efficiency, safety and improved access to network.

Region	Government strategy or policy	Project alignment
State	NSW Premiers and State priorities (2015)	The proposal is consistent with priorities identified. It will improve the freight and commuter efficiency along the New England Highway and improve congestion and safety for local traffic in Singleton.
	NSW Infrastructure Strategy 2018-2038	The proposal addresses a key transport recommendation made as part of the 2018 State Infrastructure Strategy. That being to develop and protect freight and service networks by improving road access for goods and services to local, national and global markets.
	Future Transport Strategy 2056	<p>The project is aligned with the following Future Transport principles including:</p> <ul style="list-style-type: none"> ▶ Successful places: sustaining and enhancing the liveability of our places. ▶ A strong economy: connecting people and places in the growing city. ▶ Safety and performance: safely, efficiently and reliably moving people and goods. <p>The project also aligns with the following regional NSW transport customer outcomes including:</p> <ul style="list-style-type: none"> ▶ Appropriate movement and place balance are established enabling people and goods to move efficiently through the network whilst ensuring local access and vibrant places. ▶ Changes in land use, population and demand, including seasonal changes, are served by the transport system. ▶ Economic development is enabled by regional transport services and infrastructure. ▶ A safe transport system for every customer with zero deaths or serious injuries on the network by 2056.
	Road Safety Plan 2021	<p>The Road Safety Plan 2021 outlines how the NSW Government will work towards the State Priority Target of reducing fatalities by 30% by 2021 (compared to average annual fatalities over 2008–2010). It also aligns the Towards Zero vision with Future Transport Strategy 2056, which aims to have NSW transport network with zero trauma by 2056.</p> <p>Consistent with this initiative, the proposal has been designed in accordance with relevant safety standards and design criteria. It will improve road safety for through and local traffic in Singleton. The diversion and reduction of traffic through Singleton, especially heavy freight vehicles, to the bypass reduce the potential for crashes involving heavy vehicles.</p>
	NSW Freight and Ports Plan 2018-2023	The New England Highway is identified in the plan as an important regional road for freight. The proposal contributes to the goals and objectives of the plan. It will improve the efficiency and safety of the highway and local Singleton road network by separating heavy vehicle movements along the bypass instead of through Singleton.
10-year Blueprint	The proposal will improve travel efficiency, network performance and reliability and in return enable economic growth through better access to efficient regional transport infrastructure.	

Region	Government strategy or policy	Project alignment
Local	New England Highway Draft Corridor Strategy (2016)	The strategy sets out the 20-year plan to manage and guide the development of the road corridor to improve safety, traffic efficiency and sustainability. The proposal will assist in delivering the preferred option for a New England Highway bypass of Singleton which will also improve safety and traffic efficiency on the route.
	Upper Hunter Strategic Regional Land Use Plan (2012)	<p>A key objective of the Upper Hunter Strategy is supplying required infrastructure to cater for sustainable economic and population growth in the region. The Upper Hunter Strategy also notes that consideration needs to be given to improved traffic management through towns (in particular, Singleton).</p> <p>The proposal will improve freight efficiency along the New England Highway. It will support the expected increase in road freight due to economic and population growth, as well as improving traffic efficiency through Singleton.</p>
	Singleton Land Use Strategy (2008)	The proposal will contribute to the future planning of Singleton. It will reduce current levels of traffic congestion, improve road safety and increase the capacity of existing road infrastructure along the New England Highway. The proposal will also reduce potential crashes associated with heavy vehicles travelling through Singleton.

3 Project need

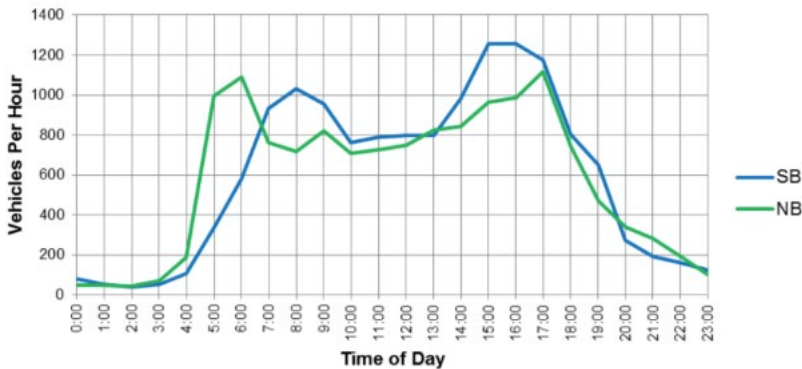
The New England Highway is the main access road through the Singleton town centre. Key road users include Singleton and Singleton Heights residents, employees of nearby mines, freight and construction industries, and commercial and private drivers seeking to access the Sydney-Brisbane corridor. In Singleton, the New England Highway generally consists of 1 lane in each direction and has a reduced speed limit of 50 km/h through the town.

