# Additional Waitemata Harbour Crossing Network Plan

## Local Roads

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**Revision Schedule**

| Rev. No | Date | Description | Prepared by | Reviewed by | Approved by |
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# Executive Summary

Flow Transportation Specialists (Flow) has been engaged by New Zealand Transport Agency (NZTA) to prepare reports covering certain aspects of the Additional Waitemata Harbour Crossing (AWHC) Network Plan. The key purpose of the Network Plan is to support ongoing integrated land use and transport planning, optimisation of benefits and decision making for the AWHC.

There are six components which are being brought together into a single Plan and this report forms the local road component of the Network Plan.

The aim of the local road component of the Network Plan is to understand and plan the connections at either end of the proposed crossing, and to provide a comprehensive list of work that would need to be completed to complement the development of the new Harbour Crossing.

The current AWHC study is assessing whether the crossing should be in the form of a bridge or a tunnel. However the option selected by the project team for this comparison includes similar lane configurations and identical connections for the two alternatives, which means that the traffic effects of a bridge will be very similar to those of a tunnel. These connections would be as follows:

- There would be full connections at the Onewa Road and Esmonde Road interchanges, both to the existing bridge and the additional crossing (either bridge or tunnel);

- The additional crossing (either bridge or tunnel) would serve longer distance traffic between the North Shore and the Central Motorway Junction (ie the Southern Motorway and the links to/from State Highway 16[1]; and

- The existing bridge would serve traffic travelling between the North Shore and the Auckland central business district (CBD), ie the existing Shelly Beach Road/Curran Street, Fanshawe Street and Cook Street ramps. The Wellington Street on ramp would be closed and replaced with a new Cook Street on ramp.

The main challenge for this assessment relates to the provision of additional capacity across the harbour and the potential flow on effects this may have on the local road network around central Auckland and feeder roads on the North Shore, particularly in the weekday morning peak. In particular it is noted that the new harbour crossing will allow more traffic to enter the CBD. This conflicts with various CBD strategies that encourage the provision of public transport for trips to/from the CBD and not to provide additional capacity for cars.

It is anticipated that space on the existing Harbour Bridge will be allocated to public transport, walking and cycling, if an Additional Waitemata Harbour Crossing is provided. The precise lane configuration on the existing Harbour Bridge will only be determined over time and this will

[1] These links are the connections between the Northern Motorway and the Northwestern Motorway and between the Northern Motorway and Grafton Gully, leading to the Port.

significantly affect the predicted traffic effects of the additional crossing. The scenario agreed for this study (for both bridge and tunnel options) includes the following lane allocation on the existing bridge:

- One lane for walking and cycling;
- A bus lane in each direction, but with general traffic heading to the Shelly Beach off ramp sharing the southbound bus lane; and
- Five general traffic lanes in total, assumed to operate with three southbound and two northbound lanes in the weekday morning peak, with the reverse in the evening peak.

This scenario would provide three southbound lanes for general in the weekday morning peak plus additional capacity, equivalent to around half a lane, for general traffic heading to the Shelly Beach off ramp. This scenario also provides the opportunity for a significant increase in the rate of flow from Esmonde Road (and Akoranga Drive) onto the Northern Motorway, thereby increasing the rate of flow able to cross the Harbour and reaching the Auckland CBD.

A range of options could be used to limit the rate of flow able to cross the Harbour, including changes in the lane allocation. However, for the purposes of this assessment it has been agreed that the effects of the additional crossing will be assumed to be restricted by some means and that this should be reflected by modelling ramp signals on the important Esmonde Road southbound on ramp. Capacity constraints are already predicted to exist on the approaches to or on the other on ramps during the morning peak, and providing ramp signals at Esmonde Road will therefore further constrain the rate of flow able to pass across the harbour and into the Auckland CBD.

This report has identified the local roads that are predicted to be affected by the AWHC and it has noted the projects that are under construction, programmed or that are under consideration that may affect these roads. This has been on the basis of the known positions of Auckland City Council and North Shore City Council, which have recently been amalgamated into the single council for the greater Auckland area. Clearly progress on the proposals that are yet to be committed may be affected by the recent change in the governance of Auckland, with the creation of the new Auckland Council and the new Auckland Transport Agency.

The main local roads predicted to be affected by the AWHC are as follows.

In the Auckland CBD:

- **Cook Street**: Significant increases in traffic flows using the Cook Street off ramp between now and 2026, as a result of the Victoria Park Tunnel project. Further significant increases in flows are predicted on Cook Street as a result of the AWHC. These increases will result partly from the assumed closure of the Wellington Street on ramp and the introduction of a Cook Street on ramp and the assumed grade separation of Union Street and Sale Street from Cook Street, but also due to the attractiveness of the off ramp to Cook Street;

Flow is aware of Auckland City's concerns relating to additional traffic flows along this route, which means that options that seek to accommodate the additional demand are unlikely to be considered acceptable. As a result, greater effect should be given to options that seek to reduce the potential effects of the additional demands, or even to options that encourage diversion of traffic to other routes, recognising that there are limited alternatives;

- **Fanshawe Street**: consideration should be given to how public transport capacity can be further optimised within the existing road reserve, without impinging on the vehicle capacity;

- **Shelly Beach Road and Curran Street**: consideration should be given to how traffic capacity can be further optimised and/or changes in the configuration/operation in the intersections with Jervois Road, together with on road cycle lanes as recommended in the Cycling and Walking component of the Network Plan. The satisfactory operation of Shelly Beach Road will be critical to the satisfactory operation of the southbound bus lane on the Auckland Harbour Bridge, with the Additional Harbour Crossing option, as vehicles heading for the off ramp are assumed to need to share the bus lane;

- **Grafton Gully**: the modelling has assumed that Stage 3 of the previous Grafton Gully upgrade project is in place by 2026. However, there is no progress on identifying a preferred option for this, nor does it feature in any of the Government's or Council's strategies or policies; and

- **Wellington Street**: with the closure of the Wellington Street off ramp there is the opportunity to explore options to improve pedestrian and cycle connections into the city from Freemans Bay.

On the North Shore:

- **Esmonde Road**: the main pinchpoint on the local road network on the North Shore resulting from the AWHC will be the reconfigured intersection of Esmonde Road and Akoranga Drive with the motorway on and off ramps. Additional bus priorities and/or transit lanes along Esmonde Road could be pursued, with consideration to be given to how traffic capacity can be further optimised. However, these measures would appear to be required by 2026 for the scenario without the AWHC; and

- **Onewa Road**: The assessment assumes that a second westbound lane from Lake Road to Birkenhead Avenue is to be provided along Onewa Road by 2026, with the additional lane to operate as a transit lane in the weekday evening peak. Further intersection upgrades should be investigated along Onewa Road, including the intersections with Queen Street and Lake Road.

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# 1.0 Introduction

## 1.1 AWHC Network Plan – Aim of the Study

Flow Transportation Specialists (Flow) has been engaged by the New Zealand Transport Agency (NZTA) to undertake elements of the Additional Waitemata Harbour Crossing (AWHC) Network Plan (the Network Plan). The key purpose of the AWHC Network Plan is to support ongoing integrated land use and transport planning, optimisation of benefits and decision making for the AWHC.

There are six components which are brought together into a single plan:

- Strategic Context;
- Passenger Transport;
- High Occupancy Vehicles;
- Land Use;
- Walking and Cycling; and
- Local Road Network.

This report forms the Local Road component of the Network Plan.

This study examines the likely impacts of the AWHC on the local roads immediately adjacent to the state highway network. The goal of the study is to highlight the possible impacts that are likely to result from the AWHC so that these can form part of any future work programmes that may be necessary.

In order to understand the future impacts, it is also necessary to identify any known network improvements as well as identifying any previous studies that the Councils have undertaken into the operation of their road networks. This enables a better appreciation as to the future role of the key corridors that may be affected by the AWHC.

## 1.2 Local Roading Component

The current AWHC study is assessing whether the crossing should be in the form of a bridge or a tunnel. However the option selected by the project team for this comparison includes similar lane configurations and identical connections for the two alternatives, which means that the traffic effects of a bridge will be very similar to those of a tunnel. These connections would be as follows:

- There would be full connections at the Onewa Road and Esmonde Road interchanges, both to the existing bridge and the additional crossing (either bridge or tunnel);

- The additional crossing (either bridge or tunnel) would serve longer distance traffic between the North Shore and the Central Motorway Junction (ie the Southern Motorway and the links to/from State Highway 16[2]; and

- The existing bridge would serve traffic travelling between the North Shore and the Auckland central business district (CBD), ie the existing Shelly Beach Road/Curran Street, Fanshawe Street and Cook Street ramps. The Wellington Street on ramp would be closed and replaced with a new Cook Street on ramp.

If an additional Waitemata Harbour crossing is provided it is anticipated that public transport and walking and cycling will be allocated space on the existing Harbour Bridge. The precise lane configuration on the existing Harbour Bridge will only be determined over time and this will significantly affect the predicted traffic effects of the additional crossing. The scenario agreed for this study (for both bridge and tunnel options of the additional crossing) includes the following lane allocation on the existing bridge:

- One lane for walking and cycling;

- A bus lane in each direction, but with general traffic heading to the Shelly Beach off ramp sharing the southbound bus lane; and

- Five general traffic lanes in total, assumed to operate with three southbound and two northbound lanes in the weekday morning peak, with the reverse in the evening peak.

The Local Roads component of the Network Plan therefore focuses on the key arterial routes in the immediate vicinity of the state highway network.

[2] These links are the connections between the Northern Motorway and the Northwestern Motorway and between the Northern Motorway and Grafton Gully, leading to the Port.

# 2.0 Background

## 2.1 Introduction

The Local Roads component of the 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. The following section provides a summary of the background documents reviewed and the relevance in terms of the AWHC.

## 2.2 National and Regional Strategies

Table 2.1 below provides a summary of the relevant national strategies and their relevance to local roading and the AWHC. From a national perspective, the overall objectives in terms of local roads are to improve efficiency, provide value for money and contribute to economic development.

**Table 2.1: National Strategy Summary**

| Strategy | Relevance to AWHC and Local Road Network Plan |
|---|---|
| **New Zealand Transport Strategy (NZTS), MoT, 2008** | This strategy has five key targets, of which the ones relevant to local roading include improving reliability of journey times and reducing average journey times on identified critical routes and increasing passenger transport and walking and cycling. Critical routes, while not specifically named in the document, will include high passenger transport and freight routes. |
| **Government Policy Statement on land Transport Funding (GPS), MoT, 2009** | The Government Policy Statement 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 Government is committed to achieving value for money. The GPS also states that local roads will continue to be invested in at a high level along with public transport, recognising that these are essential in maximising the efficiency of the transport network. |
| **Safer Journeys, MoT, 2010** | The Safer Journeys strategy provides targets in terms of safety for all road users. The actions and tasks listed for local roads include considering speed limits, demonstration projects on mixed use arterials and integrating road safety into land use planning. |
| **National Land Transport Programme (NLTP) 2009-2012, NZTA, 2009** | The NLTP is about improving the region's transport system and it focuses on projects that deliver value for money and contribute directly to economic development, improved productivity and safety. The strategy states that capacity will be improved on roads with high traffic volumes before considering new infrastructure. The NLTP contains all the land transport activities such as public transport services, road construction and road maintenance, which are expected to receive funding from NZTA. |

The following table provides a summary of the relevant regional strategies.

**Table 2.2: Regional Strategy Summary**

| Strategy | Relevance to AWHC and Local Road Network |
|---|---|
| **Auckland Regional Growth Strategy (RGS), ARC, 1999** | The strategy focuses growth along transit corridors and main arterial roads. The RGS also acknowledges that road building alone will not address all congestion or environmental factors and notes that travel demand management will be required. The strategy supports some corridors being used for pedestrians and passenger transport, while others the priorities are for cars and vehicle movements. A new Waitemata Harbour Crossing is identified as a key roading project. |
| **Auckland Regional Land Transport Strategy (RLTS), ARC, 2010** | The 2010 RLTS sets the direction for the region's transport system for the next 30 years, from 2010 to 2040. The Strategy has six strategic priorities which are:<br>– To support and contribute to a compact and contained urban form consisting of centres, corridors and rural settlements;<br>– To implement behaviour change programmes;<br>– To continue major investment in rail, bus and ferry infrastructure and service improvements;<br>– To improve the operation of existing roads, especially regional arterials;<br>– To construct limited additional road capacity; and<br>– To reduce the impacts of transport on the natural environment and communities.<br>The RLTS includes targets to increase the public transport mode share across the Harbour Bridge from 27% in 2006 to 38% by 2020 and 50% by 2040. The RLTS notes the conclusions of the 2008 AWHC study and recommends that the ability to provide an additional road and rail crossing is protected in the short term with (construction) work to commence within the next 10 to 20 years. |
| **Auckland Transport Plan (ATP), ARTA, 2009** | With respect to the AWHC the ATP highlights the need to protect the route for the additional Waitemata Harbour Crossing in order to improve accessibility for all modes across the Waitemata Harbour. It notes that while the 2008 SKM report proposed tunnels for the new road and rail connections, these new routes will allow for the reallocation of space on the Auckland Harbour Bridge for both walking and cycling across the Waitemata Harbour.<br>The implications of the ATP with regard to passenger transport will be discussed in the passenger transport component of the network plan being prepared by Parsons Brinkerhoff (PB). |
| **Regional Arterial Road Plan (RARP) ARTA, 2007** | The purposes of the RARP are:<br>– To define the existing and future role and function of regional arterial roads;<br>– To provide a framework for the integrated management of regional arterial roads, and their interaction with surrounding land uses and other parts of the road |

**Table 2.2: Regional Strategy Summary**

| Strategy | Relevance to AWHC and Local Road Network |
|---|---|
| | network;<br>– To provide a basis for project prioritisation; and<br>– To develop a rationale for more appropriate funding for regional arterial roads.<br>It is noted that roads within Auckland's Central Area were not included in the RARP assessment as it was concluded that the Central Area Access Strategy would deal with the routes to and from the CBD, although reference was made to the role of these corridors. |
| **Regional Freight Strategy, ARC (2006)** | The strategy has six over-arching policy headings designed to support the objectives of the RLTS and address identified freight issues. Of particular reference with respect to the Local Road Network Plan is:<br>– Policy 3: Relief of Congestion: Support investment in the strategic road network and TDM that provides congestion relief for freight traffic; and<br>– Policy 4: Strategic Freight Network (SFN). Support the development of an SFN and encourage alternative modes.<br>The Regional Freight Strategy suggests a number of strategic routes for inclusion in the SFN network. Those possibly affected by an AWHC are SH1, SH16, Wairau Road, Tristram Avenue and Onewa Road. |

## 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.

### Auckland City Council Strategies

**Table 2.3: Auckland City Council Strategy Study**

| Strategy | Relevance to AWHC and Local Road 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. The strategy identifies a "targeted cap" in the number of private vehicles entering the city centre. With limited road space and increased employment and residential population forecast within the city centre this means greater emphasis on the use of public transport, walking and cycling for people entering the city centre.<br>The very recent draft of the "CBD Transport - Into the Future" document includes the |

**Table 2.3: Auckland City Council Strategy Study**

| Strategy | Relevance to AWHC and Local Road Network Plan |
|---|---|
| | following key proposals:<br>– Provide for a complete strategic road network including connections to the port and the new Waitemata Harbour crossing connections;<br>– Hobson Street – Nelson Street: Hobson Street has been highlighted as a future public transport route, with enhancements to pedestrian amenity on both routes; and<br>– Cook Street – the draft CBD Transport Into the Future document includes some discussion as to the role of Cook Street and the ability to realign the off ramp, make it two way, and enhance pedestrian priority. This is likely to be driven by Council's desire to realise the potential of the Placemakers site which Council has recently acquired. |
| **Auckland City Council CBD into the Future Strategy (2004)** | The key traffic related comments applicable to the additional harbour crossing within the document include the following:<br>– Advocate for the early completion of Harbour Bridge to City motorway project (now known as the Victoria Park Tunnel project and is under construction, with completion due in 2012); and<br>– Work with Transit New Zealand (now NZTA) to identify new Harbour crossing. |
| **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 that 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. |
| **Passenger Transport Integration Study (2010)** | The implications of the Passenger Transport Integration Study (PTIS) will be discussed in the PB Passenger Transport component of the Network Plan. However in summary, the PTIS seeks to rationalise and make better use of the street network for passenger transport. This is likely to see changes in the existing routing, layover and stop locations for public transport. |
| **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 city centre and immediate surrounding areas and that reduces reliance on private vehicles. |
| **Waterfront Master Plan (2009)** | This master plan is the foundation for creating a unique, prosperous and attractive waterfront for Auckland's city centre over the next few decades. One of the objectives of the master plan is to reduce traffic on Quay Street and Fanshawe Street, with this to be achieved through the completion of the motorway network, noting that this will be essential in |

**Table 2.3: Auckland City Council Strategy Study**

| Strategy | Relevance to AWHC and Local Road Network Plan |
|---|---|
| | achieving key proposals within the Master Plan. Also stated is that the proposal for a third harbour crossing could have an impact of the waterfront depending on its location and form (road vehicle or passenger transport). To minimise any negative impact the master plan favours a route that allows rail access to Wynyard Quarter and diverts non-CBD vehicle traffic away from the area. |

### North Shore City Council Strategies

**Table 2.4: North Shore City Council Strategy Study**

| Strategy | Relevance to AWHC and Local Road Network Plan |
|---|---|
| **North Shore City Transport Strategy (2006)** | The strategy aims to achieve a safer, healthier community and encourage more residents to walk, cycle or use public transport. |
| **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. |

## 2.4 Local Area Intensification

There are a number of proposals for local area intensification which are of relevance to the AWHC.

### Auckland City

- Wynyard Quarter is a large-scale (35 hectare) reclaimed area close to the Auckland city centre. The area is subject to a Council led plan change that will allow significant development. The Proposed Plan Change for Wynyard Quarter seeks to implement up to approximately 700,000 m2 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 city centre is bounded by Hobson Street, Fanshawe Street and Union Street, the motorway, and it 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; and

- 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 Auckland[3].

### North Shore City

- 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;

- Takapuna is noted in the Growth Strategy as one of the two sub regional centres on the North Shore and North Shore City Council is currently considering the form and extent of this intensification; 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.

Further information on the above is provided in Appendix B

## 2.5 Relevant Previous Studies

The "Waitemata Harbour Crossing Study 2008: Study Summary Report" prepared by SKM summarised the study undertaken in determining a preferred option. The study involved the development of a long list of possible options for a new harbour crossing and a subsequent assessment to determine a short list. The short list of options was then refined and assessed in greater detail in order to identify a preferred option.

With respect to the effects on the local road network the SKM report noted that the additional traffic generated by an additional crossing can be accommodated by the surrounding North Shore and Auckland CBD road network. The analysis predicted congestion in the form of delays and queues, with the level of congestion expected to be similar to those forecast without the additional crossing. The congestion predicted is also in the order of magnitude typical of arterial routes within a large urban environment.

The SKM study concluded that Option 2C best meets the project objectives and functionality principles identified for this study. Option 2C consisted of a driven tunnel between Esmonde Road through Wynyard Quarter to the CBD for passenger transport, and from Esmonde Road to SH1/SH16 at CMJ for general traffic.

[3] 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.

# 3.0 Existing Corridor Functions

The following provides a brief summary of the key arterials with respect to their existing functions, their hierarchy and whether they featured in the Regional Arterial Road Plan (RARP). This provides a baseline understanding as to the role each of the key routes plays in its respective territorial authority. The public transport network is defined by ARTA as being part of the local connector network (LCN), quality transit network (QTN) and rapid transit network (RTN).

