

MINISTERIAL BRIEFING NOTE

Subject	Additional Waitematā Harbour Crossing – Route Protection for a Multi-modal Transport Corridor
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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- Withdrawn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

22 February 2018

Minister of Transport

Additional Waitematā Harbour Crossing – Route Protection for a Multi-Modal Transport Corridor

Purpose

1. This briefing provides an update on the Additional Waitematā Harbour Crossing (AWHC) project and in particular, its function in protecting a route for a multi-modal (rail and road) corridor across the Waitematā Harbour.

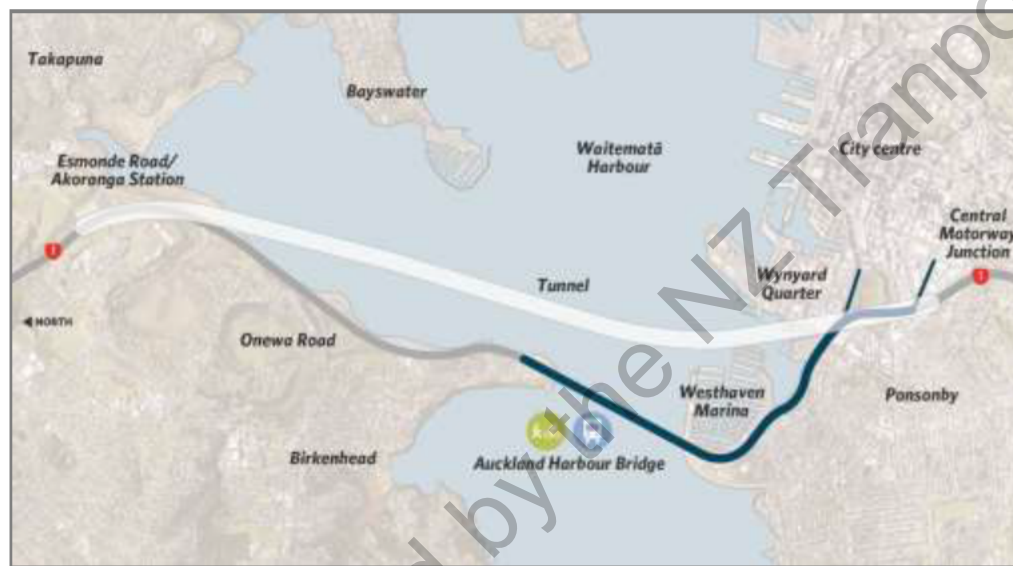
Context

2. The NZ Transport Agency and KiwiRail are currently preparing to lodge Notices of Requirement and an application for coastal occupation consent to protect for a multi-modal transport corridor across the Waitematā Harbour.
3. A multi-modal transport corridor across the Waitematā Harbour is needed to connect the North Shore with Auckland's future Rapid Transit Network (RTN), improve the resilience of the wider transport system, which is currently limited by reliance on the Auckland Harbour Bridge, and increase accessibility to growth areas, particularly in North Auckland.
4. The Auckland Harbour Bridge provides the only direct 'cross-harbour' road link between Auckland's city centre and the North Shore, and the number of heavy vehicles using the bridge is steadily increasing. The structural capacity of the Auckland Harbour Bridge has been maximised, and with projected growth, future restrictions for heavy vehicles are likely to be required in the absence of an additional crossing.
5. Route protection is the first of many project stages and provides long-term planning certainty, particularly in areas where there is development pressure. The Auckland Unitary Plan provides new opportunities for intensive development with considerable residential, commercial and recreational development planned on both sides of the Waitematā Harbour. Route protection clearly signals to property owners, businesses and the community where the multi-modal crossing will be located and enables more certainty and direction for future land use and planning decisions.
6. Under the 2016 Auckland Transport Alignment Project (ATAP), the AWHC is currently programmed for the third decade (2038–2048). However, the public transport mode share across the harbour is increasing and the Auckland Transport North Shore Rapid Transit Network Strategic Case (2016) indicates that additional cross harbour public transport capacity may be needed sooner than outlined by ATAP in order to meet projected travel demand beyond the current operational capacity of the busway.
7. The expected growth in the north may also require a higher capacity transit system. The ATAP and 2017 Auckland Transport North Shore Rapid Transit Programme Business Case (AT PBC) have recognised that projected growth may also require a heavy rail crossing of the Waitematā Harbour in the long term, beyond 2050.

