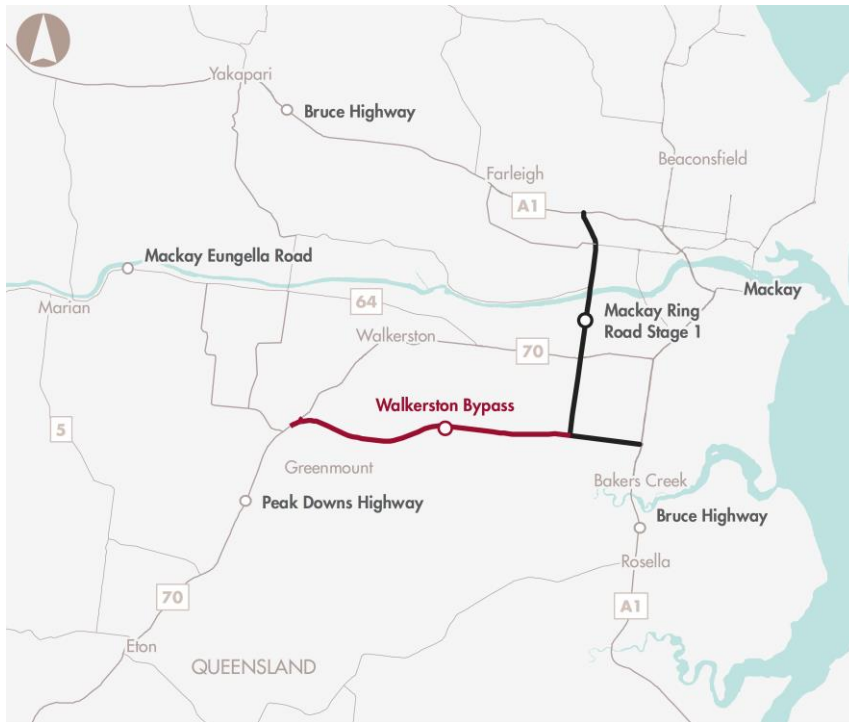


Project business case evaluation summary

Peak Downs Highway Realignment (Walkerston Bypass)

3 December 2019



Proponent

Queensland Government

Location

Walkerston, Queensland

Capital cost

\$150.9 million (P90 outturn)

Indicative timeframe

Planning: Q4 2020

Construction: Q1 2021

Project completion by Q3 2023

1. Evaluation Summary

The **Peak Downs Highway Realignment (Walkerston Bypass) Project** has been added to the Infrastructure Priority List as a **Priority Project**.

The Peak Downs Highway extends 272 kilometres south west from the Bruce Highway in the Port of Mackay to the Gregory Highway in central Queensland, near the town of Clermont. As the principal access to the Bowen Basin and Galilee Basin coal and energy provinces, Queensland's largest and most productive coal mining area, the Peak Downs Highway is an important regional route.

The Peak Downs Highway is used to transport essential mining inputs such as fuel, plant and equipment, construction material and explosives. As the main non-coal import/export gateway for the region, it is also used to transport a variety of freight including raw sugar and petroleum.

Within Walkerston, the Peak Downs Highway passes through the town centre, which includes schools, community facilities and shops, resulting in poor amenity for the local residents. This section of the highway has a number of intersections which are becoming congested and will lead to longer travel times for commercial vehicles passing through the town.

The Walkerston Bypass project includes a 10.4 kilometre realignment of the Peak Downs Highway, from west of Walkerston to the Mackay Ring Road at Stockroute Road. In diverting traffic (including heavy and dangerous goods transport) away from Walkerston's main street, the new bypass will

Overview	Context	Problem	Options	Proposal	Strategic Fit	Economic, social and environmental value	Deliverability
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provide increased freight capacity, more direct connectivity for large vehicles, increased flood resilience, improved freight efficiency, and safety and amenity benefits for the local residents of Walkerston. The project also creates an opportunity for urban expansion in the regional townships of Walkerston, Mirani and Ooralea under the *Mackay, Isaac and Whitsunday Regional Plan (2012)*.

The proponent’s business case states that the net present value (NPV) of the project is \$67 million, with a benefit-cost ratio (BCR) of 1.5, using a 7% real discount rate at P90 capital costs.

