

# Old Kopu Bridge

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*Technical Review Memo of Historic Kopu Bridge Society Proposal,  
Structural Assessments and Other Supporting Documentation*



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This report was written by Francois Pienaar - Pienaar Project Management Ltd for use by Thames-Coromandel District Council.

### Scope of Work

This work package was completed on the basis that Council wished to review the Historic Kopu Bridge Society's proposal in relation to the retention of the bridge.

NZTA, Opus International Consultants and TMH Consulting provided benchmark documentation for this review. This documentation included several structural and condition assessments and as such the work package excludes any further structural or condition related inspections.

### Purpose

The purpose of this report is to provide a review of the Historic Kopu Bridge Society's (HKBS) proposal for the management and upkeep of the old Kopu Bridge. To determine whether the proposal is feasible and point out any issues that could be easily resolved.



Built 1927-28, registered Category I by the NZ Historic Places Trust.

### Background

The history of the old Kopu Bridge is well documented and has since 1929 provided a gateway via Kopu to the Peninsula. The bridge was finally replaced in 2011 and has been declared surplus to requirements by NZTA.

It is currently scheduled for demolition unless any sustainable proposal to retain the structure and transfer NZTA's responsibilities and future liability is received.

The HKBS submitted various proposals. Their latest proposal to NZTA to retain the structure, transfer the asset and maintenance responsibility to their Incorporated Society has not been accepted by NZTA as it is not supported by Hauraki District Council (HDC) or Thames-Coromandel District Council (TCDC). Both local councils stated that they didn't wish to place further burden on their ratepayers.

TCDC is currently considering whether it should support the HKBS proposal and has requested a review of both the NZTA documentation and the HKBS proposal and supporting documentation.

The process followed during this internal review included the review of various historic documents, structural inspections and cost estimates. As such there was no need for a further structural inspection and condition assessment. Only limited discussions were entered into with HKBS's engineering representatives, who also manage the NZTA and local road networks and related structures, and TMH Consulting Ltd with regards to their recent assessment of the old Kopu Bridge, commissioned by Opus International and their ongoing involvement with structural inspections of bridges on the local roading networks.

### Review Assumptions

The review of reports and proposals included several scenarios and this creates a seemingly endless list of possibilities. In order to understand the context of this review the reader needs to be cognisant of the following key assumptions:

- In all scenarios entertaining the retention of the facility, the whole structure would be retained and not just the eastern section between Kopu and the swing arm or any other variation. This is assumed, as the total cost to manage and maintain half of the bridge while demolishing and removing the other half, would be more expensive (\$3.5M) than the total demolition (\$2.3M) or the total retention and maintenance estimates (BECA \$2.3M, BBO \$1.07M, Opus \$1.8M). Full retention for pedestrian use is therefore the only alternative option to demolition considered.
- The bridge will be managed in line with pedestrian and cyclist needs, but maintained to allow vehicle access as and when required for events or maintenance and inspections.
- That where the trust or entity is mentioned, Council is not directly involved and has not delegated its responsibility to the trust. It is not intended to establish a Council Controlled Organisation or have any voting rights.
- That the amenity value of the area is greatly improved with the retention of the old bridge especially keeping the next stage of the Hauraki Rail Trail in mind. Demolition is therefore not the only option and some benefit can be derived from the structure in future if retained.

- That the benefit of keeping the bridge also relates to the Kaiwhenua land parcels. Cell C land disposal process has already started. In respect to Cells A and B, these will no longer be required by NZTA for bridge demolition purposes and the disposal process can therefore be completed in Year 1. This will provide scope for solutions to the stormwater detention issues at Kopu as well as advance the matters related to Treaty negotiations.
- That the trust or entity would have a finite life (be it 5, 10 or 20 years) and that Council will inherit the asset and related responsibilities at some point in future, unless a bridge maintenance fund is managed in such a manner (by a trust or Council) to ensure the longevity of the trust or entity.
- That the asset has a finite life and may need to be demolished and part relocated 50 years from now.
- That in the absence of formal quotations for the maintenance and renewal works (paint systems and concrete repairs), Council is exposed to risk and hence, a very high contingency value reflecting the level of risk in dollar terms has been added to the HKBS proposal. This contingency value is 25%.

