

Tasmanian Government
2012 Transport Submission to
Infrastructure Australia

New Bridgewater Bridge

August 2012

Proposal Summary

Initiative Name:	Burnie to Hobart Freight Corridor: New Bridgewater Bridge
Location (State/Region(or City)/ Locality):	Bridgewater, Southern Tasmania
Name of Proponent Entity:	Tasmanian Department of Infrastructure, Energy and Resources
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Executive summary	<p>This project has already been recognized as a priority by both the Australian and Tasmanian Governments. Federal funding for planning was approved in February 2009. This current submission seeks funding for the next stage of this major project leading to its construction.</p> <p>The Midland Highway, of which the Bridgewater Bridge is a key component, is the State's major north-south transport corridor and a key link in Tasmania's National Network. The Highway is both a critical freight connection facilitating access from the Southern region to the State's northern ports and the major transport link for passengers (including tourists) travelling between the northern and southern regions.</p> <p>The primary function of the Midland Highway is to provide safe, high-speed travel for freight and passenger vehicles. However, safety and efficiency over the southern section is currently significantly compromised, with implications for future economic growth in Greater Hobart and southern Tasmania more widely.</p> <p>The existing Bridgewater Bridge was built in the 1940s and does not meet contemporary loading and design standards. It is not able to reliably perform its functions as part of the National Network due to dimensional limitations and the increasing likelihood of periods of closure from climate change-related events (e.g. inundation) and/or ongoing repairs and maintenance.</p> <p>Analysis shows that continued investment in the existing bridge structure is not a viable option, given the substantial periods of time for works and repairs that traffic would need to be diverted via alternative routes, which are not suitable for the volume and type of traffic that would eventuate under this scenario.</p> <p>The New Bridgewater Bridge is identified as a key project in the <i>Tasmanian Infrastructure Strategy</i> and <i>Southern Tasmania National Transport Network Investment Program</i>, which articulates the specific transport objectives for this section of the Midland Highway. Other projects in this Program include the provision of two bypasses (Bagdad/Mangalore (proposed) and Pontville/ Brighton (under construction, open in 2012)) and construction of an intermodal transport hub at Brighton. In the absence of a new bridge, anticipated transport efficiency gains achieved by providing improved highway linkages to the Brighton Bypass and between the Brighton Transport Hub, Brighton Industrial Estate and supporting inter-regional connections to / from northern export ports, will be diminished</p> <p>The new infrastructure will remove capacity and dimensional constraints on the existing Bridgewater Bridge alignment, consistent with its role as part of the National Network. The Bridge will connect the Brooker Highway with the Brighton Bypass, creating over 20km of continuous dual carriageway, highway-standard, limited access road between Claremont and Mangalore. It will reduce travel times, increase travel time reliability, reduce crash frequency and improve access for the growing industrial and commercial areas around Brighton.</p> <p>More broadly, when completed, the new Bridge will:</p> <ul style="list-style-type: none"> • Support trade and freight transport from Southern Tasmania to the northern ports;

- Improve transport efficiency and safety on the approaches to Hobart;
- Improve connectivity for transport operators to the proposed Brighton Transport Hub; and
- Advance the stated objectives of the National Land Transport Network (NLTN).

The project has previously been tested and deemed to have strategic merit, as it reflects jurisdictional objectives, policies and strategies.

The Minister for Infrastructure and Transport approved funding to complete the scoping and planning phase of the New Bridgewater Bridge project (in conjunction with the Bagdad Bypass) in February 2009.

At this stage, funding to undertake the Project Development Phase is being requested under the Nation Building 2 Program. Project Development will comprise all tasks critical for project development through to calling for tenders for construction, including the acquisition of a number of properties necessary to facilitate the proposed works. The key output of the Development Phase will be a bridge design concept that meets the technical, statutory and community requirements for the Derwent River crossing.

Is this a new submission?	No, it is next stage of project
Estimated cost of problems?	The strategic framework and transport system problems to which this project responds are outlined in the Overview document and within this submission. Detailed information on project costs and benefits, to the extent that they can be quantified, is contained in the Stage 7 template.
Estimated Capital Cost of Initiative by Proponent (\$M, nominal, undiscounted):	\$15 million (<i>Development Phase only</i>)
Commonwealth contribution sought by Proponent (\$M, nominal, undiscounted):	\$15 million
Other funding (source/amount/cash flow) (\$M, nominal, undiscounted):	Cost reflective pricing for heavy vehicle access to the road network and road funding reform is being considered as part of the national Heavy Vehicle and Investment Reform agenda, and the Tasmanian government will continue to actively participate in this reform process. Tasmania has many attributes for a pilot study of approaches developed through national processes. It is considered that a national approach to funding and financing transport infrastructure, supported by all levels of government, is critical to effectively address long term transport infrastructure needs. In this context, the recent Infrastructure Australia's Finance Working Group's report "Infrastructure Finance and Funding Reform" is an important lead for national discussion. Tasmania is not in a position currently to adopt a unilateral approach. Further work is required on project financing and the issue of cost reflective pricing in small regional economies.
BCR by Proponent excluding Wider Economic Benefits	1 (P90) 1.14 (P50)
Estimated program	Planning will commence in 2014/15 and be completed in 2015/16. Construction will occur after this point.

