

MINISTERIAL BRIEFING NOTE

Subject	Northern Pathway Project Update
Date	14 April 2021
Briefing number	BRI-2118

Contact(s) for telephone discussion (if required)				
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Action taken by Office of the Minister

- Noted
- Seen by Minister
- Agreed
- Feedback provided
- Forwarded to
- Needs change [please specify]
- Withdrawn
- Overtaken by events

14 April 2021

Minister of Finance

Minister of Transport

NORTHERN PATHWAY PROJECT UPDATE

Purpose

1. This briefing provides you with an update on the Westhaven to Akoranga section of the Northern Pathway project, following the Waka Kotahi NZ Transport Agency Board being presented with a preferred option at its 25 March 2021 meeting.

Walking and cycling connection across the Waitematā Harbour

2. The Northern Pathway shared user path is the critical missing strategic link in the Auckland active modes network. It would connect the north shore of Auckland with the central isthmus, linking the extensive active mode investment already made by Waka Kotahi and Auckland Transport on either side of the harbour and providing transport, environmental, and user health benefits.
3. Over 2.5 million¹ users a year are forecast to cross the harbour (1.5 million of whom will be cyclists) with a harbour connection in place, with sensitivity tests showing up to 3.2 million trips a year could occur. By 2048, there will be over 180,000 jobs and 130,000 homes predicted to be located within the project's catchment area.
4. Suburbs north of Takapuna would be within 30mins of the CBD by e-bike, increasing the catchment for employment within 30 mins of travel by bike by 60 percent. These forecasts are conservative given the uptake of e-bikes and micro-mobility technology continues to occur at rates faster than predicted.
5. The connection will link the \$300-400 million of planned and delivered strategic cycling infrastructure delivered over the last decade, providing a step change in mode choice for the region and enabling users to ride from Takapuna (and ultimately Albany) through to the Airport, Westgate and Eastern suburbs on dedicated cycling facilities.
6. Not only would this project be transformational for commuters, there is a significant recreational and tourist opportunity as well given the proximity to the CBD and the link to Takapuna. Similar projects around the world have comparable demands:
 - Sydney Harbour Bridge: 3,500 pedestrians and 1,750 cyclists a day
 - Golden Gate Bridge: 5,500 pedestrians and 4,000 cyclists a day.

¹ Forecast in 2048

Waka Kotahi Board meeting – December 2020

7. In December 2020, the Waka Kotahi Board was advised that through the Northern Pathway design development process (including design work and additional wind and geotechnical testing) it has become apparent that the risk to the existing bridge by adding any further structural element (including the proposed walking and cycling path) is unacceptable to the ongoing operation and resilience of the structure. The relevant Board Paper is attached in full as Attachment 1.
8. The Board was advised that alternative options have therefore been considered to deliver the outcomes; some of which are feasible and others which are not.
9. The feasible options include:
 - a) **A short-term Operational Option (i.e. a ferry):** With a budget of around \$60 million, a ferry would be relatively quick to implement; however, it is not a walking and cycling connection. It also has some consenting challenges and a high operating cost of around \$5-10 million per annum.
 - b) **A new separate structure for walking and cycling:** Would deliver a high-quality walking and cycling connection across the harbor, providing resilience benefits and completing a strategic missing link in the Auckland walking and cycling network. However, there would be consenting challenges, and it would take around 4-5 years to become operational and would come at a significant cost.
 - c) **A new structure for multiple modes:** Could deliver public transport, road benefits and resilience. It would take an estimated seven years to be operational. It has a considerable consenting risk and significant cost. This would be accelerating considerable investment in this corridor ahead of other areas of the transport system, with long-term investment in an additional Waitemātā Harbour crossing still required in the future.
10. The following three options were ruled out as not feasible:
 - a) **SkyPath:** Engineering reviews of the original lightweight carbon fibre SkyPath project, consented in 2016, identified that the design does not meet the current loading standards and would require exemptions from the bridge manual. Loading restrictions would be required from opening day, with the possibility of no pedestrian loads in the future.
 - b) **The previous Northern Pathway option attached to the existing bridge:** A truss / pier supported option is not considered feasible due to the impact on the resilience of the existing structure, load management, constructability concerns and poor user experience.
 - c) **Using lanes on the existing bridge:** Using existing lanes in the short term, (replacing two current lanes with walking and cycling), would reduce the bridges' peak hour capacity by 20-40 percent, significantly impacting the performance of buses and have a number of operational challenges (see Appendix 1).

