Laura Bowman

From: official information
Sent: Wednesday, 3 November 2021 4:41 pm
To: [redacted]
Cc: official information
Subject: Final Response: LGOIMA 21301 - [redacted] - Peer Review regarding Proposed Cycle/Walk Bridge Options between CBD and East Side
Attachments: Hamilton CBD Waikato River Pedestrian Bridge Report - Final__Redacted.pdf

Kia Ora,

I refer to your **information request below**, Hamilton City Council is able to provide the following response.

Please find attached, a report completed by Beca aimed at exploring high level options for a new bridge. This report was not commissioned by Hamilton City Council, but was prepared for Rotary (Hamilton) and the Momentum Waikato Community Foundation.

That being said, the remainder of your request (i.e.: Terms of reference, authorisations, cost of the review, etc) is being refused as per S 17(e) of LGOIMA. This information does not exist within our organisation.

We have been in contact with Momentum Waikato who confirm:

"now that the river footbridge report we commissioned has achieved its purpose by becoming a part of Hamilton City Council's 2021 - 2031 Long Term Plan their commitment to this project has ended."

If you wish to discuss this attachment and/or have any other queries – they are happy for you to contact them directly:

Mark Servian
Communications and Marketing Manager
mark@momentumwaikato.nz
+64 7-834 0404
Momentum Waikato Community Foundation

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Kind Regards,

Tatiyana | Official Information & Legal Support Advisor
Legal Services & Risk | People and Organisational Performance
Email: officialinformation@hcc.govt.nz

Hamilton City Council
Te kaunihera o Kirikiriroa

Hamilton City Council | **Private Bag 3010** | **Hamilton 3240** | **www.hamilton.govt.nz**
Like us on Facebook Follow us on Twitter

From: official information <officialinformation@hcc.govt.nz>
Sent: Wednesday, 13 October 2021 5:02 pm
To: [redacted]
Cc: official information <officialinformation@hcc.govt.nz>
Subject: LGOIMA 21301 - [redacted] - Peer Review regarding Proposed Cycle/Walk Bridge Options between CBD and East Side

Kia Ora,

I write to acknowledge your information request of Wednesday 13 October 2021 as below.

Please be advised that your request has been passed on to the relevant team within Council and you will be informed of the outcome.

The Local Government Official Information and Meetings Act 1987 requires that we advise you of our decision on whether the Council will provide the requested information as soon as reasonably practicable, and no later than 20 working days after the day we received your request. We will respond to you no later than Thursday 11 November 2021.

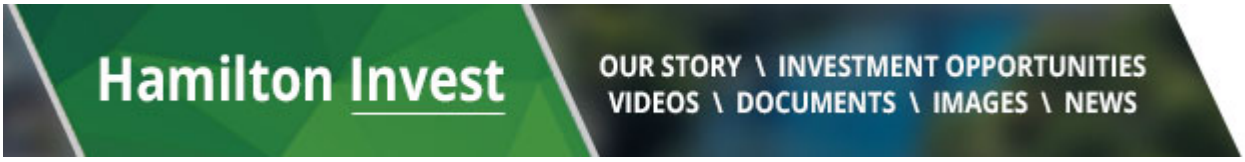
In light of the recent announcement regarding COVID-19 and New Zealand's Alert level 3, the safety of our employees is paramount. We've made necessary changes to our working environment and operations that may result in limited availability of some of our staff members. We appreciate your patience during this time. Please allow some extra time for a response to your request as we are all doing our best to accommodate the new circumstances.

Kind Regards,

Tatiyana | Official Information & Legal Support Advisor
Legal Services & Risk | People and Organisational Performance
Email: officialinformation@hcc.govt.nz

Hamilton City Council
Te kaunihera o Kirikiriroa

Hamilton City Council | **Private Bag 3010** | **Hamilton 3240** | **www.hamilton.govt.nz**
Like us on Facebook Follow us on Twitter



From: Hamilton City Council <do.not.reply@hcc.govt.nz>
Sent: Wednesday, 13 October 2021 2:46 pm
To: official information <officialinformation@hcc.govt.nz>
Subject: HCC Website - Official Information Request ref: HCC-QF-211013-8LS00-7DB

HCC Website - Official Information Request

Reference: HCC-QF-211013-8LS00-7DB
Attachment: not attached

Name: [redacted]

Email address: [redacted]

Phone number: [redacted]

Detailed Description of Request
I have been advised that a peer review has been carried out on the cycling/walking bridge options that have been, or are being proposed between the CBD and the east side of the river.

Please provide a copy of the review, terms of reference, authorisations, cost of the review, who paid and all associated correspondence.

Organisation: not supplied

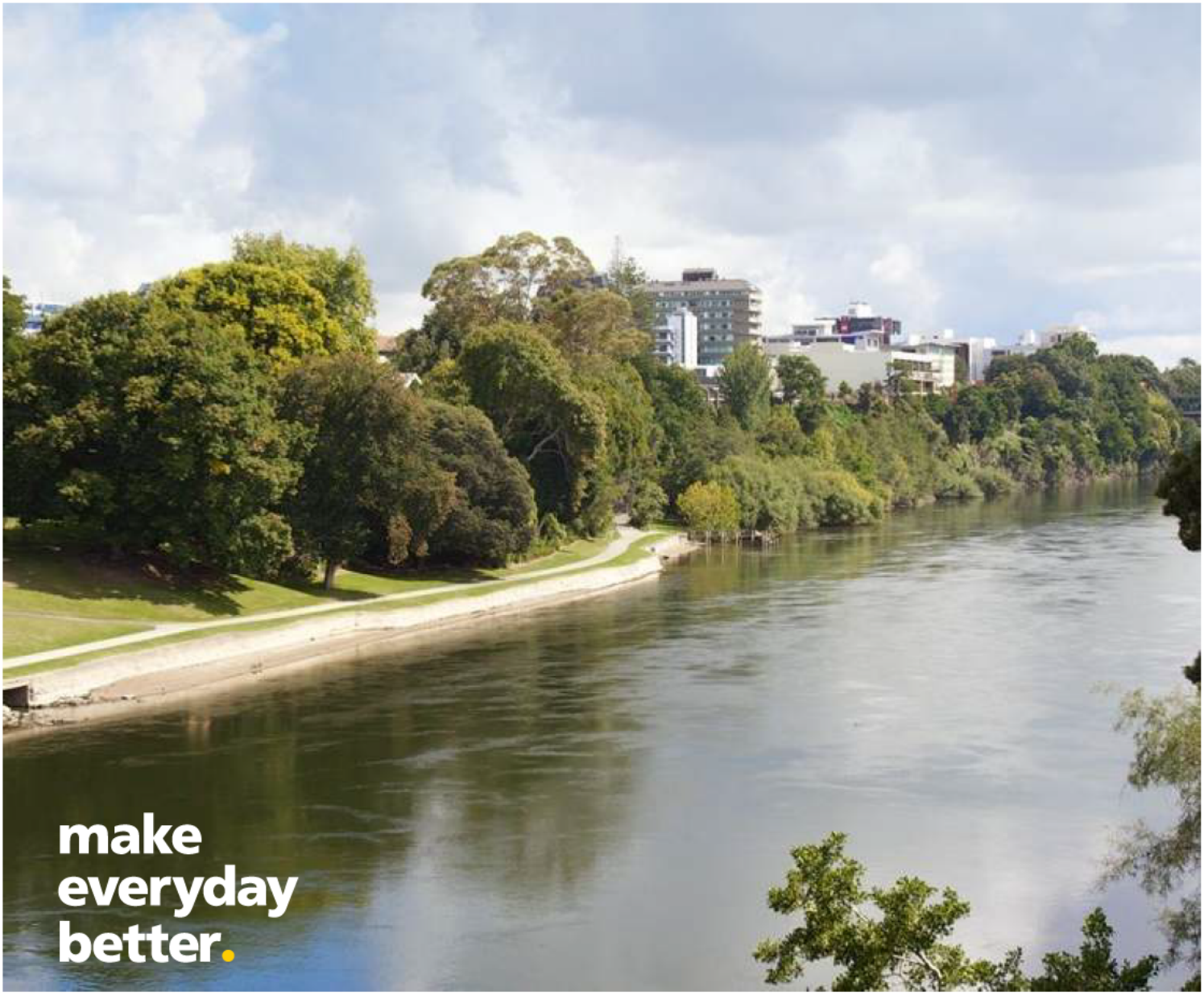
Hamilton Central City - Waikato River Walking & Cycling Bridge