**Table 3.1: Functions of Key Arterials**

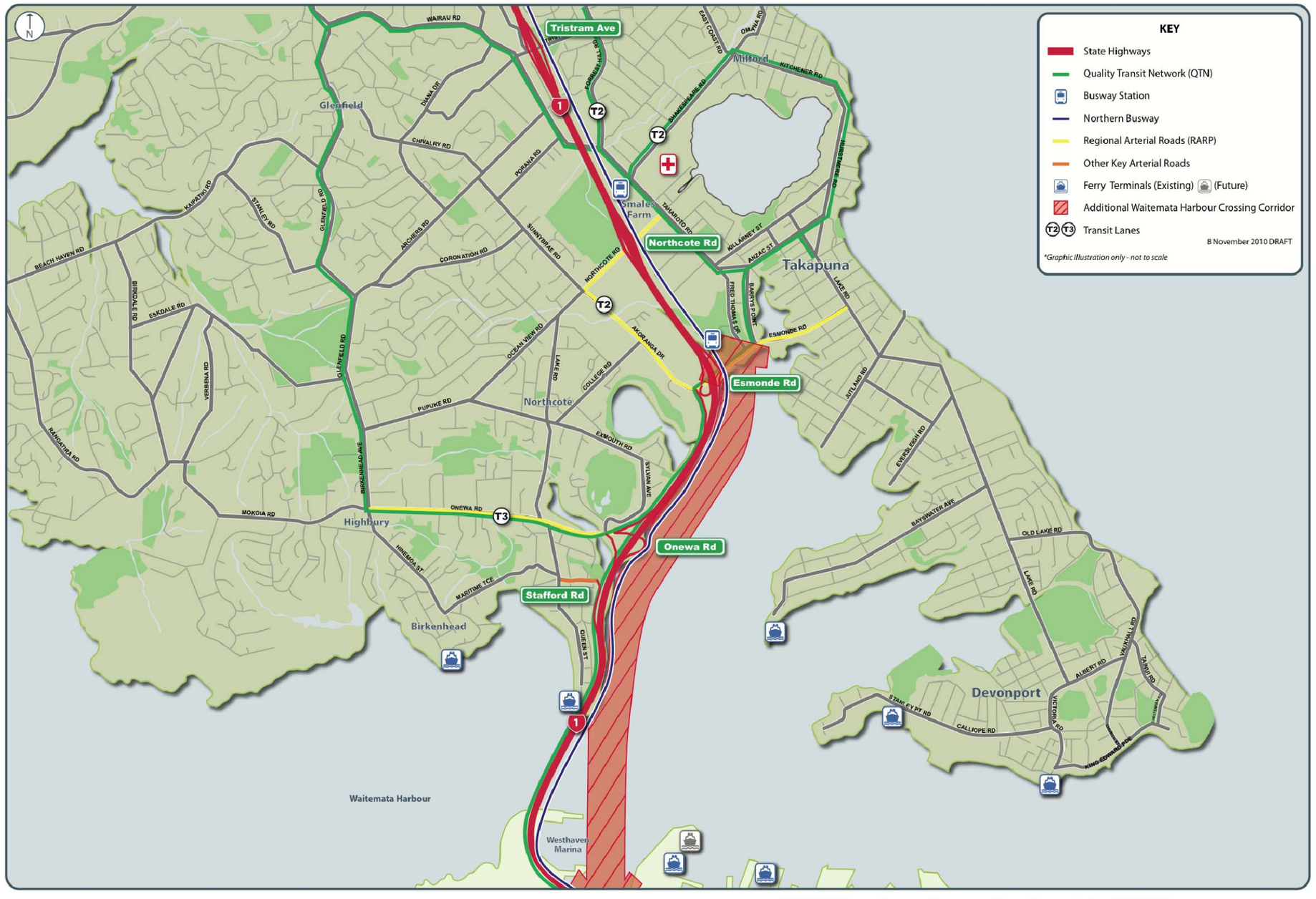
| Road | Road Hierarchy | Regional Arterial Road Plan | Existing Traffic Flows[4] (vpd) | Public Transport | Heavy Commercial Vehicles[5] |
|---|---|---|---|---|---|
| **Fanshawe Street** | Regional Arterial | Regional Arterial | 30,300 | RTN | 8.5% |
| **Cook Street** | Regional Arterial | Not assessed as part of RARP | 21,600 | LCN | 5% |
| **Wellington Street** | Collector Road | Not assessed as part of RARP | 12,300 | LCN | 3% |
| **Wellesley Street** | Regional Arterial/ District Arterial | Not assessed as part of RARP | 16,100 | LCN | No Count |
| **The Strand** | Strategic Route | Regional Arterial | 18,000 | LCN | 6.1% |
| **Parnell Rise** | District Arterial | Not assessed as part of RARP | 14,300[6] | QTN | No count available |
| **Beach Road** | District Arterial | Not assessed as part of RARP | 19,900 | LCN | No count available |
| **Shelly Beach Road** | Regional Arterial | Not assessed as part of RARP | 8,800 | LCN | 12.4% |
| **Curran Street** | Regional Arterial | Not assessed as part of RARP | 9,000 | LCN | 12.4% |
| **Northcote Road** | Primary (Regional) Arterial | Regional Arterial | 28,100 | LCN | 3% |
| **Esmonde Road** | Primary (Regional) Arterial | Regional Arterial | 37,800 | QTN | 5% |

[4] Sourced as part of investigation into the RARP and do not necessarily correlate to traffic flows presented later in this report.
[5] These percentages have been taken from information used for the RARP, or from NZTA data for the relevant motorway ramps.
[6] This count is taken from between Cracroft Street and Heather Street, some distance from Stanley Street/SH16.

**Table 3.1: Functions of Key Arterials**

| Road | Road Hierarchy | Regional Arterial Road Plan | Existing Traffic Flows[4] (vpd) | Public Transport | Heavy Commercial Vehicles[5] |
|---|---|---|---|---|---|
| **Akoranga Drive** | Primary (Regional) Arterial | Regional Arterial | 17,500 | LCN | 6% |
| **Onewa Road** | Primary (Regional) Arterial | Regional Arterial | 26,500 | QTN | 14% |
| **Stafford Road** | Collector Road | Not assessed as part of RARP | 2,700 | LCN | 1% |

**Figure 3.1 : Northern Sector Key Arterials**

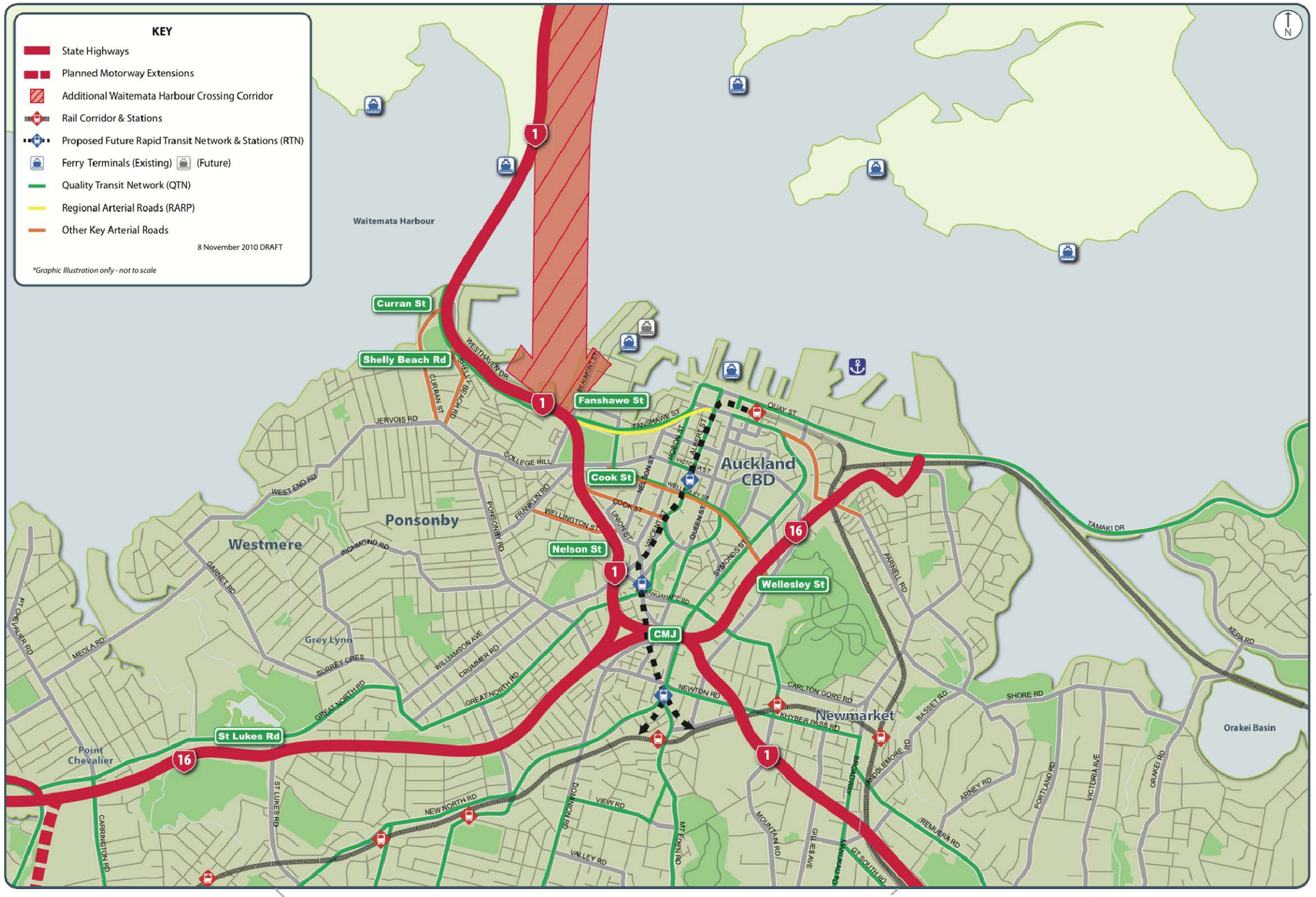



DRAFT 2

NOTE:
Key Arterial data from FLOW Local Roads Report Table 3.1
ARC "Regional Land Transport Strategy (RLTS) 2010-2040 Map 3 RTN & QTN Network"

**AWHC Northern Sector Key Arterials AWHC (Flow - Local Roads)**

**Figure 3.2 : Southern Sector Key Arterials**




DRAFT 2

NOTE: Map overlaid on -
Key Arterial data from FLOW Local Roads Report Table 3.1
ARC "Regional Land Transport Strategy (RLTS) 2010-2040 - Map 3 RTN & QTN Network".

**AWHC Southern Sector Key Arterials AWHC (Flow - Local Roads)**

## 3.1 Summary of the RARP Analysis for Arterials Affected by AWHC

Table 3.2 illustrates the key roles, strategic direction and short term actions of the key corridors identified in the RARP and likely to be affected by the AWHC.

**Table 3.2: RARP Assessment of Relevant Corridors**

| Route | Key Roles | Strategic Direction | Short Term Actions |
|---|---|---|---|
| **Fanshawe Street–Sturdee Street/Lower Hobson Street –Quay Street (to Lower Queen Street)–Customs Street West–Lower Queen Street** | Important traffic and passenger transport link between Northern Motorway (from North Shore) and the Auckland CBD<br><br>Part of RTN. | Passenger transport emphasis.<br><br>Important pedestrian connections across route. | Form to be determined by Auckland City Council through Central Area Access Strategy. |
| **Wairau Road–Taharoto Road to Northcote Road** | "Cross-city" route linking the major north south arterial routes in North Shore City, providing access to the Wairau Valley and Smales Farm employment areas and linking to SH1 at the Tristram and Northcote Interchanges. Also accesses North Shore Hospital and secondary schools.<br><br>High traffic flows and part of QTN, serving Smales Farm busway station. | High traffic demands and changing uses along Wairau Road.<br><br>Integration with SH1 management.<br><br>Passenger transport emphasis on routes to/from busway station.<br><br>Significant place pressures adjacent to business park, hospital and schools. | Determine the appropriate traffic management and route development policies and priorities for Wairau Road.<br><br>Continue implementation of bus priority measures.<br><br>Integrate arterial network management with Tristram and Northcote motorway interchange management. |
| **Esmonde Road and Akoranga Drive** | Arterials east and west of SH1 accessing Takapuna Centre, Lake Road, Devonport and AUT University's Akoranga campus. Esmonde Road and interchange recently upgraded. Now linked with Akoranga Drive in both directions. Transit lanes on Akoranga Drive. | Possible increased network role for Akoranga Drive. | Determine future role(s) of Akoranga Drive, taking an additional harbour crossing into account. |
| **Northcote Road (Akoranga Drive to** | Highly trafficked route accessing Onewa Domain, | Integration with | Integrate arterial network and Northcote Motorway |

**Table 3.2: RARP Assessment of Relevant Corridors**

| Route | Key Roles | Strategic Direction | Short Term Actions |
|---|---|---|---|
| **Taharoto Road)** | Smales Farm, North Shore Hospital and Milford. | SH1management.<br>Urban design and pedestrian improvements west of SH1. | interchange management.<br>Integrating route planning and development with pedestrian and amenity improvements. |

# 4.0 Current Network Upgrades

The following outlines network upgrades that are currently underway within the "local roads" study area.

## 4.1 Victoria Park Tunnel

The Victoria Park Tunnel Project (VPT) is anticipated to reduce traffic congestion through the section of SH1 between the Harbour Bridge and the Central Motorway Junction. This busy stretch of road regularly experiences congestion across Victoria Park Viaduct and St Marys Bay during the morning and evening peak hours.

In the mornings, congestion on the Victoria Park Viaduct is a major problem as it only accommodates two lanes for southbound traffic, often resulting in queues back onto the Harbour Bridge. In the evenings, the bottleneck occurs at the Wellington Street on-ramp and on Victoria Park Viaduct, with queues back to the Central Motorway Junction.

With VPT, the existing Viaduct will be able to accommodate four lanes for southbound traffic, with the Tunnel accommodating three lanes for northbound traffic. This will help to alleviate the current bottleneck in this location. The key aspects of the project with respect to the local roads are:

- The Fanshawe Street southbound off ramp will be reconfigured to provide a bus lane up to the stop line at the intersection with Beaumont Street. The works will also result in the addition of a left turn slip lane into Beaumont Street;

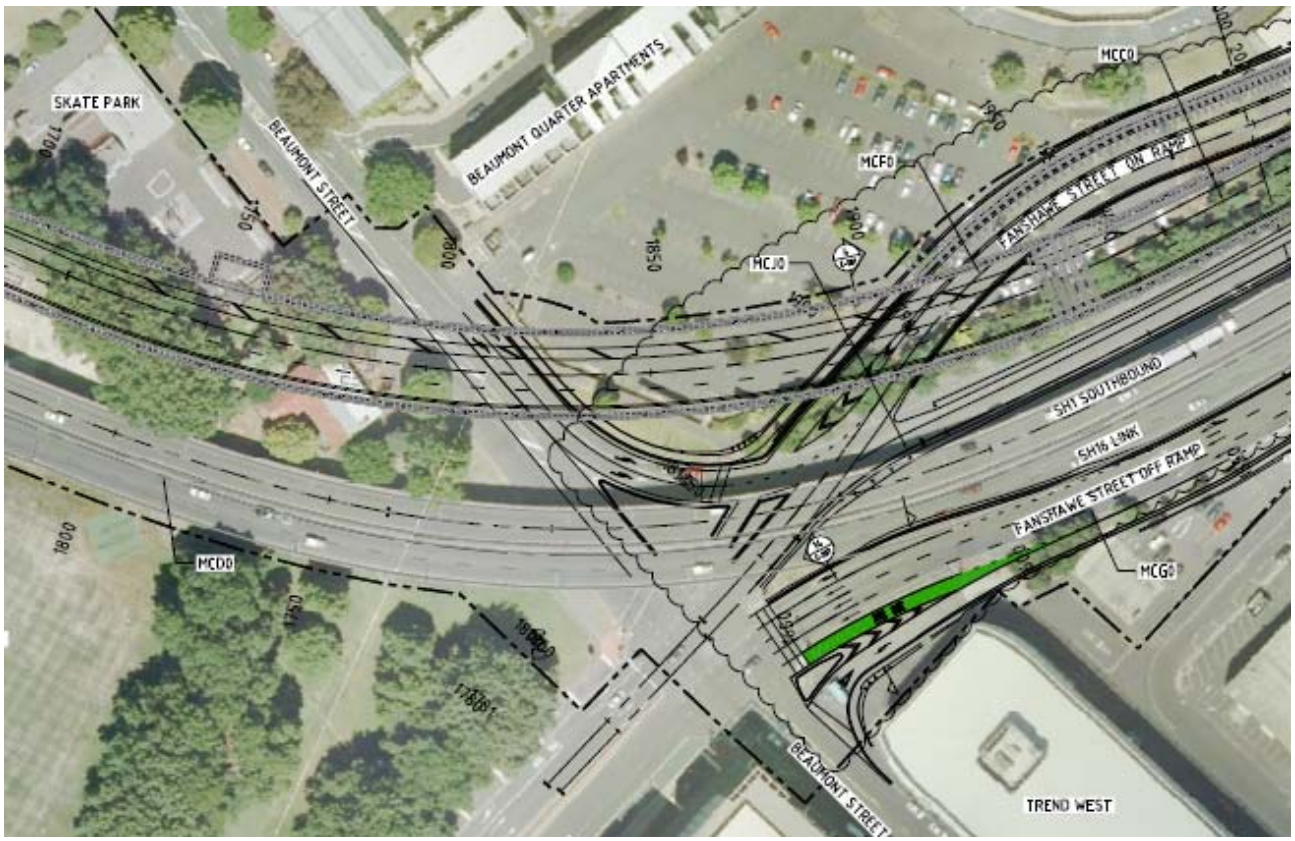
- Improved merging on SH1 with Wellington Street Interchange and the link from the Northwestern Motorway by the provision of a third lane, so traffic entering the motorway will not have to merge; and

- The Cook Street and Northwestern off-ramps will have two dedicated lanes on the Viaduct. This will separate the exiting traffic from southbound vehicles heading through the Central Motorway Junction.

## 4.2 Access to Wynyard Quarter

As mentioned above, the Fanshawe Street/Beaumont Street intersection is to be reconfigured as part of the Victoria Park Tunnel project. In addition to this, the northern arm of Beaumont Street is also to be reconfigured to provide three lanes exiting from the stop line at Fanshawe Street. This will allow for a shared left and through lane, and two right turn lanes onto the state highway. From the southern arm, the right turn from Beaumont Street to Fanshawe Street will be banned, allowing two through lanes into Wynyard Quarter. The works proposed on the Fanshawe Street off ramp are illustrated in Figure 4.1.

**Figure 4.1: Fanshawe Street Off Ramp changes**[7]




In addition, a number of movement changes are proposed at the Fanshawe Street/Halsey Street intersection:

- The right turn from the northern arm of Halsey Street to Fanshawe Street is to be banned; and
- Two lanes are to be provided in both directions between Halsey Street north and south.

## 4.3 Onewa Road Upgrade

The Onewa Road upgrade project is part of NSCC's ongoing commitment to improve transport options and reduce traffic congestion around the North Shore. The upgrade project is split into nine phases, with works on site at the moment representing Phase 3 of the planned Stage 2 improvements.

[7] Sourced from Victoria Park Alliance: Layout Plan Fanshawe Street Sheet 3 of 7: Ref: VPT-C-013, dated 30.04.10.

The Phase 3 works are summarised as follows:

- Creating a new transit lane as a continuation of the existing facility along Onewa Road;
- A shared cycle path and footpath ("Share with Care" path) along the northern side of Onewa Road, from Queen Street down towards the Onepoto Shared Use Bridge;
- A central flush median to make it safer and easier for residents entering and exiting their properties;
- New street lighting, road markings and signage; and
- Improved traffic signals at main intersections.

The Stage 2 works, and its various phases, complement the changes that were made to the Onewa Road motorway interchange and bridges as part of Stage 1, completed in September 2008.

**Figure 4.2: Planned Stage 2 works and current Phase 3 works[8]**


[8] Sourced from NSCC website

## 4.4 Taharoto – Wairau Project

In recent years Taharoto Road, Wairau Road and Shakespeare Road have become congested at peak periods due to increasing traffic levels, changes in land uses, and improvements to public transport facilities. NSCC began construction on the Taharoto-Wairau project in 2006. It is being carried out in stages to minimise disruption to residents and commuters.

To date, three stages have been completed (Stages 1, 2 and 4) including the section of Wairau Road outside Westlake Girls High School and the Shakespeare Road/Wairau Road/Taharoto Road intersection.

Construction of Stages 6 and 8 for the Wairau Road/Forrest Hill Road intersection upgrade is expected to commence mid 2011 and go through to late 2012.

Stage 7 (improvements to the Shakespeare Road intersection and the North Shore Hospital entrance) are to be carried out as part of the Metlifecare retirement village development.

**Figure 4.3: Taharoto-Wairau Road Corridor Upgrade**

## 4.5 Lake Road

Work began in March 2009 on the upgrade to Lake Road between Napier Avenue and Jutland Road, to provide significant safety and traffic flow benefits to motorists, cyclists and pedestrians. This project follows the upgrade to the Esmonde Road/Lake Road intersection and is part of a suite of major transport improvements to the wider area by NSCC and the NZTA.

In summary the proposed works will provide for:

- Two traffic lanes and one cycle lane in each direction, with each traffic lane increased to a safer width of three metres;
- Improved pedestrian amenities with new footpaths and a signalised pedestrian crossing;
- The introduction of strategically placed right-turn bans (into and out of Napier and Rewiti Avenue, and out of Hart Road); and
- A new, continuous flush median to ensure turning traffic does not hold up other motorists.

Investigations to determine the scope of works required to improve Lake Road between Hauraki Road and Belmont, were due to commence mid 2010.

# 5.0 Programmed Upgrades for Implementation

This section provides a summary of the local roads works that have been identified as programmed for implementation. Table 5.1 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;
- Discussions with Council officers; and
- North Shore City Council and Auckland City Council Web Sites.

Table 5.1 categorises the projects as planned or programmed. These definitions take into consideration the definitions from the NLTP[9]. 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.

With the transition to the new Auckland Council and the new Auckland Transport Agency it is assumed for this report that the projects identified in the following sections will remain as programmed. However, it is apparent that the priorities of the new council may affect the progress and the nature of the projects that are not yet committed.

In addition to the information included in Table 5.1, the following sections provide some additional details on the network upgrades which are most relevant to the project.

[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.

Local road network changes that are yet to be programmed, but are highly likely to occur have been identified in Table 5.2. This information has been sourced from discussions with Council officers, and information made available through other projects.