Goal Definition

The objective of the New Bridgewater Bridge project is to enhance the efficiency of growing freight and passenger movements between the southern and northern regions of the State. A new northern crossing of the Derwent River – the gateway to Tasmania’s capital, Hobart – will provide a continuous, high standard connection for the Midland Highway that reliably meets the standards required of the National Land Transport Network (NLTN). The project will link to the Brighton Bypass and will provide improved connection between the north and south of Tasmania and address traffic, safety and amenity issues associated with freight movements on this route.

The infrastructure project will be a high-standard alignment for the NLTN between the existing Brooker Highway dual-carriageway and the Brighton Bypass, creating a continuous dual carriageway through the residential areas of Greater Hobart between the Hobart CBD and the Midland Highway Brighton Bypass.

Positive contribution to Infrastructure Australia’s strategic priorities

The project aligns well with a number of Infrastructure Australia’s strategic objectives, including:

- ***Improving the efficiency of connections to major road and rail freight corridors to facilitate domestic trade and international exports*** – the northern crossing of the Derwent River is a critical link in Tasmania’s key north-south freight and passenger corridor, the Midland Highway. The Highway is a critical freight connection facilitating access to the State’s northern ports (Burnie, Bell Bay and Devonport), through which 86% of the exports and 99% of imports from the Southern Region are moved.
- ***Achieving better utilisation of existing infrastructure*** – the New Bridgewater Bridge will ensure that the anticipated benefits from the significant investment already made in the Brighton Transport Hub and the Brighton Bypass are fully realised, due to the additional travel time savings for trips between the Hub and Hobart. The opening of the Brighton Transport Hub will see the relocation of significant freight transport activity north of the Derwent River from its existing focus at Macquarie Point in central Hobart. Whilst the opening of the Hub will reduce truck activity in inner Hobart, demand for trips between Brighton and Hobart’s northern suburbs will increase by approximately 225 cars and 350 trucks each day (current volumes). Local industry surrounding and supporting the Brighton Transport Hub is also growing.

Alignment with State/regional strategic plans

The importance of the development of a new bridge has been a key element of State strategic transport planning for over 15 years.

The New Bridgewater Bridge (along with the Bagdad Bypass Project) was the subject of a Strategic Merit Test (SMT) completed by the Department of Infrastructure, Energy and Resources in November 2008. As a result of the SMT, the project was deemed to have merit to pursue further scoping as it reflected jurisdictional objectives, priorities and strategies.

Planning for the project was approved for funding under the original Nation Building 1 Program by the Minister for Infrastructure and Transport on 26 February 2009.

Tasmanian Infrastructure Strategy (www.infrastructure.tas.gov.au)

The New Bridgewater Bridge is identified as a key short to medium-term transport infrastructure priority under the *Tasmanian Infrastructure Strategy* (TIS). The TIS, released in 2010, is the State's integrated long-term strategy to guide future infrastructure projects and decision making. The TIS identifies the State's heavy economic reliance on the ability of its transport system to move freight from producers to processors and on to markets – within Tasmania, nationally and internationally.

Southern Tasmania National Transport Network Investment Program 2007-2015

Released in 2007, the Southern Tasmania National Transport Network Investment Program articulates the transport objectives and key projects to improve the northern approaches to Hobart. The New Bridgewater Bridge project is identified as a key project in this Program, along with the provision of two bypasses (Bagdad/Mangalore (proposed) and Pontville/Brighton (under construction)) and construction of an intermodal transport hub at Brighton (under construction).

The package of projects proposed under the Investment Program – including the New Bridgewater Bridge - reflects the objectives of the NLTN, by adding to an integrated network which:

- 1. Improves national and inter-regional connectivity for people, communities, regions and industry;*
- 2. Improves national, inter-regional and international logistics and trade;*
- 3. Enhances health, safety and security;*
- 4. Is consistent with the obligation to current and future generations to sustain the environment;*
- 5. Is consistent with viable, long-term economic and social outcomes; and*
- 6. Is linked effectively to the broader transport network.*

Draft Transport Policy and Draft Freight Strategy

Strategic fit with the State's draft Transport Policy and draft Freight Strategy is addressed in the Tasmanian Government's Submission Overview.

