

Te Roopu Ahi Ka Komiti Meeting

Tabled Documents

11 June 2019

Item 10 Mangaweka Bridge Replacement report



Report

Subject: **Mangaweka Bridge Replacement**
To: Te Rōpu Ahi Kā Komiti
From: John Jones
Date: 11 June 2019
File Ref: 4/0006

TABLED DOCUMENT

**Tabled At: Te Rōpu Ahi Kā
On: 11 June 2019**

1 Executive Summary

1.1 Purpose of the report

To provide Te Rōpu Ahi Kā with an update on the Mangaweka Bridge Replacement Project.

1.2 Key issues

Whether or not to retain the existing Mangaweka Bridge as a walking and cycling facility.

1.3 Major recommendations

That the Council retain the existing Mangaweka Bridge as a walking and cycling facility.

2 Context

2.1 Background

Mangaweka Bridge has provided a critical connection for the local and regional communities for over 110 years. It is an important road asset for the local community, and is maintained by two local authorities – Manawatu District Council and Rangitikei District Council. It has provided access for local communities to schools, employment, markets for produce and goods as well as a lifeline access to hospitals and emergency services. There are growing tourism and recreation related activities in the region.

A detailed inspection in 2016 revealed a large increase in deterioration of the structure. Some upgrade work was carried out in 2016, and during this bridge closure, further investigation revealed widespread deterioration. This resulted in the severe restriction of 6 tonne gross vehicle limit, with a maximum axle weight of 3 tonnes. This effectively restricted the bridge to cars, campervans and other light vehicles.

A Detailed Business Case (DBC) was submitted to NZTA in June 2018.

The recommended option for the Mangaweka Bridge is to construct a new 132m long steel plate girder bridge, 30m downstream of the existing bridge.

An application for the funds to carry out the Pre-Implementation Phase was approved by NZTA on 3rd December 2018. The Pre-Implementation Phase includes the detailed design, property acquisition, and consenting.

The detailed design of the proposed new bridge, based on the recommendations of the Detailed Business Case report is a single lane, steel plate girder, 30m downstream from existing bridge.

Assessments and investigations for the project are effectively complete with reports in their final review. The bulk of the structural design work began in May.

A site visit was conducted on 2nd April 2019 with members of the structures team, who met with the seven contractors that had registered interest in the Early Contractor Involvement (ECI) process. Following feedback from the ECI meetings lifting the beams into position is the preferred construction methodology. Two ECI contractors have been re-verified, with one contractor dropping out and one contractor still under review.

Geotechnical, Hydraulic, Ecological, and Architectural investigations are complete. Design philosophy report being finalised. Preliminary work has started on the structural design work. Monopile design is well advanced.

A site meeting was held with members of the structures team, and seven contractors that had registered interest in the Early Contractor Involvement (ECI) process. Following feedback from the ECI meetings we have adopting lifting the bridge deck into place as our preferred construction methodology.

Currently preparing consenting documentation, and liaising with affected parties, and tangata whenua.

2.2 Long Term Plan

The proposal is consistent with Council's the Long Term Plan

2.3 Significance

The proposal is not considered significant in relation to the thresholds in Council's significance policy

2.4 Maori consultation

To date the following groups have been consulted.

Ngati Whitikaupeka, Ngati Tamakopiri, Ngati Te Ohuake, Ngati Hauiti, Ngati Apa, Ngati Raukawa, Ngati Hinemanu, Te Roopu Ahi Kaa, Nga Manu Taiko, and Ngati Tuwharetoa.

2.5 Legal issues

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the Transportation activities are provided in the table below.

Legislation and Regulation	Transportation Impacted Range
Building Act 2004	*
Civil Defence Emergency Management Act 2002	**
Climate Change (Emissions Trading and Renewable Preference) Act 2008	*
Climate Change Response Act 2002 (and amendments)	*
Electricity Act 1992.	*
Health and Safety in Employment Act 1992	***
Land Drainage Act 1908	*
Land Transport Management Act 2003	***
Land Transport Act 1989	**
Local Government Act 2002	***
Local Government Rating Act 2002	*
Local Government Rating Act 1974	**
Public Works Act 1981 (and amendments)	*
Railway and Corridor Management and Safety Act 1992.	*
Reserves Act 1977 (and amendments)	*
Resource Management Act 1991 (and amendments)	**
Summary Offences Act 1991.	*
Telecommunications Act 1987	*
Transit New Zealand Act 1989.	*
Utilities Access Act 2010	***
Health and Safety at Work Act 2015	**

Different legislation has differing levels of impact on the Transportation activity; this is indicated under Impact Range (Broad ***, Moderate **, Limited *)

2.6 Approach

As part of the DBC, further investigation of the existing bridge was completed. Of particular focus was the true-right pier, which was reported to be scour prone. The investigation included an additional survey and a comparison with the historical construction drawings. It was concluded that the foundations of the western pier are likely to be embedded 3m into the papa rock. A seismic analysis of the pier was also completed and it was concluded that it is stable under an importance level I earthquake, which is suitable for a footbridge.