Concept Development Report

Prepared for Rotary Clubs of Hamilton and Momentum Waikato Community Foundation

Prepared by Beca Limited

10 November 2020



Creative people together transforming our world

Revision History

0.7	[redacted]	Draft report for internal review	4 November 2020
0.75		Final Draft for client review	9 November 2020
1.0		Final report for issue	10 November 2020

Document Acceptance

Prepared by	[redacted]	10 November 2020
Reviewed by		10 November 2020
Approved by		10 November 2020
on behalf of	Beca Limited	

Contents

Appendices

Executive Summary

The Rotary Clubs of Hamilton in collaboration with Momentum Waikato wish to reignite the concept of delivering a walking and cycling bridge across the Waikato River in central Hamilton. To catalyse the delivery of this project, this report has been commissioned for the purposes of introducing the project to Hamilton City Council's Long-Term Plan (LTP). This report will assist in identifying a preferred location and the requisite funding and partnerships required for the delivery of a new river crossing for Hamilton.

The report considers five possible locations for a walking and cycling bridge between Victoria on the River and the Victoria Bridge on the western side of the river and Parana Park and Memorial Park on the eastern side. Each location has been assessed against assessment criteria that consider:

- Connectivity and use
- consentability and impact
- the locational benefits of creating an iconic structure in Hamilton
- constructability.

The actual assessment was undertaken by a wider stakeholder group in a workshop that included representatives from Te Haa o te Whenua o Kirikiriroa (THaWK), Hamilton City Council, Momentum Waikato, Rotary Clubs of Hamilton, Bike Waikato, Living Streets, as well as the technical team from Beca.

The assessment identified a clearly preferred outcome - from the north-side of the Waikato Museum to Memorial Park. This option would provide a good connection to destinations in Hamilton East and land at street level in the central city near key destinations, including the Waikato Museum, the new Waikato Regional Theatre and the city's main dining and entertainment precinct.

The bridge is an opportunity to provide an iconic structure that becomes a Hamilton landmark, that is a source of pride for residents of the city, providing a unique opportunity to interact with the Waikato River from above in a pleasant environment free from traffic.

High-level cost estimates have been undertaken for the delivery of a bridge in this location, including an estimate of costs for connecting the bridge structure to Memorial Drive and Victoria Street. An initial estimate based on limited investigation suggests the figure for a new walking and cycling bridge in this location is in the order of $18 - 34 million.

This will provide a bridge with a significant span and deck of 5m of uninterrupted space that is accessible from Memorial Drive and Victoria Street. The design gradient of 1 in 20 will enable the bridge to accommodate users of all abilities and modes, including pedestrians, cyclists, scooter riders and those using mobility devices.

1 Purpose & Background

The concept of a pedestrian footbridge across the Waikato River in the Hamilton CBD has been canvassed on numerous occasions over the last two decades in particular, with projects such as the Millennium Esplanade in the late 1990s and the Pedestrian and Cycle Bridge as part of the Ferrybank Development plan in the last five years being good examples.

The purpose of this report is to identify and assess possible locations for a new walking and cycling bridge that connects the central city with the eastern riverbank, with the ultimate goal of securing funding in Hamilton City Council's Long Term Plan. By taking a fresh approach to the defined study area between Victoria on the River and the Victoria Bridge (shown in Figure 1), the report considers the opportunities and constraints associated with five locations across the River. The options are then assessed against criteria to determine their relative merits and suitability, taking into account a range of factors.

The report takes the location analysis and provides an estimate of costs associated with the construction of the preferred bridge location option for the purpose of introducing the project to the Hamilton City Council Long Term Plan (LTP).

It is worth noting that this is a desktop-based concept report, undertaken over a four week period to assist Council in its LTP process.

Figure 1: Pedestrian Bridge Study Area

2 Methodology

The options assessment has been undertaken in the following manner.

1. A review of previous documentation associated with development along the riverbank, including.
    - The River Plan – Hamilton City Council.
    - The Ferrybank Development Plan – Hamilton City Council.
    - The River Plan Cultural Precinct Masterplan Design Report – Wraight Athfield Landscape + Architecture.
    - Waikato River Foot Bridge Feasibility – Chow Hill.
2. An assessment of the constraints and opportunities present in the study area including.
    - District Plan Zoning.
    - District Plan Overlays.
        - Known heritage and cultural sites and significant trees.
        - Hazard and geotechnical hazard overlays.
    - Topography.
    - Identification of key sites and attractors adjacent to the study area.
3. An assessment of the wider walking / cycling / micro-mobility connectivity to and from the study area.
4. Site walk over to ground truth the desktop exercise.
5. Identification of potential options for the bridge location.
6. Development of an assessment criteria matrix to enable a robust assessment of the options.
7. Workshop to discuss key issues, opportunities and constraints, and options with a stakeholder group and completion of an assessment of the proposed options using the assessment matrix.
8. Review of the options assessment and a recommendation of the preferred option.
9. Development of a cost estimate for a preferred location.
10. Guidance and advice around next steps.

3 Stakeholder Engagement

The report has been developed as a means to develop traction for the construction of the pedestrian bridge over the Waikato River. The location and nature of the bridge mean that there are a number of stakeholders who have an interest in its location and construction.

Stakeholder engagement will clearly be critical for this project's success. Engagement undertaken to date (outside of Rotary Club and Momentum Waikato as proponents of this report) have included representatives from the following:

- Te Haa o te whenua o Kirikiriroa
- Hamilton City Council
- Waikato River Authority
- Hamilton CBD Association
- Brian Perry Charitable Trust
- Bike Waikato
- Living Streets

We note that engagement in some instances has been brief due to the short time period available to develop this report. The conversations to date have been high level and have focussed on the following key aspects.

1. The level of support for the project (in principle).
2. Identification of any possible constraints that should be factored into the process.
3. Key opportunities that should be considered regarding a location.
4. Key matters that should be taken into account for a future design.
5. The role the stakeholders would be keen to play if the project progresses.

