



Feasibility of Constructing Another Waitemata Harbour Crossing



I. Summary

The Auckland Regional Land Transport Strategy tasks Transit New Zealand, in partnership with the Auckland Regional Council, North Shore City Council and Auckland City Council, to:

- ‘Plan for and protect the ability to construct an additional road crossing of the Waitemata Harbour in the vicinity of the existing Auckland Harbour Bridge, and connecting directly to the Northwestern Motorway-State Highway 20 extension by way of a tunnel, and protect the right of way.’
- ‘Plan for and protect the ability to implement a passenger transport connection between North Shore and Auckland Cities across the Waitemata Harbour and connections to the south of the Central Business District (CBD).’
- ‘Ensure that any additional cross-Waitemata Harbour capacity includes provision for walking and cycling.’

The first part of the task was to determine if it was possible to construct these links in the vicinity of the Auckland Harbour Bridge. Now that this is completed, the issue of the location of a future additional crossing of the Waitemata Harbour will be reviewed by the Regional Land Transport Committee.

The objective of the study was to find answers to the following questions. *If a new crossing or crossings are to*

be constructed in the vicinity of the existing harbour bridge in accordance with the RLTS:

1. *Is it practical to construct the crossing(s)?*
2. *What are the alignment options?*
3. *What are the options for the form of crossing(s)?*
4. *What are the possible environmental impacts, construction issues, risks and preliminary costs for different crossing forms and alignments?*

This brochure presents the findings of the study.

As the main focus was on the technical issues, public consultation was not part of the study. Wide public consultation is planned in the subsequent phases of the study in the next 2-3 years.

On the issue of constructability associated with a new Waitemata Harbour crossing in the vicinity of the existing Auckland Harbour Bridge, the study shows:

- **For bridge options, Option 0A** - a separate bridge 500m west of the existing harbour bridge, is preferred to other bridge options considered in the study. This bridge option has the least impact on Northcote Point compared with the other bridge options. Because it is separated from the existing bridge by 500m, Option 0A has fewer constraints to enable easier construction. It also presents an opportunity for modern design.
- **For tunnel options, Option V** - an immersed-tube tunnel under the harbour to near the cement silos on the Western Reclamation, is preferred to other tunnel

options considered in the study. Apart from improving CBD access, this tunnel option also provides good network management by separating CBD and through traffic on State Highway 1 and connecting to the port and State Highway 16.



Figure 1. Preferred Bridge Option - Option 0A



Figure 2. Preferred Tunnel Option - Option V

The additional crossing will have major construction impacts for either bridge and/or tunnels due to its metropolitan location.

Busway or light rail transit could be provided either on the existing bridge or the new bridge or tunnel. A decision on the long-term form of passenger transport between Auckland and the North Shore is seen as very desirable to the selection of any crossing form and location.

Pedestrian and cycle facilities need to be provided either on a new bridge or on the existing bridge. They are not suitable in a tunnel for health and safety reasons.

Further investigations will be required in the next 2-3 years to identify the preferred options and support the planning process in the subsequent phases. These investigations include:

- transportation modelling
- more detailed preliminary design
- economic assessment
- social impacts through studies and consultation with all interested parties
- more detailed preliminary environmental studies.

It is a lengthy process (13-16 years) to plan for and construct the crossing. Transit and ARC consider that this is the right time to begin the process.

2. Auckland – a growing region

The Auckland region is the biggest economic centre in New Zealand, accounting for around one third of the nation’s economic output. It also has the fastest population growth rate in the country.

The current population for the Auckland region is nearly 1.2 million people. Projections suggest that, by 2050, the region could have 2 million people.

The North Sector of the region is expected to have 443,000 people by 2050. North Shore City accounts for 66% of this population in 2050 and is on track to achieve the predicted population.



Figure 3. Region Growth – Sector Divisions

This growth places a significant demand on Auckland’s north-south transportation capacity.

The Regional Growth Forum, a partnership between Auckland’s local and regional authorities, recognises the need to improve transportation capacity and has made an effective transport system a key component of the Regional Growth Strategy (RGS). A key tool for the implementation of the RGS is the RLTS, which has been prepared for the Auckland Region by the Regional Land Transport Committee (RLTC), pursuant to the provisions of the Land Transport Act 1998.