Infrastructure Delivery Imperative

The imperative for the progression of the New Bridgewater Bridge as a priority project is directly linked to the end to the existing bridge's serviceable life, which is expected to occur around 2020.

Initial scoping and planning for the project – along with the related Bagdad bypass – has already been completed, using funding provided by the Australian Government. The Project Development Phase needs to commence as a priority in order to ensure that final designs can be developed, final surveys undertaken, the required transport corridor is reserved, and all required regulatory approvals are achieved. This will ensure the project is ready to proceed to construction.

The Development Phase will undertake tasks critical for project development through to calling tenders for construction. The tasks are aimed at providing further assurance in the scope and estimated costs of the project, and minimising residual risks by implementing the mitigation strategies identified in the Scoping Phase. These tasks include:

- Land acquisition as necessary to facilitate the proposed works (total acquisition of eight properties, boundary adjustments to 15 properties);
- An Environmental Monitoring Program;
- Project Delivery Planning, including management plan for existing bridge, procurement strategy, contract documentation;
- Preliminary Geotechnical Investigation;
- Reference Design (bridge structures, roadworks) suitable to inform tender process;
- Stakeholder Engagement;
- Planning, heritage and social impact assessments, as required for planning approvals;
- Preparation and submission of documentation for statutory planning and environmental approvals (assuming a Project of State Significance approach);
- Preparation and submission of Delivery PPR;
- Final Geotechnical Investigation to inform tender process.

Problem identification, assessment and analysis

The primary function of the Midland Highway is to provide safe, high-speed travel for freight and passenger vehicles. However, safety and efficiency over the southern section is currently significantly compromised, with implications for future economic growth in Greater Hobart and Southern Tasmania more widely.

The existing Bridgewater Bridge was built in the early 1940s and does not meet contemporary loading and design standards. It is unable to reliably perform its functions as part of the National Network, due to the following:

- The dimensional limitations of the existing bridge, affecting traffic carrying capacity, travel time reliability, delays at intersections and level crossings, and the inability of the existing structure to satisfy the design standards for the NLTN for the long term.
- The risk of the effects of climate change creating more regular occurrences of the existing bridge and causeway being inundated, with resulting repairs required and diversions of traffic;
- A significant and increasing risk associated with the continuing settlement of the causeway, which may necessitate lengthy repairs;
- Substantial periods where the existing bridge may need to be closed while maintenance is undertaken (the duration of these closures will vary between 2 days and 14 weeks, during which time all traffic will need to be diverted via the Bowen Bridge or New Norfolk, routes that are unsuitable for the volume and type of traffic that would eventuate under this scenario);

At present during normal daytime traffic flows, the Level of Service (LOS) of the existing Bridgewater Bridge is Level of Service D, reducing to LOS E during peak hour. Factors contributing to this low level of service include:

- A 60km/h speed limit across the bridge;
- A railway level crossing at the Western end of the bridge approach;
- Single carriageway bridge carrying approximately 19,500 vehicles per day;
- Regular bridge maintenance program which further reduces the speed limit on the bridge; and
- A roundabout at Boyer Road, provided for traffic management and safety purposes, but which impedes the efficient movement of freight.

Construction of a new bridge is justified on traffic capacity grounds under existing demand levels. The Tasmanian *AusLink Corridor Strategy* identifies future growth along the Highway between Bridgewater and Brighton of around 79% in heavy vehicle traffic and 45 per cent for passenger traffic by 2030. Table 1 shows cross-river demand is forecast to increase by almost 15,000 vehicles per day between 2010 and 2050. Heavy vehicles make up approximately 8 per cent of the total cross-river traffic demand (see Table 1).

Table 1: Forecast Annual Average Daily Traffic Cross-River Volumes

Year	Light Vehicles	Heavy Vehicles	Total
2010	18,900	1,700	20,600
2020	22,200	1,900	24,100
2030	25,600	2,200	27,800
2040	29,000	2,400	31,400
2050	32,400	2,600	35,000

The opening of the Brighton Transport Hub will see significant freight transport activity move to the north of the Derwent River, from its existing focus at Macquarie Point in central Hobart. Whilst the opening of the Hub will reduce truck activity in inner Hobart, demand for trips between Brighton and Hobart's northern suburbs will increase by approximately 225 cars and 350 trucks each day (current volumes). Continued strong growth in industrial development at the Hub and in the Brighton area will see freight volumes increase further.

A new bridge crossing is necessary to provide industry with improved travel time reliability and reduced operating costs. The new bridge will reduce cross-river travel times by up to 2 minutes, a 45 per cent saving compared to existing peak conditions. Travel time savings across the whole study area road network, as measured by Total Vehicle Hours Travelled, is almost 35 per cent when compared to the base case.

