

Project business case evaluation summary

Parkes Bypass

Location

Parkes, NSW

Geography

Smaller cities and regional centres



Category

National Connectivity

Capital cost

\$175 million (P50, outturn)

Indicative timeframe

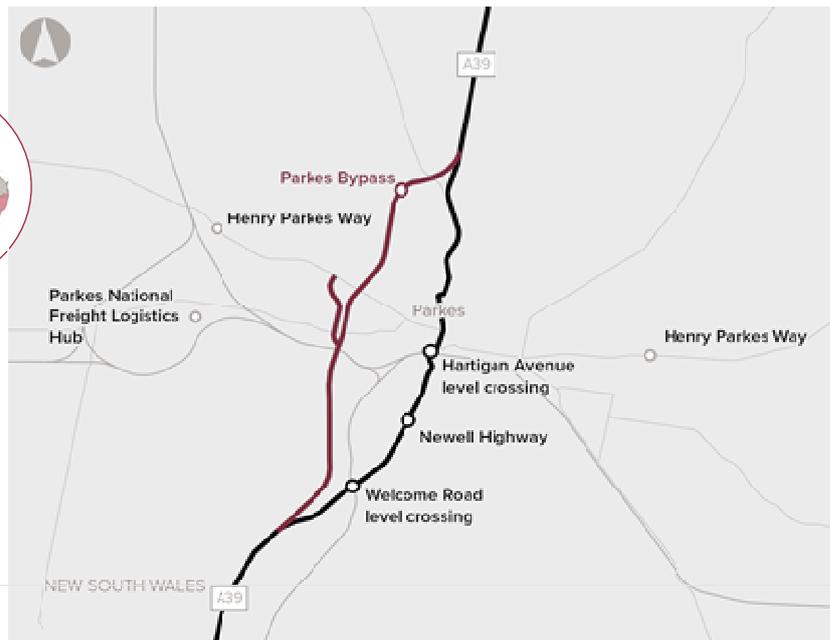
Construction start: 2021
Project completion by: 2024

Proponent

NSW Government

Evaluation date

3 September 2020



1. Evaluation Summary

The **Parkes Bypass** project has been added to the Infrastructure Priority List as **Priority Project**.

The Parkes Bypass is the final upgrade in the Newell Highway program to enable more efficient Performance Based Standards (PBS) Level 3A vehicles to use the entire highway. The Newell Highway connects Melbourne and Brisbane, and is an important freight corridor for consumer goods and manufacturing materials, as well as agricultural goods within New South Wales.

The existing highway runs directly through the Parkes town centre, which limits the length of vehicles which can be used and contributes to congestion and safety risks in the town. In the west of Parkes, the NSW Government is developing the Parkes Special Activation Precinct to leverage the Inland Rail project and the existing freight logistics hub. This precinct will also increase freight and commuter traffic in Parkes.

The business case is for a 10.5 kilometre western bypass of Parkes, including bridges over existing railway lines, connections to the Parkes Special Activation Precinct, and upgrades to local roads. The project has an estimated capital cost of \$175 million (P50, outturn costs) and is expected to be completed by 2024.

The project forms part of a broader program of work, and is strategically significant as the final section to be completed before PBS Level 3A vehicles can use the entire highway. Upgrading the Newell Highway is recognised as a Priority Initiative on the *Infrastructure Priority List*. The project also strongly supports NSW Government's Parkes Special Activation Precinct. It would provide connectivity to the precinct and the Inland Rail at Parkes, but is also likely to enable more freight vehicles to use the Newell Highway, competing for some of the same freight markets and potentially reducing the benefits of Inland Rail.

The proponent's business case states that the Parkes Bypass would have a net present value (NPV) of \$24 million and a benefit-cost ratio (BCR) of 1.2, using a 7% real discount rate and P50 capital cost estimate. Our review found some limitations in the business case, but we consider that the project is still likely to have a positive impact on the economy.

The proponent has undertaken appropriate deliverability planning for most aspects of the project, and key project risks have mitigation strategies in place. However, we recommend further refinement of the ongoing maintenance costs and planning for a Post Completion Review to measure whether the benefits and objectives of the project are achieved.