With the state highway network being the backbone of the Auckland regional road network to provide inter-regional transport connectivity, Transit has a significant role in improving north-south accessibility under the Regional Land Transport Strategy.

3. Existing Auckland Harbour Bridge

The effective operation of Auckland’s regional transport network is limited by the capacity of the north-south corridor. The reliance on the Auckland Harbour Bridge also poses a significant risk to the functionality of the network. Although a number of projects, such as the Upper Harbour Motorway and State Highway 20 extensions (being part of the Western Ring Route), are underway to assist the north-south accessibility, heavy reliance on the Auckland Harbour Bridge remains.

The Auckland Harbour Bridge had an annual average daily traffic count of 155,000 vehicles per day in 2002, and already operates almost at capacity in peak periods.

4. What has been done in the past

The Auckland Regional Council (ARC) and its predecessor the Auckland Regional Authority (ARA), have made a significant contribution to the investigation of north-south accessibility improvement options.

In 1987/88, the ARA commissioned the Ministry of Works and Development to investigate the provision of additional capacity across the Waitemata Harbour.

The study was part of the ARA's *Auckland Comprehensive Transportation Study Update* – an ongoing process of planning for the region's transportation needs. The study examined the feasibility and costs of road and public transport routes between the Auckland CBD and the North Shore.

In 1997, the ARC commissioned an investigation to identify and evaluate options for an additional harbour crossing. A total of 14 corridors with 48 options for a new harbour crossing were studied. In 1998, the final report on these options was distributed by the RLTC for public comment as part of the wider draft of the 1999 RLTS. A sub-committee of the RLTC considered all the submissions (more than 2,500 submissions were received), conducted

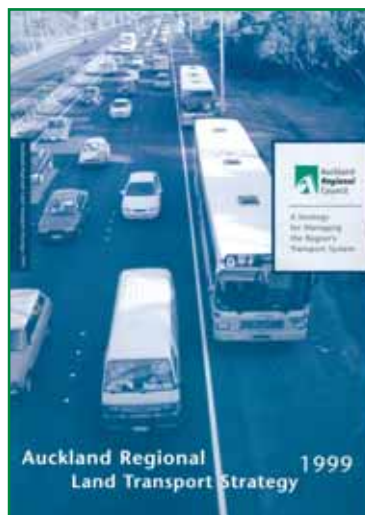


Figure 4. 1999 RLTS

public hearings for those parties who wished to present their submissions and deliberated on the outcome.

Most submissions were from people or organisations potentially adversely affected by one or other of the crossing options. The sub-committee believed that the best crossing option, which would minimise community and environmental costs, would be situated in the vicinity of the present harbour bridge. The new harbour crossing would take the form of either a bridge or tunnel, and connect directly to the Northwestern Motorway and the extension of State Highway 20 to the Northwestern Motorway by way of a tunnel. The recommendations on the harbour crossing were subsequently adopted in the 1999 RLTS and are retained in the 2003 RLTS.

Features of the crossing defined in the RLTS and addressed in the study are that:

- it should be in the vicinity of the existing bridge.
- it should connect directly to the Northwestern Motorway, via a tunnel, in the vicinity of Western Springs.
- connectivity to the south could be achieved by using the proposed Avondale and Mt Roskill extensions of SH20.

The RLTS also includes provisions to:

- plan for and protect the ability to implement a passenger transport connection between North Shore and Auckland Cities across the Waitemata Harbour and south.
- ensure that any additional cross-Waitemata Harbour capacity includes provision for walking and cycling.

The 1999 and 2003 RLTS identify a full package of transport improvement measures to provide better north-south accessibility while deferring the need for another road crossing of the Waitemata Harbour. One of the key measures is Bus Rapid Transit (BRT) which is part of the plan to develop an integrated public transport network for the Auckland region that aims to provide a comfortable, frequent and fast passenger transport service. Other improvement measures include education and behaviour-changing initiatives, promotion of teleworking and flexi-work hours, support for ride-sharing, introduction of parking restraints and support for pedestrians and cyclists.

However, the RLTS also acknowledges that while these measures are likely to be sufficient for the next 20 years, it cannot be concluded with confidence that another road crossing will not be needed in the longer term. It is therefore important to make provision for the long-term scenario.