11. The update also noted to the Board that the work done to date on the Additional Waitematā Harbour Crossing Business Case assumes that a walking and cycling link across the existing bridge structure is in place.

12. After considering the above, the Board resolved that:

'they were committed to a walking and cycling option, but that it should not be at any cost. Given the engineering risks, the Board's view was that no new structure should be attached to the existing bridge. They encouraged Management to investigate innovative short and medium options for walking and cycling options (separately to consideration of any alternative crossing options to resolve resilience concerns).'

Options analysis

13. Since December 2020, the project team has been subsequently developing alternative options for providing an active mode link across the Waitematā Harbour. This has considered a wide range of options, including both structural and non-structural, and various alignments and forms of a crossing. These were presented to the Board at their March 2021 meeting (Attachment 2).

14. From the initial long listing process the following options were shortlisted:

- a) Structural – New bridge at the full navigational height
- b) Structural – New bridge at mid-height
- c) Structural – New bridge at mid-height with opening span in centre
- d) Structural – Gondola
- e) Non-Structural – Dedicated ferry solution
- f) Non-Structural – Dedicated bus-based solution.

15. Appendix 2 provides a summary of the key aspects of each shortlisted option. The option of using the existing lanes on the bridge was not shortlisted.

16. Based on an assessment of these short-listed options, the following conclusions have been drawn:

- a) Neither of the two non-structural options represent an acceptable long-term solution as they are unlikely to meet the outcomes sought. The need to transfer to another mode will reduce user attractiveness and therefore reduce the ability of these solutions to meet the forecast demand. In the short term however, these options do provide potential merit to provide an immediate connection across the harbour whilst awaiting the long-term solution.
- b) The Gondola option could provide wider benefits (increased recreational and tourist trips); however, there are concerns with the lower level of service for users and the need to transfer to another mode. The Gondola option also has the highest approvals risk of the shortlisted options and carries a significant cost (including CAPEX and OPEX).

- c) The mid-height structural option would restrict large boats such as the Chelsea Sugar ships or naval vessels from passing under the bridge, while only offering a relatively small cost saving, so is not considered appropriate. A mid-height option with an opening centre addresses the adverse impact of reduced navigation under the bridge; however, it comes at a cost premium that is three times that of a fixed span.
- d) The full-height bridge option is the best performing long-term solution as it provides a dedicated 24/7 cross harbour connection, a high level of amenity for users and can meet forecasted demand (with scope for further growth in demand). A potential version of this solution could include a mid-high-mid double deck truss bridge with full height navigational clearance.

Recommended Option: Full-height bridge

- 17. The preferred option endorsed by the Board is a full height bridge option, with a recommendation to consider an interim operational option until the long-term solution can be implemented.
- 18. The full height structural bridge option has an estimated P50 cost of \$650-\$715 million, depending on design, with a P95 of \$715-\$785 million.
- 19. This solution would take in the order of five years to be operational (including consenting and design development), which is two years later than outlined in the NZ Upgrade Programme Establishment Report.
- 20. The cost of a new structural component of the project is higher than originally proposed; however, the project has focussed on both minimising project costs and maximising outcomes that can be delivered for users. Options exist to optimise the design, for example the width can increase from 5.5 to 9.2 metres at only 10 percent additional cost.
- 21. Additional funding would be required to deliver the preferred option given the current funding allocation within NZ Upgrade Programme for this project. This funding gap, \$290-\$375 million (at P50), would require either savings to be found from across the NZ Upgrade Programme or through additional Crown investment.
- 22. With a continued focus on outcomes, given the five-year implementation window, we have also considered the option of providing an interim operational option. This would provide a strong message to users that this link is important and enable early mode shift growth.
- 23. Work is underway to further investigate the viability of an interim operational option, such as a dedicated bus or ferry service. Initial indications are that implementing a service would take 6-12 months and require an initial capital investment of \$30-\$58 million (depending on which option is implemented), with an annual operation cost of \$6 million.
- 24. Assessing the project against the current Investment Decision Management Framework (IDMF) shows the value of the project, with the highest rating against the GPS Alignment (Very High) and Schedule (High) criteria. This is due to the mode shift, reduced emissions and completion of a strategically important link characteristics of the project.