The project has strong strategic merit and this is supported by the benefits of the project exceeding the costs. The claimed benefits may be slightly understated as there may be additional benefits from flood mitigation which had not been quantified. Infrastructure Australia is confident that the proponent’s delivery model is appropriate for this type of project.

2. Context

The Peak Downs Highway is the primary freight corridor between Mackay, the Bowen Basin and Galilee Basin minerals provinces in Queensland.

This section of the Peak Downs Highway provides access for:

- the sugar industry to the Eton Irrigation Area and Pioneer Valley
- the mining industry to the Bowen Basin
- the timber and dairy industries with Eungella
- grain and beef industries with those areas west of the Eton Range
- tourism to Eungella National Park
- the Paget industrial area and Mackay’s railway facility
- the Port of Mackay (via the Bruce Highway).

The highway has a 3-kilometre section that runs through and divides the township of Walkerston, approximately 12 kilometres west of Mackay. The Peak Downs Highway is designated as a State Strategic road because of its importance to the Mackay and Queensland economies.

In 2016, Walkerston had a population of 3,400 people. The population is projected to grow at 1.5% each year to 2036. Freight traffic travelling to the Port of Mackay, including heavy and dangerous goods vehicles from regional industries, is also projected to grow with traffic on the network expected to increase by 2% each year to 2051.

The Walkerston Bypass project has been in development for more than 10 years, with an options review process started in 2008 by the Queensland Department of Main Roads. The Australian Government has committed \$120 million in funding towards the project.

3. Problem description

The highway currently runs through the urban township of Walkerston, creating safety, capacity and connectivity issues as there are heavy, over-dimension, over-mass and dangerous vehicles travelling through the town. The town centre includes sensitive land use areas, such as schools, childcare centres, medical facilities and shops. The increasing volumes of vehicles transporting heavy and dangerous goods through the centre of Walkerston has increased community safety concerns.

The proponent’s business case notes that on a daily basis the 6,180 vehicles that travel through Walkerston, including 130 B-doubles, 136 semi-trailers and 410 trucks or buses (2010 data). Approximately 2.5 million litres of fuel are transported through Walkerston each day.

The expansion of the coal mining sector is increasing the freight task demand. While coal from the Basin is transported predominantly by rail to Mackay Port, essential mining inputs such as fuel, plant

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and equipment, construction material and explosives are carried by road along the Peak Downs Highway. If these vehicles are not able to efficiently access the Basin, the growth of the coal mining sector may be constrained.

There is an increasing risk of collisions at local intersections along the highway due to growing traffic volumes and an increasing proportion of heavy vehicles. The highway section between Walkerston and Mackay has 165 minor access points, 29 major access points, eight four-way intersections, 23 T-intersections and three rail crossings.

Additionally, the section between Walkerston and Mackay has limits on oversized vehicles, which require long diversions. These issues are adversely affecting the efficient delivery of inputs to the Bowen and Galilee Basins, Queensland’s key economic region, and Mackay Port.

The increase in freight volumes reduces the social amenity for the growing population in Walkerston. This higher level of traffic (including dangerous materials) on the highway presents increasing safety risks for the local community.

The highway is situated in the Pioneer River Floodplain and has poor flood resilience, with a flood immunity level of 20% annual exceedance probability (AEP)¹.

4. Options identification and assessment

The proponent’s submission notes that a community consultation process was undertaken to inform planning for the project and that, based on the feedback received through the consultation process, Stockroute Road (Option 1) was selected as the preferred route in 2008.

Infrastructure Australia strongly recommends the use of quantitative frameworks to identify which options should be considered in the business case, including the use of rapid cost-benefit economic analysis. On the basis of the information provided in the proponent’s submission, Infrastructure Australia has concerns that the best performing option(s) were not assessed in the business case.

As part of the short-list, the proponent initially identified an option that included major infrastructure upgrades to the highway to cope with the projected increase in traffic volumes. However, the proponent later removed this option and only assessed the preferred option against a base case. The options included in the detailed economic appraisal are:

- The base case – ensures the ongoing maintenance of the existing highway. Any committed and funded rehabilitation works on the existing highway have already been completed and these costs are not included in the base case.
- The project case – the preferred Walkerston Bypass route option, which is a duplication of the Peak Downs Highway from Wollingford Road (west of Walkerston) to the Bruce Highway approximately three kilometres south of the City Gates intersection.

