Australian Government | Infrastructure Australia

Project business case evaluation summary

Albany Ring Road – Port of Albany Freight Access Enhancement Project

Location
Albany, WA

Geography
Small towns, rural communities and remote areas

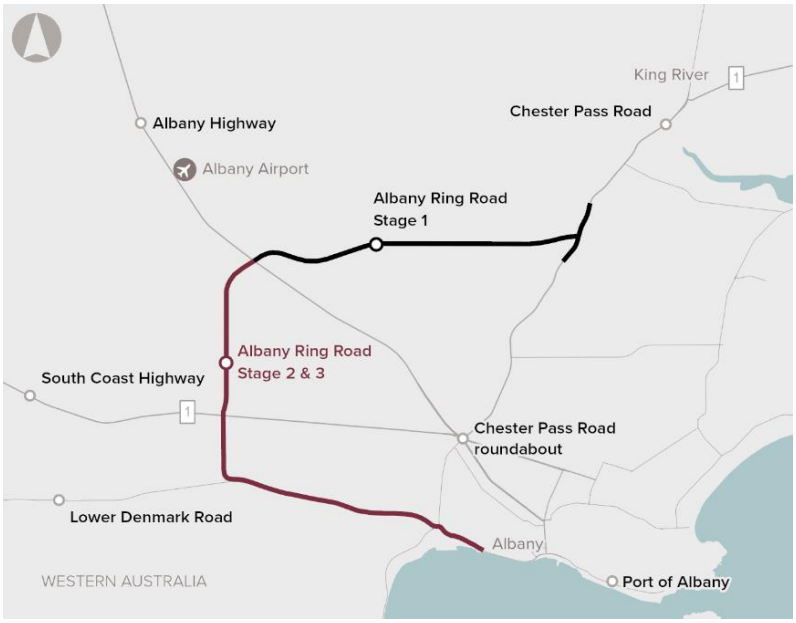
Category
National Connectivity

Capital cost
$171 million (P50 outturn)

Indicative timeframe
Construction start: Q3 2020
Project completion by: Q4 2023

Proponent
WA Government

Evaluation date
8 December 2020



1. Evaluation Summary

The Port of Albany is an important bulk products port for grain and woodchip, located 400 km south of Perth. The road freight access route to the Port passes through urban areas, causing heavy vehicles to mix with local traffic. This results in local amenity, quality-of-life and potential safety issues for Albany residents. The volume of freight transported by road to the port has and is expected to continue growing, which could worsen these issues. Our review found the identified problems are not nationally significant. However, we have evaluated the business case as the Australian Government has committed $140 million of funding towards this project.

The WA Government has investigated a range of solutions to remove heavy vehicle traffic from the urban areas and identified the Albany Ring Road as their preferred project. We observe that it is the highest cost option assessed in the business case, involving approximately 12 km of new road and three new grade separated intersections.

The proponent's business case reports that the costs of the project exceed its social, economic and environmental benefits, with a benefit-cost ratio (BCR) of 0.71 and a net present value (NPV) of $38.3 million. Our review found that some potential project benefits have not been fully quantified, but that the BCR is also likely to be slightly overstated. Although the project benefits the local population by addressing the amenity problems, road user benefits for non-port users are relatively modest. The ring road will also increase trip length and costs for freight vehicles, who will be mandated to use it.

The proponent has selected a Design and Construct approach to deliver the project, which we consider appropriate as the project risks are well understood and this model is likely to deliver better value than other approaches.

On the balance of our assessment, the **Albany Ring Road project has not been added to the Infrastructure Priority List**. We recommend that the WA Government consider opportunities to reduce the scope and cost of the project to better match its benefits. We also recommend further investigation of opportunities to encourage more producers to transport freight to the port by rail.

2. Context

The City of Albany is a key economic and social hub in the South West Region. The city has a population of around 37,500 people (2016 figures), but services a broader catchment of around 60,000 people. Albany is also a popular tourist destination with over 455,000 visitors annually.

