

Additional Waitemata Harbour Crossing Network Plan



Walking and Cycling

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Executive Summary

This report forms part of a wider Additional Waitemata Harbour Crossing (AWHC) Network Plan. The Network Plan is being developed in parallel to the AWHC Study, with the AWHC Study being undertaken to identify the best form of crossing (bridge or tunnel) between Wynyard Quarter, west of the Auckland CBD and Esmonde Road on the North Shore. The AWHC Study builds on the 2008 Waitemata Harbour Crossing study, with the earlier study undertaken to provide the region with certainty on the likely corridor alignment for a future crossing option in response to plans to redevelop Wynyard Quarter. The current AWHC Study is to inform the development of a business case and enable decision-making about the final form and timing of the additional crossing.

The overall aim of the AWHC Study is:

'To contribute to an affordable, integrated, safe, responsive and sustainable land transport system within the Auckland region by providing a cross-harbour motorway route between the Central Motorway Junction and Esmonde Road that will:

- Encourage economic development and facilitate growth in line with the strategic land use objectives of the Auckland Regional Growth Strategy (ARGS);
- Improve cross-harbour accessibility and reduce the barrier effect of the Waitemata Harbour;
- Provide an additional transport route to the existing Auckland Harbour Bridge (AHB) to provide a more resilient network and reduce risks associated with concentrating a high proportion of cross-harbour capacity on a single route; and
- In conjunction with other harbour crossings, improve opportunities for cross-harbour accessibility for all modes, including commercial and general road traffic, passenger and rapid transport, walking and cycling.

The objective of the AWHC Network Plan is to provide information regarding the connectivity of the surrounding network to and from the harbour crossings (existing and future). This will enable decisions about the necessary infrastructure improvements required at either end of the Harbour Crossings to ensure optimisation of the AWHC project.

There are six components within the overall AWHC Network Plan which are brought together into a single plan, including the strategic context, passenger transport (PT), land use, high occupancy vehicles (HOVs), walking and cycling and the local road network. Of particular note is the fact that the Network Plan aims to optimise the opportunities for multimodal travel across the harbour, which is currently unavailable on the existing Auckland Harbour Bridge (AHB). This provides significant opportunity to address the current dependence on the private vehicle and increase the PT, cycling and walking modal share between the North Shore and the Auckland CBD. This report examines the walking and cycling elements necessary with the Network Plan to optimise the benefits realised by the AWHC.

Overall, the AWHC is considered to align with current transport strategies and policies because it will enable multimodal travel across the harbour. Walking and cycling facilities on the existing AHB are currently not available due to limitations on the existing structure. The implementation of the AWHC will enable the opportunity for high quality walking and cycling facilities either on the existing AHB or on the additional crossing, should the preferred option be a bridge. This provides a significant opportunity to link the North Shore and the Auckland CBD by walking and cycling modes. This will benefit commuters, training cyclists and recreational users. It will also provide a tourist attraction akin to facilities seen on the Sydney Harbour Bridge or the Golden Gate Bridge in San Francisco.

The provision of these additional facilities, combined with improved priority for PT will ensure integration and balance between all transport modes throughout the transport network and encourage modal shift away from single occupant vehicles. It is generally accepted that increased walking and cycling modal shares will provide environmental, health and economical benefits to New Zealand as a whole. This is particularly relevant to large urban areas such as Auckland which are reliant on a significant transfer to sustainable modes, such as PT, walking and cycling, to accommodate future growth, enable densification and improve the liveability of the city.

To understand how the provision of a walking and cycling facility across the harbour can be optimised the report has assessed the potential demand for walking and cycling trips in association with the implementation of the additional crossing. The aim of this work is to identify any gaps in current and planned infrastructure around the harbour crossings which will need to be addressed before the implementation of the third crossing. It is noted that as far as Flow is aware this is the first time this analysis has been completed in its entirety as there is currently no ability to cross the harbour at this point. As a result this work has been completed to enable a high level analysis only and no consultation with relevant stakeholders has been undertaken. Going forward consultation with Auckland Transport and Auckland Council will be required.

In summary, the analysis reveals demand for travel between the following destinations on both sides of the Harbour:

- Beaumont Street/Wynyard Quarter area;
- Downtown CBD;
- The University of Auckland/Auckland University of Technology (AUT) (CBD);
- Ponsonby;
- Pt Chevalier;
- Southern side of the CBD/Newmarket;
- Takapuna;
- Northcote Point;

- Birkenhead;
- Highbury;
- Northcote;
- Smales Farm; and
- AUT (Northcote).

An analysis of the existing, programmed and proposed walking and cycling projects reveals the following:

- There are limited existing walking and cycling facilities on the routes identified above;
- Very few of the routes have confirmed programmed works; and
- The majority of the routes are identified in the Regional Cycling Network but are not due for implementation until after 2016.

As a result of this analysis, investigation works into improved pedestrian and cycling facilities along a number of routes around the harbour crossing locations are recommended. To allow the costs of these works to be included in the AWHC business case we have undertaken a rough order cost estimate of the works. The cost of these works has been estimated to be between \$50 and \$60 million (2010 dollars).

In addition, connections from the harbour crossing to the local road network will be required. The requirements will depend on which side of the bridge the pedestrian and cycle facilities are located. The estimated cost for connections is between \$30 and \$40 million (2010 dollars). If the walking and cycling facilities are located on the new bridge structure the costs for connections are likely to be greater due to the need to cross the existing motorway but the final facility may be of a higher standard due to limitations associated with retrofitting facilities on an existing structure.

Flow recommends that the conclusions made in this report are incorporated into the AWHC study.

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1.0 Introduction

1.1 AWHC Network Plan – Aim of the Study

This report forms part of a wider Additional Waitemata Harbour Crossing (AWHC) Network Plan. The Network Plan is being developed in parallel to the AWHC Study, with the AWHC Study being undertaken to identify the best form of crossing (bridge or tunnel) between Wynyard Quarter, west of the Auckland CBD and Esmonde Road on the North Shore. The AWHC Study builds on the 2008 Waitemata Harbour Crossing study, with the earlier study undertaken to provide the region with certainty on the likely corridor alignment for a future crossing option in response to plans to redevelop Wynyard Quarter. The current AWHC Study is to inform the development of a business case and enable decision-making about the final form and timing of the additional crossing.

The overall aim of the AWHC Study is:

‘To contribute to an affordable, integrated, safe, responsive and sustainable land transport system within the Auckland region by providing a cross-harbour motorway route between the Central Motorway Junction and Esmonde Road that will:

- Encourage economic development and facilitate growth in line with the strategic land use objectives of the Auckland Regional Growth Strategy (ARGS);
- Improve cross-harbour accessibility and reduce the barrier effect of the Waitemata Harbour;
- Provide an additional transport route to the existing Auckland Harbour Bridge (AHB) to provide a more resilient network and reduce risks associated with concentrating a high proportion of cross-harbour capacity on a single route; and
- In conjunction with other harbour crossings, improve opportunities for cross-harbour accessibility for all modes, including commercial and general road traffic, passenger and rapid transport, walking and cycling.

The objective of the AWHC Network Plan is to provide information regarding the connectivity of the surrounding network to and from the harbour crossings (existing and future). This will enable decisions about the necessary infrastructure improvements required at either end of the Harbour Crossings to ensure optimisation of the AWHC project.

There are six components within the overall AWHC Network Plan which are brought together into a single plan, including the strategic context, passenger transport (PT), land use, high occupancy vehicles (HOVs), walking and cycling and the local road network. Of particular note is the fact that the Network Plan aims to optimise the opportunities for multimodal travel across the harbour, which is currently unavailable on the existing Auckland Harbour Bridge (AHB). This provides significant opportunity to address the current dependence on the private vehicle and increase the PT, cycling and walking modal share between the North Shore and the Auckland CBD. This report

examines the walking and cycling elements necessary with the Network Plan to optimise the benefits realised by the AWHC.

1.2 *AWHC and the Study Area*

There is a requirement within the AWHC project to ensure that pedestrians and cyclists are accommodated within the planned future crossing, through incorporation of facilities on a new bridge or through the use of the existing bridge.

The aim of the walking and cycling component of the Network Plan is to:

- Understand how the provision of walking and cycling facilities can optimise the benefits of the additional Harbour Crossing;
- Identify any network issues and risks;
- Understand how the provision of walking and cycling facilities can minimise/mitigate any dis-benefits of the additional Harbour Crossing; and
- Describe the short medium and long term goals (associated with walking and cycling) for optimising the network.

The report does not consider the provision of walking and cycling on the bridge before the implementation of the additional crossing, currently assumed to be in 2026.

To fulfil the aims of the project, the following key outcomes were identified:

- Review relevant national, regional and local strategies and policies;
- Identify and review all previous relevant studies, including those from NZTA, North Shore City Council (NSCC), Auckland City Council (ACC), Auckland Regional Council (ARC) and the Auckland Region Transport Authority (ARTA);
- Identify the existing walking and cycling networks on either side of the Waitemata Harbour;
- Identify the planned works in these areas that are due for implementation;
- Identify the proposed works that are not yet programmed for implementation;
- Undertake a gap analysis that will identify the works required to complete a walking and cycling network that will incorporate the ability to cross the harbour on either the existing Auckland Harbour Bridge (AHB) or the additional crossing (should the preferred option be a bridge);
- Consider who will use the proposed facilities, likely origins and destinations and possible numbers (tourists and commuters); and

- Identify infrastructure required (at a conceptual level) to connect to the networks.

2.0 Background

2.1 Introduction

This walking and cycling network plan has been completed within the overall framework of strategies and policies on a national, regional and local level. A review of all relevant strategies and background documentation has been completed and can be found in Appendix A and B. The following section provides a summary of the background documents reviewed and the relevance to walking and cycling in terms of the AWHC.

Overall, the AWHC is considered to align with current transport strategies and policies because it will enable multimodal travel across the harbour. Walking and cycling facilities on the existing AHB are currently not available due to limitations on the existing structure. The implementation of the AWHC will enable the opportunity for high quality walking and cycling facilities either on the existing AHB or on the additional crossing, should the preferred option be a bridge. This provides a significant opportunity to link the North Shore and the Auckland CBD by walking and cycling modes. This will benefit commuters, training cyclists and recreational users. It will also provide a tourist attraction akin to facilities seen on the Sydney Harbour Bridge or the Golden Gate Bridge in San Francisco.

The provision of these additional facilities, combined with improved priority for PT will ensure integration and balance between all transport modes throughout the transport network and encourage modal shift away from single occupancy vehicles. It is generally accepted that increased walking and cycling modal shares will provide environmental, health and economical benefits to New Zealand as a whole. This is particularly relevant to large urban areas such as Auckland which are reliant on a significant transfer to sustainable modes, such as PT, walking and cycling, to accommodate future growth, enable densification and improve the liveability of the city.

2.2 National and Regional Strategies

From a national perspective, the current strategies support the encouragement and promotion of walking and cycling as a transport choice. Increased walking and cycling modal shares provide environmental, health and economical benefits to New Zealand as a whole. This is particularly relevant to large urban areas which are reliant on a significant transfer to sustainable modes such as public transport, walking and cycling to accommodate future growth and improve the liveability of our cities. Table 2.1 provides a summary of the relevant national strategies and their relevance to walking and cycling and the AWHC.

Table 2.1: National Strategy Summary

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
<p>New Zealand Transport Strategy (NZTS), MoT, 2008</p>	<p>In terms of walking, cycling and public transport there are several key targets set by the NZTS in order to achieve the overall vision. These include:</p> <ul style="list-style-type: none"> — Increase walking and cycling and other active modes to 30 % of total trips in urban areas by 2040; and — Increase the number of walking and cycling trips by 1 % per year through to 2015.
<p>Government Policy Statement on Land Transport Funding (GPS), MoT, 2009</p>	<p>The GPS states that the government supports mode shift over time, particularly in the major cities, but that it considers that this should not be accelerated to the point where the outcomes are economically inefficient.</p>
<p>Safer Journeys, MoT, 2010</p>	<p>Safer Journeys is a strategy to guide improvements in road safety over the period 2010 to 2020. The strategy identifies that by addressing climate change commitments there may be an increase in the use of public transport, walking and cycling and the safety needs of all modes of transport need to be addressed. In addition to this, safe walking and cycling is identified as an area of medium concern and there is an overall aim to achieve safer walking and cycling. More specifically, the strategy aims to achieve a reduction in the crash risk for pedestrians and particularly cyclists, while at the same time encouraging an increase in use of these modes through safer roading infrastructure. This includes utilising proven engineering methods at high risk intersections, particularly facilities for pedestrian and cyclists. Investment in safe walking and cycling infrastructure is stated to continue through the National Land Transport Programme.</p>
<p>Getting There On Foot, By Cycle, MoT, 2005</p>	<p>Getting there on foot, by cycle is a strategy that that was released in 2005 to advance walking and cycling modes in New Zealand. The overall vision for the strategy is “A New Zealand where people from all sectors of the community walk and cycle for transport and enjoyment”. This vision is underpinned by three primary goals which are:</p> <ul style="list-style-type: none"> — Community environments and transport systems that support walking and cycling; — More people choose to walk and cycle, more often; and — Improved safety for pedestrians and cyclists. <p>The Ministry of Transport recognises that this strategy maximises the contribution of walking and cycling to achieving the NZTS vision and objectives. A strategic implementation plan was produced in 2006 for the three year period from 2006 to 2009. There have been no further updates since this plan.</p>
<p>Draft New Zealand Energy Strategy, MED, 2010</p>	<p>The draft NZES states that an energy efficient transport system is an area of key focus, and there will be a focus to improve modal choice in urban areas so that people are able to use public transport and walk and cycle more, thereby reducing</p>

Table 2.1: National Strategy Summary

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
	their energy use.
Draft New Zealand Energy Efficiency and Conservation Strategy, MED, 2010	The draft strategy states that the Government will continue to fund transport infrastructure to support people to make energy efficient transport choices. Encouraging the use of sustainable modes of travel particularly in cities e.g. walking, cycling, and public transport.
National Land Transport Programme (NLTP) 2009-2012, NZTA, 2009	The NLTP states that NZTA will prioritise activities that make the most significant contribution to a specific list of targets. Within this list are 'model' urban walking and cycling communities, which aim to reduce congestion by providing user-friendly environments for walking and cycling. The priority for 2009 to 2012 and beyond for walking and cycling activities is to improve the contribution that these activities make to the reduction of congestion in urban areas. It is noted that all activities funded through this process are required to be part of a current walking and cycling strategy. \$51 million has been allocated nationally to walking and cycling projects for the 2009 to 2012 period.

Regionally, walking and cycling continues to be supported and encouraged through various Auckland focussed strategies. Particular emphasis is placed on increasing the walking and cycling modal share in and around Auckland to help decrease congestion and accommodate future growth. These strategies are shown in Table 2.2 which states the relevant parts of each strategy to walking and cycling and AWHC. Details of the overall objectives and vision for each strategy are included in Appendix A.

Table 2.2: Regional Strategy Summary

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
Auckland Regional Growth Strategy (RGS), ARC, 1999	The RGS states that greenfield growth should be designed to ensure good access throughout the area and encourage use of passenger transport, walking and cycling. The areas of intensification should be developed with good facilities for walking and cycling and should encourage the use of these modes.
Auckland Regional Land Transport Strategy (RLTS), ARC, 2010	A component of the RLTS is to continue building walking and cycling infrastructure, including completion of 50 % of the regional cycle network by 2016 and 100 % by 2026. The strategy also mentions that there are additional elements including the protection of the route for an additional Waitemata Harbour crossing. The strategy has a target of increasing walking and cycling mode share to 15.3 % by 2040. There is also a target of improving residents' perceptions of walking and cycling accessibility.

Table 2.2: Regional Strategy Summary

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
<p>Auckland Transport Plan (ATP), ARTA, 2009</p>	<p>The ATP supports in principle walking and cycling across the Auckland Harbour Bridge, however the strategy notes at the time of writing that the project has not been submitted for funding through the Regional Land Transport Programme, and that when and if this occurs it will need to be prioritised against other regionally important walking and cycling projects.</p> <p>The ten year plan for transport planning provides a series of key projects. The corridor designation for the AWHC is listed as a key project and will improve accessibility for all modes across Waitemata Harbour. Also the ATP states that “While tunnels are proposed for the new road and rail connections, these new routes will allow for the reallocation of space on the AHB for both walking and cycling across Waitemata Harbour”.</p> <p>Key projects listed for walking and cycling include the following relevant projects:</p> <ul style="list-style-type: none"> — Improve walking and cycling access to the Northern Busway stations; and — Designing and constructing a cycle lane adjacent to State Highway 1 between Northcote Road and Constellation Drive.
<p>Sustainable Transport Plan (STP), ARTA, 2006</p>	<p>Plans outlined in the Sustainable Transport Plan which are relevant to walking and cycling include:</p> <ul style="list-style-type: none"> — Significant increase in demand management activities, from current levels of around \$10 million per year to an average of \$42 million per year for the next ten years. This investment is expected to divert 20,000 car trips each morning peak to walking, cycling and public transport; — Strategies for improving the walking and cycling networks by 2016 include targeted walking improvements in the CBD and 17 other town centres and complete 50 % of the regional walking network. <p>The Walking Action Plan and Cycling Action Plan¹ (which are part of the STP) have been developed to indicate activities needed to support walking and cycling as an alternative transport choice and making Auckland region a more “walk-friendly” and “cycle friendly” place by 2016.</p> <p>Through the STP a regional cycle network has been developed and has recently been updated in 2010. This map is shown in Appendix A.</p>
<p>Draft Auckland Region Walking and Cycling Strategy, NZTA, 2008</p>	<p>A key target of the strategy is to work with local authorities to double active (walking and cycling) modes of transport to 30 % of total trips by 2040 by building and maintaining quality facilities within the Auckland urban areas.</p>

¹ ARTA convenes the Auckland Regional Walking and Cycling Forum, which developed the Cycling Action Plan (part of the Sustainable Transport Plan). The group includes representatives of local councils, walking and cycling advocacy groups, central government agencies and other organisations with interests in promoting safe cycling and walking. The group also runs an annual Cycle Monitoring Programme to count the number of cyclists on the region's roads.

Table 2.2: Regional Strategy Summary

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
	<p>The walking and cycling general improvements identified for the northern sector include opportunities to link new walking and cycling routes on the western side of the Northern motorway. This will enable the completion of the Northern Motorway cycleway and recognises that new users to these facilities will increase and will in the long term support and align with an AWHC for walking and cycling.</p> <p>Each project ranked is assigned a project 'urgency' ranking according to urgent projects, investigative projects and pending projects. The SH1 (Northern Motorway) Auckland Harbour Bridge (AHB) is identified as the lowest priority (pending) although it is noted that some of the associated projects such as connections to the Northern Busway stations and Onewa Road to Esmonde Road are identified as urgent.</p>
<p>Auckland Sustainability Framework, ARTA, 2007</p>	<p>Goal Six of the Sustainability Framework is a quality compact urban form. To achieve this goal a shift is required to build a carbon neutral future, and there will need to be an enhancement of transport choices and prioritisation of walking, cycling, and passenger transport ahead of cars. Achieving this goal will mean that easy access to a range of transport choices decreases people's daily dependence on private motor vehicles.</p>
<p>Investment and Revenue Strategy, NZTA, 2009</p>	<p>The NZTA's Investment and Revenue Strategy (IRS) states that funding will be prioritised in line with the aims of the GPS.</p>
<p>Statement of Intent (SOI) 2010-2012, NZTA, 2009</p>	<p>The SOI sets out NZTA's approach and course of action for the next three years that will contribute to the delivery of the government's land transport objectives and wider transport vision. This is focussed around achieving the aims of the GPS.</p>

2.3 Local Strategies

Relevant local strategies from Auckland City Council and North Shore City Council have been reviewed and a more comprehensive summary can be found in Appendix A. Table 2.3 and Table 2.4 include a brief overview of the strategies that were reviewed for each local authority. By way of summary, both local authorities are supportive of walking and cycling and providing facilities to encourage further increases in walking and cycling. The provision of a walking and cycling facility across the harbour will contribute to the achievement of the walking and cycling modal shift targets set out in these strategies.

Auckland City Council Strategies

Table 2.3: Auckland City Council Strategy Study

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
Auckland City Council Central Area Access Strategy (2004)	The strategy sets out how Auckland City will deal with competing demands on Auckland's central business district transport network. There are seven priority strategies to guide the transport decisions, and the two most relevant to walking and cycling are providing high quality spaces for pedestrians and influencing travel demand and travel choice.
Auckland City Council CBD into the Future Strategy (2004)	This document states that as part of achieving a high quality urban environment, that they will influence travel choices through a cycling and walking strategy.
Designing a Great City Centre for our People (2008)	Primarily focused on urban design, this urban design framework identifies the need for sustainable transport routes in key areas where walking, cycling and public transport have priority over private vehicles
Liveable Arterials (2006)	The Liveable Arterials Plan seeks to ensure an adaptable, reasoned and balanced view is taken in the management of the arterial network, one that equitably responds to the needs of all user groups and looks to the long-term prosperity of Auckland City. The area covered in the plan includes Auckland City outside the central area.
Auckland City Council Cycling and Walking Framework (2007)	This document promotes cycling and walking as a viable and attractive travel option. The framework sets a long term vision for cycling and walking and provides direction on how this is going to be achieved. It also provides maps of where existing networks are provided and those planned for the next six years.
Auckland CBD Gateways Study (2009)	The purpose of this study was to investigate an urban design and transport response that encourages walking and cycling between the Auckland CBD and immediately surrounding areas and that reduces reliance on private vehicles
Auckland City Centre Waterfront Master Plan (2009)	This masterplan is the foundation for creating a unique, prosperous and attractive waterfront for Auckland's city centre over the next few decades. The plan includes a pedestrian and cycle promenade along the waterfront and across the AHB providing good connections between the AHB and the CBD. A public park is also planned for the southern side of the bridge.

North Shore City Council Strategies

Table 2.4: North Shore City Council Strategy Study

Strategy	Relevance to AWHC and Walking and Cycling Network Plan
North Shore City Transport Strategy (2006)	The strategy aims to encourage more residents to walk, cycle or use public transport, and a safer, healthier community.
North Shore City Plan (2008)	The City Plan sets the strategic goals for North Shore City. The two pathways to achieve the strategic goals of the city plan which are of particular relevance are to develop walking and cycling routes and to improve accessibility throughout the City for active transport modes such as walking and cycling.
North Shore City Cycling Strategy (2009)	The North Shore City Cycling Strategy vision is "To provide a safe, convenient and enjoyable cycling environment that meets the needs of cyclists and encourages cycling as a mode of transport and as a means of recreation". The Plan does not include a link between the AHB and Onewa Road as part of the current or planned cycle network. Onewa Road, Akoranga Road and the Northern Motorway between Onewa Road and Esmonde Road are identified as "Strategic Routes" in the cycle network. Exmouth Road and Lake Road (Northcote) are identified as "Local Routes".
North Shore City Council Walking Strategy (2009)	This Strategy aims to improve the walking environment (including convenience and safety) and to encourage more people to walk more often for transport, recreation and physical activity and the Strategy describes how NSCC plans to do this. One of the main targets is to increase the proportion of walking to work journeys to 7% by 2019 (currently 3%). There are other targets associated with resident satisfaction with surrounding footpaths and other walking facilities such as seats, litter bins etc.

Growth Nodes

Growth areas resulting in local area intensification provide a source of potential users of the local walking and cycling networks and create demand for additional or enhanced facilities.

The ARC's Regional Policy Statement identifies areas of planned growth within the region over the next 40 years. This provides some indicative information on planned future developments in the region. The growth centres identified by the Auckland Regional Growth Strategy are identified in Figure 2.1. Of note is the fact that the CBD, Grey Lynn, Takapuna, Highbury and Northcote are identified.