**Table 5.1: Planned and Programmed Local Road Projects**

| Project | Location | Time Period | Source | Relevance | Status | Effect to AWHC |
|---|---|---|---|---|---|---|
| **Onewa Road** | North Shore City | 2009/ 2010 | NSCC Web Site.<br>Discussions with Council Officers. | Described in Section 4.3 | Programmed | Reducing congestion and improving transport choices. Will improve capacity of route, realising some of the bottleneck and allowing more traffic onto SH1. |
| **Anzac Street Corridor** | North Shore City | 2009/ 2010 | NLTP: Auckland Region: 2009/2012<br>North Shore City Annual Plan.<br>Discussions with Council Officers. | The NLTP and annual plan funding is for investigations and land purchase to allow widening works.<br>Walking and cycling facilities will be included; however the final design will be dependent on funding. | Programmed | Nil. |
| **Taharoto/ Wairau Corridor** | North Shore City | 2010/ 2011 | NLTP: Auckland Region: 2009/2012<br>North Shore City Annual Plan<br>Discussions with Council Officers | Described in Section 4.4 above. | Programmed | Reducing congestion and improving transport choices. Will improve capacity of route, realising some of the bottleneck and allowing more traffic onto SH1. |

**Table 5.1: Planned and Programmed Local Road Projects**

| Project | Location | Time Period | Source | Relevance | Status | Effect to AWHC |
|---|---|---|---|---|---|---|
| **College Road/Exmouth Road** | North Shore City | | Discussions with Council Officers | Realigning the major movement to run from west to north. This focuses traffic to use College Road as opposed to Exmouth Road (East). Bus priority measures proposed for this intersection are back under review. | | Nil |
| **Wynyard Quarter Intersection Improvements** | Auckland City Council | 2010/ 2011 | ARCG Forward Work Plan | Works include the signalisation of:<br>– Beaumont Street/Gaunt Street;<br>– Beaumont Street/Westhaven Drive;<br>– Halsey Street/Gaunt Street/Viaduct Harbour Road intersections. | Programmed | Nil |
| **Wellesley Street East/Princes Street intersection improvements** | Auckland City Council | 2010/ 2011 | ARCG Forward Work Plan | Signalisation of Wellesley Street East with Princes Street intersection. | Programmed | Nil |

**Table 5.2: Network Upgrades yet to be Programmed**

| Project | Type of Works | Brief Description |
|---|---|---|
| **Akoranga Drive - Sunnybrae Road** | Widening | Widening Akoranga Drive and Sunnybrae Road (mainly Sunnybrae Road) to four lanes with transit lane in both directions. |
| **Lake Road** | Widening | Widening Lake Road south from Hauraki to Bardia-Winscombe or possibly Bayswater Ave. |
| **Glenfield, Highbury, Birkenhead Bus Priority Measures** | Widening and possible transit lane | Works include:<br>– Onewa Road westbound transit lane (evening commuter peak period)<br>– Birkenhead Avenue widening to four lanes with northbound and southbound transit lanes (both peak periods in both directions)<br>– Glenfield Road widening to four lanes with additional northbound and southbound traffic lanes<br>– Mokoia Road and Highbury Bypass eastbound transit lane from approximately Waipa Street to Onewa Road<br>– Queen Street northbound transit lane on the approach to Onewa Road (morning peak period)<br>– Wairau Road widening to four lanes between Kathleen Street and Target Road with an eastbound transit lane (morning peak period) |
| **Highbury Plan Change** | Network changes | A number of transport options have been considered to determine if the traffic impacts of development within Highbury can be successfully mitigated, and to what degree. These options include:<br>– Widening intersection approaches, mostly by removal of on-street parking around the Glenfield Road/Pupuke Road, Onewa Road/Birkenhead Avenue, Hinemoa Street/Mokoia Road and Mokoia Road /Highbury Bypass intersections<br>– Road widening on Mokoia Road, Highbury Bypass and Birkenhead Avenue to provide for general traffic, or alternatively for buses and high occupancy vehicles during peak periods<br>– The concept of transit lanes along Highbury Bypass and Birkenhead Avenue |

# 6.0 AWHC Connections

The current AWHC study is assessing whether the crossing should be in the form of a bridge or a tunnel. However the option selected by the project team for this comparison includes similar lane configurations and identical connections for the two alternatives, which means that the traffic effects of a bridge will be very similar to those of a tunnel. These connections would be as follows:

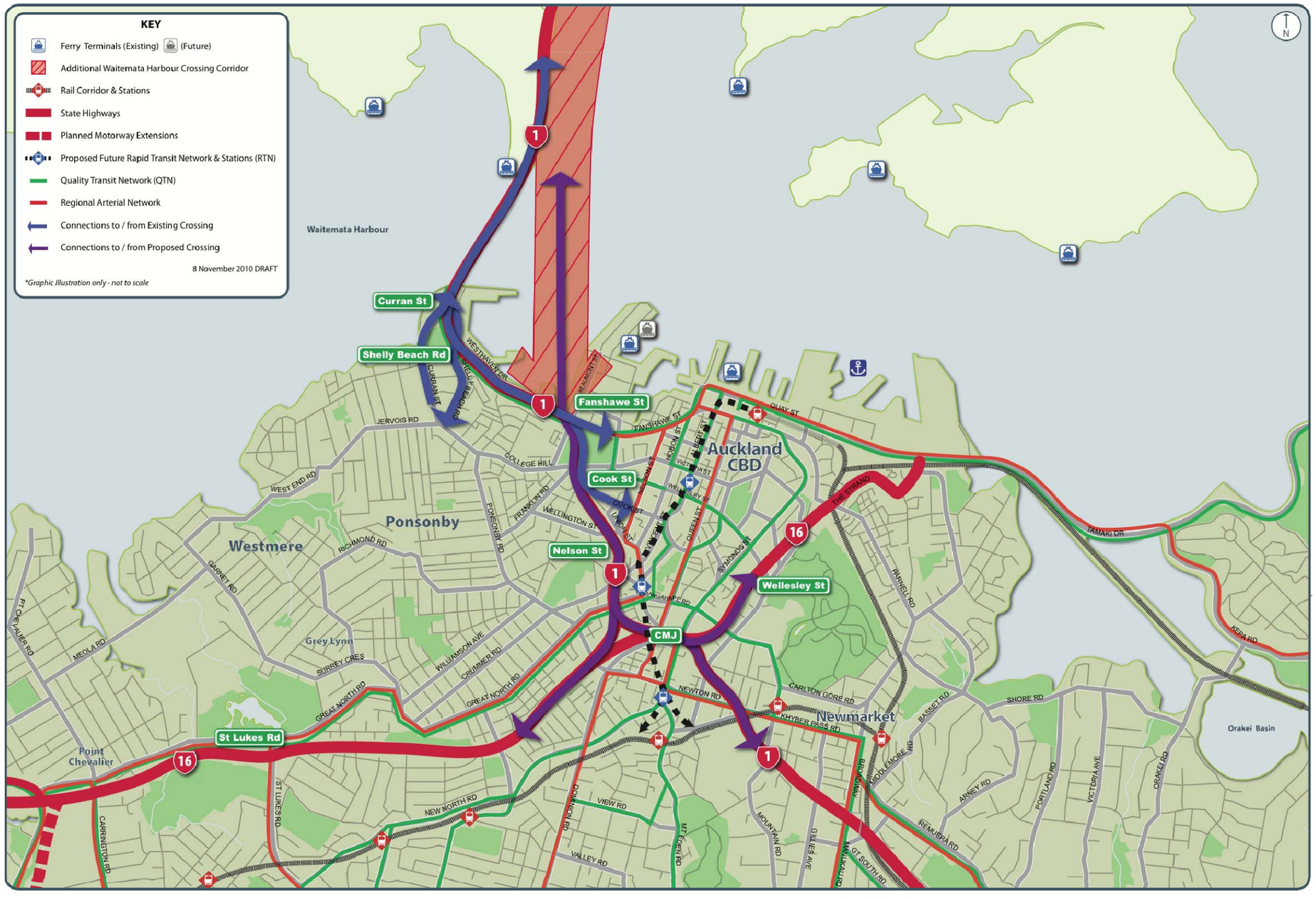
- There would be full connections at the Onewa Road and Esmonde Road interchanges, both to the existing bridge and the additional crossings (either bridge or tunnel)

- The additional crossing (either bridge or tunnel) would serve longer distance traffic between the North Shore and the Central Motorway Junction (ie the Southern Motorway and the links to/from State Highway 16[10]

- The existing bridge would serve traffic travelling between the North Shore and the Auckland central business district (CBD), ie the existing Shelly Beach Road/Curran Street, Fanshawe Street and Cook Street ramps. The Wellington Street on ramp would be closed and replaced with a new Cook Street on ramp.

[10] These links are the connections between the Northern Motorway and the Northwestern Motorway and between the Northern Motorway and Grafton Gully, leading to the Port

**Figure 6.1: AWHC Connections Map**

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**AWHC Southern Sector Connections (Flow - Local Roads)**

A significant challenge for this assessment relates to the provision of additional capacity across the harbour and the potential effects on the local road network around the Auckland city centre and around feeder roads on the North Shore to accommodate the additional traffic demands, particularly in the weekday morning peak. In particular it is noted that the ability of the new crossing to allow more traffic to enter the CBD is in conflict with various strategies that seek to encourage the provision of public transport for trips to/from the CBD, and not to provide additional capacity for cars.

It is anticipated that space on the existing Harbour Bridge will be allocated to public transport, walking and cycling, if an Additional Waitemata Harbour Crossing is provided. The precise lane configuration will only be determined over time and this will significantly affect the predicted traffic effects of the additional crossing. The scenario agreed for this study (for both bridge and tunnel options) includes the following lane allocation on the existing bridge:

- One lane for walking and cycling;
- A bus lane in each direction, but with general traffic heading to the Shelly Beach off ramp sharing the southbound bus lane; and
- Five general traffic lanes in total, assumed to operate with three southbound and two northbound lanes in the weekday morning peak, with the reverse in the evening peak.

This scenario would have provided three southbound lanes for general in the weekday morning peak plus additional capacity, equivalent to around half a lane, for general traffic heading to the Shelly Beach off ramp. This scenario was also providing the opportunity for a significant increase in the rate of flow from Esmonde Road (and Akoranga Drive) onto the Northern Motorway, thereby increasing the rate of flow able to cross the Harbour and reaching the Auckland CBD.

There are a range of options that could be used to limit the rate of flow able to cross the Harbour, including changes in the lane allocation. However, for the purposes of this assessment it has been agreed that the effects of the additional crossing will be assumed to be restricted by some means and that this should be reflected by modelling ramp signals on the important Esmonde Road southbound on ramp. Capacity constraints are already predicted to exist on the approaches to or on the other on ramps during the morning peak, and providing ramp signals at Esmonde Road will therefore constrain the rate of flow able to pass across the harbour and into the Auckland CBD.

# 7.0 Future Assumptions

## 7.1 Traffic Demands

Two forecast year models have been developed, being 2026 and 2041. The Auckland Regional Transport (ART) model runs that form the basis of the forecast demands for the SATURN model relate to the Regional Land Transport Strategy (RLTS) work completed by the Auckland Regional Council (ARC), although some modifications have been made to the assumptions made for the RLTS. The changes to the assumptions have been agreed by NZTA and the peer reviewer for this assessment.

Traffic demands for each forecast year have been cordoned from the ART3 model and manipulated to take into account the changes made in the base traffic demand calibration process, which updated demands from those supplied by ART for 2006 to 2008.

Further details on the modelling undertaken for the AWHC project are provided in reports (currently under preparation by the SKM/Flow modelling team). Models have been developed for the weekday morning peak, inter peak and evening peak hours, with each representing the average hour for the periods 0700 to 0900, 1100 to 1300 and 1600 to 1800. Daily flows have been derived from these three models.

This report has focussed on the 2026 models, without and with the AWHC.

## 7.2 Future Network Improvements

The assessment of which projects should be included in 2026 and 2041 has been based on the RLTS, and on the discussions with NZTA on 16 June 2011. The assumptions for road projects are generally consistent with those used for the SH20 Waterview Extension.

A full list of the future network changes is included in Appendix C.

# 8.0 Future Traffic Demand Comparisons

## 8.1 SATURN Model Outputs

In order to understand areas where traffic demands are anticipated to change, the daily traffic volumes have been compared for the 2008 base model and the 2026 Do Minimum and AWHC Option traffic models. It is worth noting that the role of the Local Roads component of the Network Plan is to understand the potential impact of the AWHC project on the operation of the surrounding road network. It is assumed that the operation of the motorway corridor is to be assessed in a separate report.

## 8.2 2008 Comparison with 2026 Do Minimum

Table 8.1 provides a comparison between the base (2008) flows and the forecast flows for 2026, for the Do Minimum scenario (ie the scenario without the AWHC Option).

**Table 8.1: Comparison of Daily Traffic Flows, between Base (2008) model and 2026 Do Minimum Scenario (vehicles/day)**

| Road | 2008 Base Model | 2026 Do Minimum | 2008 to 2026 Change in Traffic Volumes | % Change |
|---|---|---|---|---|
| Northcote Road (west of interchange) | 27,500 | 28,100 | +600 | +2% |
| Esmonde Road (west of Fred Thomas Drive) | 55,000 | 73,200 | +18,200 | +33% |
| Akoranga Drive (west of Esmonde Road off ramp) | 13,900 | 16,300 | +2,400 | +17% |
| Sunnybrae Road (north of Northcote Road) | 16,600 | 13,700 | -2,900 | -17% |
| Onewa Road (east of Queen Street) | 42,900 | 46,500 | +3,600 | +8% |
| Shelly Beach Rd (north of Sarsfield | 10,500 | 7,600 | -2,900 | -19% |

**Table 8.1: Comparison of Daily Traffic Flows, between Base (2008) model and 2026 Do Minimum Scenario (vehicles/day)**

| Road | 2008 Base Model | 2026 Do Minimum | 2008 to 2026 Change in Traffic Volumes | % Change |
|---|---|---|---|---|
| Street) | | | | |
| Curran Street (on ramp) | 10,100 | 9,500 | -600 | -6% |
| Fanshawe Street (east of Daldy Street) | 35,600 | 28,000 | -7,600 | -21% |
| Cook Street (west of Nelson Street) | 6,100 | 8,600 | +2,500 | +41% |
| Wellington Street (south of Union Street) | 24,500 | 30,500 | +6,000 | +24% |
| Wellesley Street (north of off ramps) | 20,000 | 28,300 | +8,300 | +42% |
| Victoria Street West (west of Wellesley Street) | 23,600 | 30,700 | 7,100 | +30% |
| The Strand (north of Parnell Rise) | 12,900 | 20,800 | +7,900 | +61% |
| Parnell Rise (east of The Strand) | 25,100 | 29,200 | +4,100 | +16% |
| Beach Road (west of The Strand) | 21,800 | 37,400 | +15,600 | +72% |
| Jervois Road (east of Shelly Beach Road) | 10,400 | 11,100 | +700 | +7% |
| Ponsonby Road (north of Franklin Road) | 12,000 | 16,100 | +4,100 | +34% |
| Grafton Gully (Stanley Street south of Parnell Rise) | 44,800 | 60,400 | +15,600 | +35% |

Table 8.2 sets out the hourly traffic flows on each of the key arterials affected during each of three three modelled periods. These represent traffic flows in both directions during a one hour period, for the base (2008) and 2026 Do Minimum scenarios.

**Table 8.2: Hourly Traffic Flows (vehicles per hour, two way)**

| Road | 2008 AM Peak Do Min | 2008 Inter Peak Do Min | 2008 PM Peak Do Min | 2026 AM Peak Do Min | 2026 Inter Peak Do Min | 2026 PM Peak Do Min |
|---|---|---|---|---|---|---|
| Shelly Beach Rd (north of Sarsfield St) | 1,210 | 560 | 870 | 740 | 480 | 440 |
| Fanshawe Street (east of Daldy Street) | 2,650 | 2,190 | 3,210 | 1,780 | 1,700 | 3,070 |
| Cook Street (west of Nelson St) | 350 | 430 | 410 | 850 | 540 | 470 |
| Victoria Street West (west of Wellesley Street) | 1,450 | 1,580 | 2,480 | 1,590 | 2,380 | 2,520 |
| Curran Street (on ramp) | 880 | 570 | 1,030 | 790 | 530 | 1,030 |
| Jervois Road (east of Shelly Beach Road) | 1,220 | 590 | 830 | 1,090 | 620 | 830 |
| Ponsonby Road (north of Franklin Road) | 930 | 710 | 920 | 910 | 1,070 | 1,200 |
| Esmonde Rd (west of Fred Thomas Drive) | 4,100 | 3,600 | 4,420 | 4,470 | 5,060 | 5,180 |
| Grafton Gully (Stanley St s of Parnell Rise) | 2,960 | 3,050 | 3,120 | 3,980 | 4,010 | 4,680 |
| The Strand (north of Parnell Rise) | 1,250 | 770 | 1,150 | 1,590 | 1,330 | 1,770 |

**Table 8.2: Hourly Traffic Flows (vehicles per hour, two way)**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Beach Road (west of The Strand)** | 1,330 | 1,500 | 1,690 | 2,700 | 2,480 | 2,920 |

The modelling results indicate that significant increases in traffic are anticipated on key arterials when comparing the base 2008 models with the 2026 Do Minimum models. The key arterials on either side of the harbour that are predicted to experience significant increases (based on the daily flows in Table 8.1) include:

- Esmonde Road: 33% increase in traffic (+18,200 vehicles per day);
- Grafton Gully: 35% increase in traffic (+15,600 vehicles per day);
- The Strand: 61% increase in traffic (+7,900 vehicles per day); and
- Beach Road: 72% increase in traffic (+15,600 vehicles per day).

These increases are significant, particularly on and around the Grafton Gully area. The Strand, Beach Road and Grafton Gully are all affected by the grade separation of these routes proposed as part of the Grafton Gully Stage 3 works. These works will provide additional capacity in this area, hence the increased traffic movements, with the majority being from the Southern and Northwestern Motorways.

With respect to Esmonde Road, a significant increase is predicted in the inter peak period, with increased traffic flows in both directions.

It is highlighted that there significant increases predicted in the inter peak period between 2008 and 2026. The affected corridors see significant traffic movements occurring in both directions during this period as opposed to the peak periods where there is typically a heavier "peak-directional" flow. During the inter peak the overall two way total can be higher given that both directions of travel are expected to operate near to capacity.

It should be noted that the flows in Table 8.2 are what SATURN terms "arrival" flows, as opposed to demand flows. These arrival flows reflect the flows that can actually reach an area during the single hour modelled and these flows are generally subject to greater capacity constraints during the weekday morning and evening peak periods than during the inter peak period.

## 8.3 Comparison between 2026 Do Minimum and 2026 with AWHC

Table 8.3 reports the forecast flows for the year 2026, comparing the scenarios without and with the AWHC Option. The base (2008) model flows are also repeated in this table.

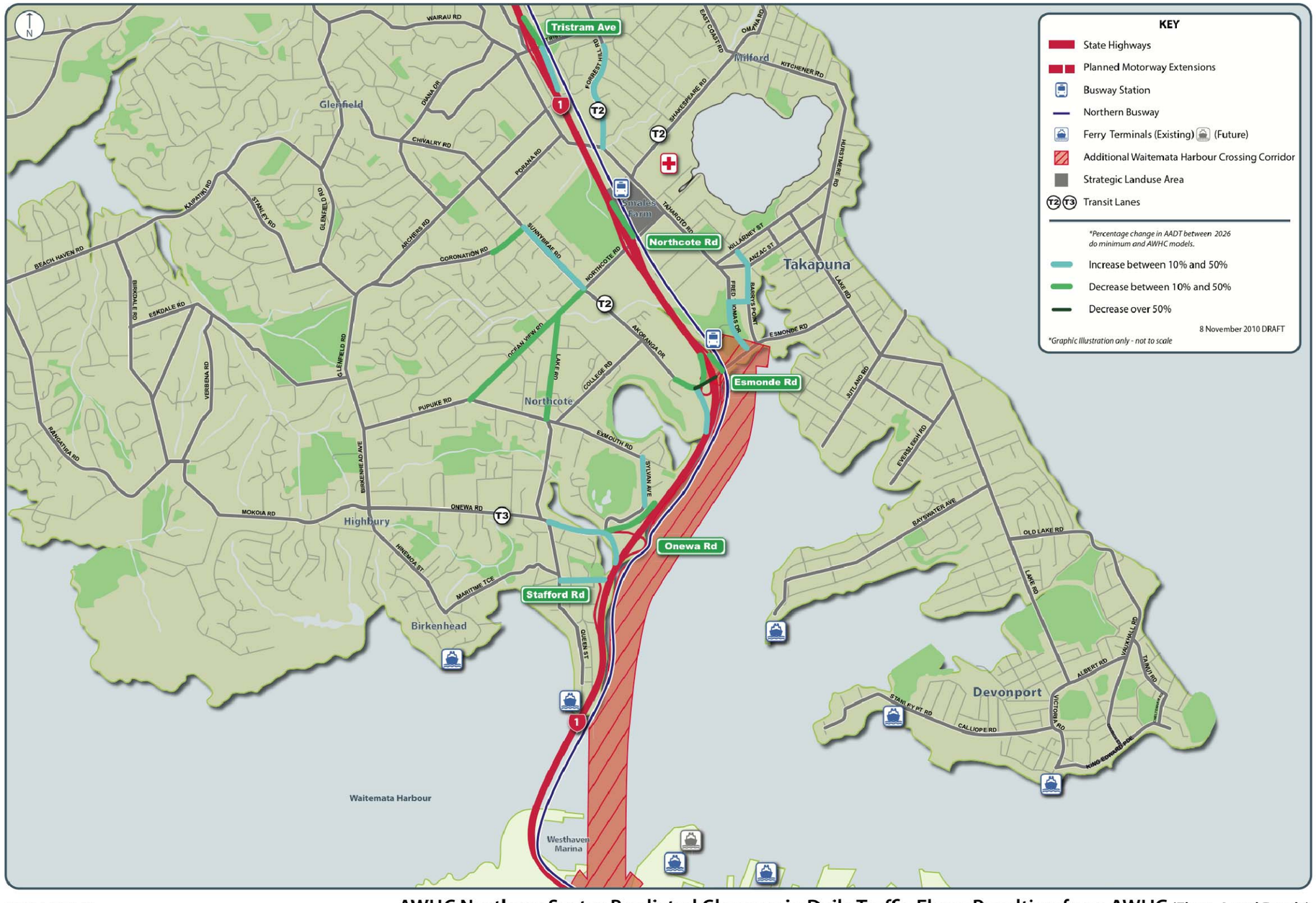
**Table 8.3: Forecast Daily Traffic Flows (vehicles/day)**

| Road | 2008 Base Model | 2026 Do Minimum | 2026 AWHC Option | 2026 Change in Traffic Volumes | % Change with AWHC |
|---|---|---|---|---|---|
| Northcote Road (west of interchange) | 27,500 | 28,100 | 27,100 | -1,000 | -4% |
| Esmonde Road (west of Fred Thomas Drive) | 55,000 | 73,200 | 77,900 | +4,800 | +7% |
| Akoranga Drive (west of Esmonde Road off ramp) | 13,900 | 16,300 | 17,000 | +700 | +4% |
| Sunnybrae Road (north of Northcote Road) | 16,600 | 13,700 | 15,300 | +1,700 | +12% |
| Onewa Road (east of Queen Street) | 42,900 | 46,500 | 50,300 | +3,900 | +8% |
| Shelly Beach Rd (north of Sarsfield Street) | 10,500 | 7,600 | 12,300 | +4,800 | +63% |
| Curran Street (on ramp) | 10,100 | 9,500 | 11,400 | +2,000 | +21% |
| Fanshawe Street (east of Daldy St) | 35,600 | 28,000 | 32,200 | +4,300 | +15% |
| Cook Street (west of Nelson Street) | 6,100 | 8,600 | 24,600 | +16,000 | +186% |
| Wellington Street (south of Union Street) | 24,500 | 30,500 | 25,400 | -5,100 | -17% |
| Wellesley Street (north of off | 20,000 | 28,300 | 27,900 | -400 | -1% |