The following needs for the project were identified in the business case.

Need 1: Local network cannot meet traffic demand from commuters, the mining industry and heavy vehicles during AM and PM peaks, leading to increased travel times and delays for road users.

Road users experience delays and lengthy travel times along the New England Highway, particularly during the morning (AM) and afternoon (PM) peak periods. This is due to higher volumes of traffic arising from mining workers, and school and work trips. The existing layout coupled with an increasing traffic volume, particularly during AM and PM peak hours, has contributed to network congestion and travel delays for road users. Intersection Level of Service (LoS) is currently suffering at New England Highway and Bridgman Road, with heavy delays in the peak periods.

Figure 1 Southbound and northbound peak periods across the day



Source: TfNSW (2019), New England Highway bypass of Singleton, Review of Environmental Factor, Transport for NSW, Dec 2019 REF Chapter 6.5 Traffic Assessment

Historical annual average daily traffic (AADT) shows that traffic volumes have steadily increased at about 2.6% per annum between 2015 and 2018¹, well above growth on the broader state road network.²

Traffic modelling has found that the forecast increase in demand (up to 27.7% by 2046) will result in increased congestion. The impact of this means that a large proportion of traffic will not be able to enter the network during peak periods by 2036 and 2046 when compared to 2018. Further deterioration of intersection performance is also expected.

¹ TfNSW (2019), New England Highway bypass of Singleton, Review of Environmental Factor, Ch 6.5, Transport for NSW, Dec 2019

² Infrastructure Australia (2019) available at <https://www.infrastructureaustralia.gov.au/map/regional-nsw-roadnetwork-safety-improvements>

Need 2: High heavy vehicle volumes, which are often oversized and/or over-mass vehicles, and activities associated with mining puts pressure on local roads and existing infrastructure, leading to poor safety and amenity outcomes.

Average daily traffic volumes indicate that up to 28,000 vehicles use the New England Highway through Singleton, with heavy vehicles accounting for up to 15% of traffic. The route allows for the transport of goods to domestic and international markets via Newcastle and Sydney. It also accommodates the transport of mining equipment and machinery, which are often oversized and/or over-mass vehicles. Currently, there are access restrictions for some Performance-Based Standards (PBS) vehicles operating on the New England Highway.³ Additionally, there is an over-height limit of 5.4 metres at Gowrie Gates where the highway passes under rail tracks. The alternative heavy vehicle route is via the Golden Highway. However, this route limits heavy vehicle access to local cattle yards, industrial and mining sites.

The movement of heavy vehicles through the town centre has raised concerns about safety, amenity and residents' wellbeing. The perceived negative impacts related to air and noise pollution and road safety are mainly caused by the size and speed of heavy vehicles.

The crash severity index (CSI) based on 5 years of data (October 2015 to September 2020) for the proposal area was calculated at 1.44. This was significantly higher than the overall NSW CSI of 1.24. Further assessment of the crash data shows that 87% of the total 87 crashes resulted in injury. The highest instance of crashes occurred on the New England Highway from Haggarty's Lane to Rixs Creek Lane (78% of total crashes in proposal area).

³ National Heavy Vehicle Regulator (NHVR) (2021), available at <https://www.nhvr.gov.au/road-access/route-planner>

4 Project objectives and design

4.1 Objectives

The primary objectives of the project are to:

- ▶ improve travel reliability on the New England Highway through Singleton, particularly for road freight supporting the Upper Hunter and the North West New England region
- ▶ improve the amenity of Singleton by removing freight traffic
- ▶ improve road safety for through and local traffic in Singleton
- ▶ support future traffic growth along the New England Highway associated with planned land use in the Upper Hunter area
- ▶ provide access for oversize and over-mass vehicles along the New England Highway.