### Historic and amenity value

The old Kopu Bridge has a New Zealand Historic Places Trust (NZHPT) Category 1 status. This refers specifically to the swing bridge. Any changes of use or alteration to the asset and its links to the shore will require consideration by NZHPT and potentially an HPT Authority (consent) to complete proposed works. This includes the upgrade of handrails.

Hauraki District Council has the bridge listed as a Category A Heritage Feature in the Schedule of Historic Heritage Inventory and will require Building Consent for the upgrade of the structure but not the maintenance of the bridge.

Thames-Coromandel District Council's (TCDC) proposed District Plan has the bridge listed as a historic heritage item. Resource Management Act requirements specified in the future operative District Plan are likely to impact on the future bridge owner if the bridge is retained.

Related projects which would be advantaged by the retention of the old Kopu Bridge include the:

- Hauraki Rail Trail with its future extension from Kopu to Kaiua across the Waihou River, which could change Thames to a stopover destination for cyclists. The number of visitors recorded along with projected economic benefit potential to the area would be increased with the retention of this historic feature.
- Future vision for the Kaiwhenua / Kopu Gateway area as part of the urban design strategy in the Kopu to Thames Structure Plan includes an increased focus on improved amenity and attraction of visitors to the area as a pause point and eventually a destination. The bridge in its current form would serve as an open-air museum with associated

storyboards, which if promoted well (through events and regular swing bridge demonstrations for example) will become an attraction for tourists and visitors alike.

If the bridge is retained it would also be a catalyst for the early release or disposal process for the Kaiwhenua land and hence a speedier outcome on treaty negotiations and development of the Kaiwhenua / Gateway concept as promoted by the Thames Community Board. This holds potential immediate and future economic benefit for the Kopu to Thames area.

It needs to be remembered that once the bridge has been demolished, there is no way to replicate the structure or its potential benefits.

### **Intended future use**

Future use and related maintenance costs are based on the assumption that the bridge will not be maintained to vehicular loading standards. This, in itself, is an incomplete and potentially misleading statement as maintenance of the structure, and by extension future replacement of any unsafe components, would require some vehicular access for inspections and maintenance in order to retain the bridge for pedestrian and cyclist access.

The change of use from Highway Bridge to pedestrian bridge will see the reduction of vibration and impact loading of cars and trucks on the structure and thereby extend the remaining projected life of the asset. This will also reduce the level of routine maintenance required on an annual basis.

### **Planning, Resource and Building consent compliance**

The BECA report on Kopu Bridge Options 24 September 2012 includes a list of resource consent conditions relating to NZTA activities in the Kopu area. There are no outstanding consent compliance issues or ongoing consent requirements on the 10 resource consents and related designation change stated for the Kopu Bridge if retained.

Resource and building consents would be required in the event of alterations to the structure or change of use. The alteration of the handrail will only be required if there is a change in use. Pedestrians and cyclists had access to the bridge in the past.

TCDC Building Department confirmed on 15 May 2013 that the bridge was built prior to inception of the Building Code in 1992 and accordingly the bridge can't be expected to meet the code. Council is not likely to require any alterations in relation to compliance with the building code unless the structure becomes either dangerous or insanitary. As long as no alterations, additions or changes of use occur the bridge will continue to comply with the same extent as before.

It is therefore assumed from the statement by NZHPT and statements contained in this section that there is no requirement for an upgraded or replacement handrail, merely maintenance of the existing.

### Condition Assessments

A number of condition assessments were available for this review along with as-builts and asset register. The structural assessments completed by Bloxam Burnett and Olliver Ltd. (BBO) largely show a trend with regards to progressive deterioration throughout the years 1999 to 2008 with a major change to projected cost for proposed maintenance in their last report in 2012 (one month after the new bridge opened).

A sudden increase from \$65,000 (2008) to \$1,071,400 (2012), which includes spall repairs and corrosion protection reported in previous years and scheduled repainting of steel structure of \$800,000 (to be completed by 2017).

This is also the first mention of a different Consultant (BECA) completing a related package of work for NZTA on the Kopu Bridge and also the first report that is accompanied by a maintenance follow up sheet (it is recorded that no maintenance recommended from the 2012 BBO report was completed).

The 2012 BBO condition assessment reports the bridge in reasonable to fair condition.