In summary, there was strong support for the provision of a pedestrian bridge in the central city across all stakeholders.

Key opportunities identified included; connecting into the Te Awa River ride and the broader network, ensuring it is accessible, creating opportunities for views and attractive public spaces, and designing a bridge that is genuinely iconic and becomes a real asset to the city.

Key design issues focussed on constructability, accessibility, lighting design, safety and maintenance.

Most stakeholders were keen to be actively engaged in the development of the bridge design, with some interest in partnership and funding opportunities.

Most of the stakeholders were also invited to attend the evaluation workshop and participated in the scoring of options against the assessment criteria.

Workshop attendees included representatives from:

- Te Haa o te Whenua o Kirikiriroa (THaWK)
- Hamilton City Council
- Momentum Waikato
- Rotary Clubs of Hamilton
- Bike Waikato
- Living Streets

The stakeholder workshop scored the assessment criteria by consensus and all agreed with the recommended option.

4 Opportunities and Constraints

In undertaking a desktop review of the study area, a number of opportunities and constraints were identified. Whilst not an exhaustive list, the table below is a summary of key aspects captured. This information was valuable for the location assessment and evaluation process.

Area	Opportunities	Constraints / Parameters
Consenting	While there are a number of factors that need to be considered as part of the consenting of the bridge, the location provides for a number of opportunities to respond to the environment. • Have a 'light touch' on the riverbank and to ensure the bridge sits outside of hazard areas. • Create a design that integrates with the environment, responding to the river corridor. • Ensure the bridge is sensitive to known cultural and heritage sites, and significant trees. • Collaborate with mana whenua to design a bridge that is consistent with cultural values and their relationship with the River and therefore be consistent with the Vision and Strategy.	Consent will be required from both the city and regional council. Key consenting aspects to consider would include the following. • River and Gully Flood Hazard Areas. • Significant Trees that are located along both sides of the riverbank. • Identified and unidentified cultural/ heritage sites. Three known identified Heritage/Cultural sites in the area. These include the PS – Rangiriri, The Hamilton Punt/Borrow Pits and Hua O Te Atua Urupa. The bridge design will need to consider the Vision and Strategy for the Waikato River and respond to the cultural importance of the Waikato River.
Land use integration	**Eastern Riverbank** There are limited opportunities to provide a wider connection on the eastern side beyond Memorial and Parana Parks, namely: • Beale Street Ramp • Dawson Street stairs • Riro Street • ANZAC Parade. **Western Riverbank** The western side of the river has a number of opportunities to connect to existing land use or future development. • Central City and the Victoria on the River site. • Central locations have the opportunity to tie into existing downtown Hamilton, the Waikato Museum and provide a connection to the future Waikato Theatre site.	**Eastern Riverbank** The eastern side of the river in the study area consists of open space with limited access to residential and commercial development. The purpose of the bridge needs to be considered when determining the location of the eastern landing. The area also has cultural significance to mana whenua, who should be consulted as part of further design work. **Western Riverbank** The western side of the river has a number of heritage and culturally important sites that need to be taken into account when considering the location of the western landing.

Area	Opportunities	Constraints / Parameters
	• A southern location would tie into the Ferrybank Precinct, an area Hamilton City Council has signalled for future redevelopment.	
Cultural and heritage	The Waikato River is of high cultural importance to tangata whenua. The construction of a bridge provides the following opportunities. • Collaborate with mana whenua in the design of the bridge. • To incorporate education of the public on improving river health and tangata whenua's relationship with the river. • To view important heritage and cultural locations from a different perspective.	Due to the importance of the Waikato River, it is considered highly important to engage and consult with Waikato-Tainui and local hapuu to fully understand any cultural constraints that need to be considered in any bridge location and design. Due to the rich heritage and history of the Waikato River on both the eastern and western banks, and the number of identified heritage and cultural sites in the area, it is known that the general area is associated with pre-1900 activity. An archaeological investigation should be commissioned as part of detailed scoping of the area. The general Ferrybank area in particular should be considered to be a high archaeological risk.
Environmental	The location of the bridge and its design should consider the important River environment and the opportunity to integrate with the corridor with a light touch.	Hamilton is home to NZ's native long-tailed bat. The design of the bridge will need to consider any effects on the bats ability to use this area.
Ground Conditions		Ground condition risk is considered to be fairly similar along the riverbank in lieu of any site information and can be resolved through engineering design in future phases of the project. Design and construction is likely to become more complicated towards the north as the riverbank steepens.
Bridge Form	The bridge design should be of sufficient size to comfortably and safely accommodate people walking and cycling. To achieve this, the deck should have a clear width of 5m. There are opportunities to incorporate 'pause points' and light buildings/structures into the bridge to give people the opportunity to stop and view the Waikato River. There is the opportunity to create an iconic architectural design that is unique to Hamilton.	The design of the bridge will be constrained by the Waikato River, its banks and requirements to keep structures outside of the water. To achieve universal accessibility, the gradient of the bridge and adjoining ramps need to be 1:20 or higher.

Area	Opportunities	Constraints / Parameters
	The design of the bridge should carefully consider the treatment of tie-in points and how landscape architecture and planting can create attractive places at each landing point.	

5 Long Term Plan - Strategic Fit

5.1 Our Vision for Hamilton Kirikiriroa - Hamilton's long-term priorities

The creation of a walking and cycling bridge across the Waikato River would strongly align with a number of the long-term priorities and their focus areas identified in Hamilton City Council's 'Our Vision for Hamilton Kirikiriroa'. The following considers each of the five priorities and briefly explains how the pedestrian bridge aligns with these themes.

- It creates ***a city that is easy to live in,*** providing a safe walking and cycling connection between the destinations of the central city and Hamilton East, allowing people to move quickly and easily.
- It establishes ***a city where our people thrive,*** by investing in infrastructure that supports Hamilton as an attractive place to do business, by providing easy and safe connections to the central city.
- It builds on the creation of ***a central city where people love to be,*** by strengthening the connection between the Waikato River and the city, providing a new viewing point and opportunity for people to pause and be above the water in a pleasant environment. A bridge will make it easier to access the central city, providing alternative travel options to people walking and on bikes.
- The bridge will add to the creation of **a *fun city with lots to do,*** by providing an iconic structure that is part of the journey and entry into Hamilton's central city, supporting access to key destinations in the city.
- By encouraging walking and cycling, it assists in delivering ***a green city*** by providing the opportunity to reduce our carbon footprint and use alternative transport modes. The construction of the bridge will need to balance the natural and built environment, having as light a touch as possible on the environmental values of the Waikato River.

6 Locational Assessment

6.1 Overview of the study area

The study area is located between Victoria on the River and Riro Street to the north and Victoria Bridge to the south. Hamilton's central city is located on the western bank of the river and this location includes the majority of the central city's hospitality businesses.

Other key attractors include public open spaces such as Victoria on the River, Embassy Park, the Ferrybank, the Waikato Museum and the soon-to-be-constructed Waikato Theatre. A number of Council documents identify significant investment in this location, such as the River Plan and Ferrybank Precinct Plan. Further

work is underway for the HCC-led Central City Transformation Plan. There are a number of private development projects also occurring in this area of the central city.