In addition to this a number of local area intensifications are identified below:

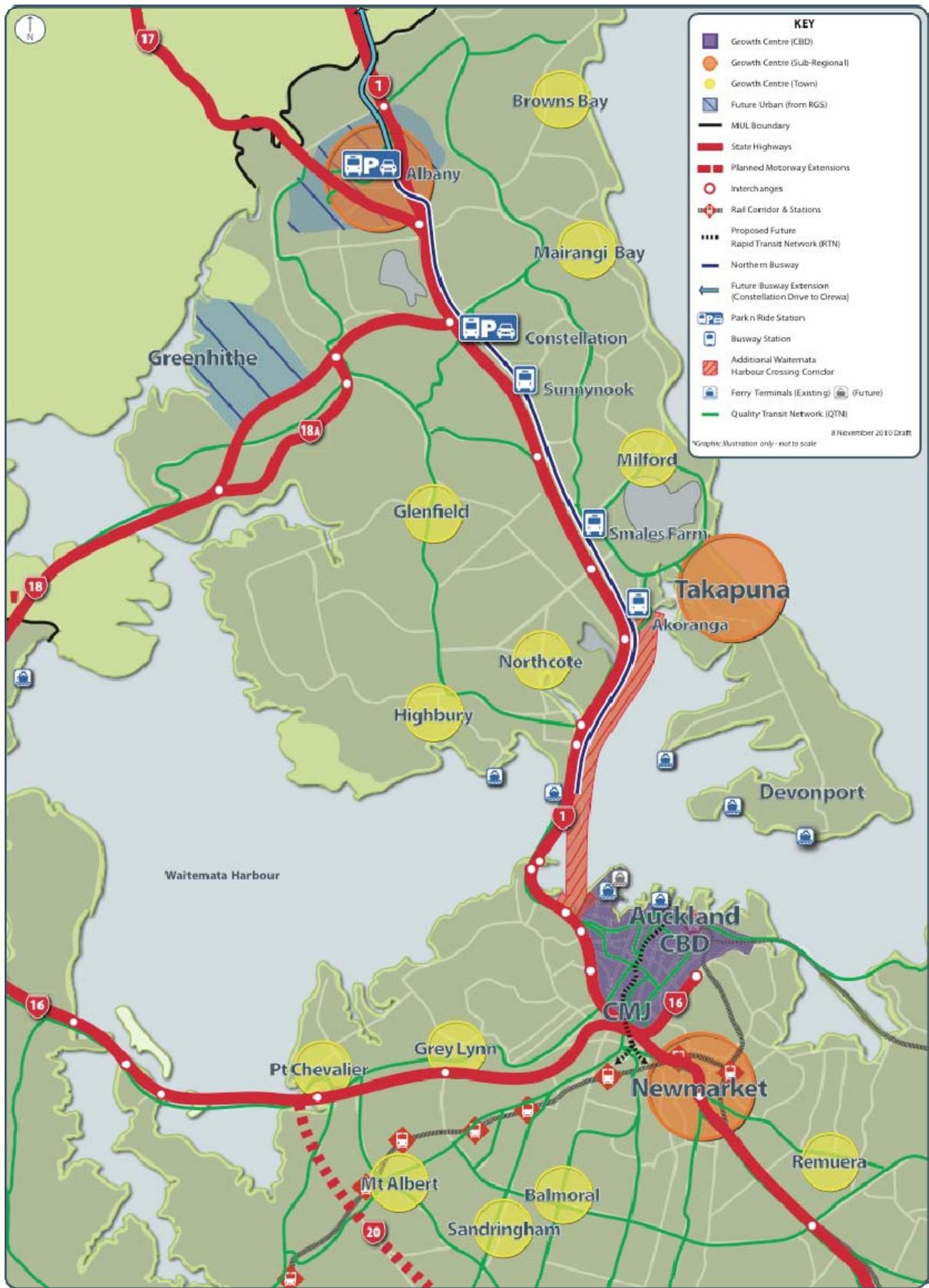
- Wynyard Quarter is a large-scale (35 hectare) reclaimed area close to the central business district. A Plan Change for Wynyard Quarter is currently part of a Council led change to the District Plan that will allow significant development within Wynyard Quarter. The Proposed Plan Change for Wynyard Quarter seeks to implement up to approximately 700,000m²

gross floor area (GFA) of development, comprising a mix of office, residential accommodation, retail and marine uses, along with public space;

- The Victoria Quarter within Auckland’s CBD is bounded by Hobson, Fanshawe and Union Streets, the motorway, and includes Victoria Park. ACC aims to make Victoria Quarter into the CBD's dynamic western fringe, providing a diverse choice of alternative, intensive inner city urban living and working opportunities;
- The Learning Quarter covers the city campuses of the University of Auckland and the Auckland University of Technology. The Learning Quarter Plan expresses the vision of the partners for Auckland’s Learning Quarter and outlines how they will work together to guide and help drive the area’s economic, social, cultural and physical development over the next ten years. The partners within the Learning Quarter are the two universities, Auckland City Council and the Committee for Auckland²;
- The Highbury Centre Plan, released in July 2006, was developed with community input and outlines NSCC’s vision for Highbury. It includes a number of proposals for the future land use mix, transport, pedestrian and cycle linkages; and
- The Wairau Valley is seen by NSCC to be important to the long term economic wellbeing of the city, as the city’s development strategy evolves from its current “twin centre” focus on Takapuna and Albany (supported by a number of general business areas) towards a broader employment strategy based on the city’s central spine.

Figure 2.1: Growth Centres

² The Committee for Auckland is a not-for-profit private sector organisation seeking to leverage influence in the enhancement and development of Auckland as an exciting and dynamic place to live.



DRAFT 6 NOTE: Map created from ARC Future Land Use & Transport Planning Project April 2009 - Map 2 Scenario 4.1 Current Policy.

Strategic Context

2.4 Relevant Previous Studies

Previous studies into providing walking and cycling facilities across the existing AHB were also reviewed and full summaries are provided in Appendix B. Information considered particularly relevant to this project is outlined below:

- A study completed for NSCC concluded that a cycleway along the Northern Motorway was recommended to improve walking and cycling accessibility to Akoranga Bus Station (Burton, 2004³);
- A feasibility study into the provision of a cycleway on the existing AHB prepared for NZTA concluded that, in terms of safety and practicality, a two-way segregated movement with pedestrians on the eastern side of the bridge and cyclists on the western side is the best option (Beca, 2006⁴);
- An investigation into the viability of a Northern Motorway corridor cycleway prepared for NSCC concluded that a cycle path on the eastern side of the motorway is not feasible and should be discounted from all further investigations. The recommended preferred option was to provide a cycle path on the western side of the motorway corridor. (SKM, 2008⁵);
- A further feasibility study into pedestrian and cycle access across the AHB was completed in 2008 for the Waitemata Harbour Crossing Implementation Executive. The recommended option included a 3 m wide cyclist facility on the western side and a 3 m wide pedestrian facility on the eastern side. Connectivity at the northern end of the AHB involved a combination of connections to Princess Street and Sulphur Beach Road. The southern access option comprised connections from Westhaven Drive. (Maunsell, 2008⁶);
- A cyclist and pedestrian access study between the AHB and Akoranga Station for NZTA identified a route from the AHB at Princess Street and Sulphur Beach Road to Akoranga Station adjacent to the northern motorway as having greater perceived benefits for cyclists and pedestrians over a route via Lake Road and College Road. An economic analysis of the preferred option resulted in a BCR of 1.78. (Maunsell, 2009⁷); and
- A cyclist and pedestrian access study between St Mary's Bay and the CBD for NZTA concluded that a route that starts at the west side of the Point Erin Park and ends at the southwestern corner of the Beaumont Street/Fanshawe Street intersection is preferable to the existing intermittent off-road cycle way on Westhaven Drive that starts at the northeastern corner of the Beaumont Street/Fanshawe Street intersection and ends at the

³ Burton Consultants, 2004, Pedestrian and Cycle Linkages to North Shore Busway Stations

⁴ BECA, 2006, Auckland Harbour Bridge Cycleway Feasibility Project, Stage 1

⁵ SKM, 2008, Northern Motorway Corridor Cycleway Project Feasibility Report and associated File Note Update dated 6 April 2009

⁶ Maunsells, 2008, Waitemata Harbour Crossing Pedestrian and Cyclists Access Study

⁷ Maunsells 2009, Auckland Harbour Bridge to Akoranga Station Cyclists and Pedestrian Access Project Feasibility Report

Shelly Beach Road/Westhaven Drive roundabout. However the report notes that the preferred option is dependent on the completion of the Victoria Park Tunnel project. (SKM, 2009⁸). This route does not coincide with the route shown in ACC's Walking and Cycling Framework.

⁸ MWH, 2009, St Mary's Bay walking and Cycling Project Feasibility Report

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3.0 Existing and Planned Networks

3.1 Existing Walking and Cycling Networks

The Auckland City Walking and Cycling Framework, the North Shore City Cycling and Walking Strategies, and the ARTA Regional Cycling Network identify the existing walking and cycling network and the planned future cycle networks to 2016 and beyond. These networks are illustrated for the northern and southern sides of the harbour in Figure 3.1 and Figure 3.2. It is noted that the definition of cycling facility can include cycle lanes, bus lanes, low speed zones, quiet routes, sign posted routes, cycleway and off road paths. The walking network is illustrated through the local road network, with off road facilities labelled separately.

It is noted that currently there is no facility for cyclists to travel across the existing AHB. Cyclists are able to cross using the ferry service from Devonport, Bayswater, Birkenhead and Northcote Point at no additional charge for the bike. The ARTA cycle counts for 2010 indicate a total of 500 cyclists per day cross the harbour via this method. ARTA and NZTA are currently working on a proposal to allow bikes on bus services but currently cyclists are not permitted to take their cycles on the existing buses.

Figure 3.1: Existing and Planned Cycle Network Northern Sector



KEY

- Growth Centre (Sub-Regional)
- Growth Centre (Town)
- Existing Pedestrian Link Across SH1
- Ferry Terminals (Existing) (Future)
- Additional Waitemata Harbour Crossing Corridor
- Regional Cycle Network - current
- Regional Cycle Network - proposed 2009 - 2016
- - - Regional Cycle Network - future after 2016
- Future Cycle Network - once AWHC is built
- Strategic Landuse Area
- University
- Missing Facilities

5 November 2010 DRAFT
 *Graphic Illustration only - not to scale

DRAFT 8

NOTE: Map overlaid on -
 ARE "Future Landuse & Transport Planning Project" April 2010 - Map 2 Scenario 4.1 General Policy

AWHC Northern Sector (Flow - Walking & Cycling)

Figure 3.2: Existing and Planned Cycle Network Southern Sector



KEY

- Growth Centre (Sub-Regional)
- Growth Centre (Town)
- Ferry Terminals (Existing) (Future)
- Additional Waitemata Harbour Crossing Corridor
- Existing Pedestrian Link Across SH1
- ACC Current Walking Network
- ACC Future Walking Network
- Future Cycle Network - once AWHC is built
- Rail Corridor & Stations
- State Highways
- Planned Motorway Extensions
- Regional Arterial Network
- University
- Completed Regional Cycle Network
- Proposed Regional Cycle Network

5 November 2010 DRAFT
 *Graphic: Illustration only - not to scale

DRAFT 7

AWHC Southern Sector (Flow - Walking & Cycling) - Draft 7
 Prepared by Auckland Transport Planning Department
 Date: 5 November 2010
 This map is a draft and should not be used for any other purpose without the express written consent of Auckland Transport Planning Department.

AWHC Southern Sector (Flow - Walking & Cycling)

3.2 *Planned and Programmed Walking and Cycling Projects*

This section provides a summary of the works that have been identified as programmed for implementation. Table 3.1: Planned and Programmed Projects summarises these projects with information taken from the following sources:

- National Land Transport Programme 2009 – 2012 for the Auckland Region;
- Auckland City Council – Annual Plan -2010/2011;
- North Shore City Council – Annual Plan -2010/2011;
- Auckland Region Contracts Group (ARCG) Forward Work Plan;
- NZTA's Walking and Cycling Programme;
- Discussions with Council officers; and
- North Shore City and Auckland City Council Web Sites.

Table 3.1 categorises these projects as planned and programmed. These definitions take into consideration the definitions from the NLTP⁹. The definitions are:

- **Programmed:** All projects that are classified as Committed or Category 2 in the NLTP, or have specific budget allocations; and
- **Proposed:** All projects that are classified as Reserved in the NLTP, or are mentioned but do not have specific budget allocations.

Given the current political environment with the creation of Auckland Council the projects listed in the annual plans for both councils need to be considered with care. The Local Government (Auckland Council) Act 2009 requires each current Auckland Local Authority to produce an Annual Plan covering just the last four months when they will be in existence (July to October 2010). The Auckland Transition Agency (ATA) has been given the responsibility of leading the establishment of the new Auckland Council by the Government and has the responsibility of producing a Planning Document covering the remaining four years.

⁹ The NLTP definitions are as follows: Committed: A commitment carried forward from previous years. Category 2: projects included in the NLTP which have not been given funding approval but may be considered for funding during 2009/2012 and based on information submitted to the NZTA are expected to meet the requirements for funding. Funding applications for the projects are expected during the course of 2009/2012. The Category 2: Possible are activities which, based on information submitted to NZTA, possibly have sufficient priority to warrant funding, subject to funding being available. Reserve: projects included in the NLTP which have not been given funding approval and are not likely to be promoted for funding during 2009/2012 either due to expenditure being programmed beyond 2009/2012 or because preliminary assessment of their profile gives them a priority below that expected to be funded in 2009/2012. Reserve A projects are indicatively programmed over 2009/12, while Reserve B projects are programmed to start beyond 2011/2012.

Table 3.1: Planned and Programmed Projects

Project	Location	Time Period	Source	Relevance	Status
Victoria Park Tunnel	Auckland City	2009/2010	NLTP: Auckland Region: 2009/2012 Discussions with NZTA Officers	This project includes a pedestrian overbridge connecting St Mary's Bay with the CBD and a footpath between Pt Erin Park and Beaumont Street.	Programmed
SH16 Central Auckland Connection (CMJ)	Auckland City	2009/2010	NLTP: Auckland Region: 2009/2012 Discussions with NZTA Officers	This project includes a cycleway/footpath between Newton Gully and Grafton Gully. Currently under investigation.	Programmed
Onewa Road	North Shore City	2009/2010	NSCC Web Site Discussions with Council Officers	Works include a shared cycle path and footpath (share with care path) along the northern side of Onewa Road from Queen Street to the Onepoto cycle/pedestrian Bridge, new street lighting, road markings and signage.	Programmed
2009/2012 Anzac Street Corridor	North Shore City	2009/2010	NLTP: Auckland Region: 2009/2012 North Shore City Annual Plan Discussions with Council Officers	The NLTP and annual plan funding is for investigations and land purchase to allow widening works. Walking and cycling facilities will be included; however the final design will be dependent on funding.	Programmed

Table 3.1: Planned and Programmed Projects

Project	Location	Time Period	Source	Relevance	Status
2009/2012 Taharoto/Wairau Corridor	North Shore City	2010/2011	NLTP: Auckland Region: 2009/2012 North Shore City Annual Plan Discussions with Council Officers	Cycle lanes will be implemented from Shakespeare Road to the Wairau Road underpass at SH1.	Programmed
SH1 Northern Cycleway Stage 2: Onewa Road to Esmonde Road	North Shore City	2011/2012	NLTP: Auckland Region: 2009/2012	This funding is for detailed investigation of a cycleway link between Onewa Road and Esmonde Road.	Programmed
Pedestrian and cycle improvements	Auckland City	2009/2010 2010/2011 2011/2012	NLTP: Auckland Region: 2009/2012 Auckland City Council Annual plan Discussions with Council Officers	This funding is for minor improvements to pedestrian and cycle facilities. The projects are yet to be finalised.	Programmed
Wynyard Quarter Intersection Improvements	Auckland City Council	2010/2011	ARCG Forward Work Plan	Works include the signalisation of:the Beaumont Street/Gaunt Street. Beaumont Street/Westhaven Drive and the Halsey Street/Gaunt Street/Viaduct Harbour Road intersections.	Programmed
Wellesley Street East/Princes Street intersection improvements	Auckland City Council	2010/2011	ARCG Forward Work Plan	Signalisation of the Wellesley Street East with Princes Street intersection.	Programmed

Table 3.1: Planned and Programmed Projects

Project	Location	Time Period	Source	Relevance	Status
Grafton Road Pedestrian improvements	Auckland City Council	2010/2011	ARCG Forward Work Plan	Provision of a signalised pedestrian crossing across Grafton Road by the Owen Glenn Building within the University of Auckland.	Programmed
Northern Busway Access to Stations	North Shore City	2011/2012	NLTP: Auckland Region: 2009/2012 Discussions with Council Officers	This is for investigation and design of improved access to all busway stations. The works will predominantly include minor improvements.	Proposed
2009 - 12 Te Wero Bridge	Auckland City	2010/2011 2011/2012	NLTP: Auckland Region: 2009/2012 Auckland City Council Annual plan.	The Wynyard Crossing / interim crossing is to be established in mid 2011 prior to the Rugby World cup. The temporary bridge will be in place until funding becomes available for the permanent Te Wero Bridge.	Proposed
SH1 Northern Cycleway Stage 1: Northcote Road to Constellation Drive	North Shore City	2011/2012	NLTP: Auckland Region: 2009/2012	This project is listed for investigation but is currently reserved until funding becomes available.	Proposed
Devonport to Takapuna off road cycle route	North Shore City	2009/2010, 2010/2011	NLTP: Auckland Region: 2009/2012	This funding is for construction, however it is currently reserved until funding becomes available.	Proposed
New footpaths - city wide	North Shore City	2010/2011	North Shore City Annual Plan Discussions with Council Officers	General footpath renewal projects yet to be specified.	Proposed

4.0 Demand

4.1 Existing Situation

Existing Travel Characteristics

To obtain an understanding of the existing demand for cycling and walking facilities across the AHB we have reviewed a number of sources which are detailed in Appendix C. The findings are summarised below:

- The 2006 Census recorded that of those travelling to employment destinations in the Auckland CBD, 1.4% cycle and 9% walk or jog. The equivalent figures for the North Shore are 1.1% cycle and 5.5% walk or jog;
- The Auckland Regional Transport Authority (ARTA) cycle counts for 2010 show a total of 3,774 cyclist movements across 12 sites in Auckland City and 1,105 cyclist movements across the 13 sites in North Shore City. This represented an increase from 2009 of 34 % in Auckland City and 5 % in North Shore City;
- A consultation survey carried out in the North Shore in 2009 revealed that 6 % of respondents (1251 people) walk to work or study¹⁰; and
- The Auckland City Council Walking and Cycling Strategy states that over 15,000 cycle, walk or jog to work every day.

Estimates of Existing Demand for a Harbour Bridge Crossing

A number of existing studies and strategies have included estimates of the demand for cycling and walking facilities over the existing AHB. These include the following:

- Investigations for cycle facilities on the bridge in 1995¹¹ identified a potential demand of 700 cycle trips a day. This is based on applying a modal split percentage to the number of existing vehicle trips across the AHB and factoring this percentage down to account for people who live too far away or may not work in an appropriate place. Pedestrian volumes are expected to be small;
- A letter produced in 2007¹² utilises two different methodologies to estimate the demand, one using the 2007 Young and Rubicam survey data and the other the 2006 census data.

¹⁰ North Shore City Council, 2009, North Shore City Cycling and Walking Strategy,

¹¹ SERCO, Auckland City Council, 24/01/95, Report to the Transport Committee Cycle and Pedestrian Access Auckland Harbour Bridge

¹² Tasman Research, 17/12/07 Letter to Cycle Action Auckland, Crossing the Auckland Harbour Bridge by Foot or Cycle

The results show that there would be a walking and cycling demand on the AHB of around 10,000 trips per day;

- An estimate of the AHB Cycle demand was prepared in 2008¹³. The methodology involved using the Census journey to work data to develop a profile to determine the percentage of cycle trips made at different distances. The profile was then fitted to the origin/destination data from the Auckland Regional Transport (ART) Model for the relevant zones. The results indicated that there would be a demand of 1580 bicycle trips per day during the first year (assumed to be in 2008);
- The Maunsell Report⁶ uses two methodologies to estimate cycle demand across the bridge. The first approach is based on the Land Transport New Zealand Research Report No. 340¹⁴ which proposes a method for estimating demand for a new cycle facility based on counts of existing cyclists on the road. It employs a step function to determine the new demand at facility opening. The report assumes that the number of cyclists arriving at the ferry terminal is representative of cyclists that would be on an existing route. The second methodology involves estimating a likely catchment area for the bridge and assuming that future behaviour in this catchment area will be similar to other populations of cyclists in Auckland. Both methods produce similar results with a first year demand of 450 to 500 cycle trips across the bridge per day. However the report indicates that these figures may be conservative and that the demand from recreational cyclists may be higher. A qualitative assessment of pedestrian demand identified an average of about 280 pedestrians per day, mainly from recreational users; and
- A review of the Maunsell Report was prepared by the “getacross” campaign¹⁵. This review included a letter from a Research Fellow at the University of Auckland which indicates that the pedestrian demand analysis carried out in the Maunsell report is underestimated as it does not take into account any significant demand from tourist trips and recreational users, particularly on public holidays.

We have reviewed the various methodologies used to estimate the demand for cycle trips across the Harbour Bridge outlined above and in general we agree with the findings of the Maunsell report which conclude that the demand for commuter cyclists is likely to be in the range of 450 to 1580 trips per day. However we note that the existing estimates may have been conservative when estimating the potential use of the bridge by recreational users and tourists.

¹³ OPUS International Consultants, 2008, , Auckland Harbour Bridge Cycle Demand Estimation for NZTA

¹⁴ Land Transport New Zealand, 2007, research report No. 340: Estimating Demand for New Cycling facilities in New Zealand

¹⁵ “Getacross” Campaign, 23/10/10 Review of the Auckland Waitemata Harbour Cyclists and Pedestrian Access Study

4.2 Estimate of Future Cycling Demand

Commuter Cycling

The aim of this section of our report is to identify the main cycle routes which will be in demand following the implementation of a cycling facility across the Harbour (assumed to be 2026). The aim is not to identify a definitive estimate for the demand for a cycling facility across the AHB (as has been the subject of previous studies outlined in Section 4.1 but to use the demand analysis to help identify any gaps in the existing and planned walking and cycling networks which can be planned for implementation in line with the implementation of the cross harbour cycling facility.

Methodology

To estimate the future demand for cycling on the various routes we have developed a model to illustrate the main demand origin and destinations for commuter cycling trips in 2026. The methodology for the analysis is based on that used by OPUS¹⁶ to develop a demand for an AHB cycle facility but has been adapted for the purpose of this project.

The base data used for the analysis is as follows:

- 2026 trip demand figures from the AWHC Base Saturn Model for the morning and evening peak periods. These demands are based on the Auckland Regional Transport 3 (ART 3) model with various changes as agreed as part of the AWHC project¹⁷;
- An estimate of the cycling trip mode share for 2026. Two estimates, of 1 % and 3 %, have been assumed for this analysis; and
- The cycling distance demand profile from the OPUS16 report which plots the percentage of cycle trips in the Auckland region against the distance of the trip as recorded in the 2001 census.

In summary, the methodology takes the 2026 trip demand figures (vehicle and public transport) from all ART 3 zones within a distance of approximately 20 km north and south of the AHB and removes all trips which do not involve crossing the harbour.

The ART 3 trip demand data is based on seven trip types. Only those cross harbour trip types which we consider to have the potential to be transferred to a cycle trip during the peak periods are used. As a result we include home based work, home based education and 25 % of home based other trips and excluded home based shopping, employers business, non home based other and medium/HCV.

¹⁶ Auckland City Council and ARTA, January 2008, Local Application of the Regional Cycle Network Methodology,

¹⁷ SKM, 20 August 2010, Waitemata Harbour Crossing – ART3 Do Minimum Forecasts

The motor vehicle trips are converted to people trips by multiplying the motor vehicle trips by an assumed vehicle occupancy rate of 1.2. The public transport people trips are then added to the motor vehicle person trips. An assumed total cycling mode share is then applied to calculate the total cycle trip demand from each zone. The cycling distance demand profile is then applied to the total cycle trips associated with each of the zones, according to their distance from the origin of the trip.

The key varying factor is the assumed cycling trip mode share for 2026 and we have used lower and higher percentage estimates of 1 % and 3 % of total people trips to allow for a range of results. It is noted that the aim of this exercise is not necessarily to estimate actual demand figures but to understand the likely origin and destination of these trips and as a result the percentage used is not critical. However we have outlined below the basis of the percentage mode shares used in the analysis.

The lower percentage estimate of 1 % is based on the 2006 Census journey to work data which showed that approximately 1 % of journeys to work in the Auckland region were made by bicycle. This is considered to be a very conservative figure as it does not take into account any growth in cycle mode share as a result of infrastructure improvements between 2006 and 2026. In addition the data is based on journey to work trips only and the cycling mode share for non work trips such as educational trips (and therefore the percentage of all people trips) will be higher.

The higher percentage estimate for the cycling mode share has been assessed as 3 %. It is noted that this is not intended to represent the maximum cycle mode share and the demand may be significantly higher than this (for example the OPUS report included a maximum mode share percentage of 8 %). As a result the 3 % estimate is still considered to be relatively conservative. The 3 % estimate is based on the Auckland Regional Land Transport Strategy (RLTS) estimate for a walking and cycling mode share of 15.5 % by 2040. Back calculating this mode share to 2026 results in a figure of 12.5 %. We have assumed that the walking/cycling split of the 12.5 % is 75%/25% (based on 2006 Census figures), resulting in a total cycling mode share of 3 %. It is noted that this mode share is a percentage of all trips as opposed to only work journey trips.

Using the cycle trip results from the morning and evening peak periods (two hours) we have calculated the AADT using the methodology for estimating cycling AADT figures recommended by NZTA¹⁸.

To illustrate the demand we built a simple network model for the area using traffic modelling software SATURN. The model network includes the arterial road network and penalties have been applied to routes on the network with significant positive gradients. We acknowledge that the model is high level and further work to refine the attractiveness of the various routes is required before it can be used to accurately predict cyclist's choice of route. However we consider that the existing model can be used for the purposes of this project.

¹⁸ NZTA, 2004, Cycle Network and Planning Guide

The SATURN plots showing the lower and higher estimated AADT figures for the southern and northern side of the AHB are shown in

Figure 4.1, Figure 4.2, Figure 4.2, and

Figure 4.3. Full results for relevant links are shown in Appendix D.