The Port of Albany is located adjacent to Albany's town centre, with freight vehicles travelling directly through urban areas to access the port. In 2019, the port processed around 4.5 million tonnes of exports, consisting mainly of grain (60% of exports), woodchips (34% of exports) and silica sand (5% of exports), as well as 200,000 tonnes of imports consisting primarily of fertiliser and fuel. The Port accounts for a significant proportion of the State's grain exports and is the highest exporter of both woodchips and timber products across all ports in Western Australia. Several cruise ships also visit the port each year, bringing visitors to Albany.

Commodities are transported to and from the Port using a combination of rail and road. About 50% of grain is carried to the port by rail and the other 50% by road. Over the past decade, the mode share of road freight to the Port has been increasing. Between 2014 and 2016 the volume of freight transport to the Port of Albany by rail decreased from 2.2 million tonnes per annum (mtpa) to 1.7 mtpa, while the volume transported by road increased from 2.3 mtpa to 2.8 mtpa over the same period.

Road freight growth has been driven by the increasing efficiency and flexibility of high productivity vehicles relative to rail freight – a trend which is expected to continue. Areas to the west and east of Albany also have no direct rail access, so they currently rely on road transport.

Planning for a freight access solution to the Port started in 1997 with the Albany Freight Study. This identified a solution to build a heavy haulage route around Albany, which became the Albany Ring Road. The ring road is broken into three stages, of which Stage 1 was completed in 2007 (an east to west connection that links Chester Pass Road to Albany Highway north of Albany). This business case considers the remaining Stages 2 and 3.

3. Problem description

The location of the Port of Albany adjacent to the Albany town centre requires heavy vehicles travelling to and from the Port to mix with local traffic, resulting in poor amenity and safety.

Vehicles access the Port of Albany from the north-west via Albany Highway, while Chester Pass Road and the South Coast Highway carry vehicles from the north-east. These freight routes meet at the Chester Pass Roundabout, where vehicles then travel through urban areas to the Port. In 2016, 437 heavy vehicles (up to 36.5 metres long and weighing 107.5 tonnes) on an average weekday travelled through the urban corridor – or about one truck every 3.5 minutes. The business case states that this impacts on:

- Local amenity: Heavy vehicles passing through urban areas worsen local amenity and liveability. These impacts include noise, air pollution, and urban separation, as busy traffic corridors may create barriers between different parts of Albany.
- Safety: Freight routes through Albany have high crash rates. Between 2012 and 2016, there were 455 crashes on the existing freight routes through the Albany urban area. The WA Road Safety Commission rates 18 sections along these routes with a Black or Red Road Trauma Risk (highest and second highest crash density rate categories) and 32 intersections rated with poor or worse performance. The Chester Pass Road Roundabout has a particularly poor safety record, with the highest crash frequency and crash cost of all intersections in regional WA, and the seventh highest crash frequency in the entire State.
- Productivity: The mix of heavy vehicles, cars and pedestrians reduces the efficiency of the road network. Further development of residential areas along Albany Highway and Chester Pass Road will increase local traffic, which may require additional road upgrades.
- Maintenance costs: Heavy vehicles cause greater deterioration of the road network due to the number and weight of axles, particularly when making turns such as at Chester Pass Roundabout. The maintenance costs for roads within Albany used by heavy vehicles accessing the port are about 68% higher than the average maintenance cost for roads within the Great Southern Region.

These problems are expected to worsen over time as the population of Albany grows by about 1.1% on average each year to 2031. They will also be exacerbated by the growing freight task, driven by exports in the region.

4. Options identification and assessment

The proponent used a multi-stage process to identify and assess options. In the first stage, a long list of 14 options was identified, ranging from non-asset initiatives and asset optimisation, to new infrastructure solutions. Three options aimed to increase rail mode share: subsidising rail freight, improving the rail network and constructing a new rail line to un-serviced areas north-east of Albany. Six of the longlisted options were eliminated from further consideration as the proponent determined that they would not effectively address the identified problems in their own right.