**Table 8.3: Forecast Daily Traffic Flows (vehicles/day)**

| Road | 2008 Base Model | 2026 Do Minimum | 2026 AWHC Option | 2026 Change in Traffic Volumes | % Change with AWHC |
|---|---|---|---|---|---|
| ramps) | | | | | |
| Victoria Street West (west of Wellesley Street) | 23,600 | 30,700 | 28,800 | -1,900 | -7% |
| The Strand (north of Parnell Rise) | 12,900 | 20,800 | 19,900 | -1,000 | -5% |
| Parnell Rise (east of The Strand) | 25,100 | 29,200 | 29,500 | +300 | +1% |
| Beach Road (west of The Strand) | 21,800 | 37,400 | 36,800 | - 600 | -2% |
| Jervois Road (east of Shelly Beach Road) | 10,400 | 11,100 | 12,200 | +1,100 | +10% |
| Ponsonby Road (north of Franklin Road) | 12,000 | 16,100 | 15,000 | -1,100 | -7% |
| Grafton Gully (Stanley Street south of Parnell Rise) | 44,800 | 60,400 | 59,400 | -1,100 | -2% |

**Figure 8.1 : Northern Sector Predicted Changes in Daily Traffic Flows Resulting from AWHC.**

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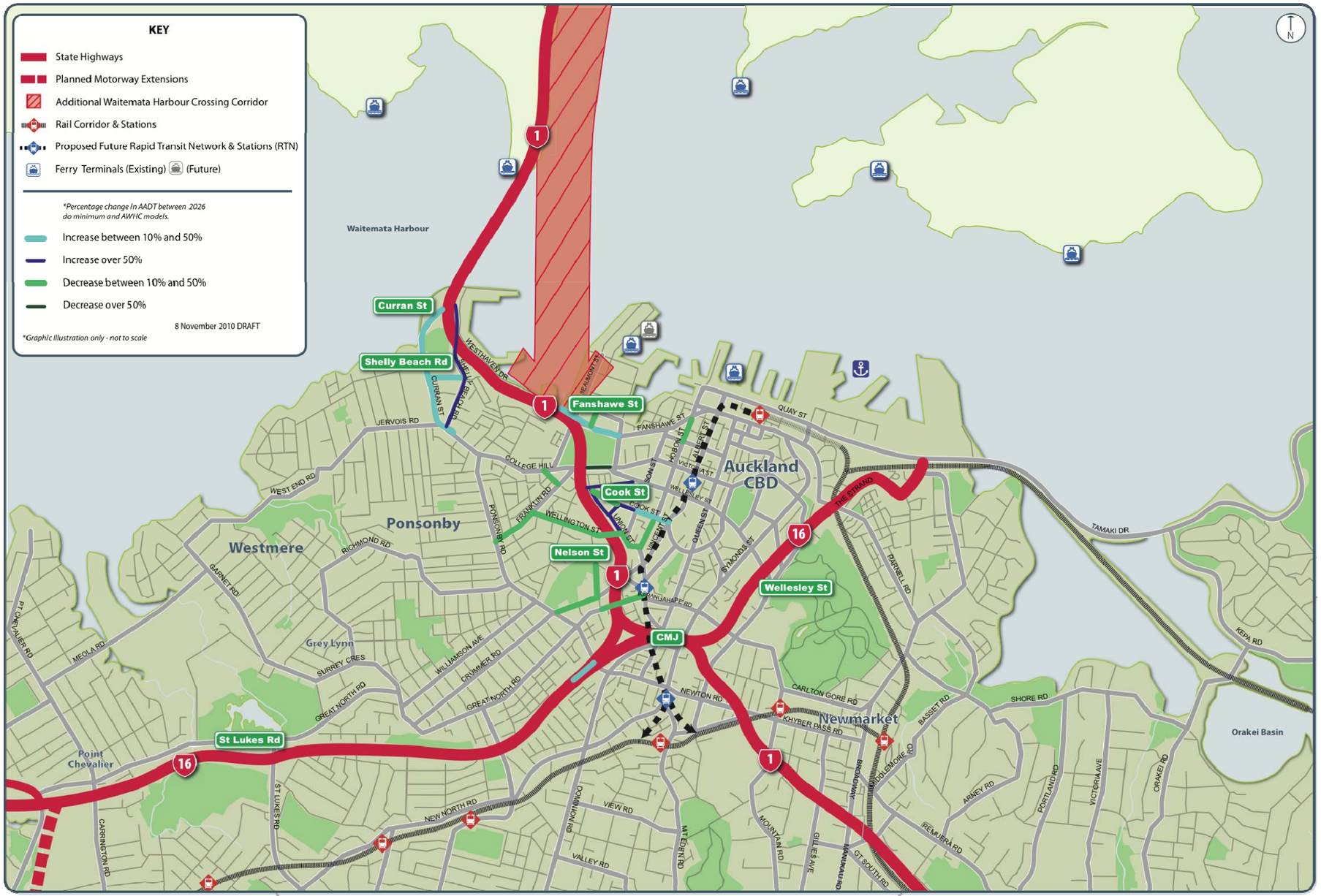
**AWHC Northern Sector Predicted Changes in Daily Traffic Flows Resulting from AWHC (Flow - Local Roads)**

**Figure 8.2 : Southern Sector Predicted Changes in Daily Traffic Flows Resulting from AWHC.**

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**AWHC Southern Sector Predicted Changes in Daily Traffic Flows Resulting from AWHC (Flow - Local Roads)**

Table 8.4 sets out the hourly traffic flows on each of the key arterials affected during each of the three modelled periods. These represent traffic flows in both directions during a one hour period, for the 2026 Do Minimum scenario and the scenario with the AWHC.

**Table 8.4: Hourly Traffic Flows (vehicles per hour, two way)**

| Road | 2026 AM Peak Do Min | 2026 Inter Peak Do Min | 2026 PM Peak Do Min | 2026 AM Peak With AWHC | 2026 Inter Peak With AWHC | 2026 PM Peak With AWHC |
|---|---|---|---|---|---|---|
| Shelly Beach Rd (north of Sarsfield Street) | 740 | 480 | 440 | 1,220 | 780 | 920 |
| Fanshawe Street (east of Daldy Street) | 1,780 | 1,700 | 3,070 | 2,760 | 1,870 | 3,220 |
| Cook Street (west of Nelson Street) | 850 | 540 | 470 | 2,350 | 1,460 | 1,970 |
| Victoria Street West (west of Wellesley Street) | 1,590 | 2,380 | 2,520 | 1,830 | 2,220 | 2,090 |
| Curran Street (on ramp) | 790 | 530 | 1,030 | 970 | 690 | 1,030 |
| Jervois Road (east of Shelly Beach Road) | 1,090 | 620 | 830 | 1,190 | 760 | 870 |
| Ponsonby Road (north of Franklin Road) | 910 | 1,070 | 1,200 | 1,100 | 970 | 1,150 |
| Esmonde Rd (west of Fred Thomas Drive) | 4,470 | 5,060 | 5,180 | 5,600 | 5,290 | 5,860 |
| Grafton Gully (Stanley St south of Parnell Rise) | 3,980 | 4,010 | 4,680 | 4,010 | 3,950 | 4,500 |
| The Strand (north of Parnell Rise) | 1,590 | 1,330 | 1,770 | 1,580 | 1,280 | 1,580 |
| Beach Road (west of The Strand) | 2,700 | 2,480 | 2,920 | 2,620 | 2,450 | 2,840 |

Based on an absolute change of around 4,000 vehicles per day or a percentage change greater than 15% Table 8.4 indicates that the key arterials likely to be the most affected by the AWHC Option are as follows:

- Cook Street;
- Shelly Beach Road;
- Curran Street;
- Fanshawe Street;
- Esmonde Road;
- Onewa Road.

Wellington Street is predicted to benefit from a reduction in traffic, due to the proposed closure of the Wellington Street on ramp. This closure and the introduction of an on ramp from Cook Street explain in part the anticipated increase in flows on Cook Street.

Greater detail on the effects of the predicted increases in flows is provided in the following sections of this report.

# 9.0 Operational Assessment

## 9.1 Methodology

Various outputs from the SATURN model have been obtained to undertake an assessment of the future 2026 Do Minimum scenario compared with the 2026 scenario with the AWHC Option. Several model outputs have been extracted and assessed, so that the predicted operation of the future option (when compared to the future Do Minimum model) can be understood.

Outputs that have been extracted from the Do Minimum and Option models include:

- 2026 traffic flows on key arterial local roads, comparing the Do Minimum with the Option;
- Flow difference plots between the Do Minimum and Option networks;
- Congestion plots, showing areas in the network where the link volume to capacity (v/c) ratio is at or greater than 95%; and
- Queue Plots.

## 9.2 Flow Difference Plots

Flow difference plots have been prepared to illustrate the predicted changes in traffic flows along certain links. The following comparison between the 2026 Do Minimum and 2026 AWHC Option highlights the links expected to experience differences in traffic flows, with increases in traffic movements illustrated by the green lines and decreases in traffic movements illustrated by the blue lines.

This report concentrates on the predicted effects of the AWHC on the local road network. The plots indicate that significant flow changes are predicted along the motorway corridor, as follows:

- The wide blue lines along the existing motorway corridor between Esmonde Road or Onewa Road and Fanshawe Street reflect the removal of traffic onto the additional crossing; and
- The flows on the additional crossing itself are not shown, as the links do not exist in the Do Minimum scenario.

### Morning Peak Flow Differences

**Traffic flow differences in the morning peak period are set out in Figure 9.1 to**

Figure 9.3.

**Figure 9.1: Traffic Flow Differences: Akoranga Drive – Esmonde Road area: Morning Peak**

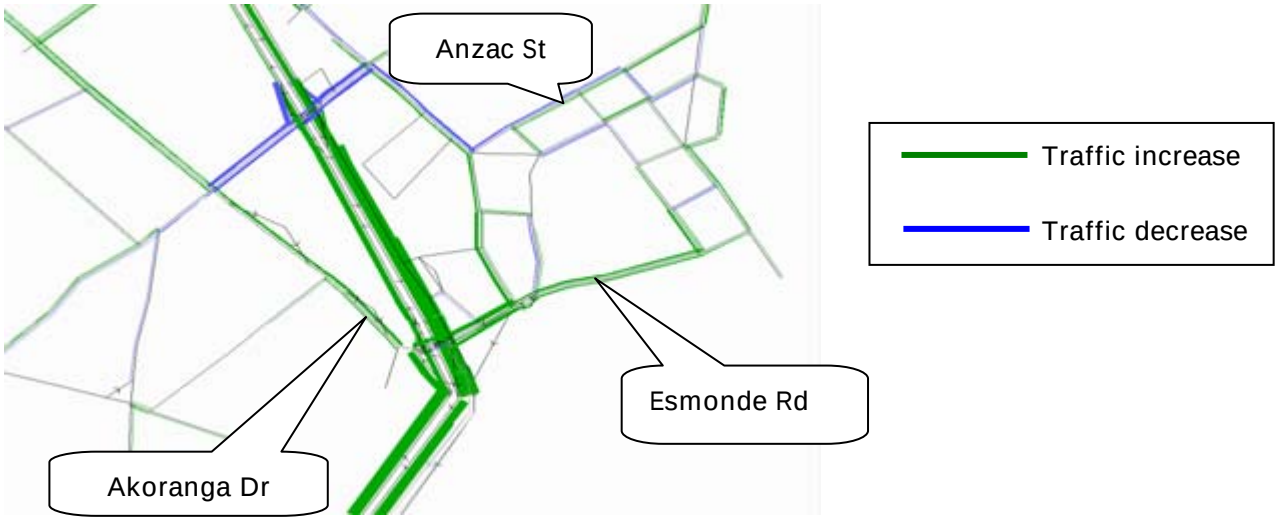



**Figure 9.2: Traffic Flow Differences: Onewa Road area: Morning Peak**

**Figure 9.3: Traffic Flow Differences : Auckland City Centre area: Morning Peak**

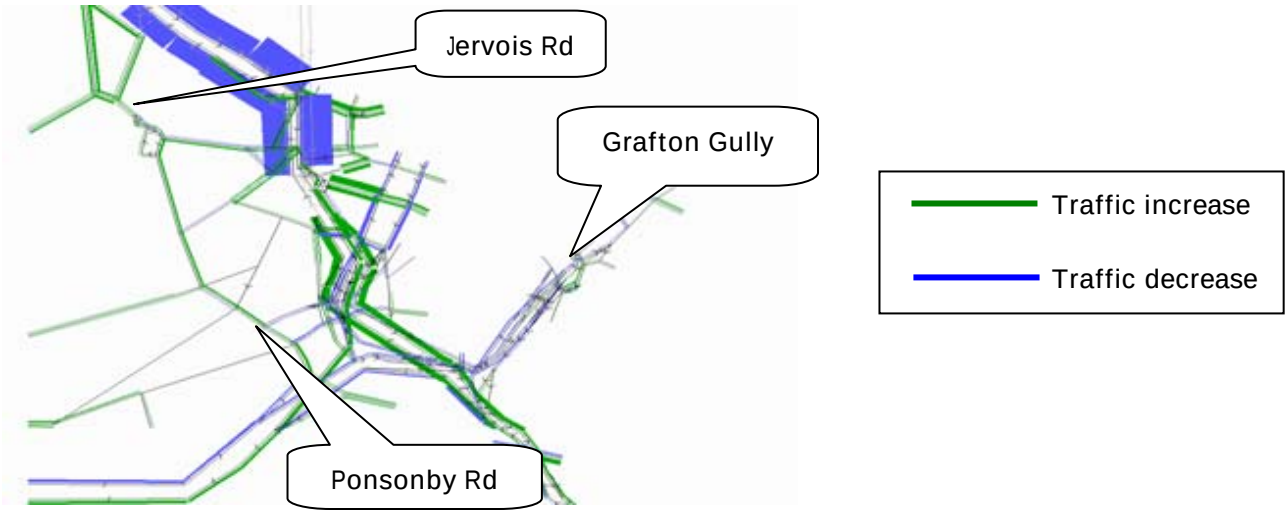



Figure 9.1 indicates that an increase in flows is expected along the motorway. The AWHC project is to include the introduction of the right turn movement from Akoranga Drive to SH1 southbound, but the model is predicting a very modest increase in traffic using Akoranga Drive, due to the capacity constraint of ramp signals assumed on the Esmonde Road on ramp. There is a noticeable increase in the predicted traffic on Esmonde Road, in both directions.

Minimal flow differences are predicted around the Onewa Road area, primarily as the constraint on the eastbound approach to the motorway of one general traffic lane and one transit lane is assumed to be retained. A slight increase in westbound traffic movements is predicted.

Within the Auckland city centre, Cook Street is predicted to experience a significant increase in traffic volume. In the eastbound direction this is an increase above what is anticipated in the 2026 Do Minimum, therefore the AWHC Option is delivering increased traffic movements via Cook Street. In the westbound direction the increase is due to the new Cook Street on ramp and traffic being attracted to this area. As a result of this there is a corresponding decrease in the Wellington Street area.

Traffic flow increases are also expected along Fanshawe Street, Shelly Beach Road and Curran Street and to a lesser extent along College Hill and Ponsonby Road. Again these increases reflect that the AWHC Option is delivering increased traffic to the city centre above that anticipated in the 2026 Do Minimum.

### Inter Peak Flow Differences

Traffic flow differences in the inter peak period are set out in Figure 9.4 to Figure 9.6.

**Figure 9.4: Traffic Flow Differences: Akoranga Drive – Esmonde Road area: Inter Peak**

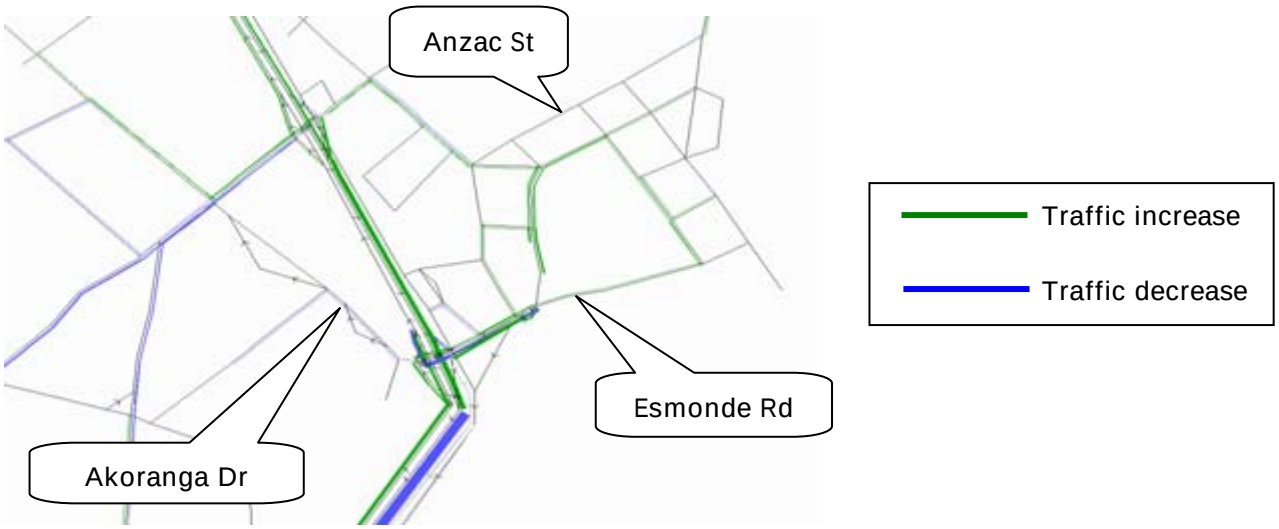
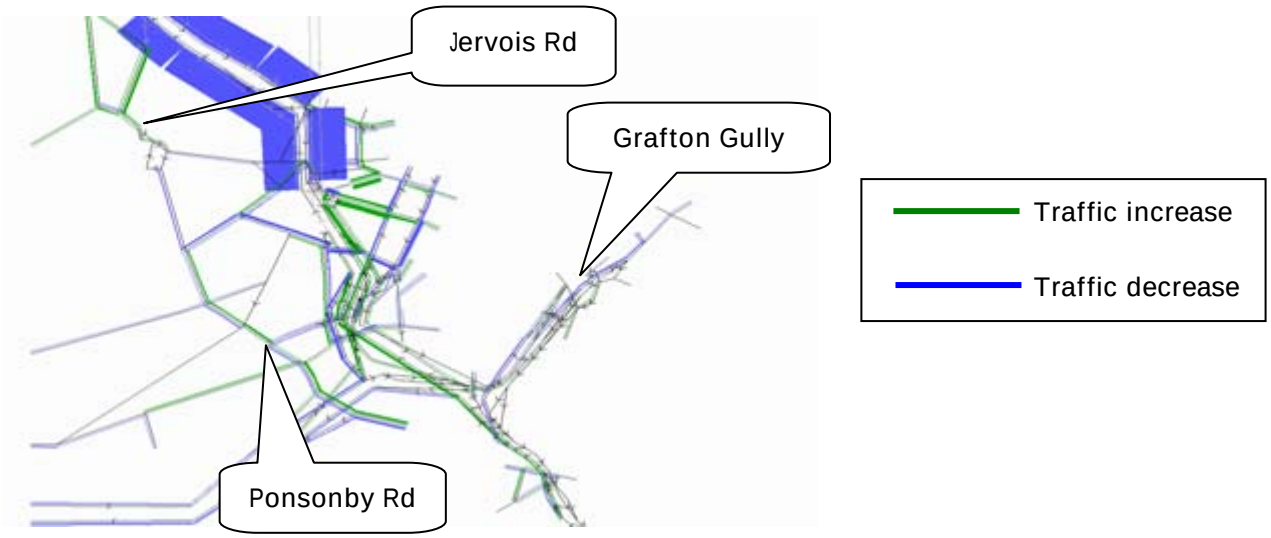



**Figure 9.5: Traffic Flow Differences: Onewa Road area: Inter Peak**

**Figure 9.6: Traffic Flow Differences: Auckland City Centre area: Inter Peak**




The above plots indicate that fairly minor flow differences are predicted on the local roads on the North Shore in the inter peak period. This probably reflects the fact that the congestion in the 2026 inter peak is predicted to be modest during this time period with the Do Minimum scenario, so the AWHC option is not predicted to significantly increase the flows able to cross the harbour. Again increases in traffic are predicted on Esmonde Road and Onewa Road.

The plot of the Auckland city centre area shows increased traffic movements are predicted, especially along Cook Street and also to a lesser extent along Shelly Beach Road, Curran Street and Fanshawe Street.

### Evening Peak Flow Differences

Traffic flow differences in the evening peak period are set out in Figure 9.7 to Figure 9.9.