4.2 Design considerations

Project design considered several factors including:

- ▶ improvement to road transport efficiency through travel time savings
- ▶ improved town access and amenity
- ▶ minimisation of environmental impacts, including Aboriginal and European heritage, environmentally sensitive flora and fauna, and impact on high quality agricultural land
- ▶ improving flood access routes to Singleton, while only having a minor impact on flooding
- ▶ improving safety.

5 Options identification and assessment

5.1 Strategic Business Case (SBC)

The SBC was developed in 2016 and approved in 2017. A Preferred Option Report (2016) informed the options for the SBC.

Changes since the SBC

Since the SBC, the project has gone through extensive consultation and project assessment. TfNSW has carried out multiple investigations which have considered social, environmental and economic factors, as well as community and stakeholder feedback into further development of the proposal.

An initial assessment against 3 key categories (technical/functional, socioeconomic and environmental) selected a preferred option from a list of 3 options. This assessment was further supported with an economic appraisal of the 3 shortlisted options which confirmed the economic viability of the preferred option.

In April 2021, the NSW Government announced its commitment to increase the scope of the original proposal to include ramps at Putty Road and a revised southern interchange. This change was met with support from the local community as the connections are expected to allow additional vehicle access to/from the bypass, including for heavy vehicles, which is likely to address safety issues associated with heavy vehicles using local roads.

5.2 Final Business Case (FBC)

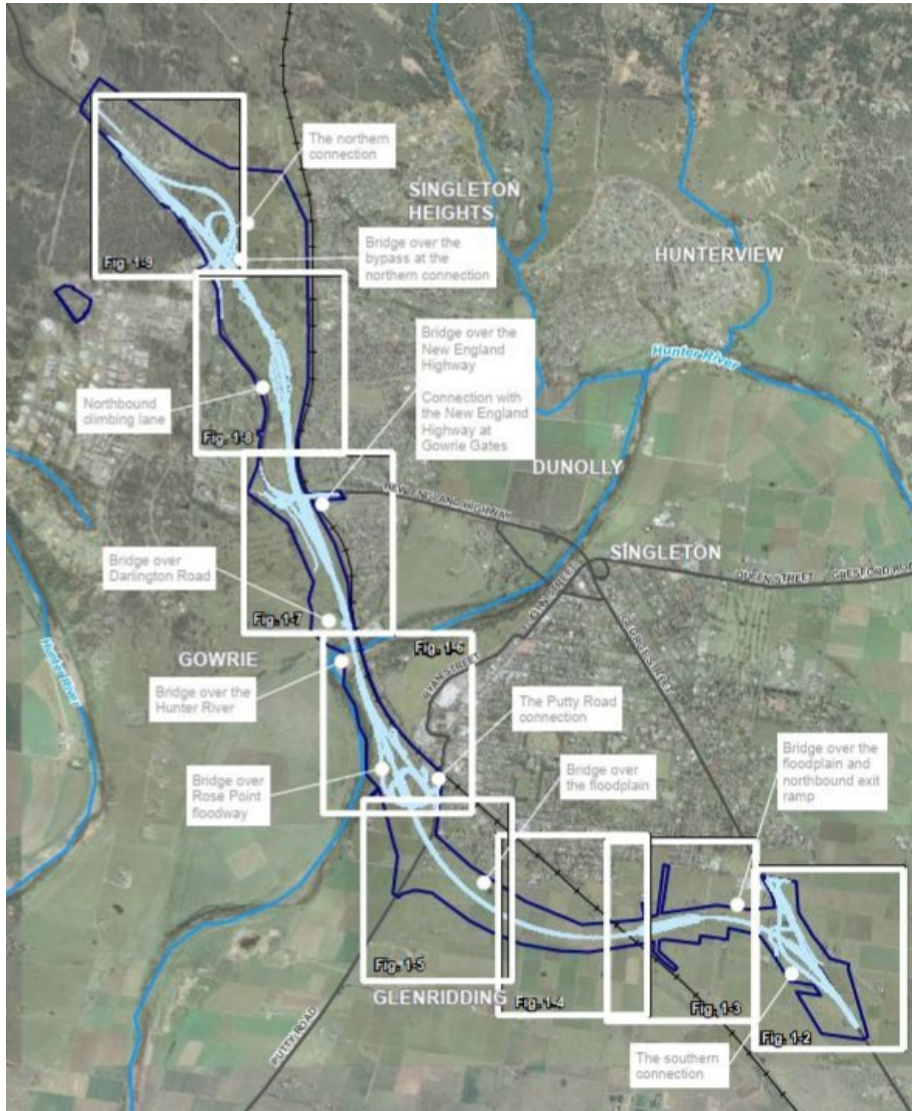
The revised preferred option at 100% concept design incorporates changes to the original preferred option to include ramps at Putty Road and the revised southern connection. The revised preferred option has been assessed in the FBC.