When considering the results the following should be noted:

- The model assumes the cycling facility is on the existing AHB. The impact of moving the facility to the additional crossing (should the preferred option be a bridge) is discussed in Section 6.5
- The Trip/Distance profile uses data from the 2001 census and there is evidence that the provision of good quality cycling infrastructure (eg the North Western Cycleway) may increase the distance cyclists are prepared to travel. Therefore the implementation of a cycleway across the AHB may have a significant impact on this profile.
- The figures illustrate demand associated with cross harbour cycle trips only and do not take into account the demand from cyclists originating from the same side of the bridge as their destination eg cyclists commuting from the city side of the bridge to the CBD. As a result these figures can not be used to show total demand for the various routes but illustrate the demand created through the introduction of the cross harbour cycle facility only.
- While the model makes some attempt to predict the preferred route of cyclists by applying a penalty to some particularly steep routes, the model includes arterial roads only and alternatives to the routes shown may form part of the final recommendations.
- The calculated demand is mainly from commuter cyclists and does not consider all trips associated with recreational cyclists and tourists. This is discussed further in Section Recreational and Tourist Cycling.
- The analysis assumes that a suitably attractive facility will be provided on the AHB itself (this is discussed further in Section 6.0).

Results

The results for the southern side of the bridge indicate that significant demand is evident from the AHB to destinations around Beaumont Street and Halsey Street, various additional locations within the CBD, Anzac Avenue and the University area and Ponsonby Road. Some of these trips will be providing access to employment in these areas while others will continue onto Wellington Street to access the southern side of the CBD or Newmarket. There is also evidence of demand from the AHB to areas such as Pt Chevalier and to gain access to the Northwestern Cycleway

The results for the northern side of the bridge indicate that (aside from the bridge itself) the main demand will be along SH1 and Esmonde Road to Takapuna and other suburbs on the eastern side of the motorway. Significant demand is also evident for access to suburbs on the western side of the motorway such as Northcote Point, Birkenhead, Northcote and Glenfield. The employment area around Smales Farm is also showing demand.

In summary the results indicate demand for the following destinations on the southern side of the Harbour:

- Beaumont Street/Wynyard Quarter;
- Downtown CBD;
- The University of Auckland/University of Technology (AUT) (CBD);
- Ponsonby;
- Pt Chevalier; and
- Southern side of the CBD/Newmarket.

On the northern side of the harbour there is demand for the following destinations:

- Takapuna;
- Northcote Point;
- Birkenhead;
- Highbury;
- Northcote;
- Smales Farm; and
- AUT (Northcote).

Figure 4.3: Northern Side 2026 AADT Lower Estimate



Figure 4.4: Northern Side 2026 AADT Higher Estimate



Recreational and Tourist Cycling

The demand analysis outlined in Section Commuter Cycling is based on predicted home based work, education and 25 % of trips associated with other purposes during the peak periods. The AADT figures have been calculated using the AADT estimation methodology recommended in the NZTA Guide¹⁹ but this methodology is based on factors calculated from the collection of data from 13 sites in Christchurch only. While we anticipate that some recreational cyclists will have been captured in these surveys, the calculated factors may not be applicable to major recreational cycling routes such as we anticipate the AHB will be. As a result it is considered that it does not fully consider trips associated with recreational cyclists.

In addition we consider that there is potential for the cycle facility on the AHB to be a major tourist facility such as the Sydney Harbour Bridge or the Golden Gate Bridge in San Fransisco, the potential for which has also not been included in the demand estimation.

It is difficult to estimate an actual demand figure for recreational and tourist cyclists and we were unable to find any estimates for the number of recreational cyclists in the Auckland Region. However, the NZ Household Travel Survey 2009²⁰ states that for people aged over 18 years, 53 % of cycle trips are for recreational purposes compared to only 20 % for commuting purposes. This indicates that there is significant potential for the use of the AHB and the surrounding cycling routes for recreational purposes.

ARTA has collected automatic count data from Tamaki Drive, which is known to be a popular recreational and training cyclist route, for the past two years. The results are for one way only and show a significant increase in cyclist numbers during the weekend with an average daily count of around 800 cyclists on a Saturday compared with an average of around 650 on a weekday (average from 8 November to 30 April 2009). In fact most weekends have a one-way count of around 1,000 cyclists per day but the average is reduced by some one-off weekends (such as Valentine's day) where the number of recorded cyclists is as low as 200. In addition we note that the counts may be underestimated as it is unclear how well the equipment will count individual cyclists travelling in packs. It is noted that using the NZTA estimation methodology the AADT for Tamaki Drive is estimated to be at 1,365 (two-way) which compared with the Saturday one-way counts of around 1,000 indicates that the NZTA methodology is likely to underestimate AADTs for recreational routes.

In general the Tamaki Drive cycle counts indicate that there is potential for a cross harbour cycling facility to be used by recreational and training cyclists, although we note that the cross harbour facility will have a significantly steeper gradient than Tamaki Drive.

The Maunsell Report⁶ includes some AADT figures from the Sydney Harbour Bridge and the Golden Gate Bridge (1300 and 1600 respectively) which we assume will include recreational cyclists and tourists. However it is unclear how these AADT figures have been calculated and whether they are

¹⁹ NZTA, 2004, Cycle Network and Planning Guide

²⁰ Ongoing New Zealand Household Travel Survey 2006 – 2009, Cycling for transport

based on continual counts over a whole week/year or estimations based on peak surveys as with the NZTA methodology. Realistically the actual demand from recreational users and tourists for the AHB and the surrounding connections will ultimately depend on the attractiveness of the facility and the marketing of the route to tourists.

In terms of the likely routes to be used by recreational cyclists and tourists we consider that the highest demand will be associated with the AHB itself, Westhaven Drive, the Viaduct, Quay Street and connections to Tamaki Drive. On the northern side of the bridge recreational users may also wish to access destinations such as Northcote Point, Takapuna and Devonport, particularly as there will be opportunities to complete round harbour trips where cyclists could complete the return trip via ferry.

We note that these routes are already identified as part of the commuter cycle network and we do not consider additional routes will be required for recreational or tourist users. However, we consider that these user groups may result in an increased demand for these routes and may impact on the type of facility recommended.

4.3 *Walking Demand Analysis*

The same methodology for assessing commuter cycling trips can also be used to identify the demand for walking and/or jogging across the AHB. Based on the information in the NZ Household Travel Survey²⁰ and the NZTA Pedestrian and Planning Guide²¹ we have estimated a rough trip distance profile for walking trips. We have assumed that 50 % of walking trips will be below 1 km and the maximum walking/jogging trip will be 6 km.

Using the same justifications for the overall walking mode share as were used in the cycling assessment we have used two estimates of 5 % and 10 % for the total walking mode share. Using this methodology we have calculated that the demand for commuter walkers across the AHB is likely to be in the range of 50 to 100 pedestrians/joggers per day. As with cyclists, there is likely to be a higher volume at weekends.

The Maunsell Report⁶ estimates that there may be a total demand of 50 commuter joggers per day using the bridge (in 2008). This is based on an existing population of 4,000 North Shore residents living within 5 km of the Auckland CBD and assuming that 20 % of the existing walking mode share may choose to walk over the AHB. Whilst the methodology we have undertaken considers the actual demand for the trips across the AHB in 2026, it is interesting to note that the resulting numbers are not too dissimilar.

²¹ NZTA, 2007, Pedestrian Planning and Design Guide,

The NZ Household Travel Survey²² notes that for people aged 18-65 years, 25 % of all walking trips are for recreation (compared to 20 % for commuting purposes). Therefore as with the cycling trips we consider that the greatest demand for the facility will be from recreational walkers and joggers.

As described in Section 4.0 this is difficult to assess. The Maunsell Report⁶ estimates that one bus load of tourists might use the bridge as pedestrians per day based on tourists visiting Mt Eden. However the report also notes that pedestrian traffic on the Sydney Harbour Bridge can approach 5000 people on public holidays. As with a cycling facility the total number of pedestrians likely to use the bridge will depend on the attractiveness of the facility being provided as well as the presence of other facilities (such as parking) on either side of the bridge.

In terms of the pedestrian routes to the on bridge facility the demand will be the same as shown on the SATURN plots for the cycling routes (albeit at much lower percentages and trip length). As for cycle trips there is also potential for recreational walkers and joggers to complete round trips using public transport for the return journey. As a result the main pedestrian demand is anticipated to be for the following destinations:

- Westhaven Drive and the CBD;
- Ponsonby and Herne Bay;
- Northcote Point (particularly leaving/arriving by public transport or from Northcote Point); and
- Birkenhead.

²² New Zealand Household Travel Survey 2006-2009, Walking for Transport Ongoing

5.0 Gap analysis

The analysis in Section 4.0 identifies the destinations for which we consider there will be a significant increase in demand for cycling and walking following the implementation of a facility across the AHB. The relevant existing programmed and planned projects are discussed in Section 1.0. The purpose of the following section is to undertake a gap analysis to identify where additional facilities will be required.

The full gap analysis is shown in Table 5.1 but in summary:

- There are limited existing walking and cycling facilities on the routes identified in this report, and in some cases (ie where these are located alongside the motorway) are non-existent
- Very few of the routes have confirmed programmed works. The exceptions are as follows:
 - 1 The signalisation of some of the intersections around Wynyard Quarter should aid pedestrian safety and levels of service at these intersections
 - 2 The streetscape upgrade of Jellicoe Street will improve the pedestrian and cycling environment
 - 3 The SH1 Northern cycleway between Onewa Road and Akoranga Station is listed in the NLTP (though funding has yet to be confirmed)
 - 4 Onewa Road is currently being upgraded to include a shared walking and cycling facility on the northern side
 - 5 The northern end of Glenfield Road has planned widening including cycle lanes
- The majority of the routes are identified in the Regional Cycling Network but are not due for implementation until after 2016 and the type of facility recommended is unclear. The exceptions are as follows:
 - 6 There is no connection included in the Regional Cycling Network between the AHB and Northcote Point
- There is no connection along local roads included in the Regional Cycling Network between the AHB and Northcote

Table 5.1 provides a summary of the key demand destinations identified in Section 4.0, the existing facilities and the programmed and planned works that have been identified on these routes. Any gaps or other relevant points have also been noted in the far right column.

Table 5.1: Existing, Programmed and Planned Works on Key Routes

Destination	Existing Facility	Programmed Projects	Proposed Projects/Studies	Analysis
Wynyard Quarter and the proposed Gaunt Street Station	Westhaven Drive is a sign posted cycle route. Narrow footpath on one side.	Signalisation of the following intersections: Beaumont Street/Gaunt Street. Beaumont Street/Westhaven Drive Halsey Street/Gaunt Street/Viaduct Harbour Road.	Pedestrian and cyclist promenade identified along Westhaven Drive in the Waterfront Masterplan. 2009 study ⁸ recommends alternative route to Westhaven Drive on western side of Victoria Park Tunnel.	The Victoria Park Tunnel currently under construction includes a 2 m wide path along its western side only which is of insufficient width for a shared cycleway/walkway. As a result Westhaven Drive will continue to be the main pedestrian and cycle route. Westhaven Drive has been identified as a potential recreational and tourist route and therefore an off-road cycle and footpath is appropriate, however, with low traffic volumes on Westhaven Drive, commuter and training cyclists are likely to continue to use the road. Extending the existing footpath out over the marina with boardwalks or widening the footpath into the marina parking area are two options that could be considered to provide improved pedestrian facilities. Currently there are no confirmed works.
Downtown CBD	Footpaths along waterfront and Fanshawe Street Shared cyclists/bus lanes on Fanshawe Street Shared cycleway/footpath around viaduct between Quay Street and Halsey Street Shared Bus/ Cycle lanes on Albert Street	Jellicoe Street Upgrade will improve the pedestrian environment for a section of the route. Temporary Te Wero Bridge is planned for 2011.	Pedestrian and cyclist promenade identified in the Waterfront Masterplan. Off road cycle route connecting Westhaven Drive with Quay Street (incorporating the permanent Te Wero Bridge) identified in the Regional Cycle network for post 2016 .	Currently there are very limited confirmed programmed works. This route has been identified as a potential recreational and tourist route and therefore a route away from the Fanshawe Street bus lanes should be provided. The proposed cycle path will need to connect well with the section along Westhaven Drive. Consideration will have to be given to easy access from the waterfront cycleway to other parts of the CBD eg good level of service for pedestrians and cyclists at the Quay Street/Albert Street and Quay Street/Queen Street intersections.
University Precinct	Shared bus/cycle lanes on Anzac Avenue (CBD) Upgraded footpaths on Anzac Avenue (CBD)	Pedestrian crossing across Grafton Road by the Owen Glenn Building.	A cycle path along Fanshawe Street and Quay Street between Hobson Street and Anzac Avenue (CBD) identified in the Regional Cycle network for post 2016.	Currently there are very little confirmed programmed works. Ensure continual connections from AHB to Anzac Avenue.

Destination	Existing Facility	Programmed Projects	Proposed Projects/Studies	Analysis
Ponsonby	Sign posted 50 km cycle route along Westhaven Drive begins at Curran Street. Average quality pedestrian facilities on both Curran Street and Shelly Beach Road Shelly Beach Road has an extremely narrow footpath on its eastern side between the Westhaven Drive roundabout and the motorway bridge. The overbridge provides a shared cycle/footpath but no pram crossing to access it. Stairs provide access from Shelly Beach Road just north of the motorway bridge down to Westhaven Drive.	None	Cycle path along Curran Street identified in the Regional Cycle network for post 2016. Proposed cycle path identified as part of AWHC Pedestrian and cyclist access study ⁶	Currently there are no confirmed programmed works.
Westmere and Pt Chevalier	Jervois Road and West End Road are part of the sign posted 50 km cycle route. Good quality pedestrian footpath.	None	Cycle facility Identified in the Regional Cycle network for post 2016.	Currently there are no confirmed programmed works
Southern side of the CBD and Newmarket	Ponsonby Road is a slow speed zone posted at 40 km/hr. Good quality pedestrian footpaths. Shared cycle/bus lanes on Khyber Pass and Park Road. Standard pedestrian facilities.	None	Cycle facility Identified in the Regional Cycle network for post 2016. Cycle paths between Ponsonby Road and Khyber Pass and Gladstone Road are identified in the Regional Cycle Network for post 2016.	Currently there are no confirmed programmed works
Akoranga Station and Takapuna	Pedestrian underpass at Stafford Road but no further pedestrian connection north. Shared walking and cycle path between Akoranga Station and Takapuna along Esmonde Road. Cycle lanes on Lake Road between Takapuna and Devonport. Cycle lanes along Fred Thomas Drive and Shakespeare Road.	SH1 Northern Cycleway Stage 2: Onewa Road to Esmonde Road is currently in investigation Stage but funding has yet to be confirmed. Completion of Lake Road widening including cycle lanes between Devonport and Takapuna. Programmed walking and cycling connections to northern Busway Stations may include some works around Akoranga Station but the detailed works have not been confirmed.	Connection between AHB and Akoranga Station identified in the Regional Cycle network for post 2016 Cycleway along SH 1 recommended as part of improvements to pedestrian and cyclists connections to Akoranga Station in investigative report ³ . Feasibility Study completed into cycleway between Onewa Road and Akoranga Station along the western side of SH 15. Shared walking and cycling facilities between Akoranga Drive and the pedestrian overbridge at AUT, Rosmini College and Akoranga Station, Takapuna and Akoranga Station (via a new bridge connection) and Francis Street to Esmonde Road (via a new bridge connection) were recommended as part of a study to increase pedestrian and cycling connectivity to Akoranga Station ²³	Currently there are no confirmed programmed works but a number of projects are at the investigative stage The existing connections between Akoranga Station and Takapuna are not very direct and any recommendations to increase accessibility between these two points will also aid connections between Takapuna and the AHB.

²³ Maunsells AECOM, 2009, Akoranga Station Cyclists and Pedestrian Access Project Feasibility Report

Destination	Existing Facility	Programmed Projects	Proposed Projects/Studies	Analysis
Northcote Point	None	None	Cycle connection from Stafford Road to Onewa Road identified in the Regional Cycle network for post 2016.	Currently there are no confirmed programmed works. There are no proposed facilities for Queen Street (Northcote Point) or other connections from the AHB to Northcote Point or Birkenhead Wharf (except via Onewa Road) in existing NSCC and NZTA documents. This route has been identified as a potential recreational and tourist route.
Highbury and Glenfield	Shared bus/cycle lanes are on the northern section of Glenfield Road.	Onewa Road is currently being upgraded to include a shared walking and cycling facility on the northern side. Glenfield Road has planned widening, allowing for on road cycle lanes. NSCC currently has no planned works for Birkenhead Avenue.	Onewa Road, Birkenhead Avenue and Glenfield Road are all identified in the Regional Cycle network for post 2016. North Shore City Council are currently working on a proposed Plan Change for Highbury which is likely to include recommendations for walking and cycling. Birkenhead Avenue and Glenfield Road are identified in the Regional Cycle network for post 2016.	Onewa Road is the only confirmed works in this area. Need to consider how to direct pedestrians and cyclists across Onewa Road to the shared facility on the northern side. Currently there are no confirmed works for Birkenhead Road.
Northcote and AUT	None	No works programmed on Lake Road (Northcote).	Not present on the regional cycle plan.	Regional cycle maps predict cyclists will use SH 1 cycleway or Onewa and Pupuke Road to access Northcote. However this may result in a significant catchment having to backtrack. Therefore it is recommended that cycle lanes are investigated on Lake Road.
Smales Farm and North Shore Hospital	Existing cycle lanes along Anzac Street and Shakespere Roads. Good quality local pedestrian footpaths.	Programmed walking and cycling connections to northern Busway Stations may include some works around Smales Farm Station but the detailed works have not been confirmed.	Cycle path along SH 1 to between Onewa Road and Akoranga Station is listed in the NLTP but funding is yet to be confirmed. Feasibility Study completed into cycleway along the western side of SH 15 between Akoranga Station and Constellation Drive. Shared walking and cycling facilities between Argus Place and Wairau Road, Smales Farm Station and Wairau Road and Smales Farm Station and Northcote Road were recommended as part of a study undertaken in 2009 to improve pedestrian and cycling connections to Smales Farm Station ²⁴ .	SH1 is the quickest connection from the southern side of the Harbour to Smales Farm but there is no confirmed funding for this link.

²⁴ Maunsell AECOM, 2009, Smales Farm Station Cyclists and Pedestrian Access Project Feasibility Report

6.0 Infrastructure Requirements

6.1 Standards and Guidelines

Austrroads Guide to Traffic Management²⁵, and NZTA^{19 and 21} provide guidelines and advice on the provision of infrastructure for cyclists and pedestrians.

A summary of recommendations for cycling facilities is provided below:

- Separate facilities for cyclists are recommended on highly trafficked and high speed routes. This can be by way of kerbside cycle lanes, cycle lanes next to parking, contra-flow cycle lanes, wide kerb side lanes, sealed shoulders, bus-bike lanes, HOV lanes and off road paths;
- Separate facilities for cyclists are not necessarily recommended on other routes such as local and collector roads that have traffic volumes less than 5,000 vehicles per day and speeds of less than 50 km per hour. Guidelines state that separate cycling facilities may not be required where there are wide kerbside lanes, sealed shoulders, bus-cycle lanes, shared paths, slow, mixed traffic, lightly trafficked streets of adequate width, unsealed roads and paths or one way streets where signs and markings permit two way use by cyclists;
- Despite the previous point, where space permits, it is important to consider the provision of separated bicycle facilities such as bicycle lanes or a shared path as cyclists are noted to prefer marked cycle lanes wherever possible;
- Cyclists vary in skill and the needs of all skill levels should be considered in a cycling network. Therefore facilities suitable for novice, basic and experienced users should be provided for; and
- The type of facility required may vary depending on the type of cyclists using the route:
 - 1 Commuter cyclists vary in age, skill and fitness, with some highly skilled and able to handle a variety of traffic conditions. Some of these cyclists prefer paths or low stress roads and are willing to take longer to get to a destination, while others want quick trips regardless of traffic conditions. They primarily require space to ride and smooth riding surfaces that enable speed maintenance.
 - 2 Recreational cyclists also vary greatly in age, skill and experience. They desire off road paths and quiet local streets and tend to avoid heavily trafficked routes. The more experienced recreational cyclist will prefer to use the road system for longer journeys. These cyclists prefer comfort and good surfaces with a high degree of safety and personal security.

²⁵ Austrroads, 2009, The Guide to Traffic Management Part 4: Traffic management

- 3 Sporting cyclists often cycle in groups, at times two abreast, occupying the left lane. They have similar needs to commuter cyclists. They travel long distances in training on arterials which may include challenging terrain in outer urban or rural areas. They generally do not use off road facilities because of high speed and conflict with other users. The NZTA guidelines state that these cyclists prefer high quality road surfaces and physically demanding and challenging routes with generous road widths.
 - Complementary facilities must also be considered such as signage, suitable bicycle parking and trip facilities such as resting areas, toilets and drinking fountains etc.

A summary of recommendations for pedestrian facilities is provided below:

- Wider footpaths are required in areas with higher adjacent motor vehicle speeds and/or higher adjacent traffic volumes or in areas with high pedestrian volumes and/or a high number of pedestrians stopping on the footpath;
- Complementary facilities must also be considered such as signage and trip facilities such as resting areas, toilets, drinking fountains, connections to public transport and parking, etc; and
- Consideration must be given to a range of factors to ensure a pedestrian facility is attractive. These include surface, grade, personal safety, provision of street furniture, signage, street activity, lighting, crossing facilities, streetscape amenity and others.

For shared facilities for pedestrians and cyclists the following points are noted:

- Shared facilities are most suitable where the intensity of use of either user is not expected to be sufficiently great to provide separated facilities;
- There is potential for conflict between cyclists travelling at high speeds and pedestrians and cyclists travelling at lower speeds. To minimise this conflict the shared use path should be designed to high standards with sufficient width, surface treatment and forward visibility; and
- Separated paths (ie a path on which cyclists and pedestrians are required to use separate designated areas) are more appropriate along promenades, foreshores and major inner city bridges.

6.2 *On Bridge Facility*

The design of the on-bridge facility has yet to be determined and is not the subject of this report. However Flow has previously provided design advice for the facility which is outlined in our Technical Notes dated 16 July 2010 and 5 August 2010 attached in Appendix E. In summary:

- The recommended option is to provide separate pedestrian and cycling facilities due to the speed differences of commuter/training cyclists and pedestrians/recreational cyclists. With

the existing bridge, from a tourism perspective, the pedestrian facility would be located on the eastern side and the cycling facility on the western side of the bridge. It is noted this was also the conclusion of the recent Maunsell report⁶;

- The alternative option is to provide adjacent facilities on the eastern side of the existing bridge, though a barrier separating the facilities is recommended. This could easily be achieved given sufficient width on the new bridge but it is Flow's opinion this can only be achieved on the existing AHB if a whole clip-on is allocated to walking and cycling or the existing clip on is widened (see Appendix E); and
- If the additional harbour crossing was a bridge and provided for the cycle and pedestrian facilities, then it would be best to keep the facilities adjacent to each other, and on the eastern side for tourism reasons, as grade separated structures will be needed to connect to the western suburbs on the northern side of the bridge and it is likely that this would be more viable if the facilities are adjacent to each other. This is discussed further in Section 6.5.

6.3 Recommended Facilities

Based on the information above we have completed an analysis of the type of facility required for each of the routes likely to be used by cyclists and pedestrians to access the destinations identified. Our recommendations are discussed below and summarised in Table 6.1.

Southern Side

On the southern side of the bridge the key routes connecting the AHB with the CBD are Westhaven Drive and Fanshawe Street. The analysis shows that these routes will have the highest demand in terms of both commuter and recreational pedestrians and cyclists following the implementation of the pedestrian and cycling facility on the AHB.

Westhaven Drive connects the AHB with Beaumont Street. It provides two lanes for traffic and along some parts (east of Sails Restaurant) there is a narrow footpath on the northern side of the road. Cyclists travel on the road. Pedestrians can use the footpath adjacent to the waters edge. This is generally not used as a shared facility as there are no drop kerbs where the footpath crosses the marina pier accesses. It is considered that this route will require upgrading to allow for the increase in pedestrian and cyclists demand. In addition it is anticipated this route will also be used by recreational pedestrians/cyclists and tourists and as a result a high quality facility is desired. It is acknowledged that the available space on Westhaven Drive is narrow but we consider investigation works into how a high quality pedestrian and cycling facility in the form of a shared pedestrian and cycling promenade for pedestrians/recreational cyclists can be implemented is required. Commuter and training cyclists are likely to continue to use the road, which we consider appropriate given the low volume of traffic. The use of Westhaven Drive as a through route by motor vehicles should be discouraged to help prioritise the available space for pedestrians and cyclists.

Fanshawe Street runs from the interchange with SH 1 at Beaumont Street to Custom Street East and currently provides shared bus/cycle lanes. We consider that the traffic volumes on Fanshawe Street in 2026 and in particular the number of bus services will result in the use of the bus lanes for cycling becoming less attractive. In addition, cyclists travelling towards the AHB will need to cross Fanshawe Street to access Westhaven Drive/AHB or use footpaths between Fanshawe Street and Pt Erin if feasible.