- No visible settlement of the piers and no foundation issues.
- Piers and abutments are in generally good condition with little signs of distress in terms of spalling and corrosion of exposed rebar (\$75,000).
- Cracks were again reported to two of the piers (\$6,000)
- Road debris cover steel plates and bearings at top of piers and abutments. To be cleaned off (\$4,400).
- The steel beams and other steel components are in fair condition. The paint, which seems to be micaceous iron oxide based paint, is at the end of its useful life. Moderate corrosion and localised pitting. (\$800,000)
- Concrete deck is in fair condition with spalling to deck soffit exposing steel rebar at numerous locations throughout the structure. To be expected for a structure this age (\$75,000). (Review comment: Also to be recognised that the spall is in the cover concrete to the reinforcing steel. The steel needs to be protected. The concrete falling from the soffit of the deck is merely cover to the steel and doesn't add to the strength of the structure (not tensile). The exposed rebar will need to be cleaned and painted. Patching spall gaps with non-shrink grout is merely for aesthetics and it is often found that the repair is repeated in a couple of years due to further corrosion of the rebar)
- The swing span wasn't assessed for mechanical and electrical condition, but minor repairs were needed to the cabin (\$1,000).
- Swing span timber deck showed no signs of decay.
- Deck surfacing had a number of potholes and ruts over swing spans (\$10,000)

- Side protection had a number of issues to be resolved for ~\$100,000. A rough order cost to replace the handrails was provided (but not included in the costs) as \$450,000 (\$500/m which includes 25% contingency)
- Total estimated cost **\$1,071,400** (includes 25% contingency).

### Maintenance Records

Through the review process we were unable to find any record of maintenance of the bridge in recent years and have been left with a few unanswered questions.

- Did maintenance stop when the construction of the new bridge was announced or well before that time?
- When last was the superstructure painted and repairs made to the structural concrete?
- What is the actual cost of maintenance of the bridge that would correlate with its proposed future use as proposed by HKBS?

In the absence of actual maintenance records and costs, we will, for the purpose of this review, have to rely on proposed maintenance schedules, proposed methodologies and projected costs.

### Proposed Maintenance & Methodology – NZTA

The NZTA commissioned the BECA report – Old Kopu Bridge Re-use Options 24 September 2012 includes only:

- the repainting of the superstructure,
- removal of existing edge protection and
- installation of new (1.4m high) handrails.

#### *Superstructure:*

A specific methodology for the cleaning and painting of the superstructure was based on hiring specialist scaffolding, enclosing the structure, provision for mechanical ventilation, removal of rust and all paint by media blasting, repainting and removal of debris upon completion. This would give a paint or corrosion protection coating life of 25 years. The BECA work estimate is based on the recent (assume 2011 or 2012) average tender price for similar work in Bay of Plenty, SH2 Manganuka Bridge of \$144,000 for 700m<sup>2</sup>, which gives a rounded up rate of \$210/m<sup>2</sup>. The extrapolated value to complete the same work on Kopu Bridge is \$1,390,000. No allowance is made for innovation or saving due to scale of the works – this would be premature and not helpful to NZTA in planning their long term budget.

All cost stated by NZTA / BECA include 30% contingencies which indicates a low level of confidence in the accuracy of the figures presented, albeit suitable for budget planning purposes.

It is assumed that the bridge would need ongoing maintenance and at least have bi-annual inspections which would result in the scheduling of the next superstructure painting exercise in ~ 25 years. These costs aren't stated.

#### *Edge protection removal and replacement:*

The current handrail consists of timber post and top rail with six horizontal strands of cable as shown in the photo below.



The NZTA proposed removal of the existing edge protection is based on a rate of \$70/m. The installation of the new edge protection or handrail is in accordance with building code and based on a rate of \$930/m. The cost calculations also include Preliminary & General and (pedestrian) traffic management. The value of the removal component is \$100,000 and the new handrail is estimated at \$770,000 by BECA. The BBO estimate is \$450,000, which includes removal of the old railing. The life expectancy of the new asset isn't stated.