The eastern side of the river comprises public open space split into Memorial Park and Parana Park. These two adjacent public spaces, while close in proximity, are distinct in their role and function. They are important open spaces for the city.

6.2 Identification of the options

Five options were developed, based primarily on landing opportunities on the western side of the river. This is because there are limited opportunities to provide direct connections to Victoria and Grantham Streets. All options landed in either Parana Park or Memorial Park on the eastern side. An option of connecting directly to Riro Street was excluded on the basis that there are significant level differences between the eastern and western banks in this location that would be challenging to resolve in order to create a bridge design that provided a suitable gradient of 1:20 that would enable people of all abilities to use the bridge without adversely affecting the existing residents on Riro Street. Should land become available on Riro Street, this option could be revisited.

Figure 2: Bridge location options

The table below identifies and describes the options considered for the location of the bridge shown in Figure 2.

The options identified should be considered as general locations for a bridge to be constructed, subject to further investigations and design. The final bridge form may not be linear as shown.

Option		Connection	Considerations
1	**Victoria on the River (VOTR)**	**Western bank** Tie into the lower portion of VOTR **Eastern bank** Landing in Parana Park	• High landing point on the western side. • Will interfere with the current function and use of VOTR. • Requires a long bridge to span to Parana Park with a significant level difference. • Will require a connection up to Victoria Street, the current path adds complexity to the journey for cyclists and mobility impaired.
2	**Embassy Park**	**Western bank** Tie into the lower portion of Embassy Park **Eastern bank** Landing in Parana Park	• High landing point on the western side. • Requires a very long bridge to span to Parana Park. • Connection between landing and Victoria Street is difficult due to level difference between a potential landing point and Victoria Street and the current arrangement of stairs/ramps in Embassy Park. • Embassy Park is narrow and deep, with some CPTED issues for connection to Victoria Street. • It is noted that Embassy Park is signalled to be upgraded as part of the Waikato Regional Theatre development. This may assist in resolving accessibility and CPTED concerns.
3	**Sapper Moore-Jones Place**	**Western bank** Tie into the lower end of Sapper Moore-Jones Place. **Eastern bank** Landing in north end of Memorial Park	• High landing point on the western side. • Ability to use existing road connection, however, will need to treat Sapper Moore-Jones Place to provide a better pedestrian connection to Victoria Street. • Will be back of house for the theatre. • Adjacent to Hua O Te Atua Urupa. • Provides suitable connection to Memorial Park.
4	**Waikato Museum**	**Western bank** Tie into the bank at the river path, plus an additional structure to reach the Museum forecourt **Eastern bank** Landing in the middle of Memorial Park.	• Initial landing is achievable; however, an additional structure will need to provide access to the museum forecourt to tie into the central city to avoid the need to go up the current vehicle access to the carpark. • Will need to connect to the museum forecourt to create a good connection to the central city. • Opportunity to develop a great space at the bridge landing points at the museum. • Provides great connection to Memorial Park.
5	**Ferrybank**	**Western bank** Tie into Ferrybank as close to the ANZ building as possible. **Eastern bank** Landing in south end of Memorial Park	• Ties in south of the city and down the Grantham Street Hill, requiring access up the slope. • Does not provide a direct connection to the Central City so would need to tie in as far up Grantham Street as possible. • Is close to Victoria Bridge. • To connect to the bottom of Beale Street would require a high structure starting from a lower landing in Ferrybank.

6.3 Assessment criteria and evaluation of options

The following criteria was used to evaluate the various locational options. These criteria were confirmed by the group (an additional criteria was added by the group in the workshop prior to evaluation). The scoring confirmed by the group is also shown.

	Criteria	Victoria on the River	Embassy Park	Sapper Moore-Jones	Museum	Ferry Bank
Connectivity and Use	**Walking / Cycling Path Connectivity** How well does the proposed site connect in with the broader walking and cycling network?	6	6	7	7	6
	CBD & Attractions Connectivity How well does the proposed site connect to the CBD and key attractions?	6	7	6	7	5
	Safety Having consideration to gradient and location, how well will the option be able to provide for safety of users?	5	5	5	6	5
	Accessibility / Usage How flexible will the option be for a wide range of users including micromobility?	6	5	3	7	3
	Sub total	23	23	21	27	19
Consentability & Impact	**Cultural & Archaeological** Are there sites of cultural, spiritual or historical significance that will be affected?	5	4	1	4	3
	Environmental Will there be environmental impacts?	3	3	2	3	3
	Regulatory What is the overall consenting risk of the site?	3	3	2	3	2
	Land Use Impact What are the land uses in vicinity of the option, particularly at the tie ins, will private property be impacted?	3	2	4	4	4
	Visual impact and integration with context Will the bridge integrate with its visual context and impact on surrounding public places (WOW factor)?	6	5	5	6	4
	Sub total	20	17	14	20	16
Constructability	**Ground Condition** Does the site have any history or demonstrate any evidence of instability or poor ground conditions?	2	2	2	2	2
	Constructability Is the site in such a location or subject to other constraints as to make construction very difficult?	1	2	3	3	4
	Sub total	3	4	5	5	6
	Total score (out of a possible 77)	46	44	40	52	41

Scoring:

1	2	3	4	5	6	7
Significant negative	Moderate negative	Minor negative	Neutral	Minor positive	Moderate positive	Significant positive

6.4 Preferred location option

After considering the five options and measuring these against the assessment criteria framework, option 4 emerged as preferred. Detailed investigation has not been undertaken as part of this assessment, therefore a general area has been identified for the placement of the bridge.

This option is preferred due to the location:

- Providing a connection to the central city entertainment and cultural precincts as a landing destination
- providing a central connection to Memorial Park and onto Memorial Drive in a location that provides for connectivity to Hamilton East and beyond
- providing the opportunity to construct an access location that is universally accessible
- avoiding the Hua O Te Atua Urupa site
- connecting to the site near the museum, which could be developed in future into a 'WOW' public space that integrates with the new bridge.

Any option will require further detailed investigation, with a particular focus on archaeology, cultural sites and constructability.

The bridge design will need to resolve connections to Victoria Street and Memorial Drive. These connections are considered to be highly important in the usability, accessibility and wider connectivity of the bridge. Without these tie-ins, the bridge will have a reduced benefit for Hamilton's wider biking and micro-mobility network.