As a result of this we consider the completion of the waterfront cycleway/walkway between Beaumont Street and Quay Street (via the Te Wero bridge), as shown in the Regional Cycling Network, is essential. As with Westhaven Drive this should be a high quality facility, suitable for recreational as well as commuter/training users.

Consideration will need to be given as to how cyclists will gain good access to the CBD from the northern side of Quay Street through, for example, prioritising these users at crossing facilities and identifying key cycling routes to various parts of the CBD.

As well as for the CBD the analysis shows demand for access to Ponsonby, Westmere and Point Chevalier. These areas are accessed via Shelly Beach Road, Curran Street, Jervois Road and Ponsonby Road.

Shelly Beach Road and **Curran Street** provide vehicle access from and to the AHB. Both connect with Jervois Road at signal controlled intersections. Pedestrians and cyclists can access the western end of Westhaven Drive from both Shelly Beach Road and Curran Street (in both directions). South of the motorway on ramp, Curran Street has a footpath on the western side of the road which along the one way (northbound) section of Curran Street, provides for cyclists and pedestrians. Shelly Beach Road has an extremely narrow footpath on its eastern side between the Westhaven Drive roundabout and the motorway bridge. The overbridge provides a shared cycle/footpath but no pram crossing to access it. Stairs provide access from Shelly Beach Road just north of the motorway bridge down to Westhaven Drive. Cyclists are seen to carry their bikes up and down these stairs.

Ideally we consider that cyclists and pedestrians crossing the AHB will gain access to both streets, though it is acknowledged that this would depend on which side of the bridge the pedestrian and cyclist facilities were located, design requirements for pedestrians and cyclists (width, gradients, turning circles, etc) and how the facilities relate to the road network (eg crossing of Shelly Beach Road, ease of access to Westhaven Drive). Further investigative work will be required.

If a cycle facility was provided on the western side of the bridge, with connections to Curran Street, as indicated in the Maunsell report⁶, then Flow recommends that Curran Street be identified for cycle lanes. The existing shared cycle/footpath alongside the one way section of Curran Street provides for contra-flow cycle traffic, although this will need to be widened to accommodate expected demand. If a pedestrian facility was also provided on the western side of the bridge, then this could also use the connections to Curran Street, as suggested by Maunsell. If this were the case, then the existing shared cycle/footpath would need to be widened to accommodate the expected demands.

If a pedestrian (with recreational cyclists) facility was provided on the eastern side of the bridge, then connections to Westhaven Drive, as per the Maunsell report⁶ would provide for pedestrians, but cyclists would most likely need to dismount to manoeuvre the tight turning circle to cross Westhaven Drive. The Maunsell proposal includes a grade separated crossing of Westhaven Drive, which while providing a good connection with Westhaven, would result in a longer connection to Shelly Beach Road than an at grade facility (alongside the off ramp, with a crossing of Shelly Beach Road). If a commuter/training cyclist facility was also accommodated on the eastern side of the bridge then the solution suggested by Maunsell would need to be widened. Connections to Shelly Beach Road would need to consider the conflict area around the merge of Shelly Beach Road and the motorway off ramp.

Given the high volumes of traffic using Curran Street and Shelly Beach Road and their roles in connecting to the AHB as well as Westhaven Drive, Flow recommends that on road cycle lanes are provided on both roads.

Jervois Road is located at the southern end of Shelly Beach Road and Curran Street and connects Ponsonby Road and College Hill to West End Road. Jervois Road also forms the main shopping street for the suburb of Herne Bay. We consider that this route will be used mainly by commuters and as a result on-road cycle lanes are most appropriate.

Ponsonby Road is located to the south of Jervois Road and connects Herne Bay with Great North Road. Ponsonby Road is a main shopping street with a variety of shops, eateries and some office employment and therefore should provide high quality pedestrian facilities akin to a town centre location. Ponsonby Road also acts as a through route to destinations at the southern side of the CBD, Newton and Newmarket. We therefore recommend that investigations are carried out into how the environment can be improved for cyclists. This is likely to be in the form of separated cycling facilities given the predicted AADT volumes for cyclists and vehicles in 2026.

Northern Side

On the northern side of the bridge the highest demand was shown to be along SH 1 for access towards Takapuna. The SH 1 motorway corridor provides the most direct connection and various investigative studies into the provision of a SH 1 cycleway have already been completed (see Section 2.4). The previous studies have recommended that the cycleway be located on the western side of SH 1.

Northern Cycleway: Onewa Road to Esmonde Road is being investigated by NZTA, with scheme assessment investigations to be completed in 2011/12. Due to the location of the cycleway along the state highway corridor a separated off road cycleway/footpath is the only option. Consideration will need to be given as to how the cycleway/footpath will connect into other existing facilities such as the shared cycleway/footpaths along Esmonde Road to ensure good connectivity to the surrounding residential and employment areas such as Smales Farm and North Shore Hospital.

The results also illustrate demand to destinations on the western side of the motorway such as Northcote Point, Northcote, Highbury and Glenfield via routes including Queen Street (Northcote Point), Onewa Road, Lake Road (Northcote), Birkenhead Avenue and Glenfield Road. Connections

from the AHB facility to the local road network can be achieved at various point and these are discussed below.

Sulphur Beach Road to Stafford Road is close to the level of the motorway and a link could be provided here to any facility crossing the western side of the AHB. Due to the narrow width of the road, low speeds, shared use, widening and improving sight lines might be necessary. Sulphur Beach Road connects into the local street network, joining Stafford Road and then Queen Street. A link into Sulphur Beach Road would negate the need for a commuter connection at Stafford Road.

Sulphur Beach Road also connects to the Sulphur Beach boat ramps, accessed from beneath the northern abutments of the AHB. There is an existing pedestrian footpath between the boat ramp at Sulphur Beach and the underpass at Stafford Road. Whilst the previous investigations have shown that a cycleway is preferable on the western side of the motorway we consider that upgrading this existing pedestrian footpath for recreational users (pedestrians and cyclists) may also have merit.

Stafford Road provides an exit for northbound motorway traffic into the adjacent residential area. Unless a connection from Stafford Road to Onewa Road could be provided, it is considered that the Sulphur Beach Road connection would provide a safer route for cyclists. A connection between Stafford Road and Onewa Road would require either an at grade crossing of the exit lane in the vicinity of the police station (where sight lines are maximised) or a grade separated crossing over Stafford Road to avoid conflicts with traffic travelling around the corner.

Stafford Road to Onewa Road has been considered with regards to providing an off road cycle/footpath adjacent to the motorway and further investigations are required to ascertain what could be provided to connect to Onewa Road or the Onepoto Bridge.

The Onewa Road interchange provides for all traffic movements connecting to and from SH 1. A cycle/footpath along the western side of the motorway could connect to the local network alongside (separated from) the northbound off ramp. The Onewa Road/Sylvan Road Intersection is controlled by signals, with the northbound left turn exit from the motorway uncontrolled, and therefore resulting in safety concerns for any pedestrians and cyclists continuing north along the Northern Cycleway (if it extends from Stafford Road). Alterations to the signalised intersection of Onewa Road/Sylvan Road would be required to provide cyclists and pedestrians with safe access across to the Onepoto Bridge and any cycle/pedestrian path that extends north along the motorway. Alternatively, it may be possible to hang a cycle/footpath beneath the Onepoto Stream road bridge though this will require further investigation.

As well as the immediate connections to the AHB, demand is shown on the routes to the areas of Highbury, Glenfield, Northcote, Smales Farm and North Shore hospital. These various routes are discussed below.

Queen Street is located on the western side of SH 1 and connects Northcote Point (including the ferry service) with Onewa Road. The demand analysis has shown significant demand for AHB related cycling and walking trips along Queen Street and then via Alma Street and/or Princes Street to connect to the bridge. Queen Street is preferable to the parallel Stafford Road and Alfred Street

which have steep grades. Possible connections to the bridge are shown in the Maunsell report⁶, on both the eastern and western sides of the bridge. Of note is the parking provision beneath the northern abutments of the bridge, which could be used by recreational pedestrians, wishing to cross the bridge.

Based on the 2026 AADT cycle volumes we consider on-road cycle lanes on Queen Street should be provided. Consideration will need to be given as to how cyclists will be connected to the programmed shared cycleway/footpath on the northern side of Onewa Road (see below).

Onewa Road connects SH 1 with Highbury, Birkenhead and Beach Haven. Significant demand is shown along this route and a shared cycleway/footpath is planned for the northern side of the road at the eastern end. In addition HOV lanes have been implemented which can also be used by cyclists. Whilst we consider that the HOV lanes and the shared walking /cycling path will be sufficient to service cyclists, should the HOV lanes ever be removed then on road cycle lanes would be required.

Birkenhead Avenue and **Glenfield Road** connect Onewa Road with Glenfield and other residential areas to the north west. A shared cycleway/footpath is programmed for Onewa Road and the northern end of Glenfield Road but consideration should be given to connecting these two facilities along Birkenhead Avenue. In addition, provisions for commuter cyclists should be considered, including on road cycle lanes, or wider lanes (current kerbside lanes are around 3.2 to 3.3 m wide).

Lake Road connects Onewa Road with Northcote, Ocean View Road and Akoranga Drive. A study into a cycleway connection between the AHB and Akoranga Station⁷ concluded that a route along SH 1 is preferable to Lake Road as it is more direct. However our demand analysis shows demand for access to the residential areas around Northcote and not providing a facility along Lake Road may result in cyclists having to back track significantly to access this area from the SH 1 cycleway. Flow therefore considers that an on road cycle lane along Lake Road will be of benefit to commuter cyclists.

College Road provides a direct connection between Exmouth Road and Lake Road to the Akoranga Campus of AUT. If a cycle/footpath is not provided alongside SH 1, then Flow recommends that cycle lanes be implemented along College Road.

Summary of Recommended Facilities

Table 6.1: Recommended Facilities

Route	Facility Required	AHB User Type	2026 Modelled AADT	Recommended Facility	Issues To Consider
Westhaven Drive	Walking and Cycling	Commuter and Recreational	approx 1,000 vpd	Shared pedestrian/cycling promenade.	Limited width available.
Fanshawe Street	Walking and Cycling	Commuter	32,000 vpd	Commuter cyclists may share bus lanes but this is likely to become less attractive as bus services increase. Separate cycle facilities are recommended.	If bus lane use is assumed, northbound cyclists would need to cross Fanshawe Street to access Westhaven Drive/AHB.
Waterfront between Beaumont Street and Quay Street	Walking and Cycling	Commuter and Recreational	N/A	Shared pedestrian/cycling promenade and on road cycle lanes throughout Wynyard Quarter.	Ensure good access between the waterfront cycleway and the CBD for cyclists and pedestrians.
Shelly Beach Road/Curran Street	Walking and Cycling	Commuter and Recreational	12,000 vpd /11,000 vpd	On street cycle lanes Shared cycleway/footpath for recreational users.	Final design will depend on which side the on bridge facility is located.
Jervois Road	Walking and Cycling	Mainly Commuter	12,000 vpd	On road cycle lanes.	
Ponsonby Road	Walking and Cycling	Mainly Commuter, Shopping	15,000 vpd	On road cycle lanes.	Narrower traffic lanes (to allow cycle lanes) will suit the speed limit (40 km/hr) environment.
Sulphur Beach Road to Stafford Road	Walking and Cycling	Recreational, some commuter	approx 20 vpd	Localised widening of Sulphur Beach Road.	Shared use, widening, sight lines.

Table 6.1: Recommended Facilities

Route	Facility Required	AHB User Type	2026 Modelled AADT	Recommended Facility	Issues To Consider
Stafford Road to Onewa Road	Walking and Cycling	Recreational, some commuter	4,000 vpd	Off road shared cycle/footpath	Sightlines at crossing of Stafford Road or grade separated facility. Boardwalks/bridges across wetlands, access across or beneath Onewa Road interchange/Sylvan Road intersection.
SH 1 Onewa Road to Esmonde Road	Cycling	Mainly Commuter	95,000 vpd	Off road cycleway/footpath along western side of motorway.	Could be extended to Constellation Drive.
SH 1 Sulphur Beach boat ramp	Walking	Mainly Recreational	N/A	Improvements to the off-road footpath along eastern side of motorway.	This is an existing facility but with potential increased use, the pedestrian motorway underpass may need active security measures.
Queen Street	Walking and Cycling	Commuter and Recreational	5,500 vpd	On road cycle lanes	Need to consider how to connect to programmed cycle/pedestrian facility on the northern side of Onewa Road.
Birkenhead Avenue/Glenfield Road	Cycling	Mainly Commuter	25,000 vpd	On road cycle lanes or shared bus/cycle lanes.	
Lake Road	Cycling	Mainly Commuter	14,000 vpd	On road cycle lanes	

Table 6.1: Recommended Facilities

Route	Facility Required	AHB User Type	2026 Modelled AADT	Recommended Facility	Issues To Consider
College Road	Cycling	Mainly Commuter	11,900 vpd	On road cycle lanes.	May not be required as part of AHB cycle/pedestrian network if SH 1 Onewa Road to Esmonde Road cycle/footpath is provided.

6.4 Connections to the Bridge Structure

In addition to the facilities on the surrounding road network additional infrastructure will be required to connect the local pedestrian and cycle networks with the on bridge facility. This has been the subject of previous studies^{4 and 6} into the on bridge facility and the recommendations below are taken from these studies and analysis and site visits completed by Flow.

It is noted that the design of the on-bridge facility has yet to be determined. The recommended option is to provide separate pedestrian and cycling facilities due to the speed differences of commuter/training cyclists and pedestrians/recreational cyclists. From a tourism perspective, the pedestrian facility would be located on the eastern side and the cycling facility on the western side of the AHB. This was also the conclusion of the recent Maunsell report⁶. The alternative option is to provide adjacent facilities on the eastern side of the bridge, though it is Flow's opinion this can only be achieved on the existing AHB by either allocating the whole clip-on to walking and cycling or by widening the existing clip-on. This is discussed further in Flow's Technical Notes dated 16/07 2010 and 5/08/2010 attached in Appendix E.

For the purposes of this report we have provided an outline of the required connections to the bridge for the recommended option and the alternative option.

Requirements for the recommended option are:

- A relatively low impact cycle ramp to connect the cycleway on the western side of the AHB to Westhaven Drive via Curran Street;
- A grade separated pedestrian ramp between the AHB and Westhaven Drive on the eastern side of the bridge;
- A cycle ramp at Northcote Point providing access to Princes Street and Queen Street;

- A pedestrian ramp/stairs at Northcote Point providing access to the pedestrian footpath on the eastern side of the bridge and Princes Street (under the bridge);
- A cycle ramp at Sulphur Beach Road, to allow connections to/from Onewa Road, Esmonde Road and Northcote Road; and
- A pedestrian ramp/stairs at Sulphur Beach boat ramp (eastern side of AHB) and improved security for connections to Sulphur Beach Road beneath the AHB or via the existing underpass adjacent to the police station at Stafford Road/Northern Motorway.

Requirements for the alternative option are:

- A grade separated pedestrian and cycle ramp between the AHB and Westhaven Drive on the eastern side of the bridge. It is noted that this ramp will be of a higher design standard than that required for the preferred option to allow shared use by cyclists and pedestrians;
- A pedestrian and cycle ramp on the eastern side of the bridge at Northcote Point. As above, this ramp will be of a higher design standard than that required for the preferred option to allow shared use by cyclists and pedestrians. Design standards for cyclists will be difficult to achieve; and
- A pedestrian ramp/stairs at Sulphur Beach boat ramp (eastern side of AHB), widening of the shared cycle/footpath connecting to the motorway underpass and improved security for connections to Sulphur Beach Road beneath the AHB or via the existing underpass adjacent to the police station at Stafford Road/Northern Motorway.

6.5 Facility on the New Additional Harbour Crossing

General Impacts

As discussed previously, should the preferred option of the AWHC study be to provide a bridge, the walking and cycling facilities could be provided on the new crossing rather than the existing AHB. Overall the destinations identified in the analysis for a facility on the existing AHB will remain the same for a facility on the new bridge but there will be some implications for the identified routes and potentially the demand.

The new harbour crossing is proposed to be located to the east of the existing AHB. Detailed design drawings are not yet completed but from the concept drawings the new bridge will connect to the city side at Beaumont Street and the north shore in the vicinity of Stafford Road. As noted earlier, Flow recommends that if the facilities are located on the new bridge, then they be adjacent to each other (with a barrier separating the different users) to provide a more economically viable means of connecting into the local network, as grade separated connections across the existing motorway will be needed.

There are implications to cost, facility standard, travel distances and accessibility when considering whether to provide the pedestrian and cyclist facilities on the new bridge or the existing AHB.

These are outlined below (assuming that connections can still be made at Queen Street (Northcote Point)):

- The benefits of providing the walking and cycling facility on the new bridge are that designers will not be restricted by existing engineering limitations of the existing bridge structure. This may have significant implications to the cost of the project;
- The new bridge can be designed from the start for walking and cycling, which is likely to result in an increased standard of facility;
- The on-bridge facilities will be longer on the new bridge (around 3 km) compared to the existing AHB (around 1.2 km). This increased distance will make the facility less attractive to users;
- Travel distances to the CBD are slightly shorter via the new bridge than via the existing AHB from areas north of Onewa Road. For example Takapuna to the CBD via the existing AHB is around 9.5 km and Takapuna to the CBD via the new bridge is around 9 km. This is significant due to the high number of anticipated users on this route;
- Travel distances to Ponsonby and Pt Chevalier are slightly longer via the new bridge. For example Takapuna to Ponsonby via the AHB is around 8 km where as Takapuna to Ponsonby via the new bridge is around 9 km. As noted above the demand for this route is anticipated to be less than to the CBD;
- In addition to slightly increasing the travel distance, the general accessibility between the North Shore and Ponsonby is increased with the facility on the existing AHB compared to the new bridge. This is due to cyclists having to travel as far as Wynyard Quarter before being able to access the bridge. There are also implications in terms of the attractiveness of the routes as cyclists are able to access the Ponsonby Road ridge to travel to the southern side of the CBD and Newmarket more easily from the existing AHB. From the new bridge cyclists will have a significant climb to access any destinations outside of downtown CBD;
- On the northern side of the bridge, access to Northcote Point is significantly harder from the new bridge than from the AHB due to the point at which the new bridge meets land. Flow considers access at Northcote Point to be important as it allows cyclists a route along the Queen Street ridge as opposed to having to traverse steep gradients from Sulphur Beach Road. We also consider Northcote Point (and the ferry service) to be a recreational and tourist destination which also has potential to develop facilities such as parking etc. Access from the new bridge at Northcote Point will require a significant ramp structure which may be financially and realistically impracticable;
- Should access to the on-bridge facility only be feasible at Sulphur Beach Road and/or Onewa Road this will make the facility far less attractive for users to and from the areas of

Northcote Point and Birkenhead, and areas further west who would have been able to reach the existing bridge via the Queen Street (Northcote Point) ridge; and

- Restricting access to the on-bridge facility to Sulphur Beach Road and/or Onewa Road also has implications for connections to the SH1 cycleway/walkway which is proposed to be located on the western side of the motorway. It will be more challenging to connect users to the SH1 facility from an on-bridge facility located on the eastern side of the new bridge than from a facility on the eastern side of the existing AHB (where users could move to the western side at Northcote Point). The underpass at Sulphur Beach Road is not considered suitable for a shared facility due to the numbers of cyclists and pedestrians predicted to use it and it is also not ideal due to personal security reasons.

Overall Flow considers that due to the location of the new crossing there may be some fundamental reductions in accessibility for users if the facility was on the new crossing as opposed to the existing AHB. This is particularly evident to residential areas to the west of SH1 such as Northcote Point, Birkenhead and Highbury. In addition, the facility may be less attractive to users due to the length of the crossing (even through some overall trip lengths are reduced) and the lack of connections to easy cycling routes along the natural ridges. Finally, the new bridge may also be less attractive to recreational users, again due to the length of the crossing and the possible removal of the connection at Northcote Point and the Northcote Point ferry for round trips. However, these potential disadvantages may be outweighed by the advantages of a higher standard facility at a lower cost.

Connections to the Bridge Structure

A facility on the new bridge will also require different connections to the structure. As with the existing AHB we have outlined the requirements for the recommended option for the new bridge (with the cycling facility and shared cycling/walking facility on the eastern side, divided by a physical barrier).

Requirements for the recommended option are:

- A grade separated ramp between the new bridge and the pedestrian and cycle networks within Wynyard Quarter. This ramp will need to be sufficiently wide to accommodate the higher speed commuter/training cyclists and pedestrians/recreational cyclists;
- A cycle and pedestrian ramp connecting to Northcote Point providing access to Princes Street and Queen Street. This ramp will need to be sufficiently wide to accommodate the higher speed commuter/training cyclists and pedestrians/recreational cyclists. It is unclear how this can be achieved (a possible option is to provide a ramp beneath the new bridge that “lands” at the southern end of Princes Street where property is owned by NZTA) and it is likely to be of significant expense; and
- A cycle and pedestrian ramp in the vicinity of Sulphur Beach boat ramp and an overbridge across SH1 and/or improved security for connections to Sulphur Beach Road via the existing

underpass adjacent to the police station at Stafford Road/Northern Motorway, or grade separated ramp across the existing motorway to Onewa Road.

Alternatives Considered

Possible alternatives that could be considered include providing the pedestrian/recreational cycle facility on the eastern side of the existing AHB with the commuter/training cyclist facility on the new bridge. This would have the benefit of providing a shorter distance for pedestrians to cross and better connections to the local network. The cycle facility on the new bridge could be located on the western side of the bridge, which may make it easier to connect into the local cycle network, although is still likely to be very costly in the vicinity of Queen Street (Northcote Point).

7.0 Cost Estimates

7.1 Cost of Route Improvements

The projects identified for improving walking and cycling connections to the harbour crossing vary from marking cycle lanes on existing roads, to building separate off-road cycleway/walkways. In some circumstances the road environment will be such that the route is already suitable for cyclists and no additional work is required. The cost of these works will vary considerably depending on the nature and extent of the upgrade required. Where projects involve road widening, costs can depend on the civil works involved, including any retaining walls or carriageway reconstruction, whether the road widening is on both sides of the road or one side only, and whether property acquisition is required. The final costs will only be able to be determined following the completion of the recommended investigation studies.

However, in accordance with the brief, we have prepared a high level cost estimate of the recommended facilities. To complete the cost estimate we have developed three work categories based on the type of improvement works we envisage will be required. The three cost brackets we have used are as follows:

- **Category 1:** On road facility with lane re-marking only. Routes where we consider cycle lanes can be installed on the existing road carriageway without the need for any significant road widening works;
- **Category 2:** Off-road cycleway/footpath. Routes where we have identified the need for an off road shared facility; and
- **Category 3:** .On road facility with widening required. Routes where we have identified there is already limited width on the carriageway or footpath and we consider some form of widening will be required.

In some instances, we have mixed the categories, for example, where some localised widening might be required to relocate parking into indented berms to allow on road cycle lanes to be provided. In these cases, we have made assumptions regarding the proportion of each cost category might be applied.

The costs associated with each cost category have been estimated based on the cost of a limited number of similar projects undertaken in the Auckland Region. As discussed above these are high level costs and will need to be revisited following the individual investigations.

- **Category 1:** \$150,000 to \$300,000 per kilometre for projects which are largely limited to re-marking the carriageway. This cost range was based on a cost of around \$150,000 per kilometre for the proposed bus priority scheme along Remuera Road within Auckland City and \$300,000 per kilometre for the Lake Road cycle scheme on the Devonport Peninsula;

- **Category 2:** \$500,000 to \$1.5 million per kilometre for projects involving an off road shared pedestrian/cycle path. This range is based on an estimate of the cost of the shared walking/cycling facility between Northcote Road and Constellation Drive of around \$500,000 per km and between the AHB and Akoranga Station at \$1.2 million per km; and
- **Category 3:** \$4 million to \$11 million per kilometre for projects involving widening within existing road reserves to create additional width equivalent to one traffic lane. This range was based on costs of around \$4 million per kilometre for the proposed widening of Lincoln Road in Waitakere City and \$11 million per kilometre for the Glenfield Road Widening within the North Shore.

When classifying the different routes we have considered the predicted 2026 motor vehicle and cyclist demand for the routes and the type of user (commuter, recreational, experienced, novice etc) likely to use the route. We have also considered the results from the Local Road element of the Network Plan which indicates where there may be some conflict for road space as a result of increased traffic volumes. The different rates have been applied to the routes identified, using the higher end of the ranges for Category 1 and 2 and the lower end of the ranges for Category 3. This is to represent the fact that widening associated with cycling and pedestrian facilities is likely to be less than widening required for general traffic. A cost range has been estimated by adding a 25 % and a 50 % contingency to the base costs. The full calculations are shown in Appendix F.

In summary the calculations indicate that the cost of the improvement works to all of the routes is between \$50 and \$60 million in 2010 dollars.