A review of timings related to an additional harbour crossing is summarised below:

Indicative Time Periods

Planning (years)	5
Design (years)	2
Construction (years)	6-9
Total (years)	13-16

It is a very lengthy process to implement a new harbour crossing. Transit and ARC consider that this is the right time to begin the process. This study is another planning phase of considering in greater depth the provisions in the RLTS.

5. Purpose of this study

The previous ARA/ARC studies have established the need for additional capacity across the Waitemata Harbour and have also addressed some of the issues such as transportation and the environment, (although at a preliminary level only). The studies have led to the 1999 RLTS and subsequently to the 2003 RLTS. Therefore, the purpose of this study is to establish the constructability of crossing options and not to justify or establish the actual need for the additional capacity.

The study team defined the geographic limits of the study as within 1km of the existing harbour bridge and lying between an eastern line from Onewa Road to Hobson Wharf and a western line from Onewa Road to Point Erin. The study also considers the connections to the Northern Motorway in the north and the Northwestern Motorway in the south. This is consistent with the corridor outlined in the RLTS.

6. Crossing options

Following the wide range of crossing options investigated in the previous studies, this study focuses on crossing options that are in the vicinity of the existing harbour bridge in accordance with the RLTS. The options considered accommodate six lanes of traffic including two that are dedicated for passenger transport.

Positives and negatives were identified for all crossing options. However, it is clear that it is feasible and practical to construct another harbour crossing in the vicinity of the existing harbour bridge with connections to the Northwestern Motorway. The investigated options are described as follows.



Figure 5. Crossing Options

Bridge options

Option 0A – preferred option

A new bridge approximately 500m west of the existing bridge. A viaduct from the Northern Motorway median leads to a short cut-and-cover tunnel under Princes and Queen Streets that connects to the new bridge. At the southern end the new bridge links to the Ponsonby tunnel (a bored tunnel) providing a connection to the Northwestern Motorway at Western Springs. As the study progressed, it became apparent that a new bridge constructed in the vicinity of the existing bridge would increase design and construction complexity and that a bridge separated from the existing structure would be less constrained and offer greater flexibility.



Figure 6. Options 0A



Figure 7. Option 0A – bridge 500m west of the existing harbour bridge (artist's impression)

Option 0A has the advantage (compared with Options I and II) of allowing a better solution to be developed as it is unconstrained by the existing bridge. It also retains the ability to utilise the moveable barrier on the existing bridge. Construction is significantly less constrained by the existing motorway operation.

Option I

A new bridge parallel to and spaced 20m west of the existing bridge. This option requires a major new viaduct, about 1100m long, from the central median of the Northern Motorway. That viaduct crosses over the present northbound carriageway and then runs parallel to the existing approach viaduct to Stokes Point. The Ponsonby tunnel connects this route to the Northwestern Motorway

at Western Springs. Sub-options include connecting the new bridge directly to the Ponsonby tunnel (Option I.I) or connecting the Ponsonby tunnel to part of the existing harbour bridge (Option I.II). The new harbour bridge mimics the profile of the existing bridge and hence will not be too intrusive in the existing landscape across the harbour.



Figure 8. Option I – Bridge west of and adjacent to the existing harbour bridge (artist's impression)

Option II

A new bridge parallel and spaced 5m east of the existing bridge linking to a Ponsonby tunnel. A northern approach viaduct is required along the seaward side of Stokes Point. At the southern end of the new harbour bridge, there will be significant impacts on the Westhaven Drive area, including some reclamation. Again, sub-options include connecting the Ponsonby tunnel directly to the new bridge (Option II.II) or to part of the existing harbour bridge (Option II.I).

Options I and II are not recommended due to constraints posed by the clip-ons (as bridge options adjacent to the existing bridge pose significant risks and constraints on future work on the clip-ons) and/or extreme difficulties in traffic management during construction.

Tunnel options

Option V - preferred option

An immersed-tube tunnel across the harbour to Wynyard Wharf. This links with a southbound cut-and-cover tunnel to Halsey Street and northbound cut-and-cover tunnel from Beaumont Street. A proposed connection to Central Motorway Junction allows access to both the Northwestern Motorway and to the port. This option does not have a tunnel to Western Springs since it uses the proposed new, above-ground route to both locations.

(Note: This option is considered consistent with the thrust of the RLTS, although departs from some of the detail it contains. It provides connectivity consistent with the RLTS but eliminates the need for an expensive length of tunnel under Ponsonby.)