2. Context

The Newell Highway is the main inter-capital freight route between Melbourne and Brisbane, and forms part of the National Land Transport Network. The Australian Government has also identified the Newell Highway under the Roads of Strategic Importance initiative, as it is part of the Toowoomba to Seymour corridor.

Within New South Wales, the highway runs directly through the town of Parkes. The Parkes Special Activation Precinct is being developed to the west of the town, and aims to leverage Parkes' location as a junction for significant road and rail corridors. At Parkes, the Inland Rail corridor intersects with the Trans-Australia Railway, as well as an east-west road corridor and the Newell Highway itself.

The majority of interstate freight carried on the Newell Highway is consumer goods and manufacturing materials. Within New South Wales, the highway plays an important role servicing local traffic and consumer freight, as well as a significant volume of agricultural commodities from farms and other producers. Approximately 3,500 to 4,500 vehicles travel along the Newell Highway through Parkes each day, of which 15-25% are heavy vehicles.

The existing corridor through Parkes includes four 90-degree bends at three intersections, which limits the length of vehicles that can be used. Within the town, the highway also has a level crossing with the Broken Hill railway line, which is part of the Trans-Australia Railway connecting Sydney and Perth. About 3.5 kilometres south of Parkes, the highway crosses the Inland Rail corridor that is being developed by the Australian Rail Track Corporation (ARTC). The Inland Rail project aims to increase the proportion of freight carried by rail, but its competitiveness with road could be reduced if higher mass vehicles are enabled along the Newell Highway.

The Parkes Bypass business case forms part of the broader *Newell Highway Corridor Strategy*, which was originally completed by the NSW Government in 2015, and further work undertaken by the Australian Government in 2019. The need to upgrade the Newell Highway has been recognised as a Priority Initiative on the *Infrastructure Priority List* since 2016. The NSW Government has been progressively developing business cases for sections of the Newell as part of the overall program to improve freight productivity, safety and reliability.

3. Problem description

The existing Newell Highway alignment through the centre of Parkes is limiting freight efficiency, leading to delays and safety concerns at railway level crossings and impacting on safety, amenity and pedestrian access within Parkes. There is also an opportunity to support and improve connectivity to the Parkes Special Activation Precinct.

Heavy vehicles travelling the full length of the Newell Highway are currently limited to PBS Level 2B vehicles up to 30 metres long. Following a number of recent upgrades, the existing corridor through Parkes is the only constraint to allowing PBS Level 3A vehicles, such as road trains and B-triples, along the entire highway. Enabling these vehicles can reduce the costs of transporting freight and reduce the total number of heavy vehicles on the road network.

The existing alignment through the town and over two level crossings impacts on safety and traffic flow. This is due to the mix of local and heavy vehicle traffic in the town centre, which increases the likelihood and consequence of accidents with vehicles and pedestrians.

Within Parkes, the Hartigan Avenue railway level crossing is activated approximately 28 times per day, causing an average delay of 2.5 minutes. However, the business case notes that approximately 60% of these are 'false triggers', where level crossing gates closed without an actual need. It states that these could be avoided through improved design, but the project would instead bypass it entirely. The level crossing south of Parkes, near Welcome Road, is used for approximately seven train services each day. While the business case records no collisions at either level crossing in the last five years, it remains an ongoing risk with potentially fatal costs.

Enabling PBS Level 3A access and improving delays and safety at level crossings are two of the project's key objectives. The other primary objective of the project is facilitating future connectivity improvements to the Parkes Special Activation Precinct. The precinct is expected to create up to 3,000 jobs over the next 20 years across freight and logistics, resource recovery and other industries. The precinct includes an accelerated take up of land and business activity, which will increase pressure on the transport network with more commuter and freight trips.

4. Options identification and assessment

The NSW Government investigated options to address the project objectives through a strategic and final business case, as well as leveraging the findings of the *Newell Highway Corridor Strategy* from 2015.