7.2 *Cost of Connections to the Bridge Structure*

We have also prepared a cost estimate for the connections required to the bridge structure. These costs are based on those prepared for the report prepared by Maunsell in 2008⁶. The estimated cost for connections to the existing bridge at Westhaven Drive, Curran Street, Princes Street (both sides) and Sulphur Beach Road (both sides) is between \$30 and \$40 million.

If the cycling facility is located on the new bridge structure the costs for connections are likely to be significantly greater due to the need to cross the existing motorway.

8.0 *Conclusions and Recommendations*

The aim of the walking and cycling component of the Network Plan is to:

- Understand how the provision of walking and cycling facilities can optimise the benefits of the additional Harbour Crossing;
- Identify any network issues and risks; and
- Understand how the provision of walking and cycling facilities can minimise/mitigate any dis-benefits of the additional Harbour Crossing.

Describe the short medium and long term goals (associated with walking and cycling) for optimising the network. Overall, the AWHC is considered to align with current transport strategies and policies because it will enable multimodal travel across the harbour. Walking and cycling facilities on the existing AHB are currently not available due to limitations on the existing structure. The implementation of the AWHC will enable the opportunity for high quality walking and cycling facilities either on the existing AHB or on the additional crossing (should the preferred option be a bridge). This provides a significant opportunity to link the North Shore and the Auckland CBD by walking and cycling modes. This will benefit commuters, training cyclists and recreational users. It will also provide a tourist attraction akin to facilities seen on the Sydney Harbour Bridge or the Golden Gate Bridge in San Francisco.

The provision of these additional facilities, combined with improved priority for public transport will ensure integration and balance between all transport modes throughout the transport network and encourage modal shift away from single occupancy vehicles. It is generally accepted that increased walking and cycling modal shares will provide environmental, health and economical benefits to New Zealand as a whole. This is particularly relevant to large urban areas such as Auckland which are reliant on a significant transfer to sustainable modes, such as public transport, walking and cycling, to accommodate future growth, enable densification and improve the liveability of the city.

To understand how the provision of a walking and cycling facility across the harbour can be optimised the report has assessed the potential demand for walking and cycling trips in association with the implementation of the additional crossing. The analysis reveals demand for travel between the following destinations on both sides of the Harbour:

- Beaumont Street/the Wynyard Quarter area;
- Downtown CBD;
- The University Precinct;
- Ponsonby;
- Pt Chevalier;

- Southern side of the CBD Newmarket;
- Takapuna;
- Northcote Point;
- Birkenhead;
- Highbury;
- Northcote;
- Smales Farm; and
- Auckland University of Technology.

An analysis of existing, programmed and proposed facilities (as documented in national, regional and local government documents) revealed that:

- There are limited existing walking and cycling facilities on the routes identified in this report;
- Very few of the routes have confirmed programmed works; and
- The majority of the routes are identified in the Regional Cycling Network but are not due for implementation until after 2016 and the type of facility recommended is unclear.

As a result of this analysis and to ensure optimisation of the proposed facility investigation works into improved pedestrian and cycling facilities along the following routes are recommended:

- Westhaven Drive – improved/wider footpath/boardwalk;
- Waterfront footpath/cycleway connecting Beaumont Street with Quay Street;
- Cycle lanes on Curran Street and Shelly Beach Road;
- Cycle lanes on Jervois Road;
- Cycle lanes on Ponsonby Road;
- Pedestrian/cycle facility along Sulphur Beach Road and an off road shared pedestrian/cycle facility between the northern end of Sulphur Beach Road and Onewa Road alongside the motorway;

- Cycle lanes on Birkenhead Avenue connecting existing facilities on Onewa Road and Glenfield Road;
- Cycle lanes on Lake Road (Northcote), Northcote Road and College Road connecting Onewa Road with existing facilities on Akoranga Drive;
- Off road shared pedestrian/cycle facility between Onewa Road and Esmonde Road alongside the motorway; and
- Off road shared pedestrian/cycle facility between Esmonde Road and Northcote Road alongside the motorway.

The cost of these works has been estimated to be around \$50 and \$60 million in 2010 dollars.

We have also prepared a cost estimate for the connections required to the bridge structure. These costs are based on those prepared for the report prepared by Maunsell in 20086. The estimated cost for connections to the existing bridge at Westhaven Drive, Curran Street, Princes Street (both sides) and Sulphur Beach Road (both sides) is between \$30 and \$40 million.

If the cycling facility is located on the new bridge structure the costs for connections are likely to be significantly greater due to the need to cross the existing motorway.

The report has also considered the impact of providing the walking and cycling facilities on the new harbour crossing (if it is a bridge) as opposed to the existing AHB. The results reveal that due to the location of the new crossing to the east of the AHB, that there may be some fundamental reductions in accessibility for users, and much greater costs associated with connecting to the local cycling and walking networks. In addition, the facility may be less attractive to users due to the length of the crossing (even though some overall trip lengths are reduced) and the lack of connections to easy cycling routes along natural ridge lines. As a result of this analysis Flow considers these potential disadvantages of providing the walking and cycling facilities on the new crossing should be taken into account when considering the location and form of the final facility. However, these potential disadvantages may be outweighed by the advantages of a higher standard facility at a lower cost.

Flow recommends that the conclusions made in this report are incorporated into the AWHC study.

APPENDIX A

Strategic Background

National Strategies

New Zealand Transport Strategy (2008)

The New Zealand Transport Strategy (NZTS) promotes a holistic, multi-modal view of transport that encompasses passenger transport, cycling, walking and travel demand management. The NZTS recognises through a series of transport objectives that transport must contribute to economic development, safety and personal security, access and mobility, public health and environmental sustainability. The overall vision the government has for transport in 2040 is that:

“People and freight in New Zealand have access to an affordable, integrated, safe, responsive and sustainable transport system.”

Government Policy Statement on Land Transport Funding (2009)

A Government Policy Statement on Land Transport Funding (GPS) was published in May 2009 and it sets out the aim to align investment in the land transport sector closer with the government’s priorities, being national economic growth and productivity. The GPS reflects the following:

- The government’s priority of investment in transport infrastructure for economic growth; and
- The modal choices that are realistically available to New Zealanders.

As such, the GPS states that the government’s priority is to invest in high quality infrastructure that supports efficient movement of freight and people, with a focus on the State Highway network. The GPS provides a list of impacts that the government wishes to achieve, namely:

- Improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transportation;
- Better access to markets, employment and areas that contribute to economic growth;
- A secure and resilient transport network;
- Reductions in deaths and serious injuries as a result of road crashes;
- More transport choices, particularly for those with limited access to a car, where appropriate;
- Reductions in adverse environmental effects from land transport; and
- Contributions to positive health outcomes.

Safer Journeys (2010)

The Safer Journeys 2010 to 2020 strategy replaces the Road Safety to 2010 strategy. The Safer Journeys is a strategy to guide improvements in road safety over the period of 2010 to 2030. The long term goal for road safety in New Zealand is to achieve

“A safe road system increasingly free of death and serious injury”.

Safer Journeys will be implemented through a series of action plans and identified priority areas. These priority areas for first actions include:

- Increasing the safety of young drivers
- Reducing alcohol/drug impaired driving
- Safe roads and roadsides
- Increasing the safety of motorcycling

There are also further additional actions to be undertaken in the following priority areas

- Safe speeds
- Reducing the impact of high risk drivers
- Improving the safety of the light vehicles fleet
- Safe walking and cycling
- Improving the safety of heavy vehicles
- Reducing the impact of distraction and fatigue
- Increasing the level of restraint use
- Increasing the safety of older new Zealanders

The strategy identifies that by addressing climate change commitments there may be an increase in the use of public transport, walking and cycling and the safety needs of all modes of transport need to be addressed. In addition to this, safe walking and cycling is identified as an area of medium concern and there is an overall aim to achieve safer walking and cycling. More specifically, the strategy aims to achieve a reduction in the crash risk for pedestrians and particularly cyclists, while at the same time encouraging an increase in use of these modes through safer roading infrastructure. This includes utilising proven engineering methods at high risk intersections,

particularly facilities for pedestrian and cyclists. Investment in safe walking and cycling infrastructure is stated to continue through the National Land Transport Programme.

Getting There On Foot, By Cycle (2005)

Getting there on foot, by cycle is a strategy that that was released in 2005 to advance walking and cycling in transport in New Zealand. The overall vision for the strategy is “A New Zealand where people from all sectors of the community walk and cycle for transport and enjoyment”. This vision is underpinned by three primary goals which are

- Community environments and transport systems that support walking and cycling
- More people choose to walk and cycle, more often and
- Improved safety for pedestrians and cyclists

The Ministry of Transport recognises that this strategy maximises the contribution of walking and cycling to achieving the NZTS vision and objectives. A strategic implementation plan was produced in 2006 for the three year period from 2006 to 2009. There have been no further updates since this plan.

Draft New Zealand Energy Strategy (2010)

The Government is currently consulting on the draft New Zealand Energy Strategy (NZES). This strategy will replace the Current New Zealand Energy Strategy (2007). The draft NZES provides a strategic direction for energy and the role that energy plays in New Zealand’s economy. The draft NZES states that an energy efficient transport system is an area of key focus, and there will be a focus to improve modal choice in urban areas so that people are able to use public transport, walking and cycling more thereby reducing their energy use. This is consistent with the current NZES (2007) which supports the use of urban design and managing travel demand through initiatives such as travel plans and the active living programme funded by Sport and Recreation New Zealand.

Draft New Zealand Energy Efficiency and Conservation Strategy (2010)

The Government is currently consulting on the Draft New Zealand Energy Efficiency and Conservation Strategy (NZECS). The strategy is a complementary strategy to the Energy Strategy; however has a more dedicated focus on energy efficiency, energy conservation and renewable energy. There are a range of sectors with sector specific targets for 2015. Transport as a sector has the overall objective of a more energy efficient transport system, with an increased diversity of fuels and renewable energy technologies. The draft strategy states that the Government will continue to fund transport infrastructure to support people to make energy efficient transport

choices. Encouraging the use of different modes of travel particularly in cities eg walking, cycling, and public transport is also stated.

National Land Transport Programme (2009 – 2012)

The National Land Transport Programme (NLTP) contains all the land transport activities such as public transport services, road construction and road maintenance, which are expected to receive funding from the NZTA. The objective of the 2009 – 2012 NLTP is a series of targeted investments that will help to address improving the efficiency of key transport routes, improving public transport, and easing congestion in key urban areas, upgrading important freight and tourism routes and improving safety and access to markets, employment and areas that contribute to economic growth.

NZTA Investment and Revenue Strategy (2009)

The NZTA's Investment and Revenue Strategy (IRS) communicates the NZTA Board's investment intentions. It's a high-level direction-setting and prioritisation tool that helps the NZTA to balance competing priorities and select the best possible mix of activities for funding –

Given the GPS's requirement that the NZTA focus on activities that make the greatest contribution to New Zealand's economic growth and productivity, this NLTP prioritises activities that make the most significant contribution to one or more of:

- roads of national significance (RoNS) and local roads critical to RoNS
- key freight and tourism routes
- key urban arterials
- public transport initiatives to ease severe congestion
- 'model' urban walking and cycling communities (Model communities aim to reduce congestion by providing user-friendly environments for walking and cycling)
- making better use of the existing transport infrastructure
- optimising the existing capacity of, and service levels on, highly trafficked roads.

NZTA Statement Of Intent 2009 – 2012 (2009)

The SOI sets out NZTA's approach and course of action for the next three years that will contribute to the delivery of the government's land transport objectives and wider transport vision. Over the coming three financial years there will be a particular focus on improving road safety, improving the

effectiveness of public transport, improving the efficiency of freight movements, planning for and delivering roads of national significance, and improving customer service and reducing compliance costs.

Regional Strategies

Auckland Regional Growth Strategy (1999)

An amendment to the Local Government Act 1974 established the Regional Growth Forum and Infrastructure Auckland. The Growth Forum developed the Auckland Regional Growth Strategy ("ARGS") as a means of identifying how growth could be accommodated in a manner that best meets the interests of the regional community.

The key features of the growth concept as expressed in the ARGS are that growth will be managed through intensification, with most growth being contained within the existing metropolitan area, and provision for managed urban expansion into identified future urban areas (greenfield growth) and selected rural towns. The areas of intensification should be developed with good facilities for walking and cycling and should encourage the use of these modes.

Whereas the growth concept was previously a non-statutory document identifying one outcome of the regional growth concept, the growth concept embodied in the ARGS now forms the statutory basis, pursuant to the Local Government (Auckland) Amendment Act LG(A)AA, of Proposed Change 6 to the ARPS and of various plan changes to each of the region's district plans.

Auckland Regional Land Transport Strategy (2010)

The 2010 Auckland Regional Land Transport Strategy (RLTS) was adopted by the Auckland Regional Council (ARC) in April 2010 and sets the direction for the region's transport system for the next 30 years, from 2010 to 2040. The RLTS adopts objectives and policies to achieve the vision of "a transport system which enhances the Auckland region".

The seven objectives of the RLTS are:

- Assisting economic development;
- Assisting safety and personal security;
- Improving access and mobility;
- Protecting and promoting public health;
- Ensuring environmental sustainability;
- Integrate transport and land use supportive of the Auckland Regional Growth Strategy (ARGS) and Auckland Regional Policy Statement (ARPS); and
- Achieving economic efficiency.

In addition, the RLTS 2010 has six strategic priorities which are listed below:

- Support and contribute to a compact and contained urban form consisting of centres, corridors and rural settlements;
- Implement behaviour change programmes;
- Continue major investment in rail, bus and ferry infrastructure and service improvements;
- Improve the operation of existing roads, especially regional arterials;
- Construct limited additional road capacity; and
- Reduce the impacts of transport on the natural environment and communities.

Four initial strategic options were prepared to compare and contrast various ways the transport system may develop, and to identify the optimum combination of approaches. These four options focused on demand management, mixed investment, public transport led change, and quantum shift approaches. The conclusion of this evaluation was that none of the four approaches on their own would achieve the NZTS targets, although significant improvements in transport performance are achievable. A preferred strategic option was developed by combining the most effective elements of each of the initial strategic options.

The preferred strategic option supports investment in public transport, walking, cycling and behaviour change measures, along with continued investment in the strategic roading network.

Auckland Transport Plan (2009)

The ATP unites the strategies, plans, projects and packages developed by Auckland Regional Transport Authority (ARTA), local authorities, NZTA and ONTRACK to deliver an integrated, safe, responsive and sustainable transport system for the region. It establishes a multi-modal, multi-agency transport implementation plan, which outlines the priorities and phasing of land transport packages and projects over the next 10 years, within a long-term context. The ATP is therefore the main mechanism for transforming the RLTS policies and strategies into actions.

Overall, the ATP supports increasing and encouraging walking and cycling and confirms that they make an important contribution to travel in the Auckland region. The ATP does however also identify a gap between the proposed expenditure and available funds, especially for public transport, local roads and walking and cycling.

The ATP supports in principle walking and cycling across the Auckland Harbour Bridge, however the strategy notes that the project has not been submitted for funding through the Regional Land Transport Programme, and that when and if this occurs it will need to be prioritised against other regionally important walking and cycling projects.

The ten year plan for transport planning provides a series of key projects. The corridor designation for the AWHC is listed as a key project and will improve accessibility for all modes across Waitemata Harbour. Also the ATP states that “While tunnels are proposed for the new road and rail connections, these newroutes will allow for the reallocation of space on the Auckland Harbour Bridge for both walking and cycling across Waitemata Harbour.”

Key projects listed for walking and cycling include the following relevant projects:

- Improving walk and cycle access to Northern Busway stations;
- Designing and constructing a cycle lane adjacent to State Highway 1 between Northcote Road and Constellation Drive;
- ARTA Sustainable Transport Plan (2006-2016);
- ARTA’s Sustainable Transport Plan sets out the actions needed to deliver the Sustainable Transport component of the RLTS, to be implemented over the next ten years, to 2016;

ARTA’s key objectives are to develop a world class passenger transport network supported by sustainable forms of travel. Plans outlined in this document that are relevant to walking and cycling include:

- Significant increase in demand management activities, from the current level of around \$10 million per year to an average of \$42 million per year for the next ten years. This investment is expected to divert 20,000 car trips each morning peak to walking, cycling and public transport;
- Strategies for improving the walking and cycling networks by 2016 include targeted walking improvements in the CBD and 17 other town centres and complete 50 % of the regional walking network; and
- A Walking Action Plan and Cycling Action Plan have been developed to indicate activities needed to support walking and cycling as an alternative transport choice and making Auckland region a more “walk-friendly” and “cycle friendly” place by 2016.

NZTA is a signatory to the STP and NZTAs responsibility towards walking and cycling includes ensuring that any link that has been severed during the process of new or upgraded works is reinstated to current standards and ensuring that those cycle links that appear in the local council’s cycle strategy are incorporated into their projects.²⁶

²⁶ ARTA , 2006, Auckland Sustainable Transport Plan 2006-2016, Page 34.

Regional Cycle Network

Through the STP a regional cycle network has been developed and has recently been updated in 2010. ARTA Indicative Cycling Network shows the current cycle network planned network to 2009, and complete network post 2016. The harbour bridge crossing is included in the post 2016 network.

ARTA Indicative Cycling Network



Key

- Major tertiary education facilities
- Schools (except contributing primary years 1-6)
- ◆ Town centres and growth areas
- Public transport centres, e.g. bus and train stations, ferry terminals
- Motorways
- Major roads
- Ferry routes
- Existing and Proposed Cycle Network
 - Up to June 2009
 - June 2009 to 2012
 - June 2012 to 2016
 - - - After 2016
- Railway line for passenger transport
- Proposed rail link

Route information for Franklin District Council is currently under development. Routes for Franklin will be included in future editions of this map.

Draft Auckland Region Walking and Cycling Strategy (2008)

The 2008 Draft Auckland Region Walking and Cycling Strategy was prepared by Transit NZ (now NZTA). The Strategy aims to identify, assess and prioritise current and future walking and cycling projects across the state highway network in the Auckland Region. The outcome of the study is a list of walking and cycling projects that are recommended to proceed to project feasibility.

A key target of the strategy is to work with local authorities to double active (walking and cycling) modes of transport to 30 % of total trips by 2040 by building and maintaining quality facilities within the Auckland urban areas.

The relevant walking and cycling general improvements identified include opportunities to link new walking and cycling routes on the western side of the Northern motorway to enable the completion of the Northern Motorway cycleway and recognising that new users to these facilities will increase and will in the long term support and align with a Waitemata Harbour crossing for walking and cycling.

Each project ranked is assigned a project 'urgency' categorisation according to urgent projects, investigative projects and pending projects. The SH1 (Northern Motorway) Auckland Harbour Bridge is identified as the lowest priority (pending) although it is noted that some of the associated projects such as connections to the northern busway stations and Onewa Road to Esmonde Road are identified as urgent.

Auckland Sustainability Framework (2007)

The Auckland Sustainability Framework has been developed in conjunction with the seven local authorities in the Auckland region with the support of the Auckland Regional Growth Forum.

Goal Six of the Sustainability Framework is a quality compact urban form. To achieve this goal a shift is required to build a carbon neutral future, and there will need to be an enhancement of transport choices and prioritisation of walking, cycling, and passenger transport ahead of cars. Achieving this goal will mean that easy access to a range of transport choices decreases people's daily dependence on private motor vehicles.

Auckland City Council Strategies

Auckland Council

Whether or not existing strategies and plans are adopted by the new Council (and Auckland Transport Agency), which will come into effect on 1 November 2010 is not known. However until new strategies or plans are developed it is anticipated that existing ones will retain their existing status. Auckland City Council Central Area Access Strategy (2004)

The Central Area Access Strategy (CAAS) was published in 2004 and is currently being reviewed and updated by Council. The "CBD Transport – Into the Future" document will replace the CAAS once finalised. The CBD Transport – Into the Future report is still in draft and has not yet been endorsed by Council.

CAAS sets out how Auckland City will deal with competing demands on Auckland's central business district transport network. It explains why changes to the transport system are planned or underway in the CBD and why these changes should occur.

There are seven priority strategies to guide the transport decisions, and the two most relevant to walking and cycling are:

- Providing high quality spaces for pedestrians; and
- Influencing travel demand and travel choice;

The relevant priority actions that are listed under providing high quality spaces for walking include:

- Improve pedestrian access to Quay Park from the Britomart Transport Centre, including upgrading Quay Street and Customs Street;
- Improve pedestrian walkways and connection to passenger transport interchanges and stops;
- Advocate for separated access for pedestrians across the motorway system that surrounds the CBD such as around Union Street and Cook Street, and from St Marys Bay to the waterfront;
- Introduce measures to improve access and reduce delays for pedestrians; and
- Advocate for a council policy to ensure missing pedestrian links are provided including partnering with Transit New Zealand (now NZTA) to provide pedestrian links as part of new motorway developments.

Auckland City Council CBD into the Future Strategy (2004)

The draft “CBD into the Future” document is a plan for reshaping and revitalising Auckland’s CBD. The vision is:

“In the next 10 years Auckland’s CBD will grow and consolidate its international reputation as one of the world’s most vibrant and dynamic business and cultural centres”.

The Into the Future document is supported by 2008-2011 Action Plans that identify key outcomes to drive the Into the Future strategy. This document identifies that as part of achieving a high quality urban environment, that they will influence travel choices through a cycling and walking strategy.

Designing a Great City Centre for our People (2008)

This document sets a framework for achieving high quality urban design in Auckland, with this framework being a key mechanism identified in the CBD into the Future strategy. Six urban design goals are identified for the city centre being:

- Distinctive, a distinctive city centre that reflects its multicultural identity, its history and its importance within the South Pacific;
- Compact, a compact city centre containing high quality, compact, walkable and mixed use environments that help to reduce the time that people need to travel;
- Connected, a connected city centre where people have sustainable transport options that are comfortable, convenient, efficient and affordable;
- Sustainable, a sustainable city centre where land use, the natural environment and the built form lead the way to a greener and healthier environment for people;
- Beautiful, a beautiful city centre where the design of our buildings and spaces (including ordinary, everyday spaces) contribute to creating beautiful places for people to enjoy; and
- Human, a human city centre where our built environment is respectful of people and how we experience the city – giving people priority

Of these, the “being connected” goal references objectives of:

- Streets being of a suitable scale and quality to be inviting for people; and
- Sustainable transport routes in key areas where walking, cycling and public transport have priority over private vehicles.

One of the objectives identified in this framework was the need to undertake a “public life” study on how people and pedestrians use the city centre.

Liveable Arterials (2006)

This guideline outlines how the Council has set about identifying and then balancing the many different demands on the arterial network by users from the local through to regional scales.

The result of this process, the Liveable Arterials Plan itself, is then supported by detailed guidance of the type of outcomes envisaged for particular arterial corridors and parts of corridors.

The Liveable Arterials Plan sets out the next 25 years of arterial street management and development for Auckland City within a 50 year context. As a consequence of on-going intensification-led growth this period will see increasing competition for the use of confined street reservation width.

The Liveable Arterials Plan seeks to ensure an adaptable, reasoned and balanced view is taken in the management of our arterial network, one that equitably responds to the needs of all user groups and looks to the long-term prosperity of our City.

The central area was not included in the Liveable Arterials Plan as it is subject to separate strategic management processes, namely the Central Area Access Strategy.

Auckland CBD Gateways Study (2009)

Although this study has not yet been endorsed by Auckland City Council it provides a useful summary of the direction Council is taking in regards to walking and cycling in the CBD. The purpose of this study is to investigate an urban design and transport response that encourages walking and cycling between the Auckland CBD and immediately surrounding areas and that reduces reliance on private vehicles. Actions to be investigated as part of this study include new pedestrian and cycling facilities, remedial action, minor improvements and environmental improvements. Project recommendations aim to mitigate the effects of vehicles on pedestrians and cyclists. The Gateways study is focused on the key gateways into the CBD. Each of these gateways are categorised into typologies that are characterised by movement and landuse. The three most relevant gateways to the AWHC are:

- Fanshawe Street – Typology D;
- Victoria Street West – Typology D; and
- Wellington Street/Union Street – Typology E.

Typology D is categorised as medium movement function and medium land use function. The objective of this typology is to reduce traffic function and encourage active modes and passenger transport access through managed lanes and the reallocation of road space to active modes.

Typology E is categorised as medium movement function and high land use function. This typology is considered to offer the greatest opportunity to respond to reduced traffic impacts through the reallocation of space to active modes and the greatest level of interaction with adjoining land use.

Specific mention is made of the following projects and areas.

Victoria Park Tunnel

The Victoria Park Tunnel (VPT) project has recently begun construction. A northbound tunnel will be constructed beneath Victoria Park and the existing viaduct will be retained and upgraded for southbound traffic, combined with lane additions through St Mary's Bay. The tunnel portals look to be placed near the existing Birdcage Tavern (to be moved) and near the current Beaumont Street/Fanshawe Street motorway on-ramp. As a condition of the project a pedestrian overbridge is proposed over SH1 between St Mary's Bay and Westhaven Drive. This will benefit pedestrian access to Fanshawe Street and the Auckland waterfront. The urban design framework is currently being updated, which will provide the template for urban design and movement options post construction. Apart from minor improvements it is not proposed to investigate more fundamental improvements for Victoria Street West.