#### *Concrete Repairs:*

The TMH Consultants Ltd review of both proposals dated 13 November 2013 indicates that concrete spall and crack repair have not been included in the NZTA maintenance scope of work and hence an estimated \$300,000 should be added to the total value. BECA has only indicated \$75,000 worth of concrete repair work. Depending on the specific methodology for concrete spall repair and rebar steel protection, it can be assumed that the additional cost ( $\$300,000 - \$75,000 = \$225,000$ ) will be absorbed into the overall work scope for the painting of the superstructure if completed at the same time. I.e. use of scaffolding for both structural steel paint and concrete repair scheduled at the same time would generate a saving.



### **Bottom line cost:**

NZTA projected cost for immediate maintenance is **\$2,335,000** (with assumption on concrete spall repair as per previous paragraph). This value is sufficient for preliminary budget setting at government organisation level. If the work is tendered by a central government organisation it can be expected that the cost will be close to that stated, due to the increased rigor and legislative requirements.

The NZTA documentation doesn't present a 10-year management programme and cost projection.

### **Proposed Maintenance & Methodology - HKBS**

It should be noted that the engineering representation for the HKBS includes Opus Roothing and Bridge Engineers as well as representation from IPENZ. In the absence of historic maintenance records the group compiled a projected future schedule of operational tasks, maintenance and renewal works.

### **Scenarios:**

Two scenarios are presented in the HKBS proposal. These are as follows:

1. All management and maintenance costs are calculated as being paid on a full commercial basis; and
2. The HKBS through volunteer labour and material in-kind undertakes as much work as possible so as to reduce the commercial basis amount as far as practically possible.

For the purpose of this review we assume that the HKBS will be able to rally support and volunteers as proposed, but we consider that the relevant assessment in the case that the entity should fail, remains the commercial basis scenario. In the eventuality of the entity failing, it is assumed that Council will need to take over the asset and its management function and can no longer rely on the HKBS or its volunteers. This review is therefore based on the full commercial scenario.

### **Asset Management:**

HKBS projected work programme and cost forecasting for scenario 1; Full Commercial Basis includes 4 categories.

These categories are as follows:

- Operations (includes administration; inspections; and bridge operation)
- Maintenance (includes general/routine maintenance; paint systems; structural concrete; deck surfacing; mechanical; electrical; and other/cleaning etc.)
- Renewals (includes girders; diaphragms and cross bracing; paint systems; concrete deck; deck surfacing; side protection; swing span, deck and control cabin; mechanical; electrical; and miscellaneous)
- Capital Improvements (include visitor information & services)

These items deal with all components of the bridge both aesthetical and structural. The work programme and cost forecasting also includes the overheads expected with the running of a facility such as this with its future intended purpose in mind.

The attention to detail from an asset management perspective was found to be more than adequate.

#### ***Capability and Resources:***

The HKBS engineering representatives include a road network manager and bridge engineer from Opus. Each qualified as civil engineers and with more than 15 years' experience on the local and NZTA roading network, bridges and other structures.

NZHPT and IPENZ representatives also support the HKBS and are members of their Interim Committee.

This support is evident in the way that the asset management of the structure has been proposed. This support from Opus, IPENZ and NZHPT gives confidence that the projected work programme and quality of workmanship will be well managed.

The management of the entity going forward is also not in doubt if the skills mentioned on the interim board and supporters group can be secured either on a commercial or volunteer basis.

Fundraising is always a risk even with the best-laid plans. The supporter group includes influential and long standing community members as well as representatives from various well-known organisations. There is no doubt that they would be able to fundraise some of the funds required, but it is unlikely that fundraising will be adequate to cover the cost of the scheduled renewal work in year 6 and 47. Ongoing fundraising for the full operation cost of the bridge every year over 50 years doesn't seem feasible without some form of on-going government funding or interest from a protected fund.

#### ***Methodology:***

The methodology presented for the administration of the entity is thorough and covers the main concerns one would have with an organisation entrusted with the responsibility of managing a significant piece of infrastructure for public use.

The legal aspect of the trust or entity needs to be formalized in such a way as to give NZTA and TCDC confidence.

The legislative requirements have been listed and taken into account where applicable.