**Figure 9.7: Traffic Flow Differences: Akoranga Drive – Esmonde Road area: Evening Peak**

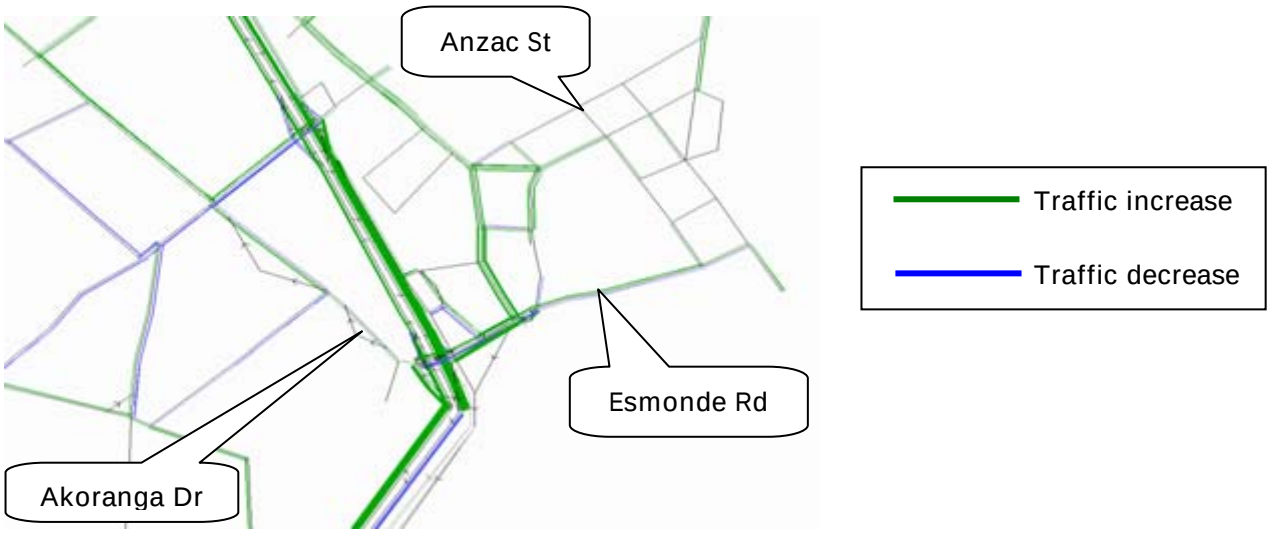
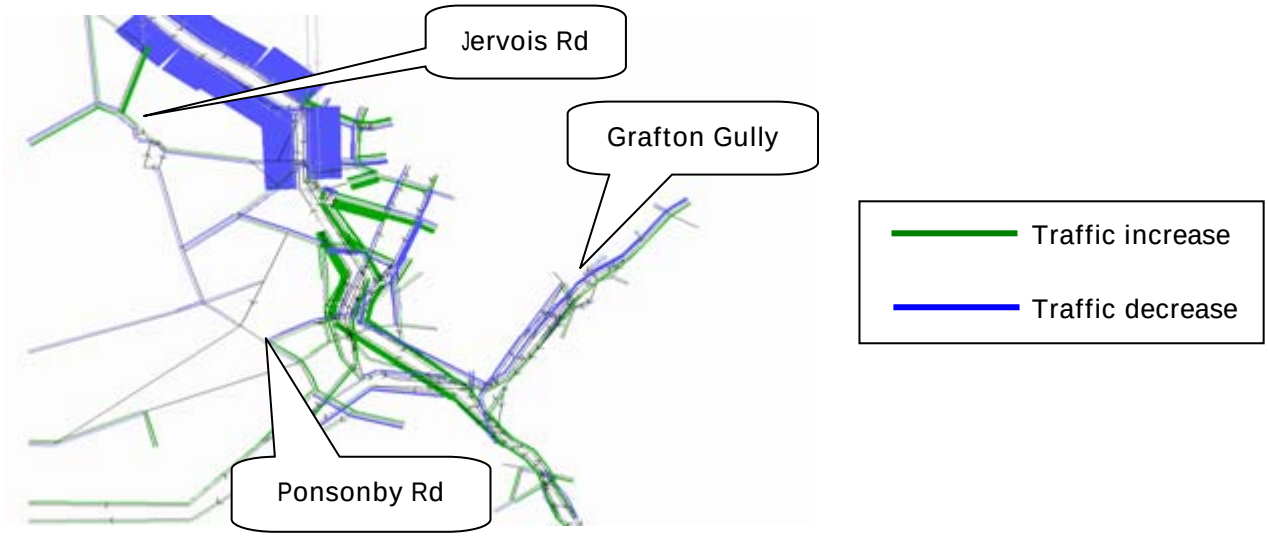



**Figure 9.8: Traffic Flow Differences Onewa Road area: Evening Peak**

**Figure 9.9: Traffic Flow Differences Auckland City Centre area: Evening Peak**




The evening period plots indicate fairly minor flow differences on the North Shore. Again increased traffic flows are predicted along on Esmonde Road and Onewa Road and also on Fred Thomas Drive.

Cook Street is showing a significant increase in traffic with this being a result of the introduction of the on ramp towards the AHB. With the diversion of traffic to Cook Street, reductions are predicted along Victoria Street and westbound on Fanshawe Street (but with an increase in the eastbound direction). With the closure of the Wellington Street on ramp, this is predicted to result in a reduction in traffic on Wellington Street.

## 9.3 Areas of Congestion

The following plots illustrate the areas within the modelled network where congestion is likely to occur. SATURN provides plots of what are termed "residual queues", which are queues that are present in the network at the end of the modelled period. As the model does not recognise slow moving queues, (ie where vehicle speeds fall below a defined speed) it is also helpful to illustrate the parts of the network where the volume to capacity ratios exceed a given threshold, which for this assessment has been taken as 95%. These plots highlight the links that are predicted to experience congestion, and will be operating very close to, or at capacity.

The following diagrams provide both queue plots and the volume to capacity (v/c)[11] ratios, comparing the 2026 Do Minimum with the 2026 AWHC option networks. The three key areas examined are Akoranga-Esmonde, Onewa Road and the Auckland city centre. Queues and the v/c

[11] If the volume to capacity ratio equals 100%, indicating that a link or intersection is operating at theoretical capacity. Values of lower than 100% are therefore within capacity and values of over 100% are over capacity. However, conditions tend to deteriorate rapidly with volume to capacity ratios approaching 100%, and a figure of around 85 to 90% is often termed "practical capacity:

ratios are illustrated by the green bars in the attached drawings; the length of the bar within the queue plots represents the length of the queue. In contrast, the green bar on the v/c ratio plots simply represent the links that will be operating very close to, or at capacity.

### 2026 Morning Peak Period

Congestion plots for the morning peak period are set out in Figure 9.10 to Figure 9.15.

**Figure 9.10: Congestion in Esmonde – Akoranga area: Morning Peak, 2026 Do Minimum**

| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.11: Congestion in Esmonde – Akoranga area: Morning Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The plots indicate the queues that are expected to extend north from the Esmonde on ramp merge with the motorway in the Do Minimum morning peak situation. The queues on the motorway are predicted to be resolved by the AWHC option, which will provide additional traffic lanes south from Esmonde Road.

The modelled results indicate that queues will still occur on Esmonde Road with the AWHC option, due to the proposed ramp signals on the motorway on ramp, which will block back along Esmonde Road and Akoranga Drive. The volume to capacity plot with the AWHC option also indicates that a number of links within the Takapuna city centre will be operating close to capacity.

**Figure 9.12: Congestion in Onewa Road area: Morning Peak, 2026 Do Minimum**

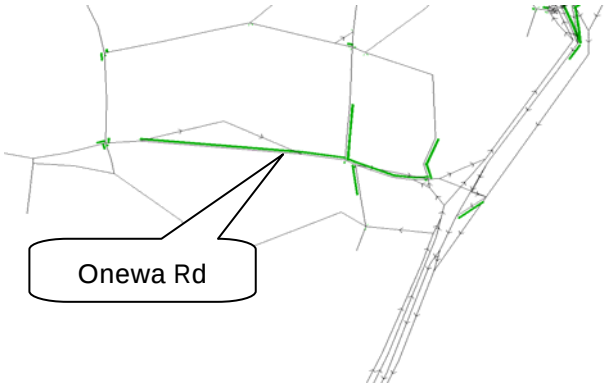
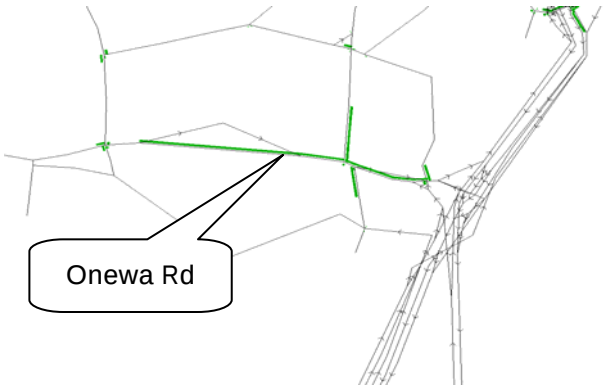
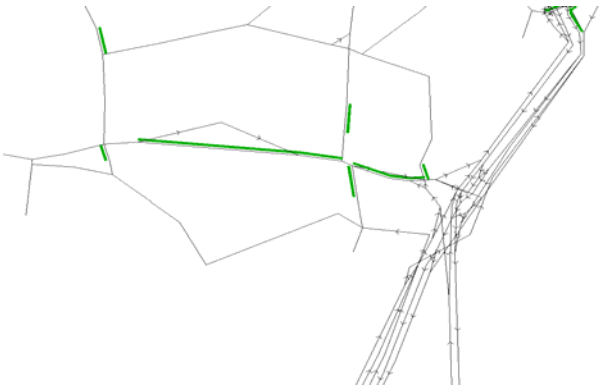
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.13: Congestion in Onewa Road area: Morning Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The modelled results suggest the queues along Onewa Road will be similar without and with the AWHC Option. A high level of queuing is predicted along Onewa Road, as the transit lane will restrict single occupant vehicles to one approach lane to the SH1 corridor. Similarly, the volume to capacity ratio will exceed 100%, showing the links to be operating above capacity.

**Figure 9.14: Congestion in Auckland City Centre area: Morning Peak, 2026 Do Minimum**

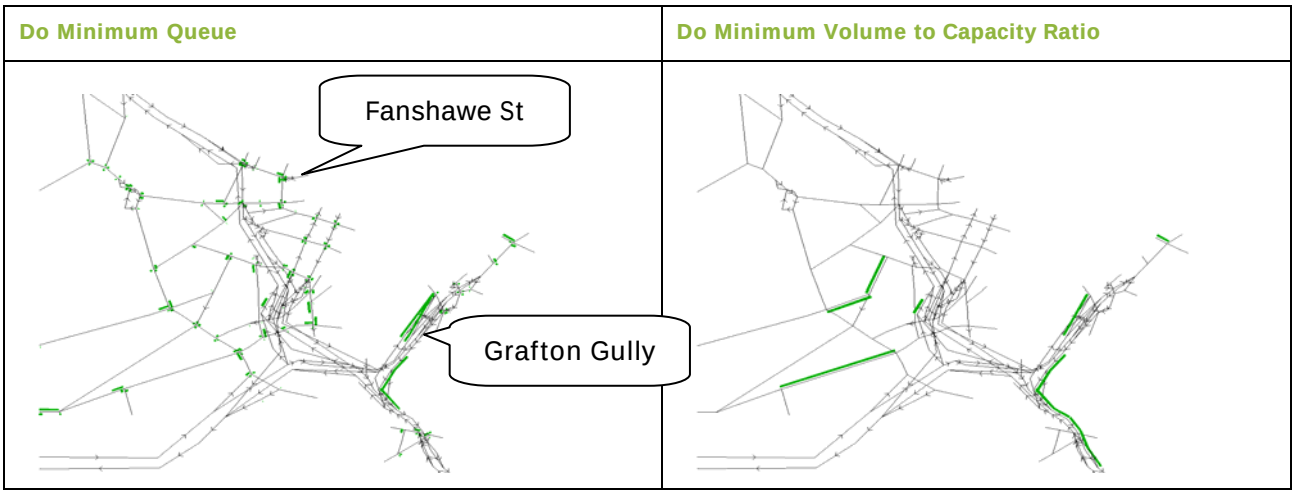
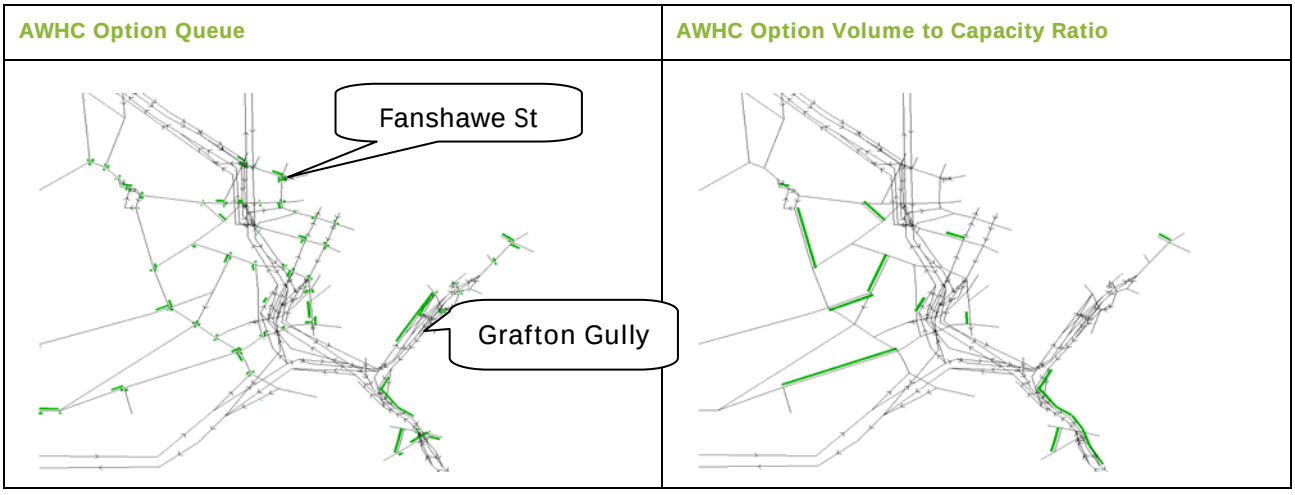



**Figure 9.15: Congestion in Auckland City Centre area: Morning Peak, 2026 with AWHC**




The models are indicating that the AWHC option will result in similar queuing in the city centre when compared with the 2026 Do Minimum. There is an increase in links showing congestion in the AWHC Option models. Of note with respect to increased congestion are Ponsonby Road, approaching Franklin Road and Cook Street, approaching Nelson Street.

### 2026 Inter Peak Period

Congestion plots for the inter peak period are set out in Figure 9.16 to Figure 9.21.

**Figure 9.16: Congestion in Esmonde – Akoranga area: Inter Peak, 2026 Do Minimum**

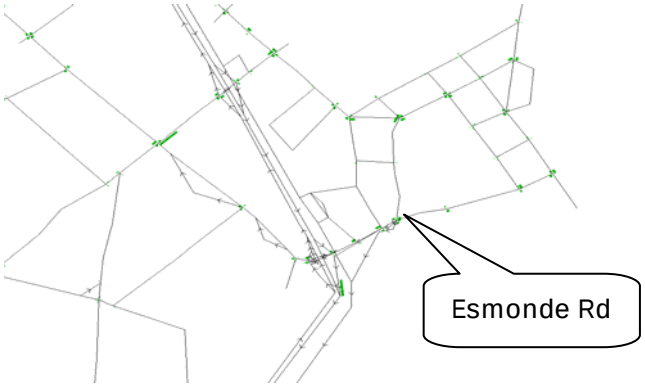
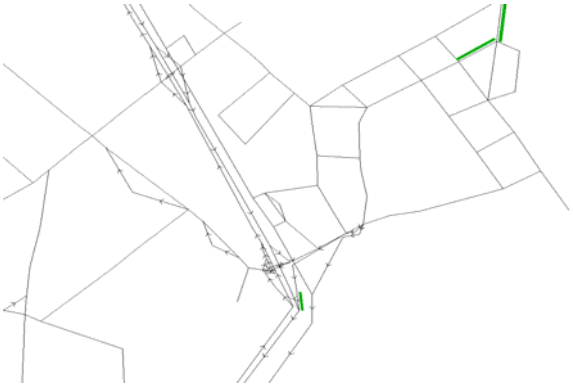
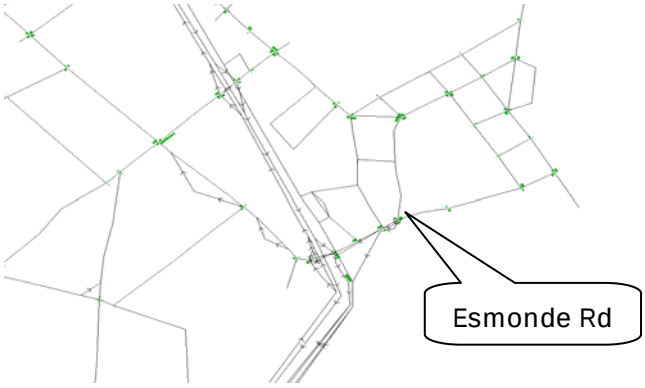
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.17: Congestion in Esmonde – Akoranga area: Inter Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The above plots indicate that the network is generally predicted to operate satisfactorily around the Esmonde Interchange area during the weekday inter peak period. However, the Esmonde Road ramp signal (to the southbound on ramp) will be at capacity, as will the proposed Esmonde Road/Akoranga Drive intersection with the on and off ramps.

**Figure 9.18: Congestion in Onewa area: Inter Peak, 2026 Do Minimum**

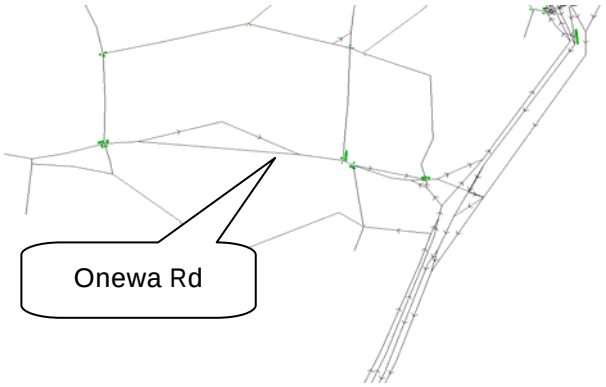
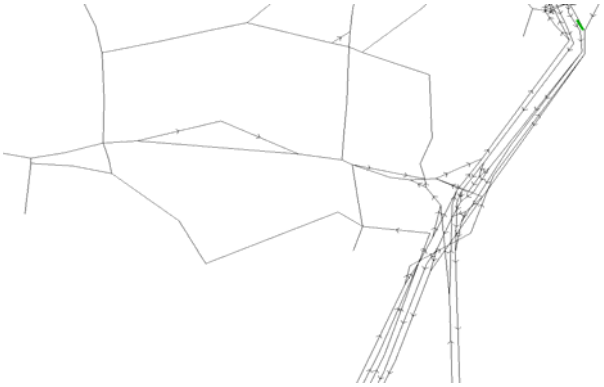
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.19: Congestion in Onewa area: Inter Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The above plots indicate that the network is generally predicted to operate satisfactorily around the Onewa Interchange during the weekday inter peak period.

**Figure 9.20: Congestion in Auckland City Centre: Inter Peak, 2026 Do Minimum**

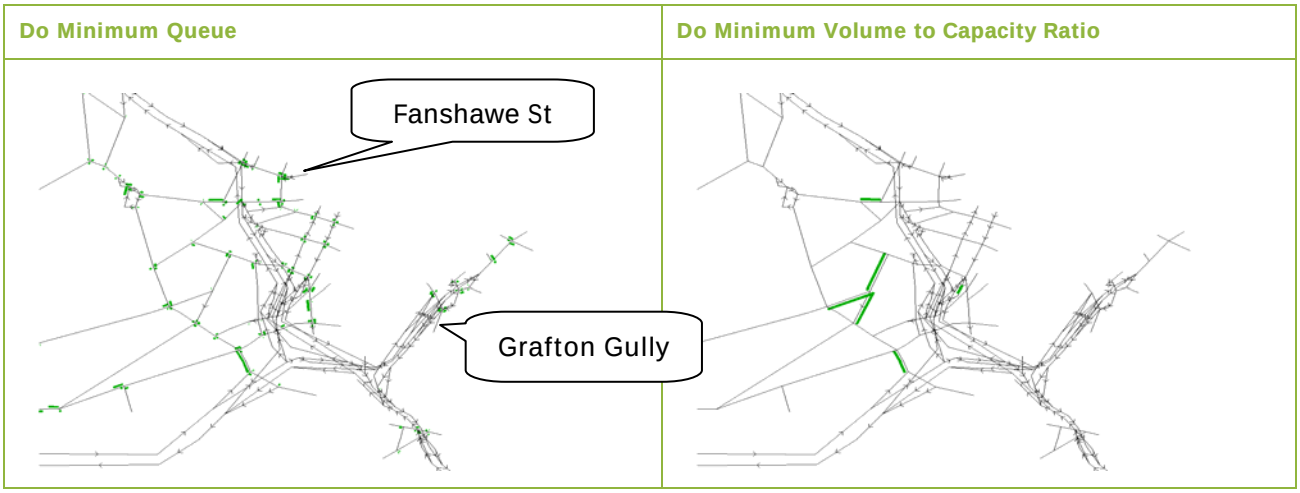
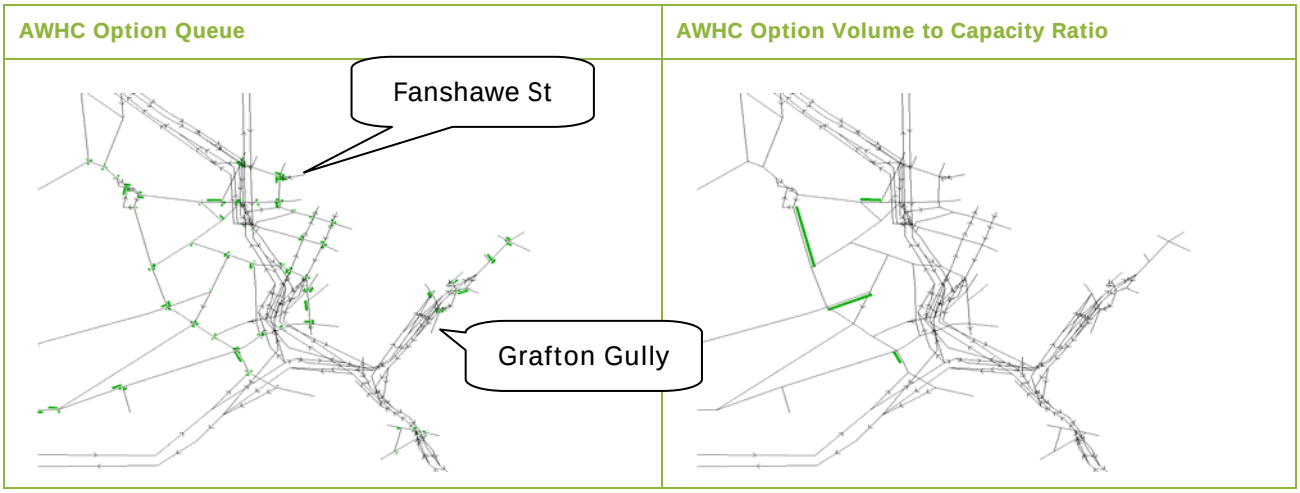



**Figure 9.21: Congestion in Auckland City Centre: Inter Peak, 2026 with AWHC**




The above plots indicate that the network is generally predicted to operate satisfactorily around the CBD, during the weekday inter peak period, although some congestion is predicted along Ponsonby Road and along Victoria Street.