Option V has many functional advantages over bridge options in servicing the CBD for general traffic plus a better and more direct public transport connection. This would leave the present route being used predominantly for trips beyond the CBD. With its connections to the port via Central Motorway Junction and connection to the Southern Motorway in case of emergencies, Option V also provides better network connectivity across the harbour than all bridge/tunnel options and is the only concept that would permit connections to the Southern Motorway for emergencies or planned closures. Option V achieves this at a cost tentatively estimated at 20% more than the bridge options.



Figure 9. Option II - Bridge east of and adjacent to the existing harbour bridge (artist's impression)



Figure 10. Option V - Immersed-tube tunnel

Option 0

A bored tunnel approximately 500m west of the existing bridge. It starts from the Northern Motorway median, crossing under the northbound carriageway, Northcote Point and the harbour and then via a Ponsonby tunnel from Point Erin to Arch Hill connecting to the Northwestern Motorway at Western Springs. Connectivity to St Mary's Bay cannot be achieved at Point Erin. This option would also require the use of two lanes of the existing harbour bridge for a dedicated passenger transport facility. The risks associated with constructing a deep undersea tunnel were assessed as very high. **For all of these reasons this option was discounted from further consideration.**



Figure 11. Option 0



Figure 12. Option III – Immersed-tube tunnel and Ponsonby tunnel

Option III

An immersed-tube tunnel approximately 1 km east of the existing bridge, under the harbour to the Westhaven side of Wynyard Wharf and then cut-and-cover tunnel through the Western Reclamation to connect to Fanshawe Street and the CBD. A separate Ponsonby tunnel connected directly to the existing Auckland Harbour Bridge completes this concept. As with all immersed-tube tunnel solutions, this option requires a cut-and-cover tunnel under the southbound carriageway of the Northern Motorway to connect the central median to the immersed-tube tunnel portal. This option was discounted from further consideration, as it was more expensive than the

bridge options and Option IV while offering no apparent advantages.

Option IV

An immersed-tube tunnel to Wynyard Wharf extended by a cut-and-cover tunnel to Halsey Street with the CBD connection and a bored *Newton* tunnel connection to Western Springs. In this study Option IV has been developed with ramps allowing entry to/from the tunnel in Fanshawe Street. Additional connections could also be contemplated to Wellesley or Cook streets.



Figure 13. Option IV – Immersed-tube tunnel and Newton tunnel

Option IVa

An immersed-tube tunnel to Wynyard Wharf extended by a cut-and-cover tunnel to Beaumont Street with CBD connections and a bored *Newton* tunnel connection to Western Springs under Franklin Road. This was discounted from further consideration due to the physical constraints of ramps in Beaumont Street and the adjacent area being considerably less satisfactory than Option IV.

Option IV and IVa are not recommended as Option V offers similar or better functional advantages at lower cost than either Options IV or IVa.

Possible connections to local road network in the south:

It should be noted that Options 0, 0A, I, II and III could be enhanced by adding additional ramps at either:

- College Hill – This would allow an alternative connection to the CBD.
- Bond Street/Grosvenor Street – This would allow a direct connection to Great North Road and a connection to the southern area of Auckland City via Sandringham Road, and also serve the local Arch Hill and Eden Terrace areas.

The demand for either of these connections would have to be determined by traffic modelling in the subsequent study phase.

7. Project costs

Firm project costs will be determined in due course. However, the completed cost of any option would very probably exceed \$3 billion.

8. Passenger transport facilities

All bridges are six lanes wide, including two dedicated passenger transport lanes. It is planned to extend the concept of a two-way busway south across the harbour and along St Mary's Bay to Fanshawe Street. If passenger transport lanes are on the new bridge, western-side bridges will require that the busway pass through St Mary's Bay and widening may be required on that section of motorway.

The two-way busway concept retains the RLTS requirement that the North Shore Busway be capable of being converted to light rail transit in the future.

For immersed-tube tunnels there are two passenger transport options:

- buses run in parallel lanes adjacent to general traffic within twin three-lane cell tubes or
- a two-lane triple cell configuration is used to separate general and passenger transport. This option offers greater route flexibility for passenger transport at the southern end.