The renewal methodology with regards to the paint systems; handrails; and concrete repairs has been altered from the BBO and BECA methodologies. The HKBS proposal includes the following specific methodologies:

- **Paint systems:** It is estimated that roughly half of the cost to media blast and paint the structural steel components can be attributed to the cost of hiring purpose made scaffolding and enclosures. It is proposed that the HKBS purchases or builds its own purpose specific scaffolding, which can be moved from span to span as work progresses. The HKBS proposal therefore only includes half the cost of renewing the paint system. Alternative methodologies (employed on other bridges in the region) can also be explored in future. The paint proposed is Gold Seal, which is expected to last 20 years in this environment. The same paint is proposed for future spot seals and repairs.
- **Handrails:** The renewal of the handrails only include repair and painting as it is not intended to replace this component of the historic bridge. The repair costs were assessed by Opus engineers and quantified after conducting a detailed inspection. The cost projected for these items is therefore vastly different to the BBO projection in 2012. There are no compliance issues as previously mentioned. The only concern would be users and in particular, unattended children. Pedestrian access is however not a new activity or use of the bridge. The current Kopu Bridge handrails offer a bit more protection than handrails present at the recently repurposed old Mangere Bridge.



- **Concrete spall repair:** These repairs would take place at the same time as the paint system renewal. This is major work, which includes scaffolding to, and enclosing of, the part of the bridge that is to be worked on. Clearing all loose concrete and rust from rebar will be required. Exposed & cleaned rebar steel is then to be painted with the same Gold Seal or equivalent approved corrosion protection paint. Spalled concrete will not be replaced on the soffit of decks as it doesn't add structural strength and is likely to be removed in future due to further corrosion of steel rebar.

Applying non-shrink grout to spalls will only be done where the structure would benefit or for aesthetical purposes.

#### **Adjusted bottom line cost:**

Costs quoted in the proposal are based on BBO values rather than BECA. The methodology employed in deriving the HKBS values sees some alterations to the proposed BBO methodology and excludes the 25% contingency margin that should be placed on project concept costings.

The spreadsheet and summary in Attachment A show the projected detailed expenditure over 50 years as proposed by HKBS / Opus.

Two adjustments were made to the financial projections.

- Attachment B - The first adjusted scenario includes \$50,000 in year 3 for the purchase of scaffolding and inclusion of 25% contingencies.
- Attachment C - The second adjusted scenario includes \$50,000 scaffolding, contingencies and a flattening of projected renewal expenditure.

Both scenarios in Attachments B & C have a bottom line total over 25 years of \$1,819,000 (compared to the original proposed \$1,405,000).

#### **Comparison of Methodologies and Costs**

Both NZTA and HKBS values stated exclude GST.

Both NZTA and HKBS figures are based on present day values without any escalation.

The NZTA/BECA values include a 30% contingency value, which indicates a lower level of confidence. The HKBS values don't include contingencies and reflect values stated in supporting documentation and previous BBO structural inspection reports commissioned by NZTA.

NZTA methodology and costs reflect the responsibilities and management structure costs of a central government agency. The HKBS is a much lighter entity and is therefore more maneuverable in the manner in which it proposes to manage the facility. The HKBS has however acknowledged in its proposal the various legislative requirements it would need to meet in managing this activity.

NZTA has no issue relating to financial health and as such can afford to complete major maintenance tasks or projects in a single year. The HKBS on the other hand will not have the same financial strength and completing large maintenance tasks in one financial year could cause the entity to fail. The HKBS will need to adjust its projected maintenance programme and by extension attempt to spread its projected expenditure for large maintenance tasks over 4 or 5 years in order to keep its maximum annual expenditure below \$180,000.

**Projected Costs:**

The table below shows the cost to manage and maintain the facility for 25 years (i.e. it includes 1 repaint and major concrete spall repair in that period for ease of comparison between BBO, BECA and Opus estimates).

Category	BBO 2008 Over 1 Year (,000)	BBO2012 Over 1 Year (,000)	BECA2012 Over 1 Year (,000)	OPUS2013 Over 25 Years (,000)	OPUS Adjusted 2014 <sup>(11)</sup> Over 25 Years (,000)
Operations <sup>(1)</sup>	0	0	0	603	603
Maintenance <sup>(2)</sup>	52	12	0	238	238
Renewals <sup>(3)</sup>	0	845	1,796	551	551
Capital Improvements	0	0	0	13	<sup>(4)</sup> 63
<i>Sub Total</i>	52	857	1,796	1,405	1,455
Contingencies (25% except for BECA at 30%) <sup>(5)</sup>	13	214	539	351	364
<b>Total</b>	<sup>(6)</sup> <b>65</b>	<sup>(7)</sup> <b>1,071</b>	<sup>(8)</sup> <b>2,335</b>	<sup>(9)</sup> <b>1,756</b>	<sup>(10)</sup> <b>1,819</b>