The AWHC Route Protection Concept

8. The current intended form of the AWHC project is combined tunnels, comprising a rail link from the Akoranga Bus Station/Esmonde Road area to the Wynyard Quarter area, with the road component connecting the Northern Motorway at Esmonde Road and the Central Motorway Junction (CMJ) (see high level overview and cross-section of the tunnel crossing concept in Figures 1 and 2 below).
9. The operation of the Auckland Harbour Bridge will be reconfigured to provide city centre connections at Shelly Beach Road/Curran Street, Fanshawe and Cook Streets. The anticipated reduced traffic demand on the Auckland Harbour Bridge will mean that space can be reallocated to other modes such as walking, cycling, buses and high occupancy vehicles.

Figure 1 High level overview of combined rail and road tunnel crossing



10. The AWHC transport function is a multi-modal transport corridor, that can accommodate either light or heavy rail (or emerging future transport technology, such as advanced buses), and road vehicles.

Figure 2 Cross-section of the combined rail and road tunnel crossing concept



11. The rail designations (AWHC landward sections) and coastal occupation consent (AWHC harbour section) will provide an opportunity for a rail link across the harbour and will be able to connect to a range of potential rail networks. The designation footprint has sufficient space for stations to be located at each end of the rail link if needed. An indicative design has been prepared for heavy rail as both light and heavy rail could be accommodated within its footprint.

12. Rail connections to future light and heavy rail networks on either side of the harbour are anticipated. Connections to these wider RTN networks can extend from the AWHC tunnels to Takapuna and Albany (and beyond) in the north, and to Britomart and Aotea Stations (and beyond) on the southern side (please see concept below in Figures 3 and 4).
13. Accordingly, protection of the AWHC route on its current alignment will provide for a multi-modal cross-harbour transport connection, which has the flexibility to accommodate emerging RTN plans as they are finalised.

Figure 3 North Shore – Potential connection points for the multi-modal transport crossing

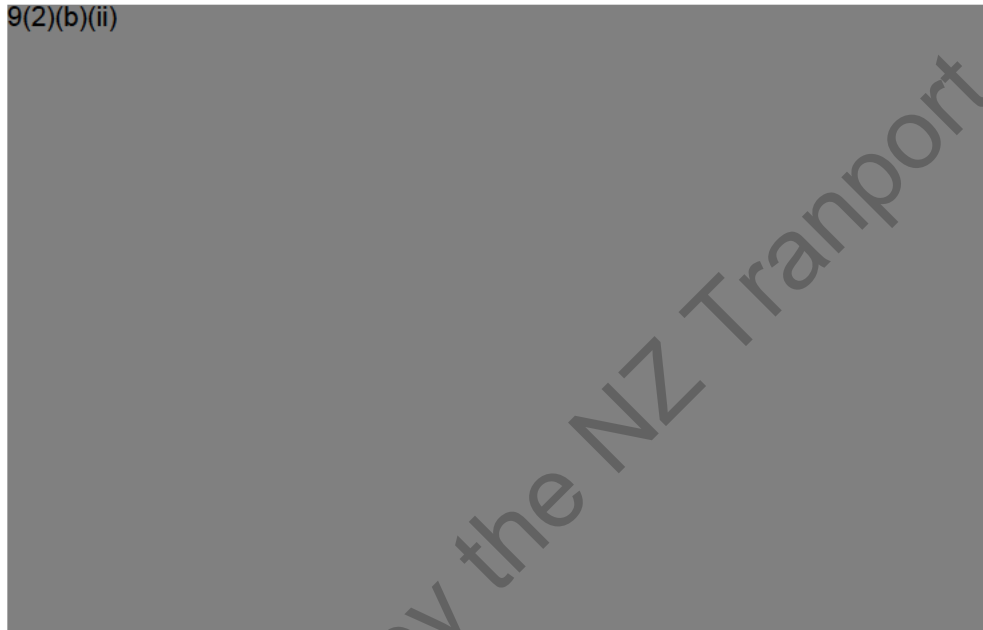


Figure 4 City Centre – Potential connection points for the multi-modal transport crossing