However, a list of recommendations will be made to maintain or improve pedestrian and cyclist access based on the current understanding of the VPT project.

Auckland Waterfront

The regeneration of the Auckland Waterfront encompasses a number of current and future projects and locations, namely Westhaven Drive, Wynyard Quarter and the Viaduct Harbour. The impact of these projects on pedestrian and cyclist access through the area is largely unknown at present although it is anticipated that access will be improved. The VPT project has committed a pedestrian overbridge that will improve access between St Mary's Bay residential area and the waterfront via Westhaven Drive.

Wynyard Quarter

Wynyard Quarter is a large industrial area located on 36ha of reclaimed land, on the harbour-side of Fanshawe Street. Recent re-zoning will enable significant regeneration to occur in the area over the next 20 years as industry relocates to alternative sites. The master plan incorporates the July 2007 urban design framework for Wynyard Quarter and proposes additional design opportunities for consideration in the future. Features of the master plan relating to access through the area include:

- Gaunt Street improvements to provide a high quality route for all modes between Westhaven Drive and Viaduct Harbour Avenue; and

- Daldy Street/Jellicoe Street improvements to provide a highquality pedestrian route between Westhaven Drive and the Viaduct/ Quay Street via Te Wero Bridge.

Te Wero Bridge

Te Wero Bridge is the proposed connection across the Viaduct Harbour between Wynyard Quarter and the viaduct basin/CBD. The aim of the bridge is to provide for walking and cycling access between the two key areas, while the decision to allow public transport access is yet to be finalised. The walking and cycling bridge is currently programmed to be completed in 2011.

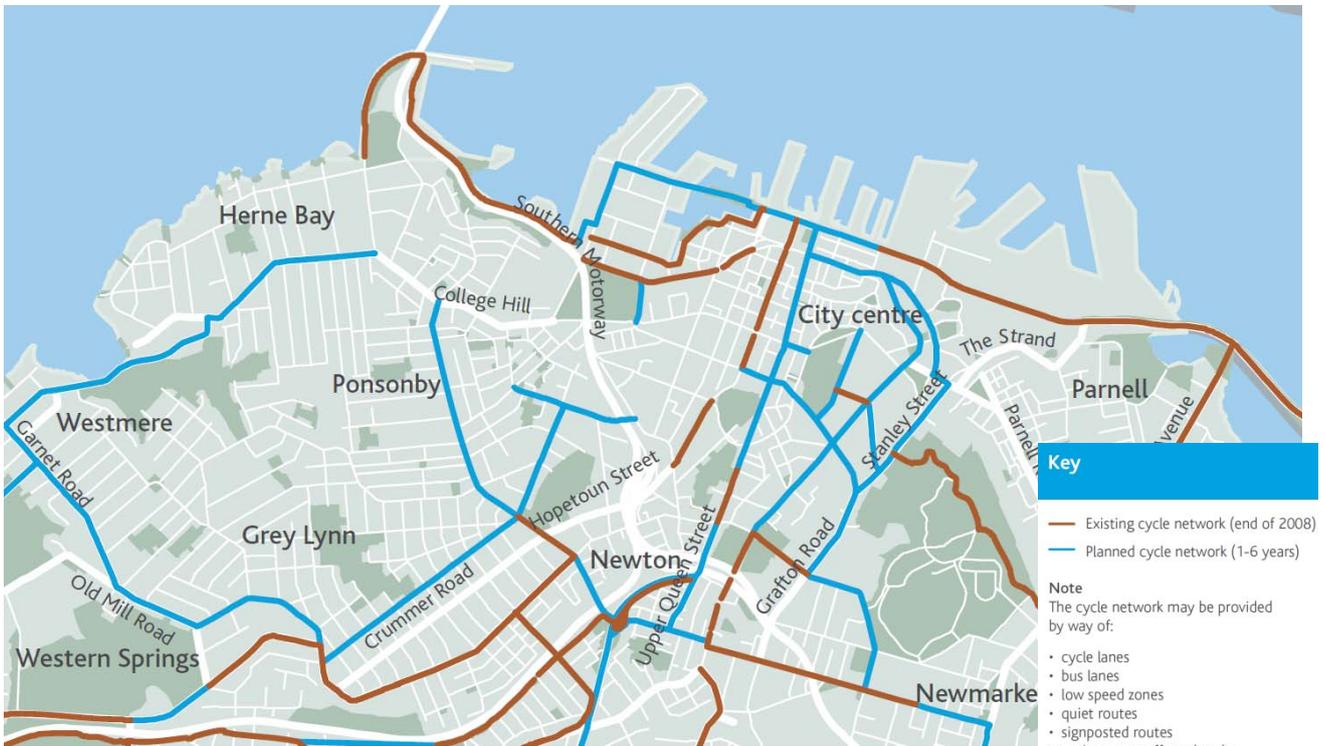
Auckland City Council Cycling and Walking Framework (2007)

The Auckland City Cycling and Walking Framework promotes cycling and walking as a viable and attractive travel option. The framework sets a long term vision for cycling and walking and provides direction on how this is going to be achieved. The overall objectives of the framework include:

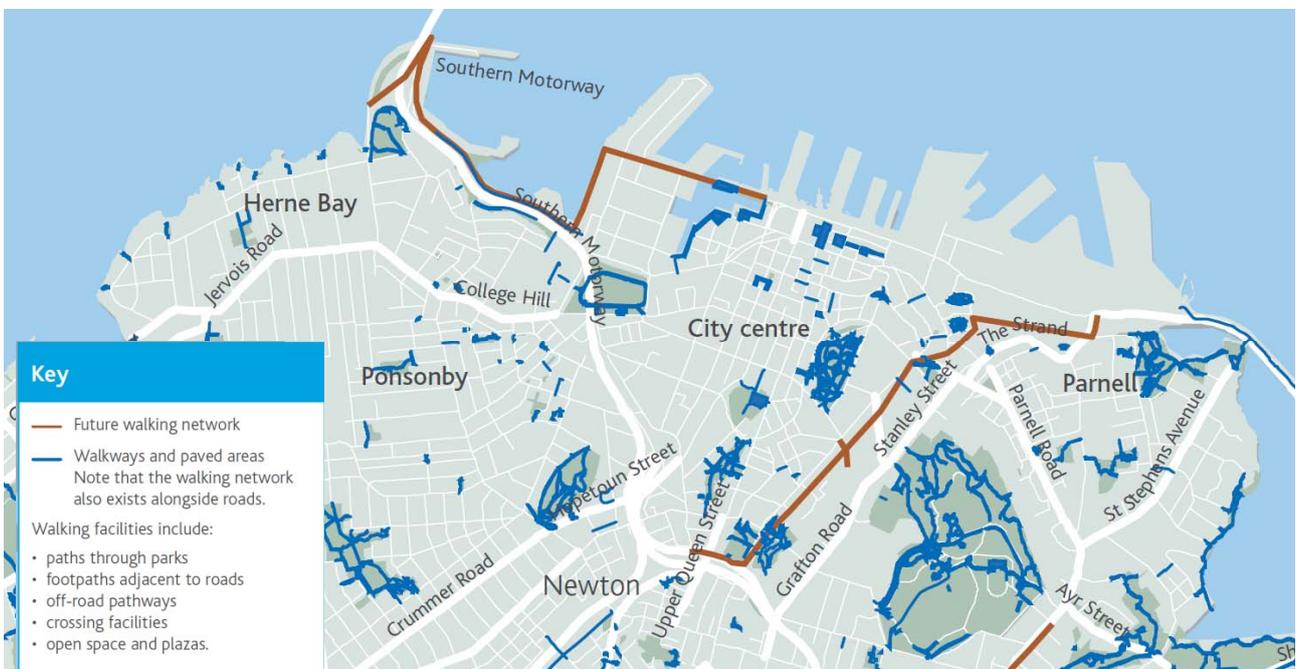
- To increase and improve cycling and walking facilities;
- To improve safety and perception of safety;
- To improve amenity and convenience;
- To create universal access;
- To improve communities and town centres;
- To support promotional events and initiatives that promote the health benefits and availability of environmentally sustainable transport options; and
- To promote equity in planning to increase transport choice.

From the Auckland City Cycling and Walking Framework, action plans for walking and cycling have been created. These action plans provide a summary of the existing network and planned networks. As shown in the figures below the existing cycle network to the end of 2008 and the planned cycle network over the next one to six years.

Existing and Planned Cycle Network



Future Walking Network



Auckland City Centre Waterfront Master Plan (2009)

This masterplan is the foundation for creating a unique, prosperous and attractive waterfront for Auckland's city centre over the next few decades. It also seeks to transform the distinctive city centre waterfront, business and residential areas into environments that attract people, while maintaining the area's working waterfront character and functions. This includes creating easy connections between the city centre waterfront and the rest of the city.

The city centre waterfront masterplan gives spatial and physical definition to the principles of the Auckland Waterfront Vision 2040, representing the collective view of what Aucklanders want the waterfront to become. Enabling activities to take place on water and land, designing good transport connections and providing ways for visitors to experience the working waterfront, are all fundamental to the masterplan.

The proposed details are outlined in Auckland Waterfront Master Plan which shows a pedestrian and cycle promenade along the waterfront and across the AHB providing good connections between the AHB and the CBD. A public park is also planned for the southern side of the bridge.

Auckland Waterfront Master Plan



North Shore City Council Strategies

Auckland Council

Again, whether or not existing strategies and plans are adopted by the new Council (and Auckland Transport Agency), which will come into effect on 1 November 2010 is not known. However until new strategies or plans are developed it is anticipated that existing ones will still be of significance.

North Shore City Transport Strategy (2006)

The Transport Strategy sets out how the Council intends to develop, manage and influence transport in North Shore City over the next ten years. This includes roads, public transport, cycling, pedestrians and parking. Overall, the strategy aims to encourage more residents choosing to walk, cycle or use public transport, and a safer, healthier community. The relevant expected outcomes in terms of walking and cycling include city residents who walk, cycle and use public transport in increasing numbers.

North Shore City Plan (2008)

The City Plan is a framework that guides the medium to long term (30-year) change and development of North Shore City in a way that responds to global, regional and local challenges. It replaces the Strategic Plan (2001) and City Blueprint (2001), and describes what the community wants in the form of our Community Outcomes.

The City Plan states:

“Whilst recognising the need to meet continuing private car demands, the council is applying a number of programs and projects aimed at encouraging greater use of alternative modes and reducing the need to travel. Behaviour change programs and providing walking, cycling and public transport infrastructure are key means of encouraging use of alternative modes.”

“Council will continue to implement strategic corridor projects, which connect key employment and residential centres. Corridor projects involve a range of road improvements including measures to improve public transport, walking and cycling”

Two pathways to achieve the strategic goals of the city plan are particularly relevant are:

- Develop walking and cycling routes and provide appropriate facilities to improve community cohesion; and

- Improvements to accessibility throughout the City for active transport modes such as walking and cycling.

North Shore City Cycling Strategy (2009)

The North Shore City Cycling Strategy vision is “To provide a safe, convenient and enjoyable cycling environment that meets the needs of cyclists and encourages cycling as a mode of transport and as a means of recreation”. Within the cycling strategy there are seven supplementary strategies that will help to achieve the goals of the cycle strategy. These strategies include:

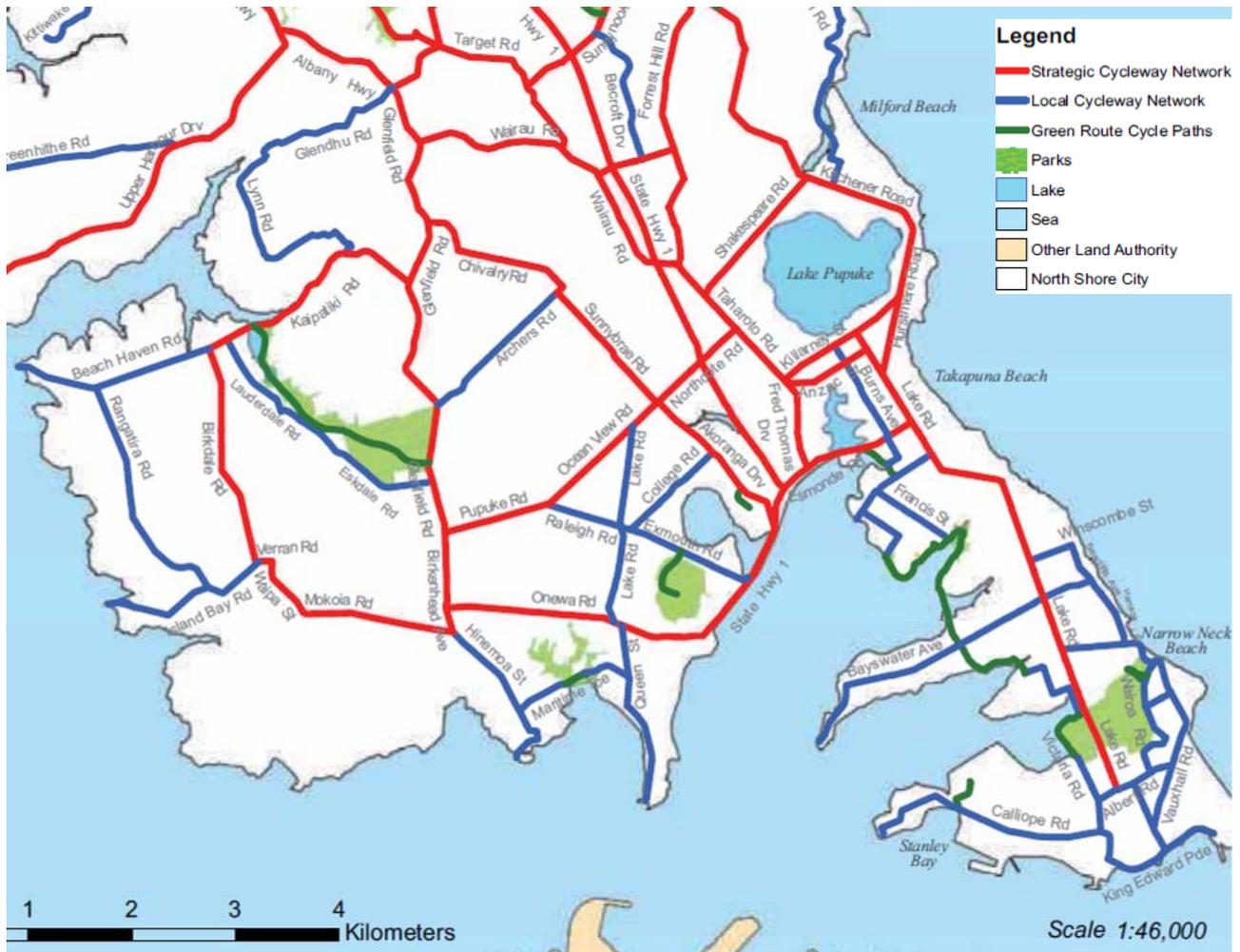
- Develop safe, convenient and quality cycle networks and supporting facilities to meet cyclists’ needs;
- Apply best practice cycle design guides to cycle networks and to cycle facilities;
- Maintain cycle infrastructure to a high standard;
- Support education and training programmes that improve cycle safety;
- Support programmes promoting cycling;
- Improve the coordination of efforts amongst groups affecting cycling; and
- Ensure that where possible, adequate resources are available to implement the Cycling Strategy.

The Strategy identifies that cycle routes need to be continuous; to go to where cyclists want to ride (such as schools, places of work and recreation facilities); and to provide cycle circuits for recreation and cycle training. Functionally, these needs are met by strategic networks, local networks and green networks through parks and reserves).

North Shore City Cycle Network shows the Strategic Cycle Network as shown in the 2009 Cycling Strategy.

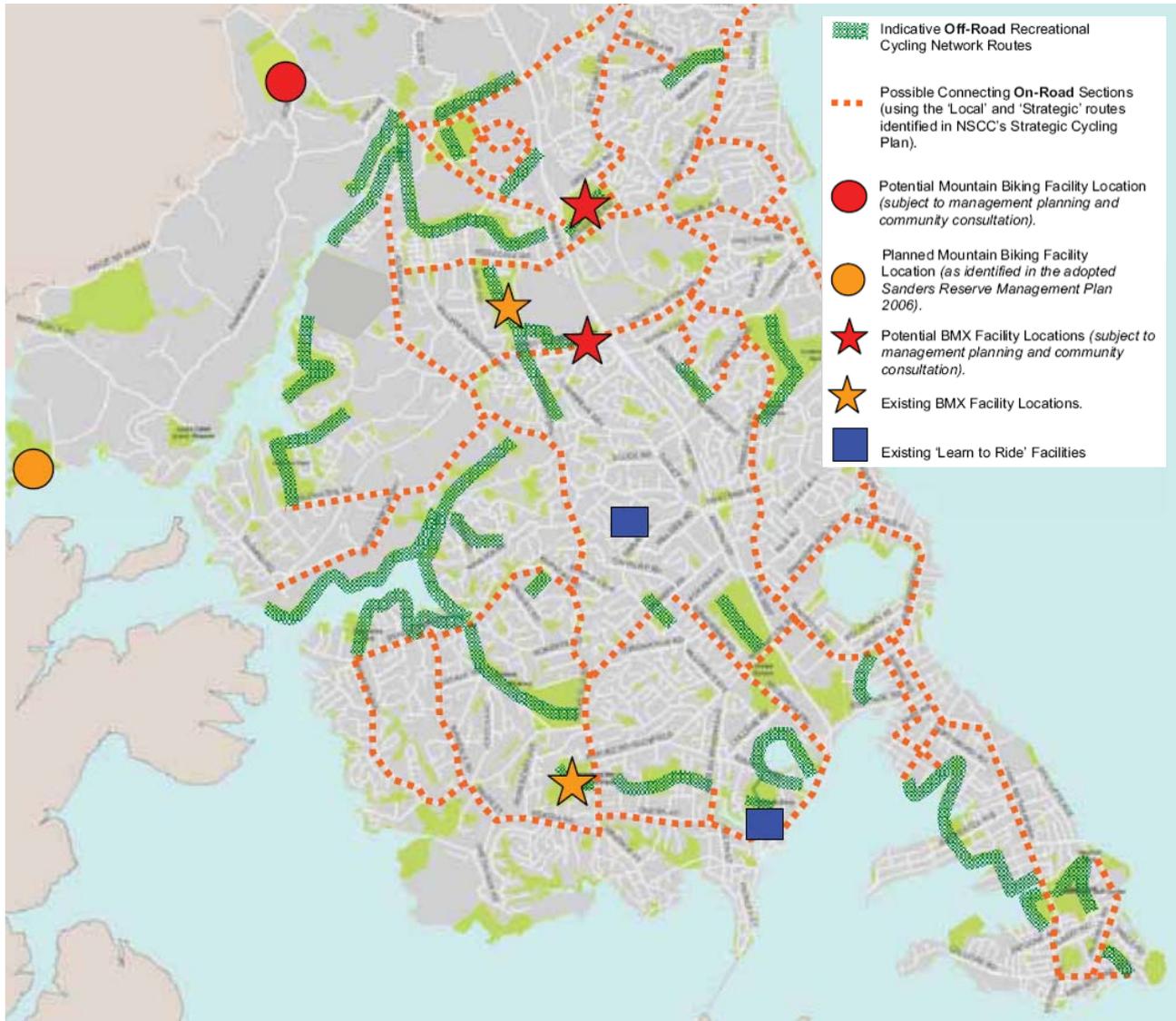
The network excludes the AHB to Onewa Road as part of the network. Onewa Road, Akoranga Road and the Northern Motorway between Onewa Road and Esmonde Road are identified as a "Strategic Routes". Exmouth Road and Lake Road (Northcote) are identified as "Local Routes".

North Shore City Cycle Network



North Shore City Council’s Recreational Cycling Network Plan outlines Council’s intent to develop a high quality, accessible recreational cycling network which provides safe and attractive cycling routes that link urban areas with the parks network and other places of interest including recreational and community facilities, residential areas and public transport routes.

North Shore City Recreational Cycling Plan



North Shore City Council Walking Strategy (2009)

This Strategy has been developed for the following reasons:

- NSCC wishes to improve the environment for walking (including convenience and safety) and to encourage more people to walk more often for transport, recreation and physical activity. How the Council plans to do this is described in the Strategy;

- The Strategy calls for better integration and co-ordination across the many divisions of Council who play a role in the development, maintenance and promotion of walking. How the Council can improve on this is outlined in the Strategy; and
- Local authorities who have a Walking Strategy backed up by an Implementation Plan are more likely to attract funding for walking projects.

The strategy provides extensive information on the background for walking in the North Shore including policy context, why walking is important, and a background of walking in the North Shore including an assessment of walkability. A range of broad issues are identified, and a series of actions and solutions in order to work towards the targets of the strategy.

One of the main targets is to increase the proportion of walking to work journeys to 7% by 2019 (currently 3%). There are other targets associated with resident satisfaction with surrounding footpaths and other walking facilities such as seats, litter bins etc.

APPENDIX B

Relevant Previous Studies

Previous Relevant Reports

Pedestrian and Cycle Linkages to North Shore Busway Stations, Burton Consultants (December 2004)

This report was commissioned by NSCC. The purpose of this study was to analyse the existing pedestrian and cycle access routes and facilities within the Busway Station catchment areas, to appraise the adequacy and attractiveness of existing provision, to determine how and where improvements can be made, to determine the feasibility of these improvements and to analyse the potential benefit of improvement.

The report provides an assessment of each Busway Station in turn and makes recommendations for improvements to walking and cycling connections. Of relevance to this report are the recommendations for Akoranga Station which is the station located closest to the Auckland Harbour Bridge. Recommendations include:

- Cycleway along the Northern Motorway;
- A pedestrian and cycle bridge link over the estuary between Jutland Road and Esmonde Road via Francis Street;
- A pedestrian and cycle bridge link across Shoal Bay between Byron Avenue and Barry's Point Road;
- A pedestrian cycle link from Onepoto Basin and Warehouse Way (ie Onewa Road to Esmonde Road); and
- Ensure the overpass to AUT is open to the public.

Esmonde Road to Stafford Road Cycleway Scheme Options Report, OPUS, (2000)

This report was commissioned by NSCC. The Esmonde Road to Stafford Road Cycleway Options scheme report was prepared for NSCC in 2000. The report investigated two options:

- The foreshore option runs parallel to the busway on the eastern side of the motorway; and
- The western option runs parallel to the western side of the northern motorway northbound lanes.

The report concludes that the foreshore cycleway proposal will provide greater recreational satisfaction to users than the western option but that the potential for adverse effects is also

greater. The report states that the adverse effects are able to be avoided, remedied or mitigated through sensitive design, location and bulk, particularly when considered in addition to the busway.

Alternative Waitemata Harbour Crossing Options for Cyclists Options and Issues Report, SERCO, (2001)

The Alternative Waitemata Harbour Crossing Options for Cyclists and Issues Report was prepared for Auckland City Council in 2001. The report looks at the feasibility of providing a cycle facility on or under the existing Harbour Bridge, together with alternative options such as bike racks on buses, a cycle shuttle service and improving the service for cyclists crossing the harbour by ferry.

In terms of bridge cycleway options the study states that predominantly the facility would be designed for commuter cyclists (as opposed to recreational cyclists) and that although the facility should cater for pedestrians it is not considered there will be a significant number of pedestrian users.

The study states that a 3 m wide facility is the recommended minimum due to the grade of the bridge. However options that would involve the facility under the bridge could be 2.5 m wide (if used by cyclists only). As discussed above the study refers primarily to a commuter cycling facility.

The study concludes that those options involving a facility on or beside the bridge extensions would not be attractive to cyclists due to the steep gradient and noise/air pollution from passing traffic. They note issues with strong winds from the eastern side and the movement of the bridge abutments as areas of concern. The report concludes that a facility under the bridge is the preferred option for commuter cyclists.

Auckland Harbour Bridge Cycleway – Feasibility Study Stage 1, Beca, (2006)

This report was commissioned by NZTA. The Auckland Harbour Bridge Cycleway feasibility study was prepared by Beca Infrastructure Limited in 2006. The key findings from the report are outlined below:

- The facility needs to cater for both cyclists and pedestrians;
- A cycleway/walkway under the truss bridge deck is not considered to be feasible due to existing services and facilities, lack of headroom and difficulty of access in an emergency;
- On road cycle lanes should not be used;
- Desirable exclusive cycle path widths of 2.5 m to 3 m depending on cycleway usage and whether cyclists speeds are greater than 30 km/hr and indicates a minimum of 2 m. A study of recent overseas practice indicates that substandard widths, shared cycleways (as

narrow as 1.6 m) are being constructed on major existing bridges where there are severe constraints;

- It is not practical to limit travel in one direction due to pedestrians and cyclists who may want to travel to the top of the bridge and then back down the same side. Also tourists are likely to prefer the eastern side of the bridge;
- In terms of safety and practicality two-way segregated movement with pedestrians on the eastern side and cyclists on the western side is the best option;
- The preferred northern access option proposes ramps to get cyclists and pedestrians to ground level. Ramps are required to be provided as separate structures and cannot be attached or supported by the viaduct structure; and
- Both southern access options provide good connections on both sides of the bridge approach lanes at ground level.