Assessment of true-right pier indicates the condition of the surrounding rock is in much better condition than initially thought. A preliminary design for repairs of the true-right pier has been completed. These repairs are sufficient to protect the pier from continued scour and provide additional life.

3 Analysis

3.1 Views

Protection of true-right pier involves pouring a concrete shelf around the abutment, down to the riverbed and tying in to the papa rock.

Retention of the bridge would also require upfront maintenance and repair work. This would include repairs to running boards, decayed timber kerbs, and replacing handrails to comply with the building code.

These works would bring the bridge to an acceptable footbridge standard and extend its lifespan for at least another 50 years. During this time, ongoing maintenance and inspection will be required, including replacement of the deck timbers as required.

Based on this, the future of the existing bridge will have to be reviewed again in 50 years.

3.2 Options

Two options in total were developed and subsequently assessed regarding the future of the existing bridge. These were:

- Repair, strengthen and maintain for 50 years
- Demolish immediately after completion of the new bridge

3.3 Costs

Repair and scour protection of true-right pier is estimated to cost \$150,000.

Retention of the bridge would also require upfront maintenance and repair work. This would include repairs to running boards, decayed timber kerbs, and replacing handrails to comply with the building code.

These works would bring the bridge to an acceptable footbridge standard and extend its lifespan for at least another 50 years. During this time, ongoing maintenance and inspection will be required, including replacement of the deck timbers as required.

Based on this, the future of the existing bridge will have to be reviewed again in 50 years.

An economic assessment for the retention of the existing bridge (as a footbridge) was conducted, based on an outlook of 50 years as follows:

Retaining the existing bridge		Demolish the existing bridge	
Cleaning and painting	\$60,000	Demolish and Removal	\$800,000
Repairs to running boards, decayed timber kerbs, and replacing handrails to comply with the building code.	\$90,000		
Scour and flood protection	\$150,000		
On-going Maintenance	\$318,500		

49 years x \$6,500 p.a.			
2 Yearly Bridge Inspections 25 x \$6,000	\$150,000		
10 Yearly Structural Inspections 5 x \$30,000	\$150,000		
Total	\$918,500		\$800,000
NPV	\$478,000	NPV	\$800,000

All future costs (inclusive of professional services fees) were converted to Net Present Value (NPV) using a discount factor of 6%. Based on this, the estimated 50 year cost of retaining the existing bridge is \$478,000, excluding GST and contingencies.

The NPV for demolishing the bridge in Year 1 is \$800,000.

Therefore over a 50 year period the lowest cost option is to retain the bridge.

This would include an initial cost of \$300,000 in year 1, then an average annual maintenance cost of \$12,370. These costs will not be subsidised by NZTA.

However, beyond the 50 years a time will come when the existing bridge will have to be strengthened at an estimated cost of \$4.6 million. Or demolished at an estimated cost of \$920,000. Under NZTA's current 'Planning and Investment Criteria' the future cost of strengthening or demolishing the existing bridge would not attract financial assistance.

4 Conclusions

Over a 50 year period, the lowest cost option is to retain the existing bridge, making it the preferred option.

Retaining the existing bridge will be supported by some members of the public.

The final decision on the future of the Mangaweka Bridge will need to be made prior to October 2019, so that an application for the Construction Funds can be made to NZTA, and Contract Documents can be completed.

4.1 The preferred option(s)

Retain the existing Mangaweka Bridge as a walking and cycling facility.

4.2 Impact on Council policy

None

4.3 Impact on taking a sustainable development approach

Retaining the existing bridge takes into account

- the social, economic and cultural well-being of people and communities;

- the need to maintain and enhance the quality of the environment; and
- the reasonably foreseeable needs of future generations

4.4 Need for further consultation

No additional consultation is considered at this stage.

4.5 Issues for Maori

No significant issues have been raised to date, noting that Te Rōpu Ahi Kā may wish to make further comment.

5 Recommendation

- 5.1 That the report on the Mangaweka Bridge Replacement be received.

John Jones
Roading Manager