Infrastructure Australia recommends that proponents consider opportunities to package options together, particularly for non-capital or optimisation options. This helps retain lower cost options that may present better value for money than large new capital solutions.

Following the initial filtering process, a qualitative multi-criteria analysis of the eight remaining options was undertaken in an options workshop with key stakeholders from state government, local government and industry (including the Port of Albany, freight operators and representatives from the woodchip and grain supply chains). The options were assessed against a range of criteria:

- Improve road safety and travel amenity
- Improve urban amenity and liveability
- Improve freight efficiency
- Provide sustainable access to the Port of Albany
- Support the long-term economic and social development of Albany, the Greater Albany area and the Great Southern Region
- Alignment with Government priorities and policies
- Achievability
- Value for money

Where multi-criteria analysis is used to filter options, the Infrastructure Australia Assessment Framework recommends that it include quantitative analysis, to improve the rigour and transparency of the options assessment process. The Assessment Framework also recommends the use of rapid cost-benefit analysis to identify a short-list of options for consideration in the detailed cost-benefit analysis.

This analysis identified four options to take forward for detailed cost-benefit analysis. By this stage, the three rail options were eliminated on the basis that they would not fully remove freight traffic issues from the urban areas of Albany. The options carried forward for further analysis were:

- Base case
- Shortlisted option 1A: Intersection treatments and further traffic control. This includes widening a 2.5 km section of Chester Pass Road (to the north of the Roundabout) and upgrading two intersections along Lower Denmark Road to provide an additional Restricted Access Vehicle (RAV) 4 route.
- Shortlisted option 1B: Build over/underpass at Chester Pass Roundabout. This includes constructing an over/underpass and a new roundabout at Frenchman Bay Road intersection with Hanrahan Road and Princess Royal Drive
- Shortlisted option 2: Complete Stages 2 and 3 of the Albany Ring Road

Options 1A and 1B improve the existing road network, while option 2 is a higher cost solution to deliver the remaining stages 2 and 3 of the Albany Ring Road. Infrastructure Australia commends the proponent for including multiple options in the detailed cost-benefit analysis, as it helps inform decision-makers on the range of options available to address the problem.

Of the options assessed in the cost-benefit analysis, option 2 was selected by the proponent as the preferred option, based on it responding best to the problem statements and having a higher BCR

than the alternative options. However, it is also the highest cost option and includes major capital works such as new grade-separated interchanges.

All options considered had a negative net present values. Option 1A was a lower cost option, which had the least negative net present value (-$9.4 million in present value terms, with a BCR of 0.6).

5. Proposal

The proponent's preferred option is to complete the remaining Stages 2 and 3 of the Albany Ring Road. This would provide an orbital road connection to the Port of Albany, bypassing urban areas located along the current freight route, at a capital cost of $171 million (P50, outturn). The scope of the project is:

- Stage 2: an east-west connection between Lower Denmark Road Link (where it ties in with Stage 3) and Frenchman Bay Road near the Port. This includes:
    - 4.6 km of dual lane single carriageway
    - Construction of six new intersections and upgrade of the intersections at Hanrahan Road and Frenchman Bay Road to a grade separated interchange.
    - Works to maintain property access
    - Tie-ins to Stage 3 and the existing Princess Royal Drive.
- Stage 3: a north-south link between the intersection of Albany Highway and Lower Denmark Road. It includes:
    - 4.3 km of dual lane single carriageway
    - 2.7 km of dual carriageway with the northbound carriageway having two lanes (one a climbing lane) and southbound in single lane
    - Construction of new grade-separated intersections at Albany Highway / Menang Drive / Albany Ring Road and South Coast Highway / Albany Ring Road, and an at-grade intersection at Cuming Road / Albany Ring Road
    - Works to maintain property access
    - Tie-ins to Stage 2 and existing Stage 1, including the existing Menang Drive.

Heavy vehicles (class 10+) will be mandated through the heavy vehicle permit system to use the Albany Ring Road. This is because freight trips from the north-west (along the Albany Highway) to the Port will become 1 km longer with the project and freight trips from the north-east (along Chester Pass Road and the South Coast Highway) will be approximately 10 km longer.