Previous studies

AWHC Function (Multi-modal transport corridor)

14. Detailed studies and investigations over the past decade have determined that combined rail and road tunnels across the Waitematā Harbour between Esmonde Road on the North Shore, and Wynyard Quarter and the CMJ in the city centre, would best meet Auckland's growing demands and strengthen the resilience of the wider transport network.
15. In 2008, the Waitematā Harbour Crossing Study, a joint investigation by Transit New Zealand and Auckland's local authorities (including Auckland Regional Transport Authority), assessed a possible 160 crossing options (including public transport and other modes) – refer to Figure 5 below. This study identified that a tunnel crossing, including both rail and road, located between Esmonde Road on the North Shore, and Victoria Park in the city centre, to be operated in conjunction with the existing Auckland Harbour Bridge, would be the optimal option for the additional crossing. This alignment has formed the basis of the current proposed route protection phase.
16. As part of the current route protection phase, a range of alternative crossing alignments, modes and forms have been considered. The rail-only options included bored tunnels and bridges on a variety of alignments (including a connection at Onewa Road), generally between Esmonde Road and Wynyard Quarter. Alignments were developed for a range of light rail and heavy rail options, including investigating connections to existing and potential future networks.

AWHC Form: Combined or Separate Tunnels vs Bridge

Why tunnels?

17. The preference for tunnels over a bridge arose from the AHC Form Assessment Study (2011). That study considered the comparative benefits and disadvantages of bridge and tunnel options for a road and rail crossing. The study ultimately recommended tunnels principally due to fewer environmental, land use and visual impacts.
18. In summary, the Form Assessment Study found that:
 - a. the whole-of-life cost of a tunnel would be greater than a bridge
 - b. both bridge and tunnel options had similar complexity and cost in relation to constructability
 - c. in terms of operability, a bridge would offer slightly greater network resilience, and
 - d. the consenting risk for a bridge was significantly higher.
19. The recommendation for a tunnel has since received public preference through the Auckland Plan (2012), and subsequent Cabinet endorsement (2013).
20. A separate rail bridge to Onewa Road was reconsidered as part of the 2017 AHC route protection alternatives assessment. A light rail crossing on a separate bridge has also recently been investigated as part of the AT PBC.

21. The 2017 AWHC route protection assessment did not favour a separate rail bridge option because of issues associated with:
- a. landing points and tie-ins with the existing/future RTN network and the existing State highway network
 - b. shipping/sailing access requirements, which mean that a bridge would not be suitable for heavy rail due to the shallower gradient requirements of that mode. While technically feasible, the effects of a bridge across the harbour (visual, environmental and shipping access) and on land (visual and land take) would be significant
 - c. significant cultural and environmental impacts (i.e. visual, reclamation and adverse effects on Westhaven Marina), and
 - d. separate road and rail crossings would be a less efficient use of natural and physical resources.
22. Ultimately, tunnels are preferred for network, cultural, and environmental reasons. Tunnels would also be suitable for both light and heavy rail, and for a multi-modal corridor.

Why combined tunnels?