25. The Benefit Cost Ratio (BCR) is currently assessed as being 0.4-0.6. The BCR is based on the benefits calculated in the 2019 SSBC for the Northern Pathway project, and on the updated costs. The BCR therefore does not take into account of the most recent changes and benefits of the preferred option.

Risks

26. As with all options there are risks. The main risks associated with the preferred option include:
- a) Partner and Stakeholder Engagement: This is a significant project in the Auckland landscape and will attract strong views and perspectives from partners (such as Iwi and Council) and the wider community. This is a risk that delays or increases the cost of the project if not managed appropriately.
 - b) Materials: This is a significant structure and materials availability of specialist skills and materials is a risk in the current COVID environment.
 - c) Statutory Approvals: A project of this significance is not without approvals risks during the consenting phase. For this option, these include visual impacts, impacts on the harbour (ecological predominantly) and Iwi implications (particularly the Pa site on the northern landing).

Next Steps

27. Subject to Joint Ministers' agreement, with the identification of the preferred solution which has now been endorsed by the Waka Kotahi Board, the following is proposed:
- a) Waka Kotahi is to engage with joint Ministers in order to confirm funding arrangements for the preferred option, via further advice.
 - b) We will then undertake the development of a design for the entire project that will confirm the crossing's exact form (structural and architectural) and the amenity outcomes which will be delivered for users, including obtaining the necessary consents for the long-term structure.
 - c) We will investigate the viability of an interim operational option (bus or ferry type solution) whilst the detailed design and construction is underway on the long-term structure.
 - d) Finally, Waka Kotahi will engage with stakeholders and the community throughout the above steps to build support for the project and understand community concerns.

It is recommended that you:

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| 1. Note the contents of this briefing | Yes / No |
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Brett Gliddon

General Manager, Transport Services

Date: 14 April 2021

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Hon Grant Robertson, Minister of Finance

Date:

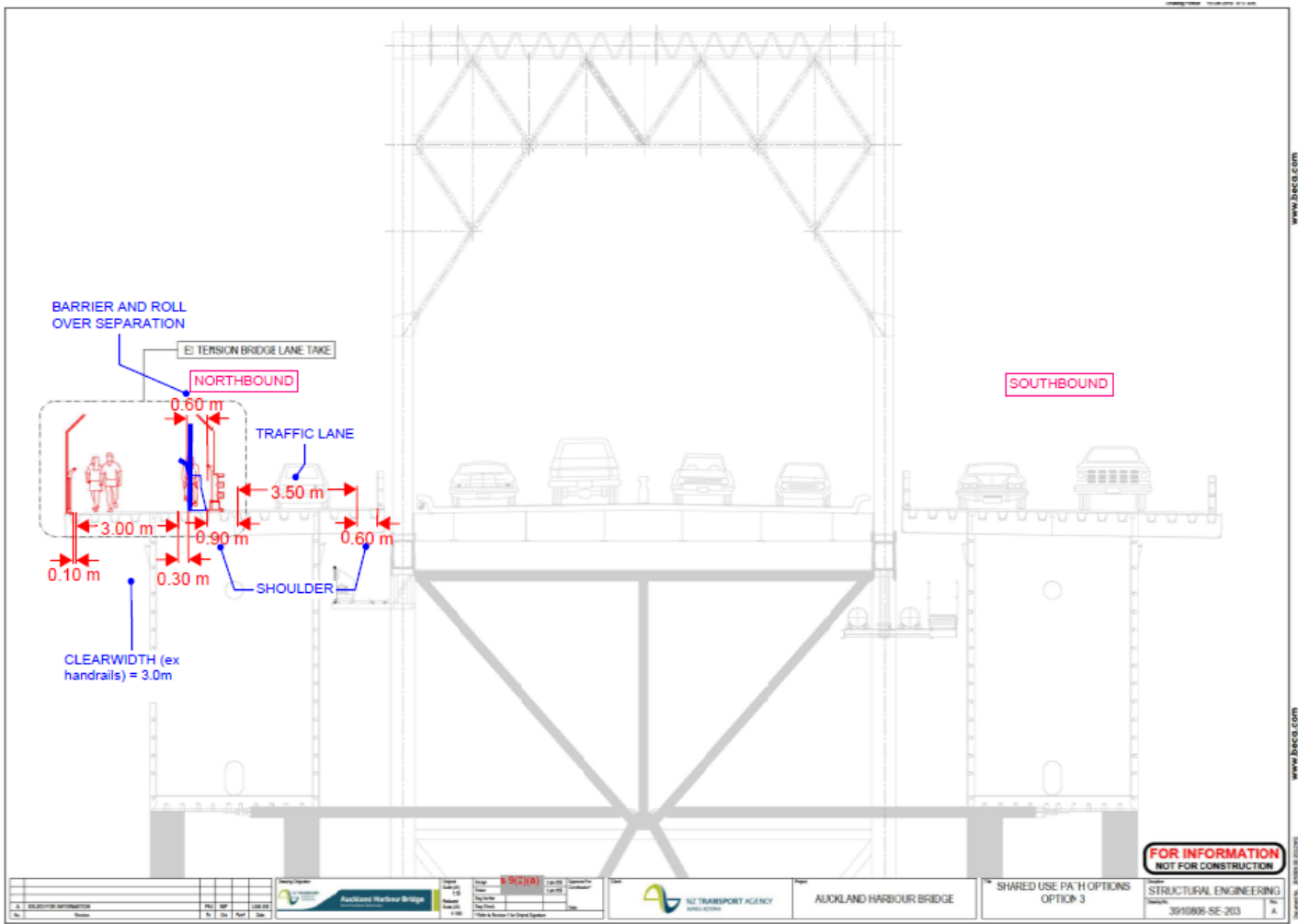
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Hon Michael Wood, Minister of Transport