The scope of the revised preferred option includes:

- ▶ Around 8 kilometres of new highway (the bypass) with 1 lane in each direction.
- ▶ Connection with the New England Highway at the southern end of the proposal, including a southbound entry ramp and northbound exit ramp only (the southern connection).
- ▶ A 600-metre-long bridge over the floodplain at the southern connection.
- ▶ A 1.84-kilometre-long bridge over the Main North railway line, Doughboy Hollow and Hunter River floodplain, Army Camp Road, Putty Road and the northbound entry and exit ramps at the Putty Road connection (bridge over the floodplain).
- ▶ Connection at Putty Road consisting of a southbound entry ramp, southbound exit ramp, northbound entry ramp and northbound exit ramp (the Putty Road connection).
- ▶ A 100-metre bridge over Rose Point floodway.
- ▶ A 205-metre bridge over the Hunter River.
- ▶ A 15-metre bridge over the potential extension of Darlington Road.
- ▶ A 40-metre bridge over the New England Highway west of the existing Main North railway line overbridge (known as Gowrie Gates).
- ▶ Connection with the New England Highway at Gowrie Gates consisting of a southbound entry ramp and northbound exit ramp. The northbound exit ramp would connect to the New England Highway via a new roundabout intersection at Maison Dieu Road.
- ▶ A 1.7-kilometre northbound climbing lane between Gowrie Gates and the northern connection.

- ▶ Connection at Magpie Street providing access to the nearby industrial area (the northern connection), consisting of a southbound entry ramp, southbound exit ramp and northbound entry ramp.
- ▶ A 60-metre-long bridge over the bypass at the northern connection.

Figure 2 Singleton bypass preferred option



Stakeholder engagement

A Community and Stakeholder Engagement Plan was developed in 2014, which outlined the consultation and engagement process that supported planning for the bypass. The plan outlined details regarding the primary stakeholders, the nature of their interest in the project, key issues, and attitude/position on the project.

Stakeholders and the community were invited to provide their feedback on the preferred option between December 2019 and March 2020. Public display of the Review of Environmental Factors resulted in 154 submissions, including from the general community, government agencies, Singleton Council, and an independent business.

Multiple strategies have been developed to consider local issues and desires for the proposal as identified by the community. They include Singleton Council's *Community Strategic Plan Our Place: A Blueprint for 2023*. It identifies the community's desire for the bypass to improve road transport reliability and safety as well as reduce traffic congestion, enhancing Singleton town centre's existing environment.

TfNSW updated the Community and Stakeholder Engagement Plan in February 2021. The plan identifies major project stakeholders and outlines the communication and consultation approach and engagement tools and timelines of communication activities.

6 Cost and economic evaluation

6.1 Estimated costs

Capital costs

Table 2 below summarises the approximate P90 and P50 capital costs for the revised preferred option.

Table 2 Total costs (P90 and P50 capex costs) (OT\$)

Cost Component (\$ million)	Total Project Cost Estimates
Outturn Cost Estimate (P50)	\$645 million
Outturn Cost Estimate (P90)	\$700 million

Ongoing maintenance, operating and service costs

Operational and maintenance costs will be a significant element in the whole-of-life road costs. Under the preferred option, the road pavement area that needs to be maintained, and the number of road furnishings will increase, leading to an increase in the ongoing operational cost.

The project maintenance costs for the preferred option are shown in the table below.

Table 3 Total costs (P50 capex costs) (\$2022)

Project maintenance costs	P50 Estimates (\$)
Ongoing maintenance cost (per annum)	\$750,000

6.2 Evaluation

The economic appraisal follows a structured cost-benefit analysis (CBA) framework to estimate the economic costs and benefits of the project. The economic appraisal was undertaken in line with TfNSW's Cost-Benefit Analysis Guide and Economic Parameter Values, and NSW Treasury's Guide to Cost Benefit Analysis.