Option Generation and Assessment

As noted above, achievement of enhanced freight productivity to meet Tasmania's future economic development needs is the key goal.

Use of rail to meet future productivity needs could be seen as an alternative to upgrading road infrastructure. However, as noted in the transport overview document, rail and road act in a complementary manner to meet Tasmania's freight needs. Rail has inherent advantages in the movement of bulk freight and some growth in the intermodal task is expected. However the majority of the freight task will continue to be moved by road, as the service characteristics of road are, in most cases, better suited to freight market needs. Consequently, road network upgrades will continue to be a priority in Tasmania.

Two scenarios have been considered as potential alternatives to the Base Case:

1. **Continued investment in the existing bridge, involving capital works programs and ongoing maintenance to extend the serviceable life of the existing structure by a further 100 years.** These works would include:
 - Repainting the lift span and flanking span trusses including towers (every 25 years);
 - Counterweight Replacement (once, with 10-yearly maintenance);
 - Timber lift span replacement (once, with 10-yearly maintenance);
 - Re-seal causeway (every 20 years);
 - Mechanical maintenance (major work every 50 years, plus annual maintenance);
 - Electrical maintenance (major work every 50 years, plus annual maintenance);
 - Replace concrete deck for approach spans and flanking spans (once);
 - Replace bridge abutments (once for each of the north and south abutments); and
 - Replace span pier sub-structure (once).

2. **Construction of a new 4-lane bridge alongside the existing structure, with facilities for pedestrians and cyclists, and with the existing bridge decommissioned as a traffic route, with no ongoing maintenance costs incurred.**

Scenario 1 represents the next most practical alternative to the construction of a new bridge structure. However, there are a number of reasons why Scenario 1 is not a viable solution, including:

- The dimensional limitations of the existing bridge, affecting traffic carrying capacity, travel time reliability, delays at intersections and level crossings, and the inability of the existing structure to satisfy the design standards for the NLTN for the long term.
- Substantial periods where the existing bridge would need to be closed while works are undertaken (the duration of these closures will vary between 2 days and 14 weeks, during which time all traffic will need to be diverted via the Bowen Bridge or New Norfolk, along routes which are not suitable for the volume and type of traffic that would eventuate under this scenario). The additional road user costs (e.g. distance, travel times, vehicle operating costs and crash costs) that would result also represent a significant dis-benefit (approximately \$116,000 per day), as does the additional maintenance and upgrades that would be required to those routes as a result of the increased traffic they would be required to carry;
- Reduced effectiveness of the \$79 million Brighton Transport Hub, to meet the freight and logistics demands of Southern Tasmania, due to the additional travel time for trips between the Hub and Hobart.
- The risk that the upgrade works would not increase the serviceable life of the existing bridge as planned, creating a missing link in the NLTN, with traffic permanently diverted via the Bowen Bridge or New Norfolk;
- The risk associated with the continuing settlement of the causeway, which may necessitate further repairs and traffic diversions while the work is being carried out; and

- The risk of the effects of climate change creating more regular occurrences of the existing bridge and causeway being inundated, with resulting repairs required and diversions of traffic.

The preferred option

The Tasmanian Government has identified a new bridge to replace the existing Bridgewater Bridge as the most viable solution.

The project will commence at the northern extremity of the four-lane dual carriageway section of the Brooker Highway at Granton, on the southern shore of the river. A new section of highway would be constructed from this point to connect to the bridge structure extending across the river downstream of the existing bridge and causeway. A shared pedestrian and cycle path will be provided on the upstream side of the new bridge.

On the northern side of the river the new highway would join the existing Midland Highway alignment south of the East Derwent Highway at Bridgewater, although this section of road would be reconstructed to facilitate connection to the southern end of the Brighton Bypass which commences at the East Derwent Highway. The new sections of highway, including the bridge, have a 110km/h design speed.

The total length of the all new infrastructure is 4.4km, including a new 1.6km bridge structure.

The bridge will provide appropriate clearance above the navigational channel of the river, consistent with the navigation span of the next bridge downstream (Bowen Bridge) and providing for the anticipated needs of river traffic into the future.

The project also includes a number of connections to support the integration of the new crossing into the road network.

Attachment 1 provides an overview of the Bridge design and concept.

Benefit/Cost Analysis

The benefit cost ratio for the Bridge has been assessed. The project returns a positive Net Present Value and a Benefit Cost Ratio in excess of 1.0, based on both the P50 and P90 costs.

Table 2. Benefit cost ratios, New Bridgewater Bridge

4.4% discount rate	BCR	NPV
Based on P50	1.14	78.64 \$M
Based on P90	1.00	2.99 \$M

NEW BRIDGEWATER BRIDGE Project Overview