Initially, different options for an eastern and western bypass were identified and considered by the proponent, as well as an option to upgrade the existing highway through Parkes (an 'internal route'). An eastern bypass was dismissed based on it likely being longer and more expensive than a western bypass. The proponent then developed and refined a range of scope alternatives for both the western bypass and the internal route. These alternatives considered different alignments, level crossing arrangements and intersections. While the rationale for refining options appears reasonable, using a formal framework such as multi-criteria analysis or rapid cost-benefit analysis would have improved the rigour and transparency of this process.

During the options refinement phase, the business case underwent an independent technical review as part of a broader Transport for NSW business case optimisation review process. This review made several recommendations, including a revision and consolidation of project objectives (from a list of eight, narrowed to the three primary objectives discussed in the previous section). It also recommended further assessment of the internal route option, on the basis that it may provide a lower cost solution that still meets these refined objectives.

Following this review, the proponent held a value management workshop to investigate the final western bypass option and internal route option in more detail. This workshop identified that a western bypass would provide an overall higher level of service and better connectivity to the freight hub, but at a significantly greater cost. It also found that upgrading the existing highway through Parkes would offer three times the value for money, and given potential funding constraints, the workshop participants recommended endorsing this option as the preferred option.

The NSW Government announced the western bypass as their preferred option prior to the independent technical review or value management workshop. The proponent has re-affirmed the western bypass as their preferred option, and the final business case only considered this option, on the basis that the internal route option would not meet several of the project objectives. Our review found that a clearer identification of project objectives and a structured options evaluation process would have helped produce a more feasible shortlist of options for comparison.

5. Proposal

The proposal is for a 10.5 kilometre western bypass of the Parkes town centre that enables PBS Level 3A vehicle access along the Newell Highway and connects to the Parkes Special Activation Precinct. The works include:

- A two-lane road (one lane in each direction) with four key intersections including:
 - North and south T-intersections with turn lanes between the existing Newell Highway and the Bypass
 - A split T-intersection at London Road
 - A split T-intersection at Brolgan Road
 - A four-way roundabout at Condobolin Road
 - Two bridges including:
- A bridge over the Broken Hill (Sydney to Perth) and Parkes-Narromine rail lines and Hartigan Avenue
- A local vehicle bridge with a shared path for cyclists and pedestrians over the bypass connecting Victoria Street and Back Trundle Road
- An extension of Hartigan Avenue to connect to Brolgan Road, Billy Mac Place and Condobolin Road
- Realignment, reconfiguration and modification to local roads including:
 - Re-aligning Moulden Street
 - Maguire Road and Nock Road are converted to cul-de-sacs

- Construction of a new road between Brolgan Road and Hartigan Avenue
- Construction of a new road between Thomas St and Mitchell St
- New T-intersection at Thomas St and Reedsdale Road (no access between Thomas St and Moulden St)
- New T-intersection at Brolgan Road (west) onto Hartigan Ave extension (no access east/west along Brolgan Road across bypass)
- A new shared path for pedestrians and cyclists parallel to the eastern side of the bypass, which would connect Brolgan Rd, Condobolin Rd and Victoria St.

6. Strategic fit

The Parkes Bypass project forms part of a broader program of works to upgrade the Newell Highway, and is the last section to be addressed before PBS Level 3A vehicles can travel along the entire highway. This program of works was based on the 2015 *Newell Highway Corridor Strategy* and is recognised as a Priority Initiative on the *Infrastructure Priority List*. The Newell Highway is part of the National Land Transport Network and is a key freight corridor between Melbourne and Brisbane, but also supports some freight traffic destined to South Australia and Western Australia.

The project is a committed initiative under the NSW Government's *Future Transport Strategy 2056* and would contribute to the freight efficiencies sought in the *NSW Freight and Ports Plan*. It would support the NSW Government's planning for the Parkes Special Activation Precinct, as it improves connectivity to the precinct and provides capacity for additional traffic generated by freight and commuters. The precinct is being planned and developed to leverage the ARTC's Inland Rail project by improving access to the freight rail network, streamlining planning approvals and encouraging business activity and land use take up. Inland Rail is separately included as a Priority Project on the *Infrastructure Priority List*.