Figure 14. North Shore Busway

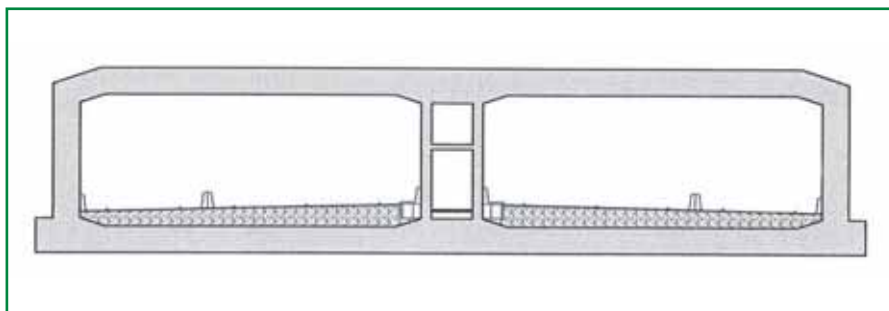


Figure 15A. Preferred Option for Busway

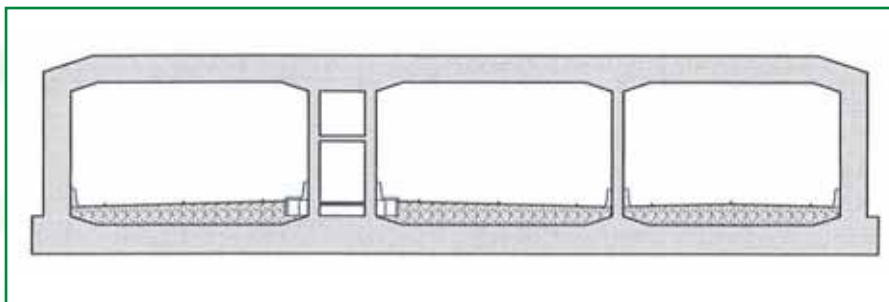


Figure 15B. Preferred Option for Light Rail Transit

The second option is not normally recommended for two-way bus travel for safety and ventilation reasons and is best suited for light rail transit.

A decision on the long-term form of passenger transport between Auckland and the North Shore is seen as very desirable to the selection of any crossing form and location.

Whether bridges or tunnels, the crossing and its approach networks must be designed for the ultimate form. It is not practical to consider future conversion from

accommodating buses to light rail on such a major project. While it is possible to operate a two-way busway in a separate tunnel, it would require an enhanced ventilation system that would not be necessary with electrified rail. The greatest disadvantages of conversion from road to rail at a later stage are the structural problems of adding rails, electrification, signalling etc and the time span that the facility would be unavailable for passenger transport services during a retrofit. There may also be the need for greater tunnel height to accommodate the catenary wires for electric trains.

9. Provision for pedestrians and cyclists

The study also considered, in principle, the provision for pedestrians and cyclists.

It is unsafe and not in accord with international best practice to consider pedestrian and cycling facilities in long tunnels. Consequently, if an immersed-tube tunnel is preferred, any pedestrian and cycle facilities will need to be on the existing bridge.



Figure 16. Footpath/Cycle Lane on Sydney Harbour Bridge

If a new bridge is preferred, then the structure would be wide enough to accommodate pedestrians and cyclists.

There are significant social and safety issues associated with isolated facilities on high structures and protective features and monitoring would be required.

10. Harbour Bridge Clip-ons

The existing Harbour Bridge has three separate bridge structures carried on a single set of foundations. The main bridge was built in 1959 and the two clip on structures were built in 1969.

The clip-ons consist of steel box girders and were designed at a time when this technology was in its infancy.

There is a need to maintain close surveillance of the structures because of design deficiencies. The design deficiencies resulted in the clip-ons being closed to heavy

vehicles for about two years when major structural repairs were undertaken in the mid 1980s, less than 20 years after its completion.

The deck surface system on the clip-ons will be a continuing maintenance issue and it must be anticipated that replacement of the surfacing will be necessary on a minimum of a 15 to 20-year cycle. This is a complex task and requires traffic to be managed while the structure is out of service.

The clip-ons are flexible structures subject to fatigue deterioration from repetitive loading cycles and will require on-going maintenance to keep operational. They will ultimately require replacement when their economic life ends – this could be as early as 2020. Therefore, it would be essential to have an additional crossing to maintain the harbour crossing capacity prior to the clip-on replacement taking place.