The revised preferred option is expected to generate substantial benefits to road users. Such as through improved road network performance (measured through travel time savings and reduced vehicle operating costs) and improved road safety (measured through crash cost savings). The benefits of the revised preferred option include:

- ▶ vehicle operating cost savings
- ▶ travel time savings
- ▶ crash cost savings
- ▶ externality cost savings
- ▶ residual value of assets.

6.3 Outcomes of the analysis

The CBA results are summarised in Table 4 below. The preferred option returns a benefit-cost ratio (BCR) and positive net present value (NPV) as follows.

Table 4 Summary of the Project's CBA

Option appraisal	Criteria	Preferred Option
Economic appraisal (7.00% real discount rate)	NPV (\$ million)	113.4
	BCR	1.2

7 Deliverability

7.1 Procurement

Based on the packaging and procurement options assessed by TfNSW, and in consideration of industry feedback through the Market Interaction Process (MIP), it was recommended to:

- ▶ Deliver the project as a single package with consideration of early work packages.
- ▶ Utilise the design and construct contract model, amended where necessary to incorporate balanced risk allocation on agreed risk items (in collaboration with Construction Phase Support and Regional Project Delivery).
- ▶ Release a single registration of interest in June 2021, from suitably pre-qualified contractors, including shortlisting Request for Tender (RFT) and interactive RFT process to facilitate a collaborative approach to risk allocation.
- ▶ Develop the Infrastructure NSW 10 Point Commitment Implementation Statement, which is the requirement to track progress against 10 point commitment actions at key milestones of NSW Government projects with a capital value greater than \$50 million.

7.2 Timeframe

At the time of the business case, the project planned to award construction in March 2023, project completion by late-2026.

7.3 Key risks and mitigation

The top project risks and mitigations identified in the FBC are summarised in Table 5.

Table 5 Key risks and mitigation

Key risk	Mitigation	Residual rating
Allowance for contract claims during project delivery - global claim.	▶ Review contract management process.	▶ High
Change of contractor.	▶ Due diligence checks and contractor prequalification.	▶ Medium
Design changes to reduce cost in viaduct design through potential reduction in viaduct length to satisfy flood modelling requirements.	▶ Concurred estimate to incorporate savings (based on strategic design).	▶ High
Tender appetite and capacity: tenders for detailed design are invited when there is high market demand for design consultants, resulting in increased tender prices (and higher contract price).	▶ Undertake market interaction process. ▶ Revisit the risk based on appetite and strategy to limit number of qualified tenderers.	▶ High
Major flood event: working on a known flood plain and possibility of an event.	▶ Floodplain management plan/emergency response plan. ▶ All weather access/haul roads.	▶ Medium

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Key risk	Mitigation	Residual rating
	<ul style="list-style-type: none"> ▶ Weather monitoring. ▶ Flood modelling used to identify higher risk areas. ▶ Wet weather allowance of six months on top of 2.5-year program (P50). 	
<p>Damage to local roads: local road impacts and damage during construction.</p>	<ul style="list-style-type: none"> ▶ Ensure precondition assessments are undertaken before construction commences. Ensure contract confirms that repair costs are to be borne by the contractor. 	<ul style="list-style-type: none"> ▶ High
<p>Addressing unexpected contamination issues.</p>	<ul style="list-style-type: none"> ▶ Phase 2 site assessment to be completed. ▶ Phase 3 site assessment undertaken if required. 	<ul style="list-style-type: none"> ▶ Medium
<p>Political appetite to adopt a 4-lane option for the proposal.</p>	<ul style="list-style-type: none"> ▶ For each activity where cost neutral include provision for four-lane option. 	<ul style="list-style-type: none"> ▶ High

8 The Infrastructure NSW view

Consistent with the NSW Government's Infrastructure Investor Assurance Framework, Infrastructure NSW routinely assesses business cases and provides advice to government on the efficacy of their findings.

The review found that the project is likely to deliver the proposed benefits within the budgetary and time constraints. In particular, the design will remove heavy vehicle traffic from the Singleton town centre and improve flood resilience. Transport for NSW will need to undertake further work with Singleton Shire Council to ensure the town capitalises on the place benefits flowing from the project.