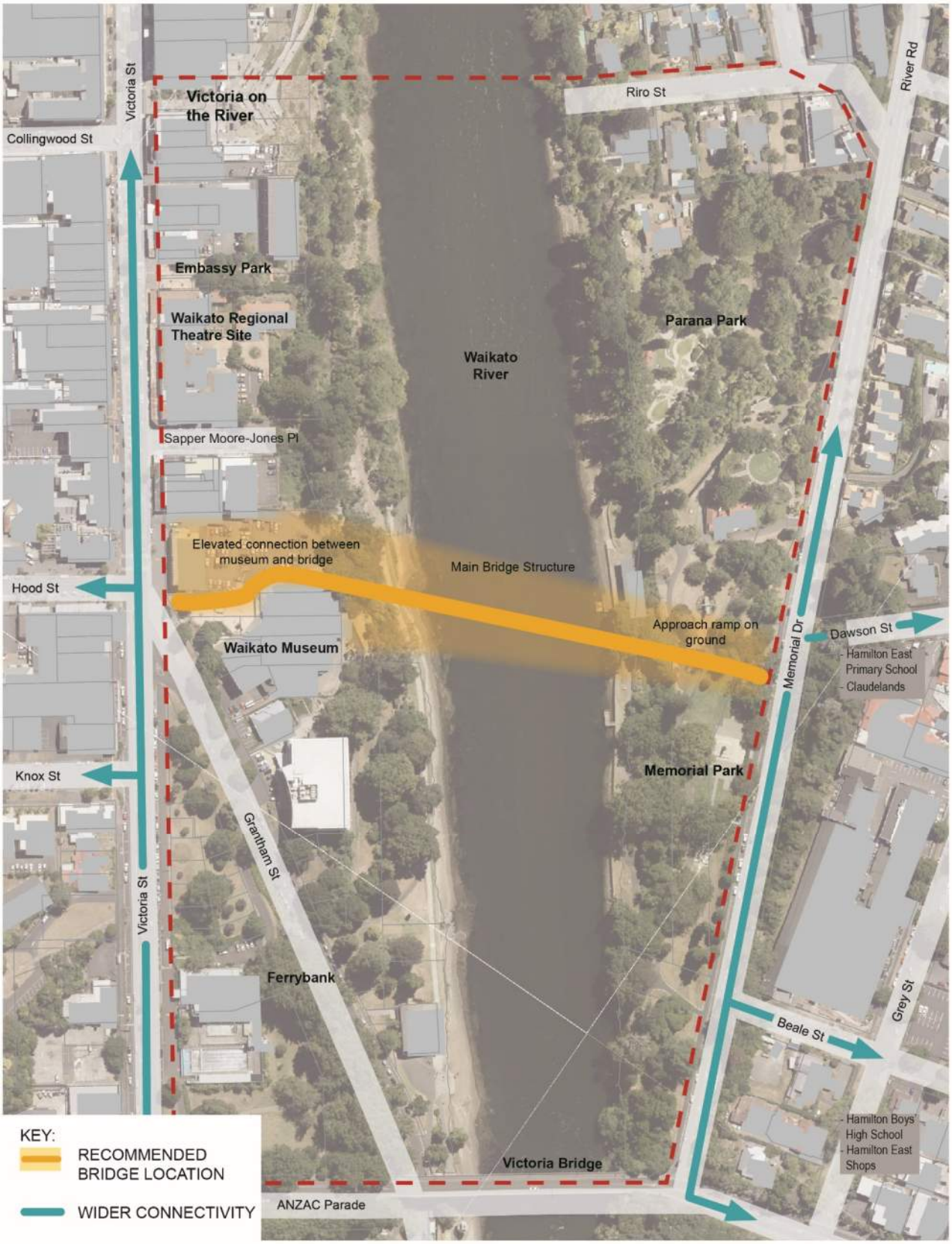


Figure 3: Preferred location of the new walking and cycling bridge (Option 4).

7 Bridge Design Considerations

7.1 Design Considerations

7.1.1 Design and stakeholder engagement

The proposal for a new bridge provides the opportunity for a collaborative approach between the designers, mana whenua and Hamilton City Council. The wider public could also be engaged in part of the design process, creating an iconic structure that has a real sense of community pride and ownership.

How the structure interacts with the surrounding environment will have a significant impact on cost, form and place making value of the bridge.

7.1.2 Constructability

Construction methodologies for working within or near waterways will need to be carefully managed to reduce the environmental impacts during construction. A resource consent will be required for the construction of the bridge. The provisions in the Regional and District Plans establish requirements relating to location, size and design that will need to be considered during the concept design stages. This will also need to consider the management of construction methodology and the associated impacts. As part of the consenting process, stakeholder consultation will be required. Key stakeholders include mana whenua, the Waikato River Authority, Hamilton City Council, Waikato Regional Council, Waka Kotahi NZ Transport Agency and Heritage New Zealand.

The effects associated with the construction of the bridge will need to be addressed, including archaeological, cultural, landscape and visual, ecological, geotechnical, contaminated land and noise and vibration effects. Through this process, appropriate mitigation and management measures will be identified and will help to inform any concept designs so that any adverse environmental effects are avoided, remedied or mitigated.

Constructability is a key consideration and it is proposed that the bridge piers would be located on the banks of the river. This approach is expected to provide the most cost-effective construction method while avoiding the placement of bridge piers in the river and respecting the cultural importance of the Waikato River.

The bridge is expected to be constructed using conventional structural materials such as structural steel or reinforced concrete. Structural steel would likely be preferred for the bridge due to its reduced weight which aids in constructability of long span structures compared to an equivalent strength reinforced concrete deck.

Temporary construction access tracks would be required to the site on either side of the river, likely requiring a new access track to be formed along the edge of the banks from the Ferrybank area north to any bridge site on the west side, and access tracks to the bridge location from Memorial Drive to the bridge site. Temporary construction laydown areas would be required at each site either side of the river to allow for heavy plant and equipment to construct the bridge. Heavy plant would include piling rigs, cranes, concrete trucks, etc. It is expected that significant temporary works would be required to construct the piers, such as a cofferdam to construct the piles and pilecaps, and potentially the use of a barge on the banks of the river. To construct the main bridge, temporary moveable construction equipment is expected to be required, and the size of this would depend on the type of bridge form that is to be constructed.

7.1.3 Vibration and serviceability criteria

Due to the long span of any new bridge crossing, pedestrian vibration and aerodynamic effects will need to be considered in detail at the concept design stage to prove the design is feasible and would meet New Zealand and international requirements for these two design considerations.

7.1.4 Geotechnical and River Hydrology

Due to the size of bridge and likely ground conditions, the main bridge is expected to be founded on deep piles for the main piers and any approach spans. There is high potential for ground instability and geotechnical issues along the riverbanks.

As there has been no geotechnical or river hydrology assessment undertaken as part of this report, these two aspects are key considerations requiring further investigation at concept design stage, as these aspects will have an impact on the bridge design.

7.1.5 Sustainability

Sustainability in design and construction should be considered during the early stage of the design process to utilise resources efficiently. Consideration of building materials, construction processes and maintenance during the design process could significantly decrease resource and energy uses with minimal design impacts. Overall, this could deliver a product that is both more sustainable and with minimal impacts to costs.

7.1.6 Cross Section of bridge

The cross section of the bridge will influence its usability and its safety for pedestrians and cyclists. It is recommended that the bridge deck has a minimum 5m of clear useable width, as this will provide a safe width to accommodate the necessary movements. Barriers could be 1.4m high as per NZ Bridge Manual requirements for a shared cycle path. It is noted that some recent walking and cycling bridges have utilised a 1.2m high barrier to improve user experience where the falling risk has been assessed as low for straight bridges with adequate width. Further consideration as to whether higher or lower fall protection barriers are required is needed in the concept design stage.

The recommended minimum bridge cross section would consist of the following as shown in figure 4 below.