**Notes:**

- (1) The brief to BBO and BECA excluded the requirement for long-term operational cost estimates.
- (2) BBO included a single year maintenance value based on condition assessments completed (2008 and 2012). BECA had no brief to develop maintenance costs and only regarded renewals of major components. Opus projected cost includes detailed maintenance for 25 years which included handrail repairs (shown here as a lump sum).
- (3) BBO included values for paint system, concrete repair and handrail repair. BECA included paint system, concrete repair and handrail replacement. Opus included paint system (excluding scaffolding), concrete repair, mechanical and electrical renewals.
- (4) Capital improvements as it relates to HKBS/Opus proposal includes information kiosk, storyboards etc. The adjusted capital improvements value includes a lump sum for purpose build/purchased scaffolding.
- (5) The contingency values are very high indicating high risk in scope blowout, procurement risk and high level of uncertainty on the values quoted. These risks are therefore costed in by way of adding very high contingency values.
- (6) BBO estimated cost in 2008 is very low at 65,000 and only deals with immediate maintenance issues.
- (7) BBO estimate in 2012 increases dramatically and includes major renewal components.

- (8) BECA estimate relies on BBO condition and structural assessment, but includes costs derived/extrapolated from other jobs in the region. These include a total sand blast back to bare metal and repaint methodology as well as new handrail system.
- (9) Opus bottom line figure adjusted to include contingencies. This value includes alternative methods of dealing with the paint system (endorsed by TMH) and expands to include operational issues and mechanical electrical components.
- (10) Opus bottom line including scaffolding purchase.
- (11) The values in Column "OPUS Adjusted 2014" are based on the adjustments made by PPML in compiling this review.

The values stated above are rough order costs. More accurate or close to actual costs will only be obtained at quotation stage.

### **Council's obligations and potential future responsibility**

In NZTA's recent letter of 8 May 2014 to TCDC, it was explained that NZTA declared the structure redundant, as it was surplus to their obligation of providing state highway network. Both HDC and TCDC advised NZTA that they didn't require the surplus infrastructure for roading purposes. The revocation process was therefore not pursued. Council has no current obligation to own or manage the bridge structure.

NZTA was further unable through its consultation process to find a viable and sustainable proposal for the ongoing ownership, management and maintenance of the asset. Under this scenario NZTA would vest the asset and its burden to a trust or other entity. NZTA would hold the equivalent value of demolition and removal of the structure in trust, in the event that the entity failed at some point in future, in which case the burden would return to NZTA. This contingency plan was to be put in place due to the clear message received from both local councils that they didn't want to place further burden on their ratepayers.

The cost of demolition and removal of the structure is currently estimated in line with revised methodology, as \$2.3M. In order for NZTA to consider transferring the demolition funding, Council will need to satisfy NZTA that ownership of the structure and all future costs and liabilities would transfer away from the Transport Agency, and there would be minimal, or preferably, no risk that the entity would fail in the future and leave a burden on the general public or the government.

### **Financial Impact**

The funding strategy proposed by HKBS doesn't seem feasible. There are many alternatives to the HKBS funding strategy. One such alternative is discussed below. This alternative is presented in a way that would potentially satisfy NZTA's desire to have no further responsibility or liability in relation to the ongoing ownership and management of the facility.

If NZTA's terms are met and the funds transferred to TCDC then TCDC could manage the fund and either:

- allocate a portion (say 80%, leaving 20% to replenish the fund in order to overcome construction industry inflation) of the interest earned on the demolition fund for the year to be available for grants to the entity for

management and maintenance of the structure and no allowance for reduction or draw down of capital unless for the demolition of the bridge; or

- the fund and its compounded interest earned can be held indefinitely to provide for demolition at some future stage whether it be through failure of the entity or that the structure has become structurally unsound.

With the former the entity or trust will receive a grant from a trust or TCDC (if the account is managed in-house) from the demolition fund for some of their costs and would need to fundraise or apply for grants to cover their remaining expenditure or accept volunteer labour and related in-kind contributions.