Options I and II outlined above are to construct a western side bridge with a 20m clearance to the existing structure and an eastern side bridge with only a 5m clearance, respectively. If future replacement of the clip-on structures is required, it would be practical but difficult to work on the western side to dismantle the present box girders. Clearances for cranes would be minimal between the existing structure and the new bridge. In particular, the very small clearance available on the eastern side in Option II has very high risks for future reconstruction.



Figure 17. Auckland Harbour Bridge

The concept of feeding a Ponsonby tunnel from existing harbour bridge lanes has the following high impact risks:

- the need to remove the clip-ons from use for lengthy periods during structural and surfacing maintenance with no alternative for feeding the tunnel.
- the need to replace the clip-ons when their useful life ends.

These reasons are considered to be sufficiently problematic for the option of feeding a Ponsonby tunnel from the existing bridge to be discarded. As a result, only connections directly with a new bridge should be considered.

II. Construction impacts

Each form of construction will have significant impacts on the adjacent locality. Construction access for materials, plant and services would be required at each end of all sections of new infrastructure. This access includes Arch Hill near Western Springs, Point Erin at the southern end of the existing bridge, Stokes Point at the northern end of the existing bridge for Options I or II, Northcote Point for Option 0A, the centre of the motorway near Onewa Rd for all options, and the coastal area outside the motorway at the south end of Shoal Bay.

Bridge Option 0A will require reclamation at the southern abutment that could be used as a construction base site. The construction of Option I may also need temporary works for a suitable base facility. Substantial volumes of concrete are required and this would likely dictate on-site mixing to minimise delivery risks.



Figure 18. Option 0A – Potential reclamation at the southern abutment

Immersed-tube tunnel options require a substantial casting area of approximately 300m x 400m in a coastal area with water depth of about 10m. It may be practical to consider a site adjacent to the northern portal but there would be high impacts on a sensitive area. Each of the 10 units would require 45,000 m³ of concrete to be

poured, which would generate logistical challenges and require temporary bridge access for substantial loads. If that site is deemed unsuitable as a casting area, it may be necessary to consider alternatives such as Marsden Point with consequential long sea tows for the units.



Figure 19. Example of Casting Basin
(Öresun, Denmark)

There are substantial issues with the excavation of a large trench on the harbour floor to accommodate the tube units as it creates high risks from sediment dispersal in a sensitive area. The disposal of excavated material (approximately 1.3million m³) will be a significant issue if land-based sites are not available. The portal structures at each end of the immersed tube, as the road ramps up to ground level, will be large structures and incorporate a significant number of support services.

The Option V cut-and-cover tunnels impact on the proposed Ports of Auckland/Auckland Waterfront Advisory Group (AWAG) Western Reclamation development between Fanshawe Street and Wynyard Wharf. The cut-and-cover concepts extend to structures under Halsey St, Beaumont St

and buildings south of Victoria Park to provide connections to the new links within Central Motorway Junction. All this work will have significant impacts on access during the construction phase.

Contaminated ground will be a major factor in this area, given current land use and past reclamations.



Figure 20. Tunnel Construction

Driven tunnels require the excavation of massive amounts of tailing material that need to be taken from the site. This would probably be concentrated at the Arch Hill end. Similarly, there is a large quantity of both in-situ and precast concrete required for tunnel linings. Large portal and ventilation structures are also needed for driven tunnels.

Another issue with driven tunnels is the potential for ground movement during construction which may affect surface land. There will be compensation issues to address with every land owner above or along the tunnel route. While a route below roads would be sought, the width required for separated twin barrel tunnels is significant and it will be impossible to avoid access under private land in a number of locations.

12. Operating tunnels

There are risks in operating tunnels. Ventilation systems and exhaust stacks are dominant features of tunnels (20-30m high). The exact locations of stacks for all tunnel options will be a major issue. Other major services required are fire protection, drainage, (especially for immersed-tube tunnels), lighting, traffic control, cleaning and evacuation systems. International experience suggests that the operating costs for tunnels are much higher than that of bridges. For safety reasons, tunnels must operate

without significant congestion and capacity is normally lower than for surface roads and bridges.