Parkes is one of the major stops along the Inland Rail route and this project would help facilitate road freight transferring to and from rail. However, as the bypass would improve the efficiency of freight carried by road, the upgraded Newell Highway is likely to compete with Inland Rail for freight demand in many of the same markets. The influence of Inland Rail on freight demand was not explicitly modelled in this business case, so it is not clear to what extent demand for either project will be affected.

Improving safety at level crossings is one of the primary objectives of the project. While the project will reduce traffic at level crossings and therefore likely reduce the number of potential incidents, the business case did not measure these impacts or include them in the economic appraisal. It is therefore unclear how effective the project is at achieving this objective. This is also the case for improving town amenity and pedestrian access within Parkes, which was a secondary objective of the project, but not measured in the business case.

7. Economic, social and environmental value

The proponent's stated BCR for the project is 1.2, with a NPV of \$24 million, based on P50 capital costs. The majority of benefits are vehicle operating cost savings and travel time savings, as a result of vehicles travelling on the bypass rather than through the town. This offers them a faster and more efficient journey, and reduce congestion in town.

The business case assumes that a proportion of existing freight vehicles would swap to the PBS Level 3A vehicles. It also assumes a number of other freight vehicles that currently do not use the Newell Highway for long-distance routes would switch to the highway due to the Parkes Bypass. These freight efficiency improvements would reduce environmental emissions, and the construction of the project itself is not expected to have any major environmental impacts. The project did not require referral to the Australian Government under the *Environmental Protection and Biodiversity Conservation Act 1999*.

Infrastructure Australia has reviewed the business case against its Assessment Framework. We found that the business case generally aligns with the requirements set out in the framework, but also identified some limitations that would impact on the stated benefits and costs of the project.

The proponent undertook detailed traffic modelling to understand the operational impacts of the project for traffic and congestion in Parkes. However, the analysis for freight traffic switching to using PBS Level 3A vehicles or switching to the Newell Highway were developed using more simple assumptions and approaches. The business case would have benefited from a more detailed assessment of where freight demand is and travels from, taking into consideration how these industries and our population will change into the future. Nevertheless, there is evidence that the proponent has used conservative assumptions in the business case for freight.

The proponent did not measure the potential impact of the Inland Rail project becoming fully operational, which will compete for freight demand in many of the same markets. The Parkes Bypass is likely to shift some demand away from Inland Rail and impact on the benefits of that project, particularly for intercapital freight. However, Infrastructure Australia's evaluation of the Inland Rail business case in 2016 found that upgrading the Newell Highway, when paired with additional road pricing to fund the upgrades, would have a minimal impact on the economic, social and environmental case for Inland Rail. This road pricing policy should continue to be investigated.

The proponent included close to \$10 million in sunk costs in the economic appraisal, which is not recommended by the Assessment Framework. Excluding these costs slightly increases the NPV and BCR of the project. The proponent also measured land value uplift, as a result of less heavy vehicle traffic around properties. This was not measured according to the principles in the Assessment Framework, but the benefits do not materially impact the analysis.

The business case identified, but did not measure, a number of impacts from the project. These include safety at level crossings (a primary objective of the project), avoided level crossing delays, and amenity and pedestrian access in Parkes (a secondary objective of the project), as well as potential avoidance of light vehicle and pedestrian crashes. We recommend that business cases measure as many project impacts as possible, particularly when they are key objectives.

Taking into consideration the limitations noted above, we consider that the project is likely to have a positive impact on the economy.

Benefits and costs breakdown

Proponent's stated benefits and costs	Present value (\$m, 2019) @ 7% real discount rate	% of total
Benefits		
Vehicle operating cost savings	\$63.6	43%
Travel time savings	\$62.8	42%
Reduced environmental externalities	\$9.1	6%
Crash cost savings	\$4.3	3%
Land value uplift	\$0.2	0%
Residual value of asset	\$9.0	6%
Total Benefits¹	\$149.0	(A) 100%
Total capital costs (P50)	\$129.3	104%
Maintenance costs	\$-5.2	-4%
Total Costs¹	\$124.7	(B) 100%
Net benefits - Net present value (NPV)²	\$24.3	n/a
Benefit-cost ratio (BCR)³	1.19	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).