Date:

Appendix 1: Rationale for not using lanes on the existing bridge

To safely provide a facility using the existing bridge, two lanes of the existing bridge would be required. Two lanes are required as a single lane would provide less than 3m for a walking and cycling path once safety barriers, gradients and shoulders were taken into account.

Figure 1: Cross section of the existing bridge



The forecasted volumes, speed differential of different users and gradients of the bridge do not meet the required standards and would carry significant safety risks. There would also be implications to the operation and performance of the existing users of the bridge, including public transport and freight.

Using present day volumes (and assuming the resultant lane arrangement on the bridge would be three lanes in each direction at all times), taking two lanes out to provide for walking and cycling across the harbour would:

- e) Result in current demand exceeding the reduced available capacity (three lanes in each direction) from 5am to 8pm on an average weekday. This excludes any allowance for growth (which is forecast).

- f) Increase the levels of congestion on the bridge (as a result of any lane reallocation) which would have a disproportionate impact on the performance of the busway as currently the busway has priority up to the bridge and not on the bridge itself (as it is not needed), however the bridge would become the constraint in the network, adversely impacting the performance of the entire busway.
- g) Have considerable impact on the operation of the wider strategic transport system. It is important to note that the network either side of the bridge is a constraint in the network, and not the bridge itself. Therefore, reducing capacity on the bridge would result in the bridge becoming the constraint in the network. This would have far reaching ramifications for the transport system, as was seen in the recent bridge strike of the Harbour Bridge which resulted in the wider transport system being put under considerable strain, including public transport and freight operations.

Appendix 2: Assessment of shortlisted options

Option	Details	Positives	Challenges
Ferry	<ul style="list-style-type: none"> • This option would provide a dedicated ferry for active mode users across the harbour from the existing Northcote terminal to the existing Wynyard terminal • Assumed to operate 6am to 12am daily on a dedicated shuttle system (approx. 15 min frequency) • Capital investment of \$58M for terminal upgrades and Ferries is required, along with an annual OPEX of \$6M pa • Programme: Implementation is forecast to take approximately around 24mths to procure the Ferries 	<ul style="list-style-type: none"> • Low capital cost to implement • Scalable to meet demand as it changes (increases) over time • Makes use of existing infrastructure 	<ul style="list-style-type: none"> • Operational challenges in providing sufficient capacity (berthing) for forecast demand • Operational complexity with running in parallel with existing (paid ferry service) • Some capital works required at Northcote wharf to accommodate additional ferry's • Requires transfer for users, providing a lesser user experience
Bus	<ul style="list-style-type: none"> • Scope: This option would provide a dedicated bus for active mode users across the harbour, with two options considered: <ul style="list-style-type: none"> ○ Long Option – Smales/Akoranga to Wynyard ○ Short Option – Stafford Rd to Curran Street • Assumed to operate 6am to 12am daily on a dedicated shuttle system (approx. 10 min frequency) • Capital investment of \$30M for terminal upgrades and Buses is required, along with an annual OPEX of \$6M pa 	<ul style="list-style-type: none"> • Low capital cost to implement • Scalable to meet demand as it changes (increases) over time • Makes use of existing infrastructure 	<ul style="list-style-type: none"> • Operational challenges in providing sufficient capacity (city end bus stop capacity) for forecast demand • Operational complexity with running in parallel with existing (paid bus service) • Some capital works required at drop off and pick up locations • Requires transfer for users, providing a lesser user experience