### 2026 Evening Peak Period

Congestion plots for the evening peak period are set out in Figure 9.22 to Figure 9.27.

**Figure 9.22: Congestion in Esmonde – Akoranga area: Evening Peak, 2026 Do Minimum**

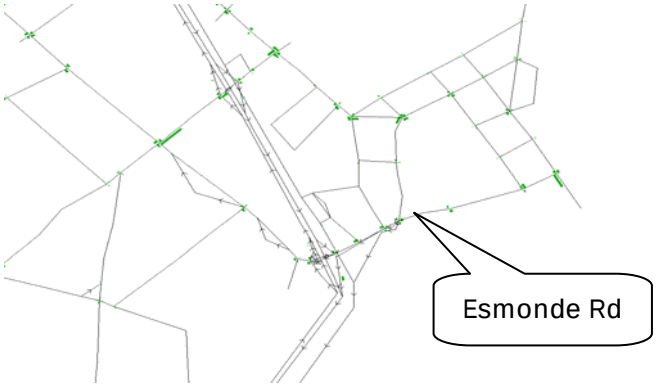
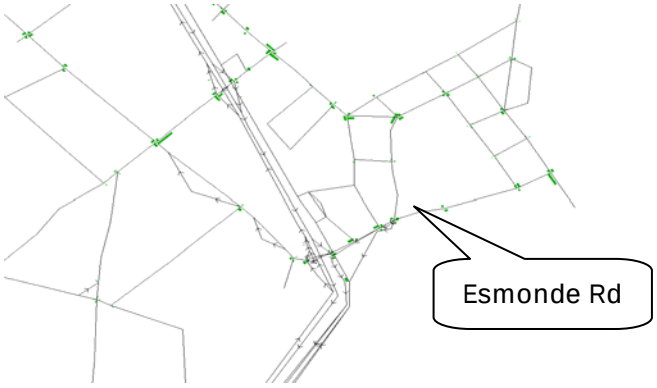
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.23: Congestion in Esmonde – Akoranga area: Evening Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The above plots indicate that the network is generally predicted to operate satisfactorily around the Esmonde Interchange area during the weekday evening period. However, the Esmonde Road ramp signal (to the southbound on ramp) will be at capacity, as will the proposed Esmonde Road/Akoranga Drive intersection with the on and off ramps.

**Figure 9.24: Congestion in Onewa area: Evening Peak, 2026 Do Minimum**

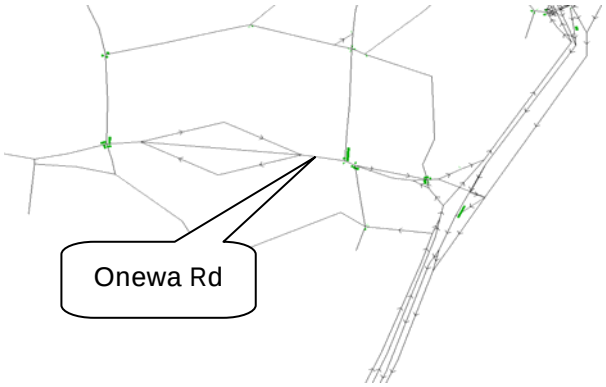
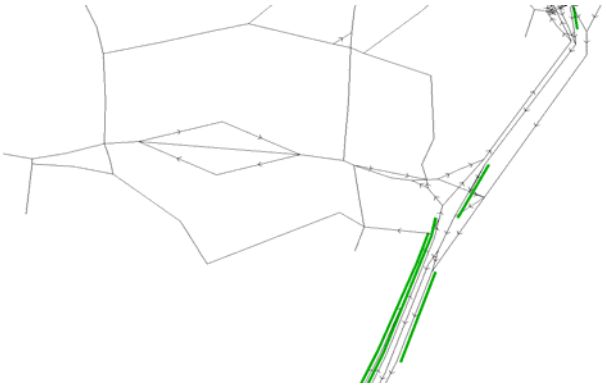
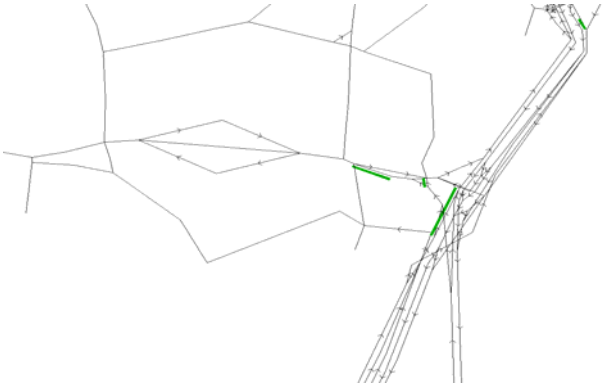
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.25: Congestion in Onewa area: Evening Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

There are no noticeable changes in the predicted queues between the Do Minimum and the AWHC Option models in the Onewa Road area. However, the volume/capacity plots indicate that the Onewa Road/Queen Street intersection will come under additional pressure with the AWHC option.

**Figure 9.26: Congestion in Auckland City Centre: Evening Peak, 2026 Do Minimum**

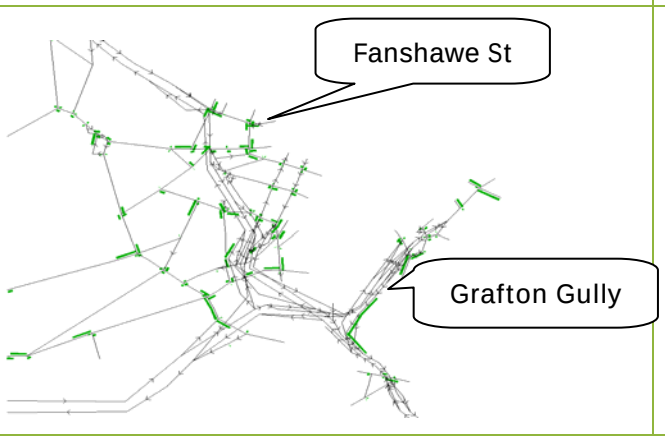
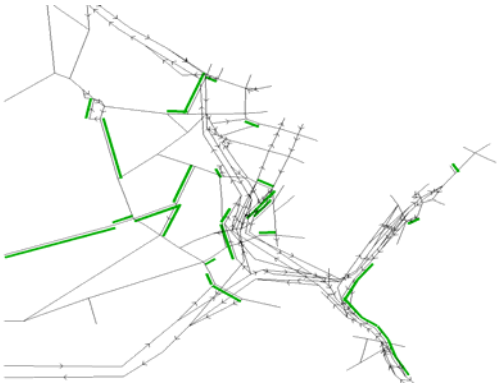
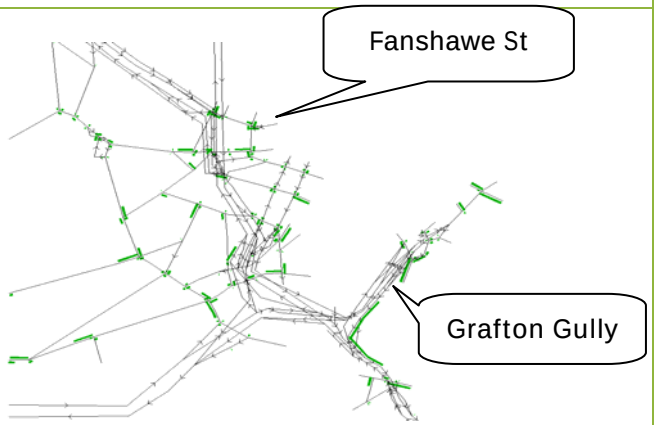
| Do Minimum Queue | Do Minimum Volume to Capacity Ratio |
|---|---|
|  |  |

**Figure 9.27: Congestion in Auckland City Centre: Evening Peak, 2026 with AWHC**

| AWHC Option Queue | AWHC Option Volume to Capacity Ratio |
|---|---|
|  |  |

The above plots indicate that a fair amount of queuing is predicted in the evening peak, both without and with the AWHC. Queuing on Ponsonby Road and Grafton Gully is predicted to be similar between the Do Minimum and AWHC Option models. With respect to the volume/capacity ratios the plots also suggests a decrease in congestion around the Beaumont Street with AWHC in place. Many of the links in and around the Ponsonby area are shown to be operating at capacity, although the 2026 Do Minimum and 2026 AWHC are showing similar results.

# 10.0 Assessment of Key Roads

## 10.1 Capacity Assessment

In general the modelling to date is showing that the AWHC Option provides more vehicle capacity on the state highway network, helping to release current traffic bottlenecks. This is largely a result of the proposed lane configurations, with increased capacity in the southbound direction. However, the effect of the crossing on the network is assumed to be limited by the provision of ramp signals on the Esmonde Road on ramp.

With respect to Cook Street the increased traffic movements on this corridor are also attributable to the proposed introduction of a northbound on ramp directly from Cook Street to the AHB. This is to replace the Wellington Street on ramp, with a re-distribution of traffic to the proposed Cook Street on ramp.

In addition there are expected to be noticeable traffic increases on the following arterials:

- Shelly Beach Road;
- Fanshawe Street; and
- Curran Street.

These increases are generally as expected, given that these roads are all key connections to and from the state highway network.

## 10.2 Auckland City Streets

One of the issues with the AWHC Option is the increase in private vehicle traffic movements to and from Auckland's CBD. This could be controlled to a significant extent by more rigorous parking policies within the CBD and enforcement of the parking restraint policies.

The following tables provide further information on the predicted traffic flows using each of the motorway connections to the Auckland CBD in the morning and evening peak period. These flows may differ from those presented in Table 8.2 and Table 8.4 as the following tables concentrate on the motorway ramp connections only.

**Table 10.1: Traffic Flows on Motorway Connections to/from Auckland CBD during weekday morning peak (vehicles/hour)[12]**

| Road | 2008 AM Peak | 2026 AM Peak Do Min | 2026 AM Peak AWHC |
|---|---|---|---|
| **Southbound** | | | |
| Shelly Beach (off ramp) | 1,210 | 740 | 1,220 |
| Fanshawe Street (off ramp) | 2,170 | 1,590 | 2,700 |
| Cook Street (off ramp) | 660 | 1,320 | 1,630 |
| SH1 to Grafton Gully | 330 | 600 | 560 |
| SH1 to NW Motorway | 520 | 640 | 1,120 |
| **Total** | **4,890** | **4,890** | **7,230** |
| **Northbound** | | | |
| Grafton Gully to SH1 | 400 | 570 | 470 |
| NW Motorway to SH1 | 500 | 880 | 970 |
| Wellington/Cook Street (on ramp) | 450 | 610 | 810 |
| Fanshawe Street (on ramp) | 710 | 590 | 1,030 |
| Curran Street (on ramp) | 880 | 790 | 970 |
| **Total** | **2,940** | **3.440** | **4,250** |

[12] It should be noted that these flows relate to the motorway ramps, so may be in different locations to the information provided in Tables 11 and 12. They are also one directional flows, not two way.

**Table 10.2: Traffic Flows on Motorway Connections to/from Auckland CBD during weekday evening peak (vehicles/hour)**

| Road | 2008 PM Peak | 2026 PM Peak Do Min | 2026 PM Peak AWHC |
|---|---|---|---|
| **Southbound** | | | |
| Shelly Beach (off ramp) | 870 | 440 | 920 |
| Fanshawe Street (off ramp) | 1,015 | 570 | 1,250 |
| Cook Street (off ramp) | 590 | 500 | 620 |
| SH1 to Grafton Gully | 390 | 630 | 420 |
| SH1 to NW Motorway | 680 | 1,110 | 1,380 |
| **Total** | **3,540** | **3,250** | **4,590** |
| **Northbound** | | | |
| Grafton Gully to SH1 | 310 | 580 | 630 |
| NW Motorway to SH1 | 650 | 680 | 850 |
| Wellington/Cook Street (on ramp) | 720 | 900 | 1,650 |
| Fanshawe Street (on ramp) | 3,060 | 3,350 | 3,070 |
| Curran Street (on ramp) | 1,030 | 1,030 | 1,030 |
| **Total** | **5,770** | **6,540** | **7,230** |

To note from the above table are the expected increases in total traffic volumes to the city in the morning peak period and to a lesser extent the increases in traffic exiting the city in the evening peak period.

The significant increase in traffic movements conflict with many of the aspirations outlined in current Council policies, strategies, frameworks and master plans. As identified in Section 2.3 and Appendix A, the 2004 Central Area Access Strategy (CAAS) identified a “targeted cap” in the number of private vehicles entering the city centre. This has been adopted in many of the strategies and policies stemming from the CAAS. The draft “CBD Transport - Into the Future” document highlights the need to complete the state highway network, and also identifies Cook Street, Hobson Street and Nelson Street as arterials that may become two way to enhance pedestrian priority and improved amenity for residents, workers and public transport users.

Current inner city projects have a strong focus on urban design, with Auckland City Council's urban design framework identifying the need for sustainable transport routes in key areas where walking, cycling and public transport have priority over private vehicles. This is likely to see the reduction in space available for the private vehicle, with shared spaces currently being investigated in three locations.

There is also the issue that increases in private vehicle numbers will affect public transport within the city centre streets. This is a vitally important issue for Auckland where there is a high reliance on bus travel to the CBD city centre and surrounding areas. Council is currently completing their Passenger Transport Integration Study (PTIS) which is likely to see changes in how public transport travels through the city centre. Routing buses differently may affect roads that are currently not used by buses.

Both locally and regionally policy planners are shifting towards more stringent parking provisions with this being a significant issue for the city centre. The current plan change in Wynyard Quarter has adopted more stringent parking ratios, particularly with respect to employee parking within the office developments. This recognises that the proliferation of parking provision encourages people to drive. Putting a limit on the parking to be provided within a development helps encourage greater mode shift towards public transport, walking and cycling.

The changes in public transport provision through the PTIS and the urban design aspirations for the city centre will affect the actual road space available for private car use, again restricting the actual capacity of the city centre street network. Auckland City Council's current policies will assist in "dampening" any traffic growth entering the city centre given the likely reduction in road space and inner city parking over the next 15 years.

Consequently it is anticipated that the level of additional traffic being predicted to enter the city centre as a result of the AWHC Option is likely to lead to significant challenges. Also, it is expected that there will be a significant change in traffic patterns about Cook Street, Wellington Street and Shelly Beach Road that will require further consideration.

One mitigating factor, which may be significant in assessing the effects of the AWHC in the weekday morning peak, is that the Do Minimum scenario assumes that the no High Occupancy Vehicles (HOVs) are allowed to use the Northern Busway in the year 2026. The concept of allowing HOVs on the Busway was envisaged at the time of the development (and funding) of the Busway, in order to increase the number of vehicles that can reach the AHB during the congested morning peak, as it has been recognised for some time that the approaches are the constraint rather than the Bridge itself. The number of HOVs that could be accommodated was assessed as around as around 1,250 vehicles/hour southbound in the morning peak.

For this assessment we have been instructed to assume that no HOVs are to be allowed to use the Busway, due to the large number of buses now anticipated and also due to weaving issues predicted between the southbound termination of the Busway and the foot of the Bridge. However, it can reasonably stated that HOVs on the Busway form part of the "permitted baseline" in terms of the

rate of flow expected to pass over the Bridge and into the Auckland CBD in the weekday morning peak. This issue is covered by a sensitivity test in Section 11.0 below.

Other points to note with respect to key assumptions made within the traffic modelling to date:

- The Wellington Street on ramp is closed, to be replaced by a new Cook Street on ramp;
- The Cook Street on ramp is assumed to operate with ramp signals. This ramp will form the start of the future route from the Auckland CBD to the AHB, but we consider that NZTA will probably meter this on ramp in a similar fashion to other on ramps in the Auckland area. We have assumed very short red phases at the signals at this stage, such that the impact of the signals are fairly modest;
- It is understood that Auckland City Council are preparing a master plan for the development of the Placemakers site. This land has been purchased by Council, which is considering the use of the site for residential and open space. We understand that Auckland City Council has aspirations to downgrade Cook Street to improve pedestrian amenity in this area. At this stage the traffic modelling has not taken this into account; and
- By 2026 Grafton Gully Stage 3 is assumed to be implemented. Within the traffic modelling this has been accounted for by grade separating Beach Road and Parnell Rise from Stanley Street and The Strand. This is based on previous assessments into Grafton Gully Stage 3, however these previous assessments are now three (or more) years old and were never finalised or adopted. In addition, and not included in the traffic modelling, is consideration of Grafton Gully Stage 4, being the link to the ports area.

The following pages comment on key streets within Auckland City.

### Fanshawe Street

Fanshawe Street plays a vital role in the CBD and any effects on its operation need to be carefully considered. This route is vital in providing access between the city centre and the North Shore both for private vehicles and for public transport. Fanshawe Street also forms the southern boundary to the Wynyard Quarter development. The majority of traffic entering and exiting this Quarter in the future will need to use Fanshawe Street. Therefore any negative effects on the operation of Fanshawe Street may also affect development within Wynyard Quarter.

The anticipated traffic flows using Fanshawe Street are as follows:

- The modelling suggests a 21% drop in the daily traffic volumes using Fanshawe Street when comparing the 2008 base with the 2026 Do Minimum. This is likely to be a result of the network improvements included within the 2026 model (including Victoria Park Tunnel and Grafton Gully Stage 3), which are likely to divert citybound traffic to Cook Street/Wellington Street and Grafton Gully;

- With the 2026 AWHC Option the daily traffic volumes using Fanshawe Street are expected to increase (relative to the 2026 Do Minimum, but are still expected to be lower than the 2008 base;

- Traffic eastbound on Fanshawe Street (towards the city centre) is expected to increase in the 2026 AWHC Option, with a 700 vehicle per hour increase in the morning peak when compared to the 2026 Do Minimum. This is, however, only a 300 vehicle per hour increase when compared to the 2008 base[13]; and

- Westbound traffic in the evening peak hour with the AWHC Option in place (1,800 vehicles/hour) is predicted to be slightly less than both the 2008 base (1,960 vehicles/hour) and the 2026 Do Minimum option (2,060 vehicles/hour).

### Cook Street

This key arterial is likely to be the most affected as a result of the AWHC Option. With the proposed introduction of a northbound on ramp from Cook Street, significant changes will be required to the corridor to cater for this. As suggested by the AWHC Engineering Team, it is assumed in the traffic model that the one way southbound section of Union Street (from Victoria Street) and Sale Street will not intersect with Cook Street, as at present, but they will pass under the off ramp and connect in with the southern section of Union Street (from north of Sam Wrigley Street to Wellington Street). However, this will provide for a more free flowing solution for Cook Street which will be in conflict with Auckland City Council's aspirations.

The modelling results suggest the following:

- Daily traffic flows on Cook Street (approaching Nelson Street) in 2026 AWHC is expected to be almost three times that of the 2026 Do Minimum;

- A significant increase in flows is expected on the Cook Street off ramp in the morning peak between the 2008 base and the 2026 Do Minimum. This is a result of the completion of the VPT project. A further increase of around 300 vehicles/hour is expected as a result of the AWHC; and

- In the evening peak there is a significant increase in westbound traffic predicted along this route, with 1,650 vehicles entering the state highway via the new Cook Street off ramp.

There will be a substantial change in the traffic movements around the Cook Street area as a result of the introduction of the Cook Street on ramp, the deletion of the Wellington Street on ramp and the proposed grade separation of Union Street and Sale Street traffic. This is likely to considerably alter the travel patterns in this area, placing less pressure on Union Street.

[13] These flows relate to the one way flow for the location used for the figures in Tables 9 to 12, not Tables 13 and 14, which relates to the motorway off ramp

### Shelly Beach Road

Outside of the city centre, Shelly Beach Road is predicted to attract an increase in traffic when comparing the 2026 Do Minimum against the 2026 AWHC Option. This increase is also expected to affect Jervois Road, Curran Street and Sarsfield Road. However, the increase will be limited to the capacity of the Shelly Beach off ramp which is not to be increased as part of the AWHC.