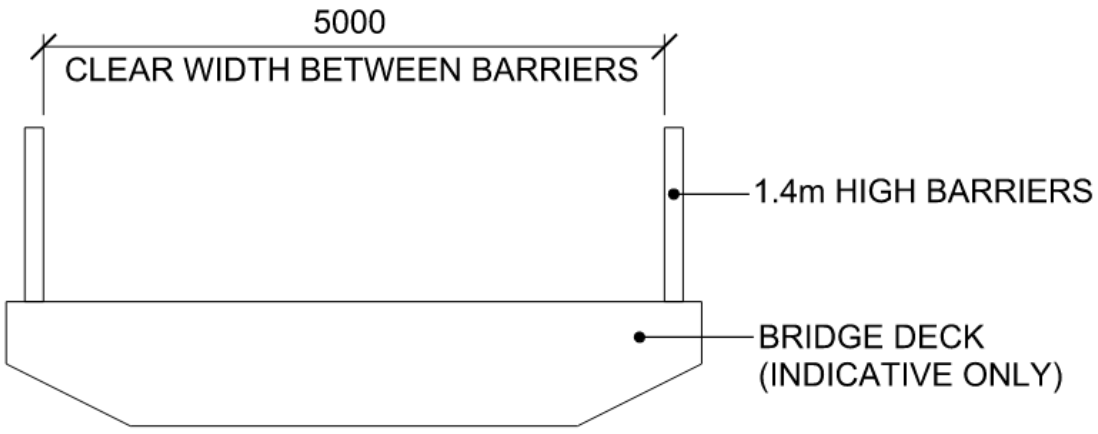


Figure 4: Indicative bridge cross section

7.1.7 Form of structure

There are many feasible structural bridge forms and variations of these which are suitable for spanning the significant distance across the Waikato River. The estimated longest span of the bridge would be approximately 100m to 150m between supports, depending on the final alignment chosen and stability and

suitability of the riverbanks. Typical bridge forms that would be considered suitable for spans of this length are:

- Cable stayed bridge
- Suspension bridge
- Arch bridge
- Truss bridge.

7.2 Precedent Bridge Examples

A number of precedent bridge examples are shown below to indicate the potential different types of structural forms and bridge aesthetics that could be achieved for a new bridge over the Waikato River. Some of these examples are more basic and some are more complex. There are many other international examples of amazing bridge crossings and urban spaces, however, a unique bridge will need to be designed to suit the landmark location over the Waikato River and to respond to its context in the centre of Hamilton.

Bridge Example	Picture and Notes
Example 1: **Perry Bridge, Horotiu, New Zealand.**	 The Perry bridge is single span network arch bridge, with a 2.5m wide shared path. The bridge has reasonably simple structural form with simple tie-ins to the surrounding ground.

Example 2:

Hendon Park Footbridge, Auckland, New Zealand.

The Hendon park footbridge is a fixed arch bridge with a main distance of 100m between arch supports. The bridge plan geometry is curved to suit the site constraints.

Example 3:

Footbridge Above The Elbe River - Celakovice, Czech Republic, Europe

This bridge highlights a simple long span cable stayed bridge structure, with a main span of 156m. The bridge is 3.0m wide and is of a similar scale to what could be required for a new Waikato River crossing.

Example 4: **Three Counties Bridge, France/Germany.**	 The three counties bridge is the longest single span pedestrian arch bridge in the world with a main span length of 229m. The bridge is 5.5m wide.
Example 5: **Passerelle Léopold Sédard Senghor, France**	 This bridge is a 106m long single span arch bridge and is 15m wide. The bridge is architecturally unique and covered in exotic timber decking. The bridge has benches and areas for congregating for promenaders

7.3 Cost Estimate

A high-level concept project cost estimate has been prepared for the bridge spanning between the museum and Memorial Park i.e. option 4 (as shown on Figure 3).

A cable stayed bridge structure with tall piers situated at the edges of the river has been used as an initial concept to base the cost estimate upon. The cost estimate is based on a 5m wide clear usable width for the entire length of the path on the approaches and the bridge. The bridge would have a main span length of approximately 135m, and total bridge length is estimated to be in the order of 240m with a longitudinal gradient of 1:20 over its length.

It is noted that the cost can vary significantly based on a range of factors, including:

- where the bridge is constructed along the river
- main span length of the bridge
- structural form of the bridge
- construction methodology
- the approaches, and how these will tie into the surrounding area.

Further the construction cost will be impacted by the serviceability vibration criteria section, the geotechnical conditions, total load limit on the bridge, bridge width, along with the desired aesthetic / architectural outcome of the design.

Two cost estimates have been prepared. The first is for a basic bridge, and the second cost is for a 'signature' bridge. The second cost estimate has additional cost allowed for aesthetic / architectural influence of the bridge design; as well as two viewing platforms at the piers and allowance for artworks on the bridge.

- The expected estimate for the first option is approximately $22 million.
- The expected estimate for the second option is approximately $26 million.

A total cost estimate range is expected to be between approximately $18M to $29M for the first option and between approximately $21M to $34M for the second option.

Key assumptions for the cost estimates are:

- Property costs, GST, and consenting fees have been excluded
- both of these cost estimates have an estimating accuracy of -20% and +30% given there has been no design effort undertaken
- the estimate has been prepared in accordance with the Waka Kotahi NZ Transport Agency Cost Estimation Guide
- bridge structures are assumed to be constructed from structural steel for the bridge decks, with reinforced concrete piled foundations, pile caps, and reinforced concrete piers for the main bridge.

8 Implementation

This report has provided a broad understanding of the options available and the benefits of a strategic shared bridge connecting the city across the river. The options have been tested to provide relative benefits of each location and how that achieves the desired outcomes. This enables the scheme to be considered further and gives a potential funding envelope required to fund the assets. The next phase will be to secure funding within the Long Term Plan (LTP) Programme. This will embed the project into HCC future thinking and set broad parameters for its delivery.

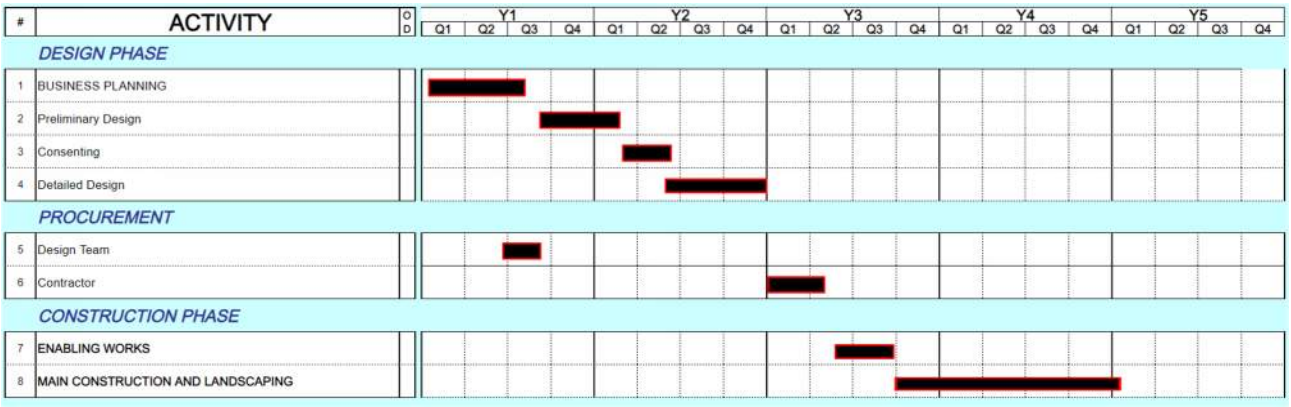
Moving forward from the LTP there will need to be a staged delivery plan that moves through robust project gateways. An overview of the stages is set out in the diagram below.