Maintenance costs are a negative value in the table, as the business case estimates that there will be an overall lower maintenance cost with the road network in the project case, compared with the base case. The proponent expects that the increase in road surface area will be offset by a cost saving from heavy vehicles shifting to the bypass, and that ongoing maintenance in town will be reduced because of initial capital spending on improving the condition of the existing route. This assumption was developed by the proponent based on their understanding of the existing network and proposed works, but there is limited evidence of a formal maintenance cost review. We recommend this as an area of further investigation to better understand the lifecycle costs of the project.

The proponent’s reported capital costs and funding is presented in the following table.

Capital costs and funding	
Total capital cost	\$175 million (P50, outturn) \$187 million (P90, outturn)
Australian Government funding (committed)	\$140 million (80% of the P50 capital cost)
Other funding	\$35 million from the NSW Government

8. Deliverability

The business case proposes that site works for the project commence in late 2021, with works to be completed and the bypass opened to traffic in early 2024. The project is being managed by Transport for NSW’s Regional Project Office Western, which reports to a steering committee and review group for the Newell Highway upgrade program.

To deliver the project, the proponent considered three different procurement models: a ‘GC21 Construct Only’ contract, a ‘Design and Construct’ (D&C) contract and an Alliance. Separate professional services contracts have been established for the concept and detailed design stages. The business case proposes the ‘GC21 Construct Only’ contract on the basis that the detailed design is nearing completion, the risks of the project are well understood and that there are limited benefits from achieving an earlier project opening, which a D&C contract or Alliance could have offered. We consider that this is appropriate for a project of this nature, and also note that the business case shows the proponent is leveraging lessons learnt from previous Construct Only contracts, such as for the New England Highway bypass of Scone.

The proponent has undertaken detailed risk reviews for the project and has a risk management plan in place. The key risks identified during this process include potential variations as a result of scope documentation or specifications, time and cost risks associated with utility relocations, interface risks with ARTC both in relocating ARTC owned assets and during construction and the risk of striking a utility. The proponent has treatments in place for these risks, but they are still key risks which will need to be actively managed.

The project does require partial (five acquisitions) and total land acquisition (one property) from private properties and crown land. There are two private acquisitions remaining and these are expected to be completed by July-2021, and the proponent considers that this timing will not impact on the delivery of the project. Crown acquisition approval has been obtained and also a licence to proceed to construction in place. The proponent has consulted with the local community and a wide range of stakeholders, and has an ongoing community and stakeholder engagement plan.

A Post Completion Review plan for the project has not yet been prepared by the proponent, but the proponent recognises that this is required by both the Australian Government’s Notes on Administration for infrastructure investments and separate NSW Government processes. We strongly recommend preparing this plan, and then undertaking and publishing a Post Completion Review of the project to assess the extent to which the expected benefits and costs have been realised. This review should assess project benefits and outcomes against pre-construction forecasts and will help inform future projects.

Consideration of COVID-19

The COVID-19 pandemic has significantly affected the use of infrastructure. Infrastructure Australia has been working collaboratively with the Australian Government to provide advice on a staged response for managing, and recovering from, the impacts of the COVID-19 pandemic.

One critical element of our advice is to maintain a pipeline of nationally significant infrastructure investments. Nationally significant infrastructure projects are long-term investments, typically considering a 30-year view of the project's social, environmental and economic impacts. In making this recommendation, Infrastructure Australia continues to take a long-term view and has also considered the sensitivity of key planning assumptions using the best data available to us.

As noted in the 2019 Australian Infrastructure Audit, we must continue to evolve the way we plan for Australia's infrastructure to embrace uncertainty. There are still many uncertainties regarding the long-term impact of the COVID-19 pandemic on infrastructure use.

We will continue to collaborate with industry, the community and governments at all levels to understand the impacts of the COVID-19 pandemic on infrastructure decisions in Australia.