The anticipated traffic flows using Shelly Beach Road reflect the following:

- With the AWHC Option, the morning peak flow is predicted to be 1,220 vehicles per hour (two way), with a daily volume of 12,300 vehicles per day;
- The modelling suggests a drop in the daily traffic volumes using Shelly Beach Road of 2,900 vehicles when comparing the 2008 base with the 2026 Do Minimum;
- With the AWHC Option in place the traffic using Shelly Beach Road is predicted to increase by 1,800 vehicles when compared with the 2008 base and 4,800 vehicles when compared with the 2026 Do Minimum; and
- The morning peak hour flow with the AWHC Option in place is predicted to be very similar to the 2008 base flow.

The issue of flows along Shelly Beach Road is critical to the operation of the proposed southbound bus lane on the AHB. Traffic heading for the off ramp will have to use the bus lane, as the off ramp cannot be easily reached from the central section of the AHB. This means that it is very important that queues do not extend back from Shelly Beach Road to the motorway. Given that there is no change in capacity for the Shelly Beach off ramp there is only a certain volume of traffic able to be delivered to Shelly Beach Road itself. Therefore it is the ability of the Jervois Road/Shelly Beach Road intersection (and maybe the Jervois Road/Ponsonby Road/College Hill intersection) to accommodate the traffic volumes that will determine the level of congestion on Shelly Beach Road.

Accordingly it is recommended that any improvements for Shelly Beach Road are focused around its intersection with Jervois Road.

### Curran Street

The anticipated traffic flows using Curran Street indicate the following:

- With the AWHC Option, the evening peak flow is predicted to be 1,030 vehicles per hour (two way), with a daily volume of 11,400 vehicles per day;
- The modelling suggests a 600 vehicle drop in the daily traffic volumes using Curran Street when comparing the 2008 base with the 2026 Do Minimum; and

– With the AWHC Option in place, the daily traffic using Curran Street is predicted to increase by 1,300 vehicles when compared with the 2008 base and 2,000 vehicles when compared with the 2026 Do Minimum.

The capacity of Curran Street is constrained by the ramp meter on the motorway on ramp and any capacity improvements along the road are unlikely to increase its capacity. Accordingly, no improvements are suggested, particularly as increases in speeds outside Ponsonby Primary school are unlikely to be considered acceptable to the local community.

### Grafton Gully: SH1 North to SH16 Connection

Table 8.1 indicated that significant increases in flows are predicted on Grafton Gully between the 2008 base and the 2026 Do Minimum, mainly as a result of the assumption that the Grafton Gully Stage 3 works will be completed by that date. The majority of this increase relates to increases between both the Southern Motorway and Grafton Gully and the Northwestern Motorway and Grafton Gully.

The SH1 North -SH16 connection into the Grafton Gully area shows a small increase in traffic between the 2008 base and the 2026 Do Minimum. With the AWHC Option the use of this link is expected to be less than that of the 2026 Do Minimum option. Accordingly, no improvements beyond the implementation of Grafton Gully Stage 3 (and possibly Stage 4 if this were to be resurrected) are suggested

### Wellington Street

With the closure of the Wellington Street on ramp with the 2026 AWHC operational there is predicted to be a noticeable drop in westbound traffic using this corridor.

There is predicted to be a significant increase in the daily traffic volumes between the 2008 base and the 2026 Do Minimum, with a 26% increase in traffic. This is likely to be a result of the VPT improvements, resulting in improved capacity for Wellington Street traffic entering the northbound state highway.

However, there is a decrease of almost 600 vehicles in the evening peak period when comparing the 2026 AWHC Option with the 2026 Do Minimum.

Across the day, traffic volumes are anticipated to decrease by 17% when comparing the 2026 AWHC Option with the 2026 Do Minimum.

With the closure of Wellington Street on ramp under the AWHC Option there is the ability to address the walking and cycling environment in this area to improve the connection between the city centre and the surrounding neighbourhood.

### Through Traffic

In the morning peak hour, approximately a half of the traffic currently travelling south over the Bridge enters the CBD (via the Shelly Beach, Fanshawe Street and Cook Street off ramps. Just over 10% uses the SH16 Connections, with almost 40% heading to the Southern Motorway. With the 2026 Do Minimum scenario, these percentages are predicted to be fairly similar, with the SH16 figure increasing from around 11% to 15% and a corresponding decrease in the percentage to the CBD.

## 10.3 North Shore City Streets

Of note within the North Shore is the significant growth in traffic movements on Esmonde Road. However this growth in Esmonde Road traffic is predicted to occur between the 2008 base and the 2026 Do Minimum A 33% increase, or 18,200 vehicles/day is anticipated between these two periods. The increase in traffic predicted to result from the AWHC is approximately 7%, or 4,800 vehicles/day.

Whilst minor increases in traffic movements are predicted on Onewa Road and Akoranga Drive as a result of the AWHC option, it is highlighted that transit lanes operate along both corridors, providing useful demand management measures to increase the number of people moved.

### Esmonde Road

The modelling suggests there will be a minor increase in traffic resulting from the AWHC Option. The increase of approximately 7% increase in the daily traffic volume is likely to have a minor effect. However the modelling suggests a 33%, or 18,200 vehicle increase in traffic between the 2008 base and the 2026 Do Minimum models.

When examining the peak hour increases in the traffic volumes the following points are noted:

- Between 2008 and 2026 Do Minimum, increases of approximately 350 and 750 vehicles per hour are predicted in the morning and evening peak hours, respectively, while a significant increase of over 1,450 vehicles per hour is predicted during the inter peak period; and

- The AWHC Option is predicted to lead to an increase of 1,100 and 700 vehicles per hour in the morning and evening peaks respectively, relative to the 2026 Do Minimum. Increases in the inter peak are predicted to be 200 vehicles.

Any possible changes to the operation of Esmonde Road will need to be implemented prior to the 2026 AWHC Option coming on line, given the significant increase in traffic expected between 2008 and 2026 Do Minimum. These changes could include extensions of the westbound bus lane (eg back to Burns Avenue), plus the possible provision for westbound facilities for HOVs and eastbound bus facilities.

### Akoranga Drive – College Road area

With the AWHC Option allowing traffic to enter the southbound state highway network via a right turn from the Esmonde Interchange, a change in traffic patterns in and around Akoranga Drive, College Road and Sunnybrae Road is expected.

In reviewing the changes in daily traffic volumes it is noted that:

- College Road volumes are predicted to be reasonably constant between the 2026 Do Minimum and the 2026 AWHC Option. There is however a predicted 3,600 vehicle increase in traffic between the 2008 base and 2026 Do Minimum;

- Akoranga Drive shows a minor increase in traffic between the 2026 Do Minimum and 2026 AWHC. This increase is predominantly in the morning peak period, with approximately 360 additional vehicles eastbound during this period. This is likely a result of the AWHC Option allowing vehicles from Akoranga Drive to right turn onto the state highway; and

- Sunnybrae Road shows a 1,700 vehicle increase in the daily traffic when comparing the 2026 Do Minimum with the 2026 AWHC Option. However the 2026 AWHC Option flows are less than the 2008 base, suggesting that Sunnybrae Road will operate in a similar fashion with the 2026 AWHC Option as it does currently.

### Onewa Road

In terms of traffic volumes the corridor is expected to experience the following:

- The eastbound traffic flow is expected to remain unchanged between the 2026 Do Minimum and the 2026 AWHC Option; and

- In the westbound direction the flows are expected to increase by approximately 180 to 280 vehicles per hour during the modelled periods between the 2026 Do Minimum and 2026 AWHC Option. The highest increase of 280 vehicles occurs in the inter peak period.

Council's current recommendations to implement transit lanes in the westbound direction (which are included in the 2026 Do minimum models) will help to encourage traffic management measures, but the model indicates that the AWHC will increase pressure on the intersections of Onewa Road with Queen Street and Lake Road.

# 11.0 Sensitivity Assessment

## 11.1 Sensitivity Tests on Network Capacity

In order to understand the sensitivities of the model with respect to traffic volumes entering the city centre, two sensitivity tests have been undertaken.

- The first test is in response to the issue noted in Section 10.2 above, relating to HOVs being allowed to use the Northern Busway within the Do Minimum Scenario. This has not been allowed for in the results provided to date, but we consider that the additional flows crossing the AHB in the weekday morning peak can reasonably be assumed to form part of the future permitted baseline. Therefore Sensitivity Test 1 relates to allowing HOVs in the Busway within the Do Minimum scenario; and

- The second test is in response to the assumption that the flow onto the future motorway, with the AWHC, is to be significantly constrained by ramp signals at Esmonde Road. Sensitivity Test 2 therefore removes this constraint.

These tests have been undertaken for the morning peak only, and results are summarised at Table 11.1 in terms of the flows able to enter or leave the Auckland CBD.

The table indicates that HOVs on the Busway are likely to increase the flow entering the Auckland CBD by around 600 vehicles in the morning peak (from 4,890 to 5,490 vehicles/hour) for the 2026 Do Minimum scenario.

The table also indicates that the release of the assumed bottleneck at the Esmonde Road on ramp will increase the flow able to enter the CBD by around 800 vehicles/hour with the AWHC option (from 7,230 to 8,030 vehicles/hour).

**Table 11.1: Hourly Traffic Flows on Motorway Connections to/from Auckland CBD during weekday morning peak (vehicles/hour)**

| Road | 2008 Base | 2026 AM Peak Do Min | 2026 AM Peak Sens. Test 1 (Do Min + HOVs) | 2026 AM Peak AWHC | 2026 AM Peak Sens. Test 2 (removing ramp signals at Esmonde Rd) |
|---|---|---|---|---|---|
| **Southbound** | | | | | |
| Shelly Beach (off ramp) | 1,210 | 740 | 910 | 1,220 | 1,450 |
| Fanshawe Street (off ramp) | 2,170 | 1,590 | 1,740 | 2,700 | 3,060 |
| Cook Street (off ramp) | 660 | 1,320 | 1,410 | 1,630 | 1,740 |
| SH1 to Grafton Gully | 330 | 600 | 660 | 560 | 560 |
| SH1 to NW Motorway | 520 | 640 | 770 | 1,120 | 1,220 |
| **Total** | **4,890** | **4,890** | **5,490** | **7,230** | **8,030** |
| **Northbound** | | | | | |
| Grafton Gully to SH1 | 400 | 570 | 570 | 470 | 470 |
| NW Motorway to SH1 | 500 | 880 | 890 | 970 | 970 |
| Wellington/Cook St (on ramp) | 450 | 610 | 620 | 810 | 830 |
| Fanshawe Street (on ramp) | 720 | 590 | 600 | 1,030 | 1,040 |
| Curran Street (on ramp) | 880 | 790 | 790 | 970 | 970 |
| **Total** | **2,950** | **3,440** | **3,470** | **4,250** | **4,280** |

## 11.2 Sensitivity Tests on Growth

The modelled demands used in the SATURN traffic model have been derived from the ART model using a method known as the multiplicative method, whereby the change factors predicted by the ART model (between 2006 and 2026) have been applied to the SATURN flows (from 2008). Table

11.2 compares the daily flows that result from this method with the alternative method known as the additive method. As this name suggests, this additive method takes the differences predicted by the ART model between 2006 and 2026 and adds these to the base SATURN demands.

**Table 11.2: Forecast Daily Traffic Flows (vehicles/day)**

| Road | 2026 Do Minimum: Multiplicative Method | 2026 AWHC Option: Multiplicative Method | 2026 Do Minimum: Additive Method | 2026 AWHC Option: Additive Method |
|---|---|---|---|---|
| Northcote Road (west of interchange) | 28,100 | 27,100 (-1,000) | 26,700 | 26,500 (-200) |
| Esmonde Road (west of Fred Thomas Drive) | 73,200 | 77,900 (+4,700) | 71,200 | 74,500 (+3,300) |
| Akoranga Drive (west of Esmonde Road off ramp) | 16,300 | 17,000 (+700) | 15,200 | 16,500 (+1,300) |
| Sunnybrae Road (north of Northcote Rd) | 13,700 | 15,300 (+1,600) | 13,700 | 15,500 (+1,800) |
| Onewa Road (east of Queen Street) | 46,500 | 50,300 (+3,800) | 46,900 | 46,100 (+800) |
| Shelly Beach Rd (n of Sarsfield St) | 7,600 | 12,300 (+4,700) | 9,700 | 13,300 (+3,600) |
| Curran Street (on ramp) | 9,500 | 11,400 (+1,900) | 9,400 | 11,400 (+2,000) |
| Fanshawe Street (east of Daldy Street) | 28,000 | 32,200 (+4,200) | 29,600 | 32,100 (+2,500) |
| Cook Street (west of Nelson Street) | 8,600 | 24,600 (+16,000) | 8,200 | 22,800 (+14,600) |
| Wellington Street (south of Union Street) | 30,500 | 25,400 (-5,100) | 30,300 | 25,100 (-5,200) |
| Wellesley Street (north of off ramps) | 28,300 | 27,900 (-400) | 27,200 | 26,500 (-700) |
| The Strand (north of Parnell | 20,800 | 19,900 (-900) | 21,100 | 20,400 (-700) |

**Table 11.2: Forecast Daily Traffic Flows (vehicles/day)**

| | | | | |
|---|---|---|---|---|
| Rise) | | | | |
| Parnell Rise (east of The Strand) | 29,200 | 29,500 (+300) | 29,500 | 29,700 (+200) |
| Beach Road (west of The Strand) | 37,400 | 36,800 (-600) | 34,500 | 34,100 (+400) |
| Jervois Rd (east of Shelly Beach Rd) | 11,100 | 12,200 (+1,100) | 11,800 | 12,100 (+300) |
| Grafton Gully (Stanley Street south of Parnell Rise) | 60,400 | 59,400 (-1,000) | 59,300 | 58,400 (-900) |

**Table 11.3: Forecast Weekday Morning Peak Traffic Flows (vehicles/hour)**

| Road | 2026 AM Peak Do Min: Multiplicative Approach | 2026 AM Peak AWHC: Multiplicative Approach | 2026 AM Peak Do Min: Additive Approach | 2026 AM Peak AWHC: Additive Approach |
|---|---|---|---|---|
| Shelly Beach (off ramp) | 740 | 1,220 (+480) | 920 | 1,300 (+380) |
| Fanshawe Street (off ramp) | 1,590 | 2,700 (+1,110) | 1,590 | 2,600 (+1,010) |
| Cook Street (off ramp) | 1,320 | 1,630 (+310) | 1,240 | 1,450 (+210) |
| SH1 to Grafton Gully | 600 | 560 (-40) | 590 | 570 (-20) |
| SH1 to NW Motorway | 640 | 1,120 (+480) | 650 | 1,180 (+530) |
| Total | 4,890 | 7,230 (+2,340) | 4,990 | 7,100 (+2,110) |
| Grafton Gully to SH1 | 570 | 470 (-100) | 590 | 500 (+90) |
| NW Motorway to SH1 | 880 | 970 (+90) | 880 | 940 (+60) |
| Wellington/Cook Street (on ramp) | 610 | 810 (+200) | 620 | 810 (+190) |
| Fanshawe Street (on ramp) | 590 | 1,030 (+440) | 610 | 1,100 (+490) |
| Curran Street (on | 790 | 970 (+180) | 780 | 950 (+170) |

**Table 11.3: Forecast Weekday Morning Peak Traffic Flows (vehicles/hour)**

| Road | 2026 AM Peak Do Min: Multiplicative Approach | 2026 AM Peak AWHC: Multiplicative Approach | 2026 AM Peak Do Min: Additive Approach | 2026 AM Peak AWHC: Additive Approach |
|---|---|---|---|---|
| ramp) | | | | |
| Total | 3,440 | 4,250 (+810) | 3,480 | 4,300 (+820) |

A comparison of the differences between the scenarios without and with the AWHC indicates that the method used for this assessment generally leads to slightly greater differences than the alternative additive method.

# 12.0 Gap Analysis

The gap analysis has focussed on the routes where increase in traffic flows are anticipated, with these increases resulting in the need for further consideration as to how they may be best managed. The relevant existing programmed and planned projects are also highlighted, in line with those reported in Section 5.0. The purpose of the following section is to undertake a gap analysis to identify where additional analysis or investigation will be required. The following sections also comment on the relative merits of corridor improvements and previous studies to understand the limited options available to improve capacity on certain routes

## 12.1 Shelly Beach Road and Curran Street

Shelly Beach Road is a prime example where the surrounding land uses are likely to significantly inhibit the ability to undertaken significant infrastructure works. There could be the opportunity to improve the corridor's capacity by examining the operation of the intersection with Jervois Road. Alternatively, an extension of the morning peak clearway on Shelly Beach Road may provide enough additional stacking capacity to ensure that queues do not extend back to the motorway.

The possibility of creating Shelly Beach Road and Curran Street as a one way pair has been debated, however Flow considers that this would have a detrimental impact on residential and community amenity, particularly with the location of Ponsonby Primary School on Curran Street. The provision of two northbound lanes on Curran Street (as part of a one way pair with Shelly Beach Road) would be likely to create a high speed environment down the hill, which would appear to be unacceptable.

Given the interaction of Shelly Beach Road and Curran Street there is likely to be a need to consider the operation of Jervois Road and the two closely spaced intersections.

## 12.2 Ponsonby Road

The analysis to date suggests that there will not be a significant increase in traffic on this corridor. Ponsonby Road has recently had a reduction in the posted speed limit to 40km/h in recognition of the pedestrian environment along this corridor and in an effort to reduce the number of pedestrian related crashes that have occurred. Given the number of retail, cafe and side road accesses it is difficult to imagine this corridor being able to accommodate a greater level of traffic. It is more likely that changes to the corridor are more likely to constrain traffic movements in an attempt to further improve the pedestrian environment and create more of a "town centre" atmosphere, particularly at its northern end.

## 12.3 Fanshawe Street

A number of options have been recently investigated into improving the operation of Fanshawe Street in order to accommodate the Wynyard Quarter development. The Integrated Transport

Assessment (ITA) in support of the plan change for the quarter examined two "significant" options summarised as:

- Victoria Park Gyratory, consisting of a one way clockwise gyratory option around Victoria Park, including contraflow bus lanes, westbound along Fanshawe Street and eastbound along Victoria Street; and

- Fanshawe Street – Halsey Street grade separation, comprising an underpass which would have allowed through traffic along Fanshawe Street to pass under the Halsey Street intersection.

In terms of their relative merits, the ITA noted the following points:

- The clockwise gyratory offered a solution that may have had some merits in the short to medium term, as the simplified signal phasing at several intersections implied greater capacity. However, it would have diverted large volumes of traffic around Victoria Park, resulting in potentially significant effects from increases in traffic flows along certain legs around the gyratory, and capacity bottlenecks as flows increase, especially at the Halsey Street/Victoria Street and Beaumont Street/Fanshawe Street intersections; and

- The Fanshawe Street Underpass option offered the prospect of additional traffic capacity at the Fanshawe Street/Halsey Street intersection, facilitating certain turn bans at the Fanshawe Street/Beaumont Street intersection. It therefore offered a potential long term solution, although the benefits were significantly constrained by the capacity of the adjacent road network, particularly at the Fanshawe Street/Nelson Street and Halsey Street/Victoria Street intersections. The costs of the Underpass were identified as being substantial and there were adverse effects in terms of urban design issues.

Neither of these options is being pursued further.

There does remain, however, the need to understand the ability for Fanshawe Street to accommodate increased public transport to realise potential of the Northern Busway.

## 12.4 Cook Street

There will be significant changes needs to the Cook Street – Union Street – Sam Wrigley Street area in order to accommodate the AWHC Option. This will have flow on impacts to the surrounding road network, particularly Wellington Street, Nelson Street and Hobson Street.

It is also recognised that this is a key area for ongoing development within the city centre. The Victoria Quarter Depot site is slowly coming to fruition, with resource consent granted, but development slow given the recent recession. This is a significant mixed use development with the potential to generate approximately 1,000 vehicles in the peak hour.

Auckland City Council is also investigating a master plan development for their recent acquisition of the Placemakers site. Details are still at a concept level, but it is understood that development in this area is likely to include open space and retail uses.

The modelling undertaken to date as part of the AWHC option assessment is at a reasonably high level and does not necessarily pick up the intricacies of these various developments. Changes to the roading layout in this area need to consider the impacts on these two developments.

## 12.5 Grafton Road

This corridor has been highlighted as requiring the implementation of Grafton Gully Stage 3 works in order to accommodate the 2026 Do Minimum traffic flows. This is a significant infrastructure project and will require further assessment and funding in order for this upgrade to be completed. Whilst not directly related to the AWHC Option, the upgrade of the Grafton Gully corridor will be required.

## 12.6 Esmonde Road

The Esmonde Road corridor has only recently been upgraded following the completion of the new Esmonde Interchange Upgrade. It is therefore difficult to foresee whether further capacity improvements would be palatable to the local community. It is more likely that further management measures could be introduced to the corridor, such as transit lanes, to improve the "people carrying" capacity of the corridor.

Changes to the operation of Esmonde Road will be required prior to the 2026 AWHC Option coming on line, given the significant increase in traffic expected between 2008 and 2026 Do Minimum. These changes could include extensions of the westbound bus lane (eg back to Burns Avenue), plus the possible provision for westbound facilities for HOVs and eastbound bus facilities.

## 12.7 Onewa Road

Onewa Road is currently being upgraded as outlined in Section 4.3. In addition there are a number of planned works with respect to transit lanes and bus priority measures for this corridor. The Highbury area is also currently progressing through a plan change to allow for future intensification. Any works to the corridor will therefore need to be implemented regardless of the AWHC Option, although the AWHC will increase the need for measures at the intersections of Onewa Road with Queen Street and Lake Road.