6. Strategic fit

Albany is a key Great Southern Regional Centre and acts as a major economic, retail and administrative centre.

The Albany Ring Road would allow heavy vehicle and other through-traffic to bypass the urban areas of Albany, improving amenity and reducing the mix of heavy vehicles with other road users. This can improve the traffic performance and potentially safety of the local road network, which would improve the liveability of Albany and make it a more attractive place to live and visit. Freight traffic will also benefit from avoiding stop-start traffic in urban areas. However, this will be offset by the longer freight route to the Port using the Albany Ring Road.

The project supports the Albany Local Planning Strategy, which identifies the Albany Ring Road to reduce traffic conflicts between freight and local and tourist traffic. The Strategy also supports land use and development controls to minimise the impacts between the Albany Ring Road and other heavy freight routes on adjacent land use. The project aligns with state strategies and plans:

- State Planning Strategy 2050
- Western Australian Regional Freight Transport Network Plan
- Lower Great Southern Strategy
- The Regional Development Strategy 2016-2025

These documents generally support improving the efficiency of the freight network, improving safety and minimising the local amenity impacts of freight networks. The project is primarily aligned to improvements in amenity and safety, as the longer freight access route to the Port means the project is not likely to substantially improve freight productivity. The business case also indicates the project would marginally reduce safety due to the route length to the Port. However, we believe that this benefit may be somewhat understated.

From a national perspective, the initiative aligns with the National Ports Strategy, given the important role of the Port of Albany in grain and woodchip export supply chains, the National Land Freight Strategy, and the National Road Safety Plan.

The Albany Ring Road is not included on the Infrastructure Priority List as our review found the problems addressed by the project were not nationally significant. The project has been submitted for evaluation by Infrastructure Australia as the Australian Government has committed $140 million of funding towards this project.

7. Economic, social and environmental value

The project's economic, social, and environmental appraisal estimates that the NPV of the project is -$38.3 million, with a BCR of 0.71 when evaluated over a 30-year operational period using a 7% real discount. The majority of project benefits are environmental externality savings (71%) and travel time savings (21%). The proponent has also measured vehicle operating cost savings and reliability benefits from the project, but these are relatively small. Infrastructure Australia found that the proponent has appropriately quantified most of the costs and benefits of the project.

The largest benefit estimated from the project is lower environmental externality costs, as fewer heavy vehicles travel through urban areas of Albany. This benefit is from less noise and visual impacts in urban areas. However, the guidelines for these parameters emphasise their uncertainty, as they depend on project conditions such as population density in the project area and levels of congestion. There is a risk that this benefit could be overstated.

The proponent measured travel time reliability benefits using guidance from New Zealand. While the methodology and parameters underpinning these benefits is still in development in Australia, they make up less than 2% of benefits. Vehicle operating costs have been measured using the Australian Transport Assessment and Planning Guidelines (2016) approach, which Infrastructure Australia considers may overstate benefits. However, these savings are also relatively modest.

The business case also noted that some benefits have not been quantified in the cost-benefit analysis. These include:

- Benefits from improved amenity – changes in amenity are captured to some extent by the environmental externalities, such as noise, air pollution and urban separation, however there may be additional amenity benefits that have not been accounted for in the analysis.
- Benefit of having two freight access routes to the Port – currently there is only one road freight route to the Port, meaning that an accident or other disruptions may prevent access to the Port. This project would provide an alternative route in these situations.
- Land use benefits – opportunities to improve land use outcomes on the existing route, which may be currently limited by the high volume of heavy vehicles.

In addition to these, Infrastructure Australia believes that crash cost benefits may be slightly understated. The cost-benefit analysis estimates a small increase in crash costs, due to higher vehicle kilometres travelled with the project. This does not reflect the potential road safety improvements from reduced mixing of heavy vehicles with other road users in Albany's urban areas, which may reduce may reduce the crash rate and average accident cost in Albany.