The construction related inflation is 3% per annum at present. The percentage of interest to be retained in order to safeguard the trust or Council at some point in future when the structure needs to be demolished is somewhere between 0% and 100%. The demolition funding grants to fund the ongoing maintenance of the bridge will need to be capped accordingly.

Clarification will need to be sought from NZTA on any requirements they may have for the management of the fund if the Council has the appetite to retain the structure and support the entity (in line with HKBS proposal).

In the first instance Council should consider the financial impact and future risk in the event the entity fails and ensure that a policy can be adopted for the management of the fund, which will leave limited, or preferably, no risk to the ratepayers of the Ward or District.

If the worst should happen at some point in future and demolition costs exceed available funds then work under that arrangement would be Council's responsibility and any shortfall will need to be loan funded over a three or five year loan period (operational loan). The number of ratepayers affected will be in dispute when that decision is to be taken. Further consideration should be given to making that decision with the setting of rules for the management of the fund.

The fund remains a contingent liability and as such will need to be included in the annual financial reporting accordingly.

## **Conclusions**

### ***NZTA Core Business***

The bridge is no longer required for highway network purposes and is therefore surplus to NZTA's requirements. It is not in NZTA interest to keep the asset, as the activity would be a burden on the organisation and taxpayer.

### *HKBS Proposal*

The HKBS technical proposal was found to be a practical approach to managing and maintaining the structure for its intended future use. The technical proposal is sound.

The HKBS proposal is ultimately based on the premise that the funds for management and maintenance of the bridge will be fundraised or materials obtained in-kind. The commercial scenario is based on total fundraising. This is unfortunately not a reliable source of income especially at the values required for major maintenance over 50 years +.

The methodology could include the flattening of the cash flow projection in years 6 and 47, which includes major scheduled maintenance/renewal, which could be spread out over 4 or 5 years in order to keep maximum cash flow below \$180,000 as previously explained in Attachment C to this report. This together with the proposal to own key maintenance equipment, would make for a more sustainable approach.

The trust will require between \$30,000 and \$180,000 per year to manage the facility. The attached financial spread sheets and summary sheets show the forecast for the first 50 years. These scenarios attached include;

- HKBS Original Proposal (Attachment A);
- HKBS with Contingencies and Scaffolding Purchase (Attachment B);
- HKBS with contingencies, scaffolding purchase and flattening of renewals expenditure (Attachment C); and
- Demolition fund – projected fund health over 50 years (Attachment D).

Attachment D includes examples of the fund activity over 50 years using a deposit interest rate; internal lending rate; retention of interest to overcome inflation at 3 and 5% respectively.

### *Council's role*

Council has no obligation to own or maintain the bridge at present.

The exact ownership transfer or underwriting requirements will determine the level of risk to the District's ratepayers. This needs to be ascertained from NZTA before Council decides on its support for the retention of the old bridge.

If the Council wishes to support the HKBS and Council is prepared to give NZTA assurance on the transfer of liability (if this is required) then it could arrange to receive the demolition project funding to either be placed in trust or held by Council in a purpose reserve account similar to the TUGPRA.

Considering that this fund remains a contingent liability fund for the eventual demolition of the structure in out years, and then if Council so chooses, it could make provision to grant a percentage of the total annual income on the account. It is not recommended to approve any grants from the capital portion of the fund. Making allowance for some construction industry inflation; Council should retain at least 20% of the annual interest.



In this scenario this leaves 80% per year available from which the trust could apply for grants. Two scenarios are summarised below. The first is based on deposit interest rate of 3.5% and the second is based on an internal lending rate of 6.0% (keep in mind external lending rate is 6.5%).

Attachment D is summarised below:

<b>1 - Deposit Interest Rate (3.5%)</b>											
Year (1-11 only) <sup>1</sup>	1	2	3	4	5	6	7	8	9	10	11
Shortfall (\$ ,000) <sup>2</sup>	27.7	3.5	39.3	61.6	57.4	58.8	112	53.5	0	0	76.9
Year (50 years) <sup>3</sup>	1	5	10	15	20	25	30	35	40	45	50
Fund (\$ M)	2.30	2.36	2.48	2.67	2.89	3.24	3.52	3.96	4.45	5.08	5.32