SITE OPTIONS & BUSINESS CASE	FEASIBILITY	DESIGN & CONSENTING	CONSTRUCTION
Concept Options Land & Engineering Constraints Planning Assessment Cost & Risk	Surveys Feasibility Design Consenting Strategy Delivery Plan Procurement Strategy Cost & Risk Planning Stakeholder Engagement	Detailed Design Resource Consents Procurement Cost & Risk Control	Design Inputs Contract Management Stakeholder Engagement Environmental Compliance Cost & Risk Control
Business Case **Funding Strategy**	**Preferred Option Selected** **Detailed Business Case** **Funding Approval**	**Consents and Approvals** **Contractor Award**	**Construction**

In establishing a project of this scale, a more detailed options and feasibility assessment will be necessary. This assessment will likely be built into a business case process that will support a rigorous assessment and investment stage in the project. With this will come the opportunity to identify and seek funding sources for the project. With the potential wider benefits of this bridge as a focal point for Hamilton City there may well be other potential public and private funders willing to invest in quality infrastructure and enhance the project further. This philanthropic interest to invest in the city has already been demonstrated through projects like Hamilton Gardens, the planned Theatre and even the investment in this initial report. It will be a key stage of the project to look at and secure the right funders and stakeholders to bring forward the project.

With a project of this importance having a clear governance group that can provide focused oversight and champion the project will provide the necessary oversight and drive. This project will benefit from having strong stakeholder connections and an effective communications strategy.

Working through the various business case, design procurement and construction phases the project could take around 3-5 years to delivery from commencement. A high-level programme has been provided setting out the indicative time frames for each stage.



The programme maps out a traditional delivery approach with detailed design, contractor procurement and construction. This provides a baseline plan, but consideration should be given in the business case phase to the procurement methodology. There are a range of different procurement models that should be considered for the bridge's structure to provide the appropriate balance between delivering the desired quality and inspirational design with the benefit of contractor input and certainty that could be achieved through an Early Contractor Involvement (ECI) or Design and Build approach. All have their merits and need to be considered to bring forward the desire outcome and controls.

9 Summary

This report has identified a preferred general location for a walking / cycling bridge across the Waikato River (option 4) and high-level cost estimates that can be used for consideration of the project at this early stage.

The process for undertaking this report has been desktop based within a four week period to tie in with Council's LTP process, and to endeavour to inform Council's thinking around whether this is a project they wish to adopt and consult on in their upcoming LTP. This process included an evaluation of a number of locational options with a stakeholder group that was able to provide a broad range of views to enable a robust assessment to be undertaken.

Implementation of the project could conceivably take 3-5 years from commencement and stakeholder engagement will be key to its success, both from an acceptability, design input and funding perspective.

We look forward to supporting the inception of this landmark project, and are excited by the opportunity of this much talked-about project turning into a reality for our city.

1

Appendix 1 – Bridge Location - Key Considerations

KEY SITE CONSTRAINTS AND CONSENTING ISSUES

Archaeology and Heritage

- There are a number of archaeological sites that should be considered.
- The riverbank is assosciated with pre-1900 human activity and an archaeological authority is likely to be required. This will require expert archaeological input.
- There are a number of heritage buildings and structures in the study area that need to be considered.

Significant Trees

- There are a number of significant trees, particularly on the eastern side of the Waikato River that need to be considered.

Slope Stability and Geotechnical

- Due to the nature of the riverbank and the structure required, detailed geotechincal investigation will be required.

Waikato River and Flood Hazards

- Development within the Waikato River must be avoided.
- Develpoment will need to take into account flood extents of the river.

KEY:

- Study Area
- Building
- Road
- Land Parcel
- Significant Trees
- Built Heritage Items
- Archaeological & Cultural Sites
- Waikato Riverbank Stability Area
- High Flood Hazard Area
- Destination Open Space
- Natural Open Space
- Waikato River & Gully Hazard Area