Infrastructure Australia agrees with the evidence provided in the business case that the costs of constructing the project outweigh the expected benefits. Although some benefits may be understated and others not quantified in the business case we believe that the benefits may be slightly overstate due to the risks around the size of the environmental benefits. This conclusion does not change the outcome of the analysis.

The following table presents a breakdown of the benefits and costs stated in the business case.

Benefits and costs breakdown

Proponent's stated benefits and costs	Present value ($m,2017/18) @ 7% real discount rate		% of total
Car user benefits			
Travel time savings	$14.1		15%
Vehicle operating cost savings	$2.9		3%
Reliability benefits	$0.7		1%
Heavy commercial vehicle user benefits			
Travel time savings	$3.7		4%
Vehicle operating cost savings	$3.4		4%
Reliability benefits	$0.3		0%
Heavy vehicles (Class 10+) user benefits			
Travel time savings	$1.9		2%
Vehicle operating cost savings	-$4.6		-5%
Reliability benefits	$0.8		1%
Other benefits			
Crash cost savings	-$0.4		0%
Environmental externalities	$66.6		71%
Residual value of assets	$4.2		4%
Total Benefits[1]	**$93.6**	(A)	**100%**
Total capital costs (average of P50 and P90)	$133.1		101%
Operating costs	-$1.2		2.2%
Total Costs[1]	**$131.9**	(B)	**100%**
Net benefits - Net present value (NPV)[2]	**-$38.3**	(C)	n/a
Benefit-cost ratio (BCR)[3]	**0.71**	(D)	n/a

Source: 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).

Capital costs used in the cost-benefit analysis are an average of P50 and P90 costs for the project. Infrastructure Australia recommends the use of either P50 or P90 capital cost estimate, but not an average of the two.

An independent cost review was not included in the business case. Infrastructure Australia recommends the completion of an independent peer review of project costs as an element of best practice for business case preparation. A breakdown of the proponent's reported capital costs and funding is presented in the table below.

Capital costs and funding	
Total capital cost	$171 million (P50, nominal, undiscounted) $179 million (P90, nominal, undiscounted)
Australian Government funding contribution committed	$140 million total (80% of the average of P50 and P90 capital cost estimates)

Other funding	$35 million (Western Australian Government commitment)

8. Deliverability

The proponent has selected a Design and Construct approach to delivering the project, which combines the design and construction responsibilities to a single contractor under a fixed price contract. Construction works for the project began in September 2020.

A range of delivery options were considered for Albany Ring Road as part of a procurement options analysis, which also considered the packaging of works. From a long list of procurement options, the proponent reviewed Design and Construct, as well as alliance models in more detail. Of these two, the proponent determined that a Design and Construct model was most likely to deliver value for money when considered against project risks. The proponent has noted that the project has several high-value risk-innovation elements, for which the Design and Construct method may maximise the opportunities for innovations and costs savings. This method appears appropriate given the characteristics of the project.

Risk analysis for the project has been undertaken in line with Main Road Western Australia's risk management framework. Four risks were identified as having a high rating after implementing risk controls, including costs risks around managing interactions with the freight rail network, total project costs, community opposition to the project and land acquisition risks were. The proponent indicated that after mitigation these risks have a low rating. In particular, the risk of interfering with the rail freight network was managed by separating road and rail avoiding potential relocation works. Various environmental approvals have been lodged for the project.

In addition to these risks, Infrastructure Australia has raised the possible risk around realising the benefits of the project. As previously noted, the proponent's analysis suggests that heavy vehicles do not benefit from the project (they incur a net present value cost of $1.9 million), as it increases the distance they need to travel to the Port. To manage this risk, heavy vehicles will be mandated to use the Albany Ring Road as part of the existing WA heavy vehicle permit system.

A Benefits Management Plan was included in the Business Case and details the key performance indicators, measures, baselines and targets. Infrastructure Australia encourages the proponent to conduct and publish a full Post Completion Review to assess the extent to which the project benefits and costs set out in the business case were realised. This will help inform the development of 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 Commonwealth 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.