<b>2 - Internal Lending Interest Rate (6.0%)</b>											
Year (1-11 only) <sup>1</sup>	1	2	3	4	5	6	7	8	9	10	11
Shortfall (\$ ,000) <sup>2</sup>	0	0	0	9.4	4.2	4.6	56.9	0	0	0	10.4
Year (50 years) <sup>3</sup>	1	5	10	15	20	25	30	35	40	45	50
Fund (\$ M)	2.30	2.48	2.73	3.29	4.10	5.29	6.74	8.78	11.5	15.1	19.5

**Note:**

- (1) Summarising only the first 11 years as there is generally no shortfall on either option after year 11 (except for the Deposit Interest Rate scenario, with a shortfall of \$2,900 in year 17).
- (2) Fundraising will still be required by the HKBS to complete all work proposed each year. The value required is indicated here and also in Attachment D.
- (3) Council, under this scenario, then still holds the fund and any compounded interest to cover some of its liability in the event the trust or entity fails or the structure becomes dangerous. The remaining fund balance is shown for the next 50 years with proposed deductions for grants as per projected expenditure (Attachment C).

**Sensitivity:**

The following two scenarios are added to show a more conservative approach around retaining adequate funding to demolish the bridge at some point in future. The current Construction Industry Inflation is 3%. These scenarios are based on internal lending rates and inflation rates at 3% and 5% respectively.

There is no scenario presented for the do nothing option or retain 100% of interest - i.e. no funds available for grants to HKBS for bridge maintenance as this is similar to their current proposal (full fundraising) which is not feasible.

<b>3 – Internal Lending Interest Rate (6.0%) and Inflation rate at 3%</b>											
Year (1-11 only)	1	2	3	4	5	6	7	8	9	10	11
Shortfall (\$ ,000)	23.1	0	31.3	51.9	45.9	45.4	96.8	36.2	0	0	51.7
Year (50 years)	1	5	10	15	20	25	30	35	40	45	50
Fund (\$ M)	2.30	2.59	3.06	3.77	4.74	6.15	7.89	10.32	13.55	17.91	23.23

<b>4 – Internal Lending Interest Rate (6.0%) and inflation rate 5%</b>											
Year (1-11 only)	1	2	3	4	5	6	7	8	9	10	11
Shortfall (\$ ,000)	69.1	44.2	79.2	100.7	95.7	96.1	148.4	88.8	0	0	110.5
Year (50 years)	1	5	10	15	20	25	30	35	40	45	50
Fund (\$ M)	2.30	2.79	3.57	4.57	5.87	7.66	9.91	13.02	17.16	22.75	29.70

Scenario 3 (at 3% construction industry inflation rate) would still be feasible but scenario 4 (at 5% construction industry inflation rate) is not feasible and has a shortfall up to year 18 with a much higher annual shortfall value.

**Scenario 2** (make 80% of annual income on fund available for grants) is still preferred from a funding strategy perspective as this would be a feasible alternative to fund raising and grant applications for bridge maintenance. This may not cover all of fund holder's risk, but would improve the chances of survival of the entity responsible for management of the bridge.

### **Recommended way forward**

There are a number of options that can be developed ranging between retention of the bridge to demolition. If Council in the first instance, has the appetite to consider and support the retention of the bridge and would like to pursue any of the scenarios stated directly above or any variation/other option involving the support to retain the bridge, then it should enter into discussions with NZTA, HDC and HKBS to determine whether it is a feasible way forward and determine the basis for any legal arrangements.

The release and disposal of the remaining Kaiwhenua properties needs to be agreed at the same time. These parcels of land will not be required for demolition and storage purposes.

The bridge corrosion protection was last renewed in the 1960's. As the bridge corrosion protection is at the end of its useful life and at present remains a key uncertainty in the HKBS proposal, it is recommended that HKBS obtain quotations for the scaffolding, concrete repair and paint work to be presented to both NZTA and TCDC during the negotiation process. This would provide confidence whether the work is affordable and, by extension, if the proposal by HKBS is, in its current form, sustainable.

## **Attachments**

**Attachment A** - *Kopu Bridge Cost Final - Summary & Spread sheet*

**Attachment B** - *Kopu Bridge Cost Final with Contingencies - Summary & Spread sheet*

**Attachment C** - *Kopu Bridge Cost Final with Contingencies and Flattening - Summary & Spread sheet*

**Attachment D** - *Demolition fund – projected fund health over 50 years.*