The proponent also explored a ‘demaing’ option, which would see the section of the Peak Downs Highway between Wollingford Road and Mackay-Eungella Road upgraded to a standard where Mackay Regional Council would assume ownership and maintenance responsibilities. The proponent subsequently clarified that this option was not part of the investment proposal and that the costs and benefits associated with this option were excluded from the business case.

The development of both the base case and the options could have been underpinned by a stronger narrative, which could have been enabled by a shorter project development period.

¹ A 20% annual exceedance probability means there is a 20% chance of the highway being flooded in any given year.

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Official: Sensitive

5. Proposal

The proposed project includes the following:

- A new 10.4 kilometre two-lane highway (one lane in each direction)
- Provision of approximately 1.5 kilometres of four-lane carriageway between Homebush Road and Bergmans Road to facilitate overtaking
- Four at-grade intersections, including the existing Peak Downs Highway at the western end of the bypass
- Grade separation at Bergman’s Road and Walkerston-Homebush Road
- Four new bridges
- Reinforced earth-retaining structures for two bridges
- Relocation of cane rail infrastructure, including provision of underpass
- Ancillary road infrastructure.

The new highway will be designed to accommodate B-double and other multi combination vehicles, including A-double road trains, to support various freight types including over-dimension and over-mass loads, dangerous goods, and other items required by the surrounding mining and agricultural industries. The route will have a posted operating speed limit of 100km/h and design speed of 110km/h.

The design will include an effective transport envelope of up to 10 metres to cater for very large loads required to service coal producers.

6. Strategic fit

The Peak Downs Highway is a critical strategic link in the Queensland Freight Network because it facilitates freight movements from the state’s largest and most productive coal mining regions of the Bowen and Galilee Basins. However, the Peak Downs Highway does not presently form part of the National Land Transport Road Network. In 2002, the Queensland Department of Transport developed the Mackay Area Integrated Transport Plan 2002 to 2025, which proposed an alternative road network around Walkerston.

The project strongly aligns with state and local government policy and strategic objectives, such as the *Mackay, Isaac and Whitsunday Regional Plan (2012)*, the *Queensland Plan (2014)*, the *Queensland Government’s State Infrastructure Plan (2016)* or in *Our Future State: Advancing Queensland’s Priority (2018)*. The project outcomes are to improve prosperity and liveability, provide infrastructure that leads and supports growth and productivity and connects communities and markets, and improves sustainability and resilience of the transport network.

Additionally, with Stage 1 of the Mackay Ring Road currently under construction as part of the Bruce Highway Upgrade Program, this project will directly support the realisation of the benefits from this investment and improve connectivity in the region.

The proponent has engaged with a range of external stakeholders and the community throughout the planning stage, as well as informing the final route alignment. The business case states there is strong support for the project. Overall, the business case demonstrates the strong strategic merit of the project.

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7. Economic, social and environmental value

The proponent's economic, social and environmental analysis of the project states a net present value (NPV) of \$67 million, with a benefit-cost ratio (BCR) of 1.5 using a 7% real discount rate and P90 capital costs.

Infrastructure Australia evaluated the proponent's evaluation methodology and findings using the Infrastructure Australia Assessment Framework. Our evaluation found the proponent's methodology is robust, but that the reported benefits may be slightly understated, due to the proponent not exploring all potential traffic demand drivers and not quantifying additional potential benefits. As the proponent only assessed one option in the business case, it is not possible to conclude that this is definitively the best solution to the identified problems.

The estimated benefits from the project are travel time savings (51%) along with vehicle operating cost savings (43%), safety benefits (2%), environmental benefits (2%) and residual value (2%). There is a very small disbenefit for private road users in vehicle operating costs, due to a small increase in vehicle kilometres travelled, due to the highway link. A significant proportion of the vehicle operating costs and travel time savings are attributed to commercial and freight vehicles, which is consistent with the aim to improve freight efficiency.