13. Further investigations

This study considered the feasibility of constructing a new crossing in the vicinity of the present Harbour Bridge. It seems from the outcomes that there are viable alternatives and that further investigations should occur on Options 0A and V.



Figure 21. Traffic Management Centre at Northcote

Further investigations will be required to identify the preferred options and support the planning process in the subsequent phases. These investigations include:

- a transportation modelling study to establish traffic impacts of the new routes, to assess the likely benefits and to confirm the lane assumptions.
- detailed consideration of connections required on all major feeder routes, at all entry and exit points and through transitional areas.
- further detailed work on the location and impact of tunnel portal structures and exhaust stacks, construction sites for bridges and tunnels in this locality and the landside impacts of cut-and-cover tunnels.
- economic assessment.
- further social impacts through studies and consultation with all interested parties.
- more detailed preliminary environmental studies.

14. Public consultation

The prime objective of the construction feasibility study was to determine the constructability of an additional crossing that meets the RLTS provisions.

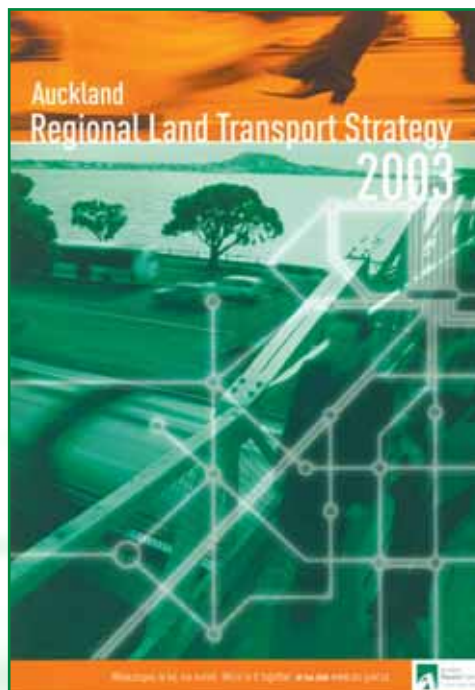


Figure 22. 2003 RLTS

As the main focus was on the technical issues, consultation was not part of the study.

It will be necessary to undertake the additional investigations outlined above in the next study phases to ensure full information is available and in order to identify the final preferred option. Wide public consultation will be necessary for formal planning approvals of the selected crossing option.

15. 2003 RLTS policies

The RLTS was recently updated and adopted by the ARC on the recommendation of the Regional Land Transport Committee. There has been no change in the harbour crossing policies between 1999 and 2003. These policies are:

Policy C3.6

Plan for and protect the ability to implement a passenger transport connection between North Shore and Auckland Cities across the Waitemata Harbour and connections to the south of the CBD (also refer to Policies C3.7, C3.8 and C3.9)

C3.6.1: Determine the most appropriate location for a passenger transport connection between North Shore and Auckland cities across the Waitemata Harbour which is separated from general traffic lanes and protect the right of way.

ARC, NSCC, ACC and Transit in partnership

Policy C3.7

Plan for and protect the ability to construct an additional road crossing of the Waitemata Harbour (also refer to Policies C3.6, C3.8 and C3.9) C3.7.1: Determine the most appropriate location for an additional road crossing of the Waitemata Harbour in the vicinity of the existing Auckland Harbour Bridge, and connecting directly to the Northwestern Motorway/ State Highway 20 extension by way of tunnel, and protect the right of way.

Transit, NSCC, ACC and ARC in partnership

Policy C3.8

Co-ordinate Policies C3.6 and C3.7 (also refer to Policies C3.6, C3.7 and C3.9)

C3.8.1: Undertake the planning for the passenger transport connection of Policy C3.6 and the additional road crossing of Policy C3.7 so that any potential conflicts between the two policies are resolved and any potential synergies between the two policies are realised.

ARC, Transit, NSCC and ACC in partnership

Policy C3.9

Ensure that any additional cross-Waitemata Harbour capacity includes provision for walking and cycling (also refer to Policies C3.6, C3.7 and C3.8)

C3.9.1: Undertake the planning for the passenger transport connection of Policy C3.6 and the additional road crossing of Policy C3.7 so that provision is made for pedestrians and cyclists

Transit and ARC in partnership & in consultation with NSCC and ACC



Figure 23. 2003 RLTS Indicative map of long-term Waitemata Harbour Crossing Options



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