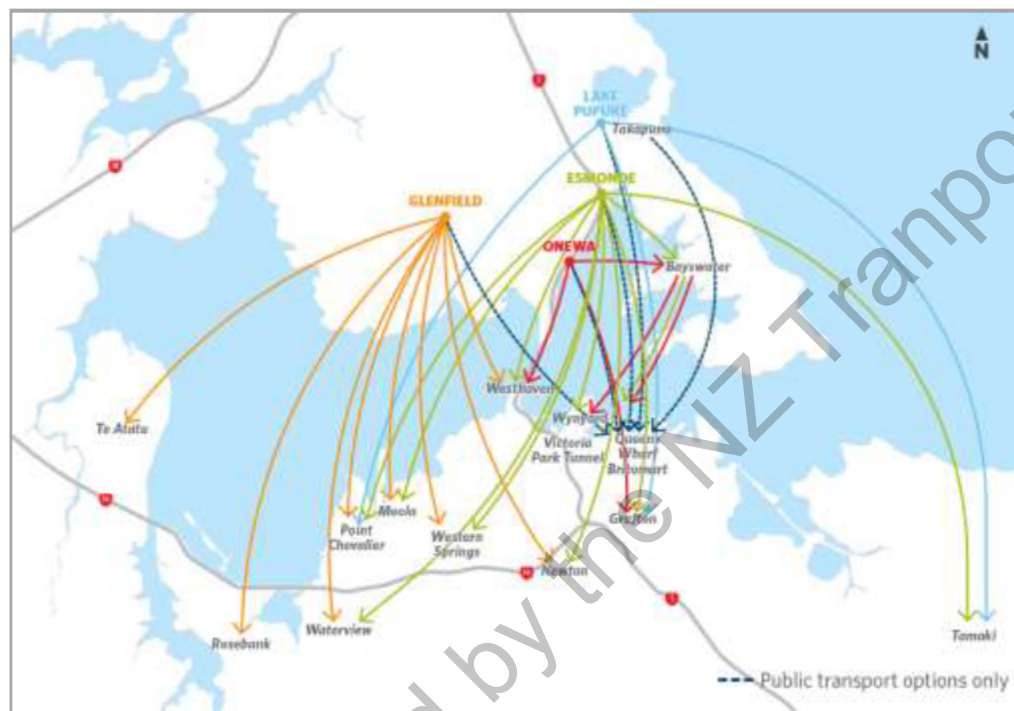
23. The 2012 Combined Tunnel Feasibility Study assessed and determined that combined road and rail tunnels would be feasible.
24. The main advantages of combined tunnels over separate tunnels include:
- a. an efficient use and development of natural and physical resources
 - b. less construction disruption by constructing both rail and road in the same corridor at the same time, and
 - c. adverse environmental effects would be concentrated in a comparatively small footprint.
25. A consideration of multi-modal combined bored tunnels is that rail stations immediately on each side of the crossing (if needed) will be deep underground, likely requiring passenger escalators and more complex operation and maintenance compared to at-grade light rail options. Underground stations are proposed for the Auckland City Rail Link including the Karangahape Road station which will be 32 metres deep, and comparable to an AWHC station located in the Wynyard area.
26. A combined tunnel concept is considered to achieve the required rail and road functionality. However, this does not preclude rail and road crossings being in two separate crossings (i.e. four tunnels) and being delivered in separate timeframes should this be needed in the future.

AWHC Alignment (comparing Northern connections at Esmonde Road and Onewa Road)

27. The proposed AWHC corridor runs from the Esmonde Road area in the north to the Wynyard Quarter area in the south, with the road component connecting further south into the Central Motorway Junction.

28. The AWHC alignment has been considered in detail over an extended 10-year period with hundreds of options considered as part of the 2008 Waitematā Harbour Crossing Study, and the 2016 and 2017 route protection alternatives assessment processes. The 2008 study identified the possibility of a connection point at Onewa Road. However, it was recognised that an Onewa Road connection would be challenging in terms of environmental, cultural and consenting matters, and would need to be justified in terms of travel demand.

Figure 5 2008 Waitematā Harbour Crossing Study - summary of the range of alignments considered



29. The recommendations of the 2008 option assessment were re-tested in 2016 as part of the alternatives assessment for route protection, and in 2017 specifically for rail. Both the 2016 and 2017 alternatives assessments re-confirmed that the Esmonde Road to Wynyard- Central Motorway Junction connection was the optimal alignment for a multi-modal transport corridor, which is compatible with both light and heavy rail, for the following reasons.