Our evaluation noted the proponent did not include the impact of increases in freight travel attributed to growth in regional industries, such as coal mining or agricultural or freight travelling to Port or Mackay, within the traffic demand modelling. This may understate the forecast traffic volumes and may slightly understate the project's potential benefits.

The proponent's business case outlined that the project will deliver improved flood immunity for Peak Downs Highway road users, but did not include this benefit in the cost-benefit analysis. The inclusion of this benefit could slightly improve the net benefits of the project.

Taking these observations and limitations into consideration, Infrastructure Australia remains confident the benefits of the project will significantly exceed its costs.

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

Benefits and costs breakdown

Proponent's stated benefits and costs		Present value (\$m,2018/19) @ 7% real discount rate	% of total	
Benefits				
Road users: Travel time savings for private, commercial and freight		\$97.4		51.1%
Road users: Vehicle operating costs for private, commercial and freight		\$81.7		42.8%
Safety crash reduction		\$4.5		2.3%
Reduced environmental externalities		\$3.6		1.9%
Residual value of assets		\$3.7		1.9%
Total Benefits¹		\$190.8	(A)	100%
Capital costs (P90)		\$115.3		93.2%
Operating and maintenance costs		\$8.5		6.8%
Total Costs¹		\$123.8	(B)	100%
Core results	Net benefits - net present value (NPV)²	\$67.1	(C)	n/a
	Benefit-cost ratio (BCR)³	\$1.5	(D)	n/a

Sources: Proponent's business case

(1) Totals may not sum due to rounding.

(2) The net present value (C) is calculated as the present value of total benefits less the present value of total costs (A – B).

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

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A breakdown of the proponent’s reported capital costs and funding is presented in the table below.

Capital costs and funding	
Total capital cost	\$145.0 million (P50, nominal, undiscounted) \$150.9 million (P90, nominal, undiscounted)
Proponent’s proposed Australian Government funding contribution	\$120 million
Other funding	\$30 million (Queensland Government contribution)

Source: Proponent’s business case

8. Deliverability

The Queensland Government’s Department of Transport and Main Roads (TMR) will lead the delivery of the project. The proponent’s preferred delivery model is a Transport Infrastructure Contract – Construct Only with Early Tender Involvement. The proponent compared the preferred model with other interactive procurement models but found there to be limited opportunities for innovation and value-add. The preferred model is considered most appropriate for the project for the following reasons:

- TMR has significantly progressed the detailed design.
- The project corridor has been publicly announced, limiting any future changes.
- The key outstanding delivery and construction risks, mainly associated with land acquisition, property access and approvals, could be more easily managed with internal TMR resources.
- The use of an interactive model may increase costs through the application of a risk premium, which would be unlikely to be offset by cost savings in other areas.

Infrastructure Australia considers the proponent’s preferred delivery model to be appropriate, given the reasons outlined by the proponent. The contract will be managed by TMR, which has extensive experience in delivering similar major highway and road upgrades. The proponent outlines project governance roles in relation to risk management activities. We recommend the proponent provides greater detail on project governance, outlining roles, responsibilities and accountabilities, when developing future projects.

The proponent has undertaken an Environmental Assessment Report and has concluded that the potential impacts can be managed, mitigated and monitored to an acceptable level. The project will not trigger referral under environmental or cultural legislation.

The proponent undertook a risk assessment for the project in accordance with Queensland Government guidance. A number of outstanding risks were identified, including contractor availability, resource availability, price and weather. These risks were assessed as being of ‘moderate’ concern and will be monitored and managed throughout delivery and construction.

The proponent qualitatively explored a range of funding models and cost recovery options for the project including user charging, private financing and Public Private Partnership (PPP) delivery. The proponent outlines road user charging through tolling will not be appropriate for the road as it may discourage road users and counteract achieving the project’s objectives. The proponent also notes there is limited potential for value capture mechanisms to offset the project.

The business case includes a high-level Post Completion Review plan and notes that a Post Completion Review will be undertaken and documented using the Department of Transport and Main Roads’ Post Implementation Review Report template. We encourage all proponents to assess the extent to which expected project benefits and costs have been realised and to publish the Post Completion Review to inform the development of future projects.

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