	<ul style="list-style-type: none"> Implementation is forecast to take approximately 6-12mths to procure the specific buses, consenting risks are not considered 		
Bridge: Same Height	<ul style="list-style-type: none"> Dedicated structure at the same navigational clearance of the existing bridge. Options of the structure were estimated as part of this option, including: <ul style="list-style-type: none"> 5.5, 7.6 and 9m width Mid-high-mid double deck truss form Capital investment of \$650-\$735M, (from and width dependent) Programme: Implementation is forecast to take approximately 5 years from approvals to implementation 	<ul style="list-style-type: none"> Consistent with NZUP scope as originally proposed Provides a continuous and permanent connections across the harbour 24/7 Delivers the outcomes sought for the project 	<ul style="list-style-type: none"> Takes five years to implement, Capital cost is in the order of twice the current Establishment Report budget for the project
Bridge: Mid Height Fixed	<ul style="list-style-type: none"> Dedicated structure at the height of the lower truss member of the existing bridge (24m above mean water line). Capital investment of \$650-\$730M, depending on the cross section Implementation is forecast to take approximately 5 years from approvals to implementation 	<ul style="list-style-type: none"> Consistent with NZUP scope as originally proposed Provides a continuous and permanent connections across the harbour 24/7 Delivers the outcomes sought for the project Lower height provides enhanced user experience (reduced gradients) 	<ul style="list-style-type: none"> Takes five years to implement, Capital cost is in the order of twice the current Establishment Report budget for the project Lower height restricts current type of vessels that can go under the bridge
Bridge: Mid Height with middle opening	<ul style="list-style-type: none"> Dedicated structure at the height of the lower truss member of the existing bridge (24m above mean water line) till the centre span, then an opening the middle (to allow full height vessels to go through as required). Additional piers (to the number of the existing structure) to narrow 'opening' section to approximately 100m. Capital investment of \$750-\$830M, depending on the cross section, in the 	<ul style="list-style-type: none"> Consistent with NZUP scope as originally proposed Provides a continuous and permanent connections across the harbour 24/7 Delivers the outcomes sought for the project Lower height provides enhanced user experience (reduced gradients) 	<ul style="list-style-type: none"> Takes five years to implement Capital cost is in the order of twice the current Establishment Report budget for the project Opening structure a further \$100M. Two additional piers required into the harbour (compared to other structure options)

	<p>order of \$100M more for the opening element</p> <ul style="list-style-type: none"> Implementation is forecast to take approximately 5 years from approvals to implementation 		
Gondola	<ul style="list-style-type: none"> This option would provide a Gondola for active mode users across the harbour from Northcote to Westhaven Assumed to operate 6am to 12am daily Capital investment similar to the bridge options is required, along with an annual OPEX of approximately \$5M pa Implementation is forecast to take approximately 3 years to complete 	<ul style="list-style-type: none"> Scalable to meet demand as it changes (increases) over time High capacity Opportunity for increased tourist trips Less intrusion into the seabed compared to bridge options 	<ul style="list-style-type: none"> Operational complexity with running in parallel with existing (paid ferry service) Requires transfer for users, providing a lesser user experience Statutory approvals carries risk with scale of landings at either end of the option. Cost is the same order of magnitude as the bridge options

Attachment 1: Northern Pathway presentation to December 2020 Board Meeting

Attachment 2: Northern Pathway presentation to March 2021 Board Meeting