- The Akoranga/Esmonde Road area has specific transport network and performance advantages for rail over an Onewa Road connection because it avoids the existing capacity constraint of the State Highway 1 corridor between the Onewa and Esmonde interchanges.
- A tunnel to Esmonde Road enables shallower grades, as rail would not have to climb as steeply to reach the surface compared to a tunnel to Onewa Road. This results in better operational performance, especially for heavy rail.
- There is limited demand for a rail station at Onewa Road as this area can be well served by buses (as noted in the AT PBC) and considering the small 'walk-up' passenger catchment. A station at Onewa would require an interchange between buses and rail, which would not be attractive to passengers as the interchange time would likely negate any travel time savings for rail over buses. By comparison, Akoranga/Esmonde Road is located at an important junction between the upper North Shore, the Takapuna metropolitan centre and the City Centre, and a major interchange station at Akoranga enables connections between these three catchments.

30. Importantly, a connection and associated station at Onewa Road triggers significant environmental, cultural and consenting issues because there is insufficient space to accommodate the infrastructure within the motorway corridor. Accordingly, the State highway and RTN connection would need to navigate this “pinch point”, which in turn could necessitate significant reclamation of the harbour along the edge of the motorway, and/or excavation of the coastal cliffs (an outstanding natural feature).
31. By comparison, a rail connection at Esmonde Road carries a relatively low level of environmental, cultural and consenting risk for a project of this scale. There is sufficient land available in this area to create a well-designed and functionally efficient interchange station to adequately serve the needs of long distance and local bus and rail passengers.
32. For these reasons, the Esmonde Road connection was considered the optimal northern connection point.

Need to protect the route with urgency

33. The 2017 Auckland RTN Delivery Plan identifies the route protection of an additional harbour crossing as a key step to enabling a future northern light rail corridor and integration with the Airport to City LRT corridor, in line with the Government’s emerging RTN priorities. The timing for light rail to the North Shore is also proposed to be accelerated to the ATAP second decade (2028–2038).

34. 9(2)(g)(i)



35. The AWHC route protection work currently being undertaken by the NZ Transport Agency and KiwiRail broadly aligns with the AT PBC, as the AWHC multi-modal crossing would provide the ability to run light or heavy rail to the North Shore, connecting stations at Wynyard Quarter and Akoranga, and to networks on each side of the harbour. The need for a separate RTN crossing as promoted by the AT PBC is largely driven by the assumption that the AWHC project would not be delivered before the mid-2040’s (under ATAP the AWHC is currently programmed for the third decade), by which time the capacity of an enhanced busway is forecast to be severely exceeded by passenger demand.
36. The Auckland Harbour Bridge is currently experiencing increases in daily vehicular transport demand and future traffic projections indicate that restrictions for heavy vehicles on the Auckland Harbour Bridge may be required by approximately 2030 to ensure its longevity. These restrictions would significantly reduce level of service, resilience and reliability for heavy vehicles. This, combined with the need for RTN to/from the North Shore supports the need for the AWHC in the 2030s.

37. If the AWHC can be delivered by 2035, including either light rail or heavy rail, the need for a third crossing in addition to the Auckland Harbour Bridge and AWHC can potentially be avoided. AWHC could provide the required public transport capacity to meet the forecast demand using either:

- a. light rail (with potential need for heavy rail much later), or
- b. heavy rail from the outset, enabling the continued use of the Northern Busway.

38. The AWHC route protection would enable either scenario to proceed in the future, and does not preclude rail and road being in separate tunnels and being delivered in separate timeframes. However, the construction of the combined tunnel infrastructure at the same time would have significantly fewer environmental effects and land requirements than the sequential construction of separate tunnels.

Route protection

39. The next phase for AWHC will ensure the required route across the Waitematā Harbour is protected and provide planning certainty for Auckland. There is also ongoing development pressure within and in the vicinity of the AWHC footprint that is likely to make it more challenging to secure designations in the future.

40. The route protection designations will provide flexibility for the future harbour crossing as they can accommodate either light or heavy rail, and they will not preclude rail and road being delivered in separate tunnels at separate times. Route protection is not intended to finalise these details. The timing, network planning, design and how the crossing will work will continue to be refined through future project phases.

It is recommended that you:

- 1. **Note** the contents of this briefing.



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Hon Phil Twyford, Minister of Transport

Date: February 2018