The report outlined the findings of Stage 1 only and therefore did not result in any conclusive option recommendations.

Waitemata Harbour Crossing Study, SKM, (2008)

This report was commissioned by the Waitemata harbour Crossing Implementation Executive. The Waitemata Harbour Crossing Study²⁷ (2008) outlines the result of the study aimed at identifying the preferred location for the additional harbour crossing. Three locations were identified as part of this process with various options regarding tunnels and bridges discussed for each location.

The study states that the importance of walking and cycling for cross harbour travel was highlighted in the project objectives and functionality principles. The report states that neither mode is suited to tunnel, due to general environment safety and amenity factors. As a result for all tunnel options it was assumed that both modes would be accommodated on the existing harbour bridge.

Waitemata Harbour Crossing Cyclists and Pedestrian Access Study, Maunsell, (2008).

This report was commissioned by NZTA. The Waitemata Harbour Crossing Cyclists and Pedestrian Access Study was completed by Maunsell Limited (now Aecom) for the WHC Implementation Executive in 2008. The study investigates options to improve access for cyclists and pedestrians across the Waitemata Harbour and evaluates dedicated cyclists and pedestrian facilities on the Auckland harbour bridge and ferry and bus services.

²⁷ SKM, Connell Wagner and ZOMAC Planning Solutions Ltd, 2008, Waitemata Harbour Crossing Study

The recommended option included a 3 m wide cyclist facility on the western side and a 3 m wide facility on the eastern side. This configuration was considered to be appropriate based on potential safety issues with peak crowding, conflicting movements of cyclists and pedestrians in a confined space on a steep grade and potential benefits gained from having a pedestrian facility on the east side for tourists.

Connectivity at each end of the Auckland Harbour Bridge is provided by northern high access points involving a combination of connections to Princes Street and Sulphur Beach Road for cyclists and pedestrians. A connection for cyclists and pedestrians from Westhaven Drive was the southern access option.

Northern Motorway Corridor Cycleway project Feasibility Report, SKM, (2008)

In 2008 NZTA commissioned SKM to investigate and report on the feasibility of providing a separate dedicated cycleway alongside the Northern Motorway. The section investigated was between Esmonde Road and Oteha Valley Road. The study built on a previous study of a proposed route by City Design in 2004.

The options considered were a western alignment with various sub options and an eastern alignment with various sub options.

The investigation concluded that a predominantly off road cycle path on the western side of the Northern motorway is feasible. The report states that this conclusion was easily met as the eastern corridor is severely constrained in some parts and does not present a viable option for a continuous cycle path.

An Update to this Study, also prepared by SKM dated 6 April 2009, outlined the feasibility of providing a shorter cycle route along the motorway corridor between Esmonde Road and Constellation Drive. This updated concluded that the shorter route was more economically viable than the route outlined in the 2008 study.

Auckland Harbour Bridge to Akoranga Station Cyclists and Pedestrian Access – Project Feasibility Report, Maunsell Aecom, (2009)

The Auckland Harbour Bridge to Akoranga Station Cyclists and Pedestrian Access Project Feasibility Report was prepared by AECOM for NZTA in 2009. The aim of the report was to investigate the feasibility of providing cyclists and pedestrian access between Auckland Harbour Bridge at Princes Street or Sulphur Beach Road and Akoranga Station via Onewa Road.

Two main route options were identified as Option 1 – AHB at Princes Street and Sulphur Beach Road to Akoranga Station via the Northern Motorway and Option 2 – AHB at Princes Street to Esmonde Road via Lake Road and College Road.

Option 1 was identified as the preferred option with the greatest perceived benefits for cyclists and pedestrians through directness and ease of use. The report includes a preliminary design of the preferred option and a provisional cost estimate of \$4.1 million. An economic analysis of the preferred option is also included with a BCR of 1.8.

Previous discussions with NZTA have established the likelihood that path structures could be formed within NZTA's existing designations in line with the purpose of the designations sought in their notices of requirement. If it is found that paths cannot be established through the existing designation, NZTA could apply for an alteration of its designation under Section 181 of the RMA to change the purpose of the designation to include paths for cyclists and pedestrians. A preliminary planning assessment is also included.

St Mary's Bay Walking and Cycling Project Feasibility Report, MWH, (2009)

The St Mary's Bay Walking and Cycling Project was prepared for NZTA in 2009 and proposes two options to improve the safety and connectivity for pedestrians and cyclists between Westhaven, Herne Bay and the Auckland CBD. The report provides an assessment for providing and improving cycling facilities along the motorway corridor and a connection to the potential Auckland Harbour Bridge cycleway.

Option 1 consists of a separate new cycleway/footpath, which starts at the west side of the Point Erin Park and ends at the southwestern corner of the Beaumont Street/Fanshawe Street intersection.

Option 2 would provide improvements to the existing intermittent off-road cycle way on Westhaven Drive that starts at the northeastern corner of the Beaumont Street/Fanshawe Street intersection and ends at the Curran Street/Westhaven Drive roundabout.

The report concludes that Option 1 is preferred but that it is dependent on the completion of the Victoria Park Tunnel project.

Akoranga Station Cyclists and Pedestrian Access Project Feasibility Report, Maunsell Aecom, (2009)

The report was commissioned by NZTA to identify and investigate options to improve cyclists and pedestrian access between Akoranga Station and the surrounding area, together with improving facilities for pedestrians and cyclists within the station. An economic analysis was carried out which identified expected estimates and benefit costs for the following improvement options:

- A shared path from Akoranga Drive to the pedestrian overbridge at AUT;
- A shared path from Rosmini College to Akoranga Station;
- A shared path between Takapuna and Akoranga Station via a new bridge connection; and

- A shared path from Francis Street to Esmonde Road via a new bridge connection.

Benefit Cost Ratios (BCRs) were prepared for all of the improvement works and all exceeded 1.0. The report recommended that these works proceed to the next stage of investigations.

Smales Farm Station Cyclist and Pedestrian Access Project Feasibility Report, Maunsell Aecom, (2009)

The report was commissioned by NZTA to identify and investigate options to improve cyclists and pedestrian access between Smales Farm Station and the surrounding area, together with improving facilities for pedestrians and cyclists within the station. An economic analysis was carried out which identified expected estimates and benefit costs for the following improvement options:

- Shared path between Argus Place and Wairau Road;
- Shared path between Smales farm Station and Wairau Road; and
- Shared Path between Smales farm Station and Northcote Road.

Benefit Cost Ratios (BCRs) were prepared for all of the improvement works and all exceeded 0.8. The report recommended that these works proceed to the next stage of investigations.

APPENDIX C

Walking and Cycling Background Statistics

Background Statistics

Auckland Regional Transport Authority (ARTA) Manual Cycle Monitoring in the Auckland Region 2007/08

ARTA undertakes a manual yearly count across a predetermined set of sites. There were 28 sites counted in Auckland City (increased from 12 sites) and 13 sites counted in North Shore City. These counts were conducted between 6:30 am and 9:00am and 4:00 pm to 7:00 pm in March 2010. The following key points were made in the executive summary of the North Shore report:

- In Auckland City a total of 3,774 cyclist movements were recorded across the 12 previously monitored sites in 2010. This represents a 34 % increase when compared with 2009 (2,818 movements) and a 54 % increase when compared with 2001 (2,456);
- More cyclists were recorded over the morning period (2,059 movements) than over the evening period (1,715 movements);
- Of the 12 sites, the busiest site in 2010 is the intersection of Tamaki Drive/The Strand with a total of 704 movements (up from 456 movements in 2009); and
- All sites have recorded increases in total cyclist numbers in 2010 compared with 2009.

The intersections with the biggest increases are:

- Tamaki Drive/The Strand – up 54 %;
- Great North Road/Carrington Road/Pt Chevalier Road– up 53 %;
- Ponsonby Road/K' Road/Newton Road/Great North Road– up 46 %;
- North Western Cycleway/St Lukes Road– up 45 %; and
- North Western Cycleway/Great North Road – up 42 %.

The Patiki Road/Rosebank Road intersection was recorded as having the lightest cyclist traffic (70movements) in 2010.The cycle numbers at the Northwestern Cycleway were recorded at 532 cyclists per day, up 59 % from 2007. These results indicate that demand for cycling is high where good quality separated cycle paths are provided.

Within North Shore City 13 sites were monitored. These sites were also counted between 6:30 am and 9:00am and 4:00 pm to 7:00 pm in March 2010. The following key points were made in the executive summary of the North Shore report:

- In North Shore City a total of 1,105 cyclist movements were recorded across the 13 sites in the morning peakperiod (between 6:30am and 9:00am) in 2010 – including 15 % observedcycling as groups. This figure is up from 1,049 movements recorded in 2009 (an increase of5%); and
- The busiest site in the morning peak was at Lake Road by Takapuna Grammar (186, up from 166 cycle movements in 2009), whereas Oteha Valley/State Highway 17/Albany Highway and Birkenhead Avenue/Mokoia Road had the lowest level of morning cyclist traffic (29 cycle movements each) out of the sites recorded.

Nine of the 13 sites recorded increases in 2010 compared to 2009. The most notableincreases were at:

- Rosedale/Bush Road – up from 26 to 48 movements (85 %); and
- Beach/Browns Bay Road – up from 29 to 50 movements (72 %).

Only four sites recorded declines, the most notable being Shakespeare/East Coast Road – down from 177 to 146 movements (18 %).

The average volume of morning cyclists across the 13 sites monitored in North Shore city was 85 cycle movements. This compares with 81 cycle movements in 2009.

Summary Table of Cycle Movements 2010 below shows the ten sites with the highest counts of cyclists, in the Auckland region. This is ranked according to a calculated AADT count based on the morning and evening peak periods surveyed.

Summary Table of Cycle Movements 2010

Site	Area	6:30am to 9:00am	4:00pm to 7:00pm	AADT 2010
Tamaki Drive/ The Strand	Auckland	498	438	1,365
Symonds Street/Karangahape Road	Auckland	283	314	865
Ponsonby Road/Karangahape Road	Auckland	272	310	843
North Western Cycleway/Great North Road	Auckland	242	317	807
North Western Cycleway/St Lukes	Auckland	244	241	705
Ferry Terminal	Auckland	222	210	629
North Western Cycleway/Te Atatu Road	Waitakere	198	197	574
Ian McKinnon/Newton Road	Auckland	179	209	562
Lake Road near Takapuna Grammar	North Shore	190	184	544

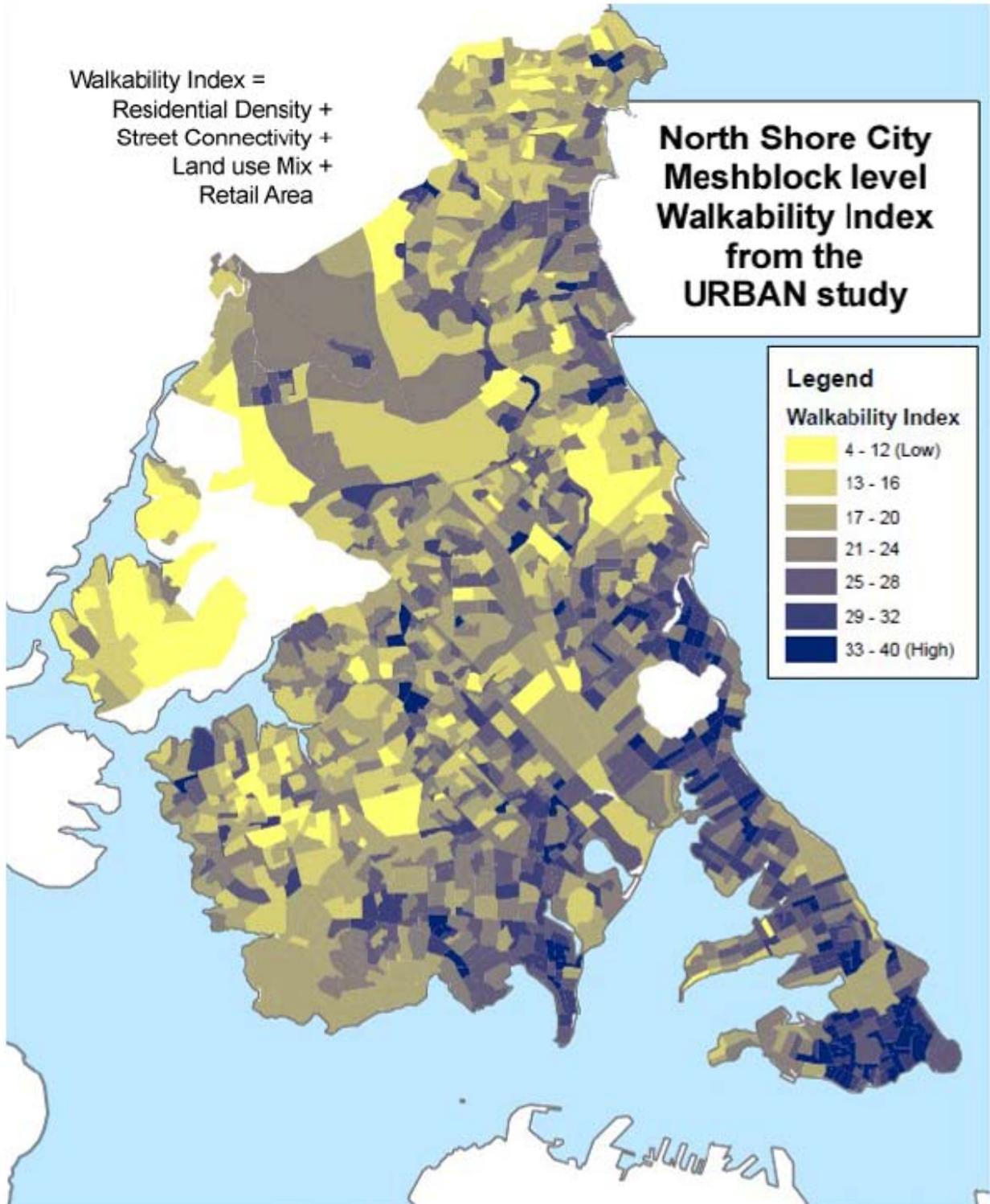
Great North Road/Carrington Road	Auckland	186	141	479
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The North Shore City Council Cycling and Walking Strategies

Bicycle counts have been undertaken at a variety of locations around the North Shore in 2002, 2007 and 2008. A number of the counting stations used in 2002 were counted again in 2008, providing an indication of cyclist usage of particular routes over time. The increase in cyclists appears significant over the period. In most cases the number of cyclists has increased by 50% since 2002. In all cases (with the exception of Oteha Valley Road and Albany Highway) the increase reflects a change since cycle facilities have been installed.

In terms of walking the North Shore Walking Strategy identifies a walkability map as shown below developed by Suzanne Mavoia at the Centre for Social and Health Outcomes Research and Evaluation, Massey University as part of the Health Research Council funded Understanding the Relationship between Physical Activity and Neighbourhoods (URBAN) Study. The study was linked to evidence that attributes at an infrastructure level, such as street connectivity, access to destinations, dwelling density, and the ratio of residential to commercial and industrial space in neighbourhood, contribute to walkability.

North Shore City: Walkability Index



NSCC undertook a research project in January 2009 to gain an understanding of the current cycling and walking behaviours of North Shore City residents, and to identify the drivers for, and barriers to walking and cycling. There were qualitative (focus groups) and quantitative (on-line survey) components to the study. 1,251 responses to an on-line survey were received. Walking specific results of this research include²⁸:

- 6% of respondents (North Shore residents) walk to work or study; and
- 15% of respondents (North Shore residents) live 2km or less from their place of work or study.

Respondents gave the following examples of the types of walking undertaken:

- Around neighbourhood, parks etc 63%;
- General recreation/fitness 62%;
- Errands 50%;
- Visit friends 26%;
- Supermarket 25%; and
- To public transport 24%

The average length of time walked for recreation:

- 4% under 15 minutes;
- 18% between 15 and 30 minutes;
- 50% between 30 minutes and 1 hour;
- 21% between 1 hour and 1.5 hours;
- 5% between 1.5 and 2 hours; and
- 3% for more than 2 hours

The study investigated physical activity sites in the city and physical activity behaviours and perceptions from residents of North Shore City. Of particular interest for transport and roading are the key relevant findings of:

- Lack of infrastructure for public transport, cycling, and transport related physical activity;

²⁸ With a Standard margin of error +/- 2.8%.

- Main barriers for transport related physical activity were time and distance constraints, lack of information, poor design and quality of footpaths;
- Connectivity within the street environment is key factor to promoting physical activity, and increasing commuting to work or study;
- Aesthetics is a key element to attract people to engage in physical activity;
- Most people deem it appropriate to walk 20 to 30 minutes for transport; and
- Walking facility over Harbour Bridge supported by a third of respondents who work or study in Auckland City.

The report stated that submissions on a harbour bridge crossing were received. The Harbour ridge issue was addressed in February 2009 by Council's Infrastructure and Environment Committee who resolved that:

- 'no further investigations be pursued on this project pending progress on planning for and implementing the third Waitemata Harbour crossing'.

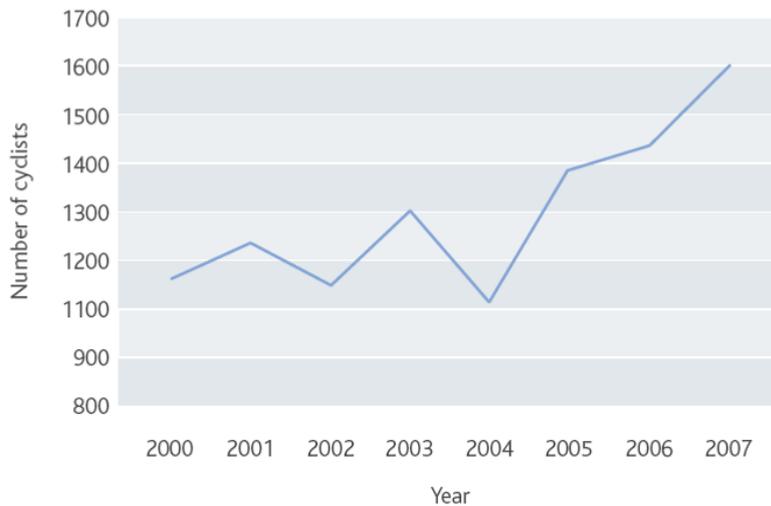
The Auckland City Council Cycling Strategy

Auckland City has over 15,000 people who cycle, walk or jog to work every day. In addition, just under half of all journeys to school are by foot or on a bike.

The region has set a target of reducing the rising number of morning peak car journeys by around 20,000 per day. Cycling and walking are expected to contribute to this target through a mode share of 15.5 % of trips by 2016 and completion of 50 % of the regional cycle network.

The council's cycling monitoring shows that since 2000, there has been an increase in the numbers of cyclists using 11 key routes as shown below.

Figure 5: Total cyclists on 11 monitored routes



It is worth noting that this data is sensitive and subject to fluctuations from external influences such as change in weather, university holidays etc. There is also a possibility that cyclists are over represented if they pass through more than one monitoring site on the same day.

To minimise these influencing factors, monitoring for this data takes place as close as possible to the same time each year, in the same locations and is weather dependent.

At this stage, the Council's pedestrian monitoring data does not provide enough information to ascertain walking trends.

2006 Census Statistics

The New Zealand Census is undertaken at five yearly intervals and asks respondents to comment on their means of travel to work. This data has been obtained for the 2006 Survey and has been transposed to show the mode choice taken by destination. The following is a summary of those that travelled to work.

- Of those travelling to employment in the Auckland CBD, 1.4% cycle and 9% walk or jog; and
- Of those travelling to employment in Takapuna Central, 1.1% cycle and 5.5% walk or jog.

NZ Household Travel Survey

The Ministry of Transport conducts an ongoing survey of household travel. Each year, people in 4,600 households throughout New Zealand are surveyed and asked about their travel behaviour.

The survey covers all travel modes. The most relevant are walking and cycling, and fact sheets have been produced by the Ministry of Transport summarising the results.

In terms of cycling the survey looks at who cycles, where to, and how the patterns change over time. The key findings of the cycling section of the surveys are as follows:²⁹

- Cycling makes up 2% of total time travelled and 1% of the number of trip legs³⁰;
- 18% of people reported cycling in the last month;
- Those in smaller towns or rural settings are more likely to have cycled in the previous month than those in urban centres; and
- Of those surveyed, 20% of cycle trips were to work and 53% were for recreational purpose, and 26% were for social/shopping/personal business.

In terms of walking the survey again looks at similar things to cycling ie who walks, where they walk to and how walking has changed over time. The key findings of the walking section of the survey are as follows:³¹

- Walking makes up 13% of total time travelled and 17% of the number of trip legs;
- People in households with no car spend more than two and a half hours per person per week walking, compared to 66 minutes per person per week or less for those households with one car or more; and
- Once over 5 years old, those in cities of over 30,000 people walk more (on public footpaths) than those outside, the below table demonstrates the minutes walked per person.

Time spent walking by age and area of residence (2006 – 2009)

Age Group (years)	Minutes walked per person in Cities	Minutes walked per person in Towns and Rural Areas
0 to 4	47	53
5 to 12	56	35
13 to 17	112	74
18 and over	62	37

²⁹ Ministry of Transport, Dec 2009, Cycling for transport v2Dec 2009.

³⁰ Ministry of Transport defines a trip leg as a single leg of a journey, with no stops or changes in travel mode.

³¹ Ministry of Transport, Dec 2009, Walking for transport v2Dec 2009

APPENDIX D

SATURN Results

AADT Southern Side

Road	Section	Lower Estimate AADT	Higher Estimate AADT
Fanshawe Street	AHB to Beaumont Street Eastbound	359	1083
	AHB to Beaumont Street Westbound	314	936
	Beaumont Street to Halsey Street Eastbound	300	907
	Baumont Street to Halsey Street Westbound	254	766
	Halsey Street to Nelson Street Eastbound	260	775
	Halsey Street to Nelson Street Westbound	215	642
Custom Street East	Albert Street to Anzac Avenue Eastbound	168	501
	Albert Street to Anzac Avenue Westbound	112	341
Wyndham Street	Hobson Street to Albert Street Eastbound	91	278
	Hobson Street to Albert Street Westbound	74	222
Anzac Avenue	Beach Road to Waterloo Quadrant Northbound	61	189
	Beach Road to Waterloo Quadrant Southbound	36	109
Shelly Beach Road/Curran Street	AHB to Jervois Road Northbound	145	441
	AHB to Jervois Road Southbound	131	387
Jervois Road	Shelly Beach Road to Ponsonby Road Northbound	115	346
	Shelly Beach Road to Ponsonby Road Southbound	96	291
	Shelly Beach Road to West End Road Eastbound	30	95
	Shelly Beach Road to West End Road Westbound	35	102
Ponsonby Road	Jervois Road to Franklin Road Northbound	101	299
	Jervois Road to Franklin Road Southbound	82	247
	Franklin Road to Williamson Avenue Northbound	57	171
	Franklin Road to Williamson Avenue Southbound	55	169
	Williamson Avenue to Greta North Road Northbound	34	110
Wellington Street	Williamson Avenue to Great North Road Southbound	33	105
	Ponsonby Road to Karangahape Road Eastbound	16	51
Pitt Street	Ponsonby Road to Karangahape Road Eastbound	0	0
	Greys Avenue to Hobson Street Northbound	16	51
Newton Road	Greys Avenue to Hobson Street Southbound	25	80
	Great North Road to Ian McKinnon Drive Eastbound	26	81

	Great North Road to Ian McKinnon Drive Westbound	24	76
Wellesley Street West	Hobson Street to Queen Street Eastbound	0	0
	Hobson Street to Queen Street Eastbound	0	0

AADT Northern Side

Road	Section	Lower Estimate AADT	Higher Estimate AADT
AHB	Westhaven Drive to Princess Street Northbound	466	1390
	Westhaven Drive to Princess Street Southbound	531	1591
SH1	AHB to Onewa Road Northbound	264	794
	AHB to Onewa Road Southbound	192	580
	Onewa Road to Esmonde Road Northbound	224	678
	Onewa Road to Esmonde Road Southbound	147	447
Queen Street	AHB to Stafford Road Northbound	200	595
	AHB to Stafford Road Southbound	339	1011
	Stafford Road to Onewa Road Northbound	146	438
	Stafford Road to Onewa Road Southbound	276	825
Onewa Road	Queen Street to Birkenhead Avenue Eastbound	140	416
	Queen Street to Birkenhead Avenue Westbound	111	333
Mokoia Road	Birkenhead Avenue to Verbena Road Eastbound	42	132
	Birkenhead Avenue to Verbena Road Westbound	56	175
Maritime Terrace	Hineomoa Street to Queen Street Eastbound	38	110
	Hineomoa Street to Queen Street Westbound	29	89
Birkenhead Avenue	Onewa Road to Pupuke Road Northbound	37	108
	Onewa Road to Pupuke Road Southbound	45	141
Glenfield Road	Pupuke Road to Eskdale Road Northbound	37	108
	Pupuke Road to Eskdale Road Southbound	45	141
Esmonde Road	SH1 to Barry's Point Road Eastbound	200	595
	SH1 to Barry's Point Road Westbound	147	447
Lake Road	Onewa Road to Raleigh Road Northbound	35	106
	Onewa Road to Raleigh Road Southbound	137	409
Barry's Point Road	Esmonde Road to Anzac Street Northbound	157	470

	Esmonde Road to Anzac Street Southbound	98	301
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APPENDIX E

On Bridge Facility

The provision of two separate facilities is in accordance with advice provided to the Waitemata Harbour Crossing Implementation Executive³² in 2008.