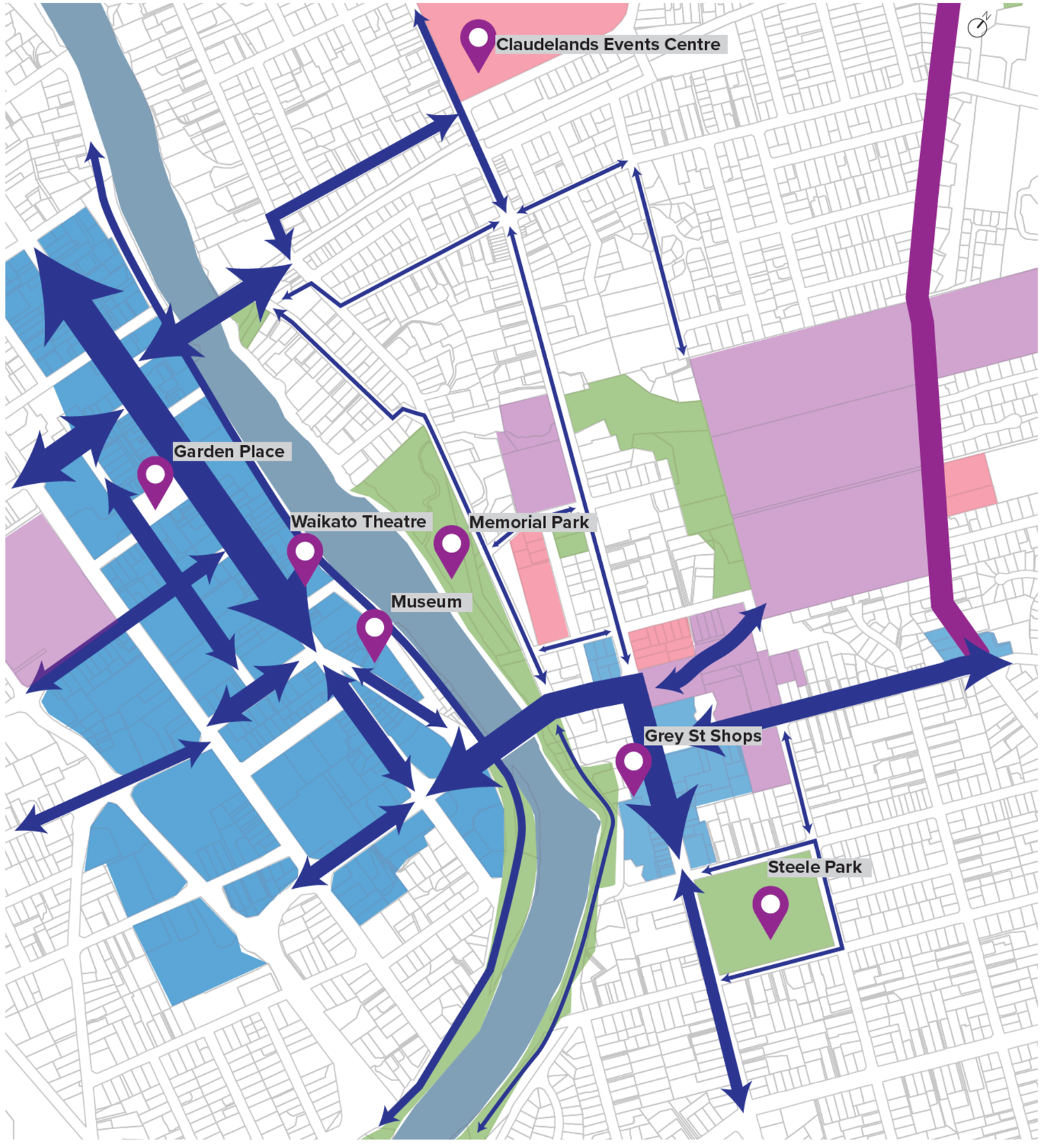
Scale 1:2500 @A3

CONNECTIVITY

Movement through the area

The movement and connectivity diagram shows important pedestrian and cycling routes and key destinations in the vicinity of the study area.

- Larger arrows indicate a higher level of movement.
- Narrower arrows indicate a lower level of movement.



Scale 1:2500 @A3

BRIDGE LOCATION OPTIONS: CONSIDERATIONS

Option 1: Victoria on the River
- High landing point.
- Will interfere with current function and use of Victoria on the River.
- Requires a very long bridge to span to Parana Park with significant level difference.
- Will require a connection up to Victoria Street, the current path adds complexity to the journey for cyclists and mobility impaired.

Option 2: Embassy Park
- High landing point.
- Requires a very long bridge to span to Parana Park.
- Connection between landing and Victoria street is difficult due to level difference between potential landing point and Victoria Street and the current arrangement of stairs/ ramps in Embassy Park.
- Embassy Park is narrow and deep, with some CPTED issues for connection to Victoria Street (This may be resolved through development of the Waikato Regional Theatre).

Option 3: Sapper Moore-Jones Place
- High landing point.
- Ability to use existing road connection, however, likely to need to treat Sapper Moore-Jones Place to provide a better pedestrian connection to Victoria Street.
- Will be back-of-house for theatre.
- Adjacent to Hua O Te Atua Urupa.
- Provides suitable connection to Memorial Park.

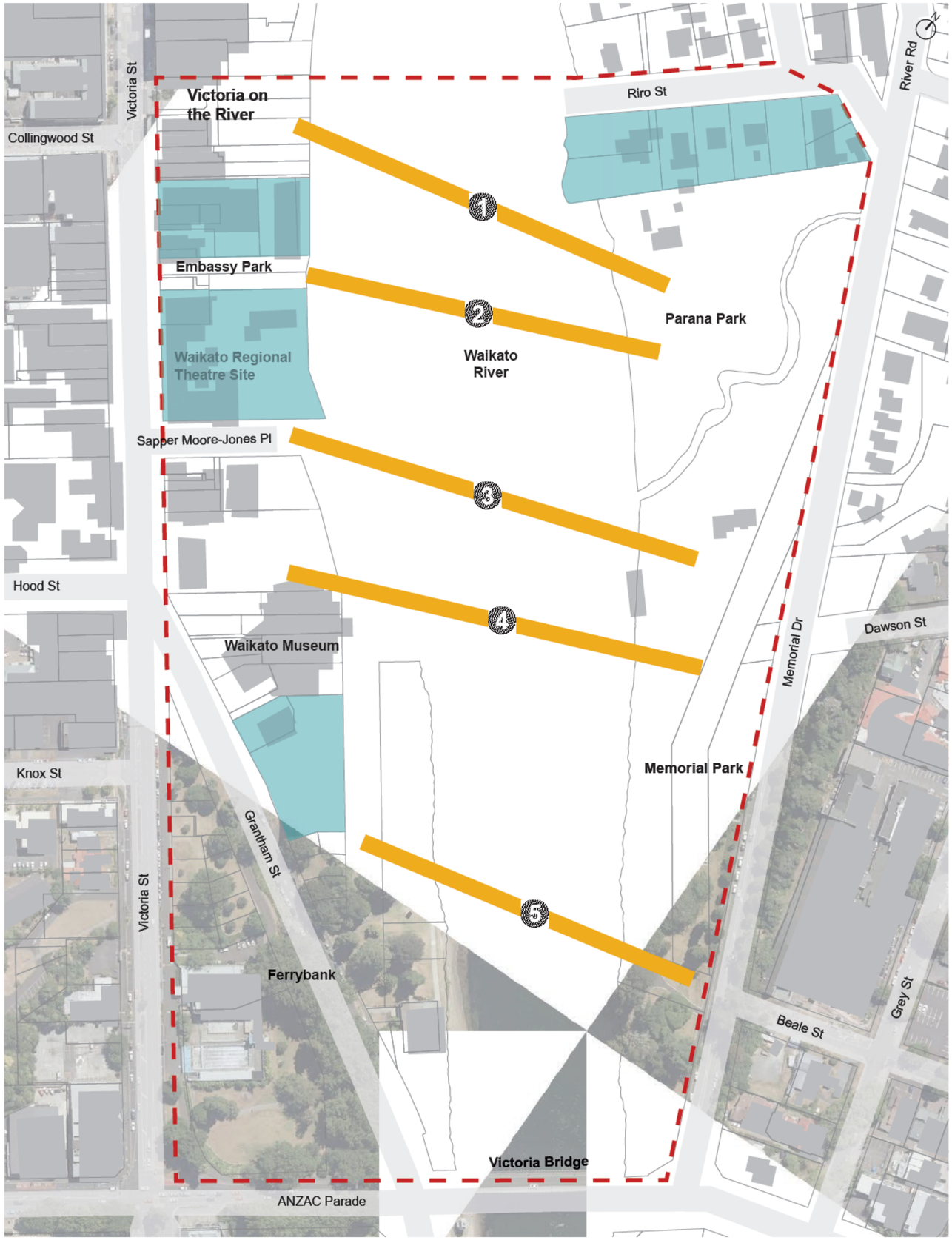
Option 4: Museum Carpark
- Initial landing is achievable, however an additional structure will need to provide access to museum forecourt to tie into the central city to avoid the need to go up the current vehicle access to the carpark.
- Will need work to museum forecourt to create a good connection to central city.
- Provides suitable connection to Memorial Park.

Option 5: Ferrybank
- Ties in south of the city and down the Grantham Street hill, requiring access up the slope.
- Does not provide a direct connection to central city so would need to tie in as far up Grantham as possible.
- Is close to Victoria Bridge.
- To connect to the bottom of Beale Street would require a high structure starting from a lower landing in Ferrybank.

General
- It is assumed that all options would have piers adjacent to waters edge / at edge of banks.
- It is assumed that all options would have similar geotechincal risk profiles.

KEY:

- Study Area
- Building
- Road
- Bridge Option
- Private Ownership



Scale 1:2500 @A3