At this stage we consider that the pedestrian facility should be provided on the eastern side of the bridge to allow recreational users and tourists access to the views from this side. This facility can provide for shared pedestrian/recreational cyclists use but we believe that a separate facility is required for commuter/training cyclists. We anticipate that the recreational cyclists using the shared facility would be slow cyclists and children, similar to the use of the Tamaki Drive shared pedestrian/cycle path. While we believe it may be preferable to also provide the commuter/training cycle facility on the eastern side, it is our opinion that this cycle facility could be provided on the western side.

Other options that may be considered during the project if preferred options are not feasible include:

- ◆ Providing one of the facilities below the bridge
- ◆ Making use of the new bridge (if this option is progressed)

DESIGN GUIDES

Width

Pedestrians Guidelines

Table 14.3 in the Pedestrian Planning and Design Guide³³ identifies specific width requirements for footpath facilities for different maximum pedestrian flows. This is shown in **Error! Reference source not found.**.

At this stage of the project we have not identified the anticipated pedestrian flows on the bridge but we believe that there is potential for the pedestrian flows to be high, especially during recreational peak times. These pedestrians are also likely to be stopping and taking in the view, adding to the potential pedestrian density. In addition to the information provided in **Error! Reference source not found.** the Guide also states the following:

- ◆ Wider street furniture zones (area between the footpath and the road) are required in areas with higher adjacent speeds and/or higher adjacent volumes.
- ◆ Wider through-route zones (footpath area) are generally required in areas with high pedestrian volumes and/or a high number of pedestrians stopping on the footpath.

³² Auckland Waitemata Harbour Cyclist and Pedestrian Access Study, 24 September 2008, Maunsell Limited 2008

³³ Pedestrian Planning and Design Guide, NZTA, 2007

NZTA recommendations for Pedestrian Width

Location	Maximum pedestrian flow	Zone				Total
		Kerb	Street furniture #	Through route	Frontage	
Arterial roads in pedestrian districts	80 p/min	0.15 m	1.2m	2.4 m +	0.75 m	4.5 m
CBD						
Alongside parks, schools and other major pedestrian generators						
Local roads in pedestrian districts	60 p/min	0.15 m	1.2 m	1.8 m	0.45 m	3.6 m
Commercial/ industrial areas outside the CBD						
Collector roads	60 p/min	0.15 m	0.9 m	1.8 m	0.15 m	3.0 m
Local roads in residential areas	50 p/min	0.15 m	0.9 m	1.5 m	0.15 m	2.7 m
Absolute minimum*		0.15 m	0.0 m	1.5 m	0.0 m	1.65 m

Consider increasing this distance where vehicle speeds are higher than 55 km/h.

* Only acceptable in existing constrained conditions and where it is not possible to reallocate road space.

Austrroads Part 13³⁴ states that the absolute minimum width of a footpath is 1.5 m and the desirable minimum width is 1.8 m, although this is generally for roads in urban streets where a grassed berm is also provided. Further guidance is provided for locations with high pedestrian volumes and/or along busy roads where the width is recommended as being 2.4 m or greater. However, this is not suitable for a shared facility

Cycle and Shared Pedestrian/Cycle Facility Guidelines

Austrroads Part 14 and the NZ supplement³⁵ state that the minimum width of a two way cycle path is 2 m but a desirable width is 3 m.

Guidelines for shared cyclists and pedestrian facilities are also included in Austrroads Part 14. The Guide states that the desirable width for a commuter path is 3 m (range 2 m to 3.5 m) and for a recreational path is 3.5 m (range 3 m to 4 m).

The Guide also states that major recreational paths should be 4 m wide to permit cyclist groups/couples to pass pedestrian couples or groups or to permit cyclists travelling in the opposite directions to pass pedestrians safely.

³⁴ Guide to Traffic Engineering Practice, Part 13, Pedestrians, Austrroads 1995

³⁵ Guide to traffic Engineering Practice, Part 14, Bicycles (1993) and NZ Supplement to the Austrroads Guide (2008)

However when discussing shared paths the Guide also states that separated paths (ie a path on which cyclists and pedestrians are required to use separate designated areas) are more appropriate along promenades, foreshores and major inner city bridges. Separated two way paths are recommended to be a minimum of 4.5 m wide.

Barrier

Based on our review of relevant guidelines, it is our opinion that due to the speed and volume of traffic on the bridge a barrier between the pedestrian and/or cycle facility and the general traffic lanes will be required. Any barriers will also need to include sufficient offsets, which are desirably 1.0 m adjacent to vehicle lanes, with an absolute minimum of 300 mm. A 300 mm clearance would also need to be factored into the width provided adjacent to the cycle or pedestrian facility. If speed limits and operating speeds in adjacent lanes were to be reduced, say to 50 km/hr, then the need for barriers could be reassessed.

PREFERRED DESIGN REQUIREMENTS

Based on the information included in the various Guidelines, and that there is limited space on the bridge, we have identified the following preferred design requirements:

- ◆ The shared pedestrian/cycle path should be 3 m to 3.5 m. This is based our belief that a large number of recreational users and tourists will use the facility and many will stop in groups to observe the view and take photographs. We consider that 3.5 m would be desirable given the location of the facility.
- ◆ The commuter/training cycling facility should be 3 m to 3.5 m to allow for an effective two way facility. In addition, if against the bridge railing, an additional 0.3 m is required for clearance.
- ◆ If the shared pedestrian/cycle path is adjacent to the commuter cycle facility then it would need to be segregated by a raised kerb, not just a painted line due to the speed differential between users.
- ◆ It is our opinion that a barrier will be required between either facility and a traffic or bus lane. This is due to the speed and volume of traffic on the bridge. Appropriate clearances will be needed both sides of the barrier.

PRELIMINARY PREFERRED DESIGN OPTION

At this preliminary stage our preferred option is to have a shared pedestrian/recreation cycling facility on the eastern side of the bridge with a commuter/training cycle facility also on the eastern side of the bridge or on the western side of the bridge. The final preferred option being dependant on the feasibility of connections to local roads on the northern side of the bridge and also security, comfort and safety. Both facilities should be separated from the general traffic lane or bus lane by a barrier. If these facilities are located adjacent to each other on the eastern side of the bridge, then the shared footpath/recreational cycle facility should be physically separated from the commuter cycle facility, eg by a raised kerb.

Assuming these facilities are adjacent to each other on the eastern side of the bridge, then the desirable width required would be 7.6 m, plus the width of a barrier and clearance between the barrier and any vehicle lane. Accordingly, it is recommended that the whole eastern clip-on would be required.

Assuming these facilities are located on the eastern and western sides of the bridge, then the desirable width required would be 3.8 m plus the width of a barrier and clearance between the barrier and any vehicle lane for the shared pedestrian/recreational cycle facility and 4.1 m for the commuter cycle facility, again plus the width of a barrier and clearance between the barrier and any vehicle lane.

Based on our analysis it is clear that one traffic lane is not going to be sufficient to cater for pedestrian and cycling facilities across the bridge. It is our understanding that the current vehicle lane requirements for the bridge crossings are two times five traffic lanes and two times one bus lane. This would allow two lanes for the cycle and walking facilities (either adjacent or on either side of the bridge). Should the requirement for an additional traffic lane become apparent in the future alternative options (such as moving the cycle lane to below the bridge) could be explored. Accordingly, providing two lanes now for active travel may not exclude the ability to provide an extra vehicle lane in the future.

Reference: S:\NZTA\039\TN1A100716.doc - mairi



TRANSPORTATION SPECIALISTS

PROJECT AWHC: NETWORK PLAN WALKING AND CYCLING
TO MATTHEW RICHARDS, TOM MORTON
FROM MAIRI JOYCE
REVIEWED BY ANGIE CRAFER
DATE 5 AUGUST 2010
SUBJECT BRIDGE LANE LAYOUT

INTRODUCTION

Flow Transportation Specialists (Flow) has been commissioned by NZTA to complete the walking and cycling component of the AWHC Network Plan. The scope of this project is to investigate the required connections to a future walking and cycling facility on the existing Auckland Harbour Bridge (AHB) and/or new crossing, if it is a bridge, to be installed in conjunction with the completion of the Additional Waitemata Harbour Crossing (AWHC).

Whilst this scope does not include designing the proposed facility on the AHB itself we consider this to be very relevant to the success of the proposed facility, including the on and off bridge components. We have previously provided advice recommending the need for allocating two lanes on the existing AHB to walking and cycling leaving a total of five lanes for traffic. This recommendation is based on separate facilities for commuter/training cyclists and pedestrians/recreational cyclists (due to safety reasons regarding differences in speed), with around 4 m for each facility. The details of our recommendations are outlined in our previous Technical Note dated 16 July 2010.

Further to our previous advice, it has become apparent that there may be a need to provide six traffic lanes on the existing bridge as opposed to five, leaving only one lane available for walking and cycling. We note that this "need" has been determined based on the potential downstream capacity of CBD off ramps, rather than the ability of the receiving city streets to accommodate this traffic, and further that whilst there are five peak period lanes currently provided, these also accommodate buses, which in the future, will have their own dedicated lanes (freeing up capacity in the other lanes). Accordingly, the proposal is to actually provide seven peak hour vehicle (car, freight and bus) lanes compared to the current five in the peak direction.

This Technical Note outlines the consequences of providing only one lane for the walking and cycling facility and suggests that it will not be possible to provide safe facilities for both cyclists and pedestrians by

using one lane on the existing bridge. We also make recommendations as to what improvements would be necessary to accommodate both cyclists and pedestrians.

CROSS SECTION OPTIONS USING ONE LANE ONLY

Design Requirements

Based on the information included in the report prepared for the Waitemata Harbour Crossing Implementation Executive in 2008³⁶ the existing AHB clip-on is 9.15 m wide between the external barriers. Various options to re-allocate this space to provide cycling and walking facilities as part of the existing bridge only were considered as part of this report. In summary the report concludes the following:

- ◆ A cycle facility of less than 2.5 m wide is not recommended due to the potential for adverse safety impacts and a cycle facility of over 2.9 m is desirable
- ◆ A pedestrian facility of 2.5 m or greater is acceptable
- ◆ A traffic lane width of 3.3 m is acceptable for lanes carrying buses
- ◆ A shoulder width (or clearance) of 0.3 m is acceptable

The findings of the 2008 report were the subject of a Safety Audit³⁷ which also discusses the acceptable range of space reallocation on the bridge clip-ons. In summary the Safety Audit concludes:

- ◆ A cycle facility should be provided at a width of no less than 3 m (including clearances)
- ◆ The pedestrian path should be provided at a width of no less than 2.3 m
- ◆ A standard traffic lane of 3.1 m is acceptable
- ◆ However one traffic lane in each direction should be a minimum of 3.4 m to allow for heavy vehicles use on the Clip-On. This is due to the narrow widths of the central lanes on the existing bridge which the Safety Audit regards as unsuitable for heavy vehicles.
- ◆ A clearance of 0.6 m is desirable from the barrier but a clearance of 0.3 m is acceptable on the condition that the adjacent lane width is 3.4 m

It is noted that these previous investigations assumed that the pedestrian and cycling facility would be segregated, with the pedestrian facility on the eastern clip on and the cycling facility on the western clip-on. If the facilities are provided adjacent to each other, then we recommend the following:

- ◆ Both facilities should be provided on the eastern side as this will be more attractive to pedestrians.
- ◆ The facilities must be physically separated (eg flexi guide delineators, or raised footpath) to ensure safety for cyclists and pedestrians.

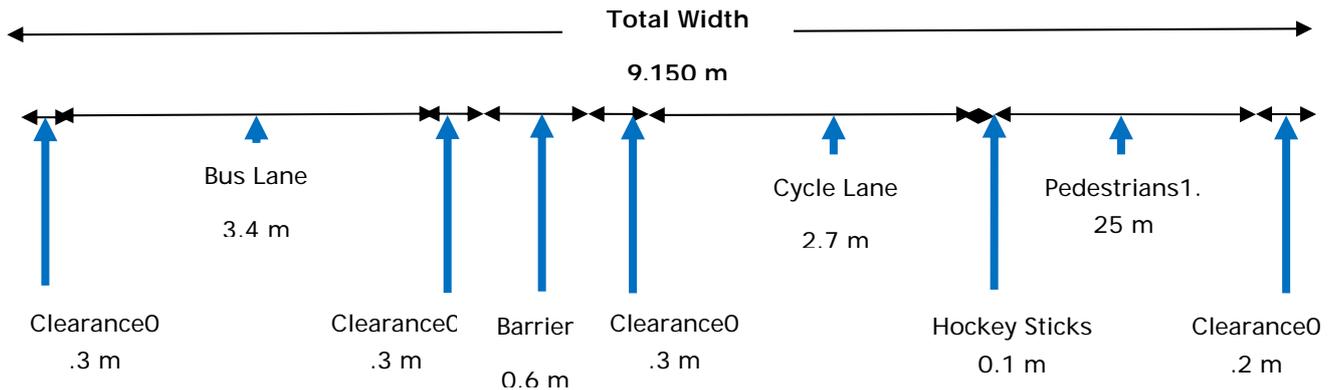
³⁶ Auckland Waitemata Harbour Cyclist and Pedestrian Access Study, Maounsell Ltd, 2008

³⁷ Auckland Harbor Bridge Road Safety Review, Traffix Group, October 2008

Option 1: Shared Facility Without Extension

Based on an available cross section of 9.15 m and the information above, the achievable widths for each facility are shown in Figure 1. It is noted that to minimise clearances we have used assumed the flexi guide delineators, colloquially known as “hockey sticks”, as a form of separation although we note this may not be the most aesthetic design choice.

Figure 1: Option 1



The results show that providing the required space for the traffic lane, clearances and cycle lane leaves only 1.25 m for the pedestrian footpath. As outlined in our previous Technical Note, Austroads Part 13³⁸ states that the absolute minimum width of a footpath is 1.5 m and the desirable minimum width is 1.8 m, although this is generally for roads in urban streets where a grassed berm is also provided. Further guidance is provided for locations with high pedestrian volumes and/or along busy roads where the width is recommended as being 2.4 m or greater. It is also noted that the Safety Audit recommends a minimum width of 2.3 m.

It is our opinion that providing a pedestrian facility of 1.25 m in width would be unacceptable from safety, attractiveness and congestion perspectives. Pedestrians are likely to step into the adjacent cycle lane to pass each other, and those with prams would not be able to pass one another. Due to the grade of the AHB and the likely speeds of commuter cyclists we consider this will result in unacceptable risk to pedestrians and cyclists using the facility.

POSSIBLE SOLUTIONS

Option 2: Adjacent Facilities With Extension

The report prepared for the Waitemata Harbour Crossing Implementation Executive in 2008³⁶ states that structurally the clip-on can support an extension of up to 1.2 m. Whilst this would require structural work to

³⁸ Guide to Traffic Engineering Practice, Part 13, Pedestrians, Austroads 1995

accommodate the changes in the wheel tracking, this would most likely be required anyway with the option put forward by the design team, detailed above.

The additional 1.2 m would increase the width of the clip-on between the barriers to 10.35 m and would allow a pedestrian footpath of 2.45 m, plus a 0.2 m clearance. All other widths would remain as shown in Figure 1.

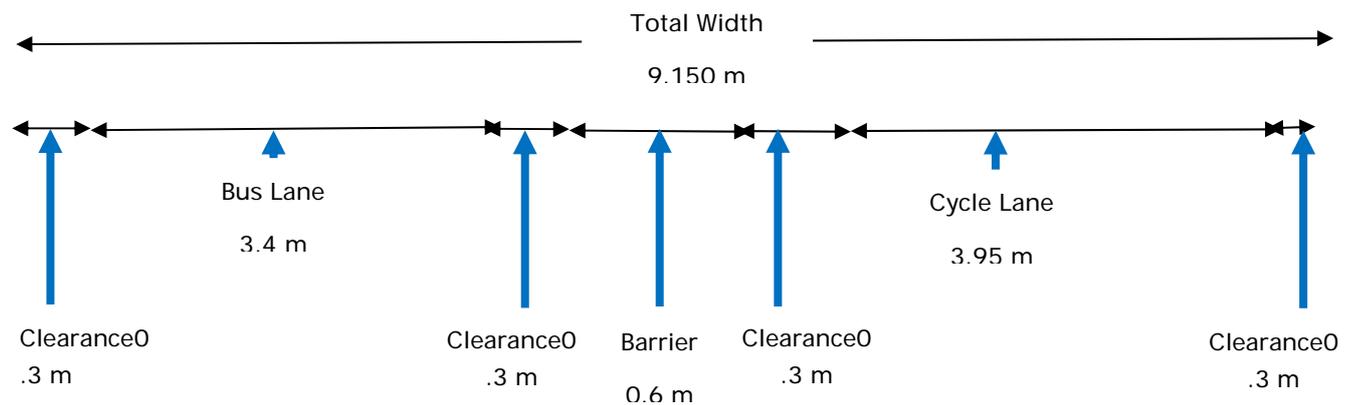
As a result, the existing clip-on with a 1.2 m extension will allow for the absolute minimum acceptable widths for the traffic lane and cycle and pedestrian facilities.

Option 3: Separated Facilities With Extension

An alternative option is to provide separate facilities with the cycling facility on the western clip-on and the pedestrian facility on a widened eastern clip-on.

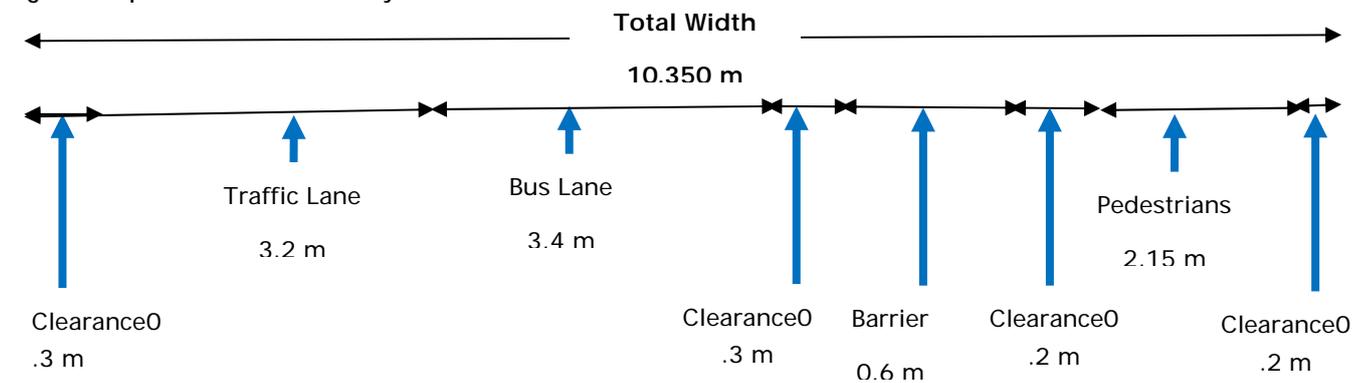
The cycling facility would be provided on the western clip-on utilising what was proposed in Figure 1 for walking and cycling. This would allow for a two way cycling facility of 3.95 m plus clearances as shown in Figure 2 below.

Figure 2: Option 3 Western Clip on Cycling Facility



The pedestrian facility would be provided on the eastern clip-on by reducing the width of the existing traffic lanes and extending the clip-on by 1.2 m. This would allow for a pedestrian facility of 2.55 m including clearances. The proposed cross section is shown in Figure 3.

Figure 3: Option 3 Pedestrian facility



DISCUSSION

Our investigation has shown that it is possible to provide cycling and walking facilities on the AHB using one lane only, provided that the eastern clip-on is widened by 1.2 m.

Option 1 has been discounted as being unsafe showing that the 1.2 m extension is required.

Option 2 results in facilities being designed to minimal standards only. It is our opinion that the minimum design standards should not be used for this facility for the following reasons:

- ◆ As stated in our previous Technical Note, it is our opinion that the walking and cycling facility across the AHB should provide a quality facility for commuters and recreational users within the Auckland region. In addition to this we believe that the facility also has the potential to be a major national (and potentially international) tourist facility (akin to the Sydney Harbour Bridge in Australia and the San Francisco Golden Gate Bridge in the USA). It is noted that any compromise with regard to the design of the proposed facility will impact on this vision.
- ◆ The standard of the facility will have an impact on the number of people using it. A higher standard will result in a higher usage.
- ◆ The proposed cross section outlined above includes cyclists and pedestrians being separated by flexi guide delimiters only. We consider that providing cycling and walking facilities on separate sides of the bridge will result in a safer solution, particularly given the grade of the AHB and the potential for a significant difference in commuter/training cycling speeds and pedestrian/recreational cycle speeds. We note that this was also the preferred recommendation of the 2008 report prepared for the Waitemata Harbour Crossing Implementation Executive.
- ◆ The provision of a cycling facility on the eastern side of the bridge results in some difficulty when considering links to other facilities on the North Shore. The results of previous studies³⁹ indicate that a cycleway along the western side of the motorway is more feasible than the eastern side. If the “on bridge” facility is provided on the eastern side then additional infrastructure for pedestrians and cyclists will be needed to cross to get to the western side. This will result in the need to use the existing underpass (which may not be desirable) or some kind of over ground structure which may be expensive.

Option 3 results in the provision of a high standard cycling facility and an average quality pedestrian facility. It also allows for the facilities to be separated, providing a safer solution. We therefore consider this is the preferred option if the width of only one traffic lane is made available for active travel modes.

³⁹ NO1: Northern Motorway Corridor Cycleway Project Feasibility Report, SKM, 2008 and Auckland Harbor Bridge to Akoranga Station Cyclists and Pedestrian Access project Feasibility Report, Maunsell, 2009

CONCLUSIONS AND RECOMMENDATIONS

The results of our investigations show that it is possible to achieve a cycling and walking facility on the existing AHB using one traffic lane only provided that one clip-on is widened by 1.2 m. A walking and cycling facility using one lane without the extension is not acceptable.

Reference: S:\NZTA\039\Report\TN2A100804.doc - mairi

APPENDIX F

Cost Estimates

AWHC Network Plan -Costs of Facility

Route	Facility Required	Length (m)	Cost per metre	Total Cost	Contingency (25 %)	Contingency (50%)	Total (20%)	Total (50%)
Westhaven Drive	Improved footpath (widen/boardwalk)	1800	1500	2,700,000.00	675,000.00	1,350,000.00	\$ 3,375,000	\$ 4,050,000
Beaumont Street to Quay Street	Off Road cycleway/footpath	1200	1500	1,800,000.00	450,000.00	900,000.00	\$ 2,250,000	\$ 2,700,000
Curran Street	on-road cycle lanes	1200	2150	2,580,000.00	645,000.00	1,290,000.00	\$ 3,225,000	\$ 3,870,000
Shelly Beach Road	on-road cycle lanes	850	2150	1,827,500.00	456,875.00	913,750.00	\$ 2,284,375	\$ 2,741,250
Jervois Road	on-road cycle lane	1500	300	450,000.00	112,500.00	225,000.00	\$ 562,500	\$ 675,000
Ponsonby Road	on-road cycle lane	1700	1040	1,768,000.00	442,000.00	884,000.00	\$ 2,210,000	\$ 2,652,000
Sulphur Beach Road to Onewa Road	Shared pedestrian/cycle facility (beside motorway)	1200	1500	1,800,000.00	450,000.00	900,000.00	\$ 2,250,000	\$ 2,700,000
Queen Street	on-road cycle lanes	1700	300	510,000.00	127,500.00	255,000.00	\$ 637,500	\$ 765,000
Birkenhead Avenue	on-road cycle lanes	750	300	225,000.00	56,250.00	112,500.00	\$ 281,250	\$ 337,500
Onewa Road	on-road cycle lanes (if Transit lane is removed)	2300	4000	9,200,000.00	2,300,000.00	4,600,000.00	\$ 11,500,000	\$ 13,800,000
Lake Road	on-road cycle lanes	2000	300	600,000.00	150,000.00	300,000.00	\$ 750,000	\$ 900,000
Northcote Road	on-road cycle lanes	1400	4000	5,600,000.00	1,400,000.00	2,800,000.00	\$ 7,000,000	\$ 8,400,000
College Road	on-road cycle lanes	1100	300	330,000.00	82,500.00	165,000.00	\$ 412,500	\$ 495,000
SH 1 (AHB to Esmonde)	Off-road cycleway/footpath	1800	1500	2,700,000.00	675,000.00	1,350,000.00	\$ 3,375,000	\$ 4,050,000
SH 1 (Esmonde to Constellation Road)	Off-road cycleway/footpath	6200	1500	9,300,000.00	2,325,000.00	4,650,000.00	\$ 11,625,000	\$ 13,950,000
Total							\$ 51,738,125	\$62,085,750