## 12.8 Summary of Gap Analysis

The following table provides a summary of the key corridors and recognises the further work that will be required to understand the necessary local road upgrades needed to support the AWHC Option.

**Table 12.1: Gap Analysis**

| Route | Existing Situation | Programmed Projects/ Land Use Changes | Proposed Projects/ Studies to be undertaken | Gaps in Current Knowledge |
|---|---|---|---|---|
| **Cook Street** | Off ramp from SH1.<br>One lane section eastbound between Union Street and Sam Wrigley Street.<br>Three eastbound lanes, two westbound lanes at its intersection with Nelson Street. | Victoria Quarter Depot Site – large scale residential and commercial development.<br>It is understood that Auckland City Council are currently undertaking a master plan for the development of the Placemakers site. This was recently purchased by Council with aspirations of open space and residential development. | Design consideration of impacts of the Cook Street On Ramp construction, particularly with respect to Union Street.<br>Placemakers Master Plan – currently being undertaken by Auckland City Council.<br>Based on suggestion by AWHC Engineering Team, modelling currently assumes Union Street and Sale Street pass over Cook Street ramps (and tie into southern section of Union Street). | Investigate options to accommodate public transport as indicated by the Passenger Transport Network Plan.<br>Investigate options to cater for increased traffic, whilst realising aspirations of Placemakers masterplan development. |
| **Grafton Gully Stage 3** | Stages 1 and 2 of the Grafton Gully project have been completed, with Stage 3 investigations currently delayed. | Not currently in the NLTP but has been assumed to be completed within the 2026 models. | Some indication in 2009 of a joint ACC/NZTA study labelled the Eastern Access Study. It is understood that this study has not been programmed to be undertaken by NZTA or ACC. | Joint study with ACC will be required in order to complete this project in order for its construction prior to AWHC being completed. |
| **Shelly Beach and Curran Street** | Accommodate one lane in each direction<br>Limited capacity at the intersections with Jervois Road<br>Clearway in the morning period on | Nil | Needs to be considered in light of flow-on effects to Jervois Road. | Shelly Beach operational assessment – identify improvements.<br>Consideration of improved pedestrian/cycle |

**Table 12.1: Gap Analysis**

| Route | Existing Situation | Programmed Projects/ Land Use Changes | Proposed Projects/ Studies to be undertaken | Gaps in Current Knowledge |
|---|---|---|---|---|
| | Shelly Beach Road to improve capacity.<br>Predominantly residential, with local school, public pools. | | | facilities to/from AHB given likely increases in traffic volumes.<br>Consideration of bus priority should this corridor need to cater for increased bus traffic.<br>Consideration of the impact on Jervois Street. |
| **Esmonde Road** | Recently completed as part of Esmonde Interchange and Northern Busway construction. | Nil – Council has recently rejected a proposal to change the westbound bus lane into a Transit lane. | Significant increase in traffic and the ability for the corridor to cater for such increases – much of this occurring prior to the AWHC Option coming online. | Proposed demand management techniques to be employed: transit lanes, eastbound bus lanes. |
| **Onewa Road** | The Stage 2 works, and its various phases are currently being undertaken. | Complete the Onewa Road upgrade project as part of NSCC ongoing commitment to improve transport options and reduce traffic congestion around the North Shore. | | Impact of Highbury and associated works in this area.<br>Status of investigated bus priority measures. |
| **Wellington Street** | Provides on ramp connection for northbound traffic. | Placemakers Master Plan | Placemakers Master Plan – currently being undertaken by Auckland City Council. | Impact of Placemakers Master Plan.<br>Improve pedestrian/cycle connections into the city centre with the on ramp removed. |
| **Union Street** | Provides access from Victoria Street through | Placemakers Master Plan | Placemakers Master Plan – currently being | Ability to maintain connections with |

**Table 12.1: Gap Analysis**

| Route | Existing Situation | Programmed Projects/ Land Use Changes | Proposed Projects/ Studies to be undertaken | Gaps in Current Knowledge |
|---|---|---|---|---|
| | to SH1 connections at Hobson-Nelson Streets | | undertaken by Auckland City Council.<br>As noted earlier, modelling currently assumes northern leg of Union Street passes over Cook Street ramps and ties into southern part of Union Street. | AWHC Option.<br>Impact of Placemakers Master Plan. |
| **Fanshawe Street** | Two general traffic lanes in each direction plus bus lanes, plus turning lanes at intersections. | Victoria Park tunnel – change in on and off ramp configuration.<br>Wynyard Quarter proposed intersection works at Fanshawe Street/Beaumont Street and Fanshawe Street/Halsey Street. | | Ability for Fanshawe Street to accommodate increased traffic and increased public transport to realise potential of the Northern Busway. |

# 13.0 Cost Estimates

This section provides very rough order cost estimates of the local roading measures attributable to the AWHC.

The cost to upgrade any section of road will depend on the particular situation at each location. Particular differences in costs per kilometre will vary significantly due to a wide variety of factors, including:

- The width of the road reserve and therefore the extent of land acquisition required;
- The cost of land in a particular area;
- The extent of service relocations;
- The complexity of the perceived transport deficiency and the nature of the upgrade under consideration, which will in turn be influenced by issues such as the land use (or "place" tension); and
- The extent of structures required and engineering complexity (eg due to geotechnical conditions).

This is not intended to be an exhaustive list.

Based on a limited number of recent projects, typical cost ranges were identified for the Regional Arterial Road Plan as follows:

- Cost band 1: $150,000 to $300,000 or more per kilometre for projects which are largely limited to re-marking the carriageway. This cost range was based on cost of around $150,000 per kilometre for the then 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;
- Cost band 2: $4m to $11m or more per kilometre for projects involving widening within existing road reserves to create additional width equivalent to one or two traffic lanes. This range was based on costs of around $4m per kilometre for the proposed widening of Lincoln Road in Waitakere City and $11m per kilometre for the Glenfield Road Widening within the North Shore;
- Cost band 3: $7m to $25m or more per kilometre for projects involving land acquisition and creating additional width equivalent to one or two traffic lanes. This range was based on costs of around $7m per kilometre for a variety of projects within Auckland City and almost $25m per kilometre for the Lake Road (Hauraki Corner to Esmonde Road) and Esmonde Road Widening projects within Takapuna; and

- Cost band 4: More substantial projects, for example those creating multi-lane "boulevards" with parallel service roads, or new or improved roads involving significant grade separation (including the provision of cut and cover or driven tunnels, or flyovers), may cost between $70m and $350m per kilometre. This range was based on costs of around $70m per kilometre for the proposed AMETI project within Auckland and Manukau City and around $350m per kilometre for the SH20 Waterview Extension.

For the purposes of this report the following corridors have been considered and indicative works suggested. This is based on the gap analysis above and would require further investigation to determine feasibility.

## 13.1 Cook Street

The extent of works required for this corridor has yet to be established. The AWHC Project Team has been investigating the necessary upgrades required to Cook Street to accommodate the AWHC Option. However any option will require consultation with council and affected parties, and given the scope of change possible, could see a number of sub-options examined. There is also a need to consider the role Cook Street may play in accommodating increased public transport.

It is recommended that costs for any upgrades to this corridor be referenced from the AWHC Project Team and the cost estimates they have prepared for the project.

## 13.2 Fanshawe Street

Any infrastructure works are likely to be limited to demand management measures, such as additional bus priority measures. It is assumed that such measures would be accommodated within the existing road reserve.

## 13.3 Shelly Beach Road – Curran Street

Any infrastructure works along Shelly Beach Road or Curran Street are likely to be contained within the carriageway. At their respective intersections with Jervois Road there may be scope to improve the capacity of the intersections, noting however that there is likely to limited availability to purchase additional land.

## 13.4 Grafton Gully

Grafton Gully Stage 3 requires the construction of significant infrastructure in order to grade separate The Strand from Beach Road and Parnell Rise. This would also require a number of changes to property access, trenching of The Strand, provision of pedestrian connection and so forth.

Given that this project will be required regardless of the AWHC Option we have not provided a cost estimate for this project.

## 13.5 Esmonde Road

Infrastructure works along Esmonde Road will be required before 2026 irrespective of the AWHC. These are likely to be limited to demand management measures, such as transit lanes. Given that the Esmonde Road Widening project has only recently been completed, it is assumed that further measures would need to be generally accommodated within the existing road reserve.

## 13.6 Summary

The following table provides a summary of the costs to upgrade the local road network to accommodate the AWHC Option. The costs are based on the four cost bands above.

**Table 13.1: Rough Order Cost Estimate**

| Corridor | Length of corridor (m) | Cost Band | Rough Order Cost Estimate |
|---|---|---|---|
| **Fanshawe Street** | 1,000 m | 1 – 2 | $250,000 to $500,000 |
| **Cook Street** | 500 m | 4 | Refer to AWHC Project Team |
| **Shelly Beach Road – Curran Street** | 1,250 m | 1 – 2 | $500,000 to $3m dependant on scope of works |
| **Wellington Street** | 400 m to its intersection with Hepburn St | 1 | $150,000 to $300,000 |
| **Esmonde Road** | 1,000 m | 1 – 2 | $250,000 to $500,000 |

# 14.0 Walking and Cycling Considerations

## 14.1 Walking and Cycling Report

A report on walking and cycling issues associated with the AWHC has been provided separately as part of the Network Plan. That report recommended investigations into the following facilities:

- Improved pedestrian and cycling facilities along Westhaven Drive;
- Pedestrian and cycling facilities along the waterfront connecting Beaumont Street with Quay Street;
- On road cycle lanes on Curran Street and Shelly Beach Road;
- On road cycle lanes on Jervois Road;
- On road cycle lanes on Ponsonby Road;
- Shared pedestrian/cycle facility between Sulphur Beach Road and Onewa Road, with an access to/from the bridge at Sulphur Beach Road, improving Sulphur Beach Road to better accommodate cyclists and pedestrians, at grade crossing of the straight section of the exit to Stafford Road or grade separated crossing of Stafford Road, boardwalks/bridges across wetlands, access across or beneath Onewa Road interchange/Sylvan Road intersection);
- On road cycle lanes on Queen Street;
- On road cycle lanes on Birkenhead Avenue connecting existing facilities on Onewa Road and Glenfield;
- On road cycle lanes on Lake Road and Ocean View Road connecting Onewa Road with existing facilities on Akoranga Drive or alternative route if applicable;
- Off road shared pedestrian/cycle facility between Onewa Road and Esmonde Road; and
- Off road shared pedestrian/cycle facility between Esmonde Road and Northcote Road.

In addition, the Walking and Cycling report stated that connections from the AHB to the local road network will be required.

Consideration is now being given by the Walking and Cycling project team into the potential connections if the walking and cycling facility is provided on a new Bridge.

## 14.2 Implications for Local Roads

The above recommendations have the following implications for the local road network

- Shelly Beach Road is shown to carry significantly higher volumes of traffic with the AWHC Option. This will invariably place pressure on Jervois Road and Ponsonby Road and in turn make it difficult to implement on road cycle lanes if they affect vehicle capacity; and

- Off road shared facilities have been recommended for Esmonde Road. The expected increase in traffic using this corridor supports off road cycle lane facilities. This corridor may be too hostile an environment to expect cyclists to ride on road.

# 15.0 Public Transport

Several of the roads within the study area of the Network Plan are used by buses. This issue is assumed to be explored by the Parsons Brinckerhoff element of the Network Plan, so the following paragraphs concentrate on the bus facilities provided and identification of where buses are or are likely to be held up by general traffic congestion.

## 15.1 Esmonde Road

A westbound bus lane currently exists between west of Burns Avenue and the motorway on ramp. This facility provides an excellent bus priority facility in that it bypasses the slow moving general traffic lane for buses travelling mainly between Takapuna (and also Bayswater) and the Auckland CBD.

Westbound buses are currently held up in traffic congestion if the main traffic queue extends back to Burns Avenue and beyond. Also, there are no eastbound bus facilities and buses can be caught up in congestion that extends back from Lake Road. Conditions for buses can therefore be expected to get worse over time, as a result of the predicted increases in traffic demands along this route.

North Shore City Council has recently rejected a suggestion for the westbound bus lane to be changed into a transit lane.

Solutions to improve conditions for buses following the AWHC Option could include:

- Extension of the westbound bus lane to the Burns Avenue intersection and the provision of bus priority facilities along Burns Avenue (althought his should be pursued irrespective of the AWHC);
- Provision of eastbound bus priority measures; and
- Diversion of some buses between Takapuna and the Akoranga bus station via Anzac Street and Fred Thomas Drive. (This was the intention during the planning of the Busway, but the proposal was changed by the current North Shore Councillors).

## 15.2 Akoranga Drive

Transit lanes have been implemented along Akoranga Drive, operating for southbound traffic during the morning peak period and for northbound traffic during the evening peak period. The volume of buses is fairly modest.

## 15.3 Onewa Road

An eastbound transit lane operates from east of Highbury Corner to west of Lake Road and it is currently being extended eastwards toward the Sylvan Avenue intersection. Also, there is a North Shore City Council project to provide a westbound transit facility, which would operate during the weekday evening peak. The existing eastbound facility is very well used, both by buses and HOVs (defined as vehicles with three or more persons, in this case).

As a result, conditions for buses along Onewa Road should be satisfactory as long as the number of HOVs is not excessive. This issue is likely to require constant monitoring.

## 15.4 Fanshawe Street

Fanshawe Street forms part of the Northern Busway and therefore accommodates high volumes of buses. Bus lanes are provided along the majority of the route, in both directions, although buses are held up at the main intersections along Fanshawe Street (with Beaumont Street, Halsey Street and Nelson Street).

Buses share road space with general traffic at a number of locations, mainly sharing with left turning vehicles. However, the greatest challenges for buses along the route are considered to relate to the capacity of the bus stops, particularly the stop outside the Air New Zealand building.

## 15.5 Cook Street

Parsons Brinckerhoff has suggested that one solution to alleviate problems anticipated to be encountered by buses along Fanshawe Street would be to divert some buses via Cook Street. There are currently no bus facilities along this route (as there are currently no bus services).

## 15.6 Victoria Street

Bus services (including the Link Bus) operate along Victoria Street. There are limited bus facilities and the modelling is indicating significant congestion at the intersections with Beaumont Street, Franklin Road/Union Street and Wellesley Street/Halsey Street by 2026. There could be scope to remove some kerbside parking to improve bus facilities or to undertake localised intersection upgrades to reduce the level of general congestion.

## 15.7 Shelly Beach Road/Curran Street

A low volume of buses currently use Shelly Beach Road and Curran Street and there are no bus priority facilities. The increase in traffic expected on Shelly Beach Road with the project may warrant bus priority at the intersection with Jervois Road.

As noted in Section 10.2, the operation of Shelly Beach Road is critical to the satisfactory operation of the proposed bus lane southbound across the AHB, as part of the AWHC option.

## 15.8 Jervois Road

There is a greater volume of buses using Jervois Road (between Curran Street and College Hill) as the buses using Shelly Beach Road and Curran Street are joined by buses travelling to and from Herne Bay. There are currently only isolated bus priority facilities, such as buses only being allowed to turn right to Ponsonby Road from the second lane in Jervois Road.

Greater levels of bus priority could be provided by the removal of parking.

## 15.9 Ponsonby Road

Bus services including the Link Bus use Ponsonby Road. There are only isolated bus priority measures such as a short southbound bus lane through the Hopetoun Road intersection. The model is predicting that there will be significant congestion at points along this route and conditions for buses could be eased by the removal of parking at peak times or even by remarking a general traffic lane as a bus lane, if this is justified.

# *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; and
- 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 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; and
- Increasing the safety of older New Zealanders.

## *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 NZ Transport Agency. 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.

# 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 ARGS 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.

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;
- Implementing 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 New Zealand Transport Strategy (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 Auckland Transport Plan (ATP) is the Auckland region's ten-year transport planning document, to be viewed in a long-term context. It brings together projects to implement the transport policies of the Government and region, creating a safe, affordable, integrated and sustainable transport system for people and freight in a growing and prosperous Auckland.

The Auckland Transport Plan (ATP) has been prepared by the Auckland Regional Transport Authority (ARTA) as a single, comprehensive transport plan for the region until 2019 and beyond. Outlining priorities and the phasing of projects, the ATP sets out a coordinated programme for the delivery of an integrated, efficient transport system.

The ATP has identified the following five strategic priority areas for focused attention:

- Greater focus on regional arterials;
- Greater focus on safety engineering for streets and roads;

- Optimising the use of the existing transport system to move people and goods;
- Strong focus on transport investments that are supportive of the RGS and integrated transport and land use planning; and
- Completing the key elements of the strategic road, passenger transport, and walking and cycling networks.

## Passenger Transport Network Plan

The implications of the Passenger Transport Network Plan (PTNP) will be discussed in the Parsons Brinkerhoff (PB) passenger transport network plan. It is however noted that Table 5 does identify the role each arterial has within the PTNP.

## Regional Arterial Road Plan (2009)

The Regional Arterial Road Plan (RARP) was published by ARTA in February 2009. The purposes of the Plan are:

- To define the existing and future role and function of regional arterial roads;
- To provide a framework for the integrated management of regional arterial roads, and their interaction with surrounding land uses and other parts of the road network;
- To provide a basis for project prioritisation; and
- To develop a rationale for more appropriate funding for regional arterial roads.

It is noted that roads within Auckland's Central Area were not included in the RARP assessment as it was concluded that the Central Area Access Strategy would deal with the routes to and from the city centre, although reference was made to the role of these corridors.

## Regional Freight Strategy (2006)

In 2006 the ARC produced the Regional Freight Strategy. The strategy promotes the efficient, safe and environmentally sustainable distribution of freight within the Auckland region. It is the result of a collaborative effort with the freight industry and regional partners including the local councils and NZTA (then Transit).

The strategy details the current situation and trends for freight in the region. It then sets out an agreed vision, key objectives, policies, actions and priorities for freight movement, both to address current issues and, over the longer term, deal with the evolving pattern of development across the region.

Congestion is the key issue for the regional freight transport industry and is the main stumbling block to operating efficiency. Congestion imposes significant costs on the freight industry.

The freight strategy forms a sub-strategy of the RLTS and falls within the wider national policy framework. The vision for this strategy is to raise awareness of the importance of freight to the long-term economic, social, cultural and environmental well-being of the region, consistent with RLTS and the NZTS. Freight movement is recognised as an essential contributor to the economic, social and cultural well-being of all Aucklanders.

# Auckland City Council Strategies

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. It is highlighted that this report is still in draft and has not been endorsed by Council.

The 2004 CAAS identified a "targeted cap" in the number of private vehicles entering the city centre, set at a total of 37,000 vehicles in the two hour weekday morning peak period (7 – 9am). With limited road space and increased employment and residential population forecast within our city centre mean greater emphasis on the use of public transport, walking and cycling for people entering the city centre.

We understand as part of the development of the upcoming CBD Transport - Into the Future document, ACC is considering and/or planning the following key proposals that may have some impact on an additional harbour crossing:

- Provide for a complete strategic road network including connections to the port and the new Waitemata Harbour crossing connections;

- Hobson Street – Nelson Street: Hobson Street has been highlighted as a future public transport route, with enhances pedestrian amenity for both routes; and

- Cook Street – it its understood the draft document has some discussions as to the role of Cook Street and the ability to realign the off ramp, make two way, and enhance pedestrian priority. This is likely to be driven by Council's desire to realise the potential of the Placemaker's site which Council has recently acquired.

The issue of bus impacts on city centre streets is an important one for Auckland where there is a high reliance on bus travel to the city centre and surrounding areas. Previous studies of city centre bus corridors have demonstrated that there is limited ability to increase bus volumes particularly on narrow city streets such as Hobson Street.

As the CBD grows, there will be an associated sustained growth in pedestrian activity with a resulting need to improve pedestrian priority at signals and widen footpaths. The impacts of bus movements on urban amenity will become a more critical issue. Completion of the CBD Rail Link will provide the impetus for improving urban amenity through a moderation in the growth of buses that would otherwise have occurred. However, it is likely that there will always be a strong

emphasis placed on improving pedestrian amenity in the CBD and removing traffic from surface streets to support this.

## *Auckland City Council CBD into the Future Strategy (2004)*

The "CBD Into the Future" document is a plan for reshaping and revitalising Aucklands 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 Plan which identifies key actions to drive the Into the Future strategy. The key traffic related comments applicable to the additional harbour crossing within the document include the following:

- Advocate for the early completion of Harbour Bridge to City motorway project; and
- Work with Transit New Zealand to identify new Harbour crossing.

## *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;
- Compact;
- Connected;
- Sustainable;
- Beautiful; and
- Human.

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

## *Passenger Transport Integration Study (2010)*

The implications of the Passenger Transport Integration Study (PTIS) will be discussed in the Parsons Brinkerhoff (PB) passenger transport network plan.

## *Liveable Arterials (2006)*

This guideline outlines how the council has set about identifying and then balancing the many different things being asked of 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 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.

One of the five themes for the masterplan is:

- Waterfront access – creating good transport links to and from the waterfront and improving public access and enjoyment of the waterfront.

The following quotes directly from the Waterfront masterplan, highlighting the role anticipated of the road network around the city centre and its impact on the waterfront.

*"In Auckland City Council's central area access strategy, Quay Street is designated as a greenway distributor road, which recognises the area's special significance and aims to give high priority to pedestrians, cyclists and passenger transport by minimising through traffic. Bus priority is being introduced into many city and city centre streets to improve the efficiency of bus travel.*

*The street network in some parts of the waterfront has been designed to meet the demands of heavy traffic and large vehicles, which can cut off pedestrian access between the waterfront and city centre. Reducing traffic on Quay Street and Fanshawe Street by completing the motorway network will be essential in achieving some of the masterplan's proposals.*

*Two future New Zealand Transport Agency (NZTA) projects being considered could influence the waterfront masterplan. There is potential to remove the existing motorway viaduct that spans Victoria Park and place the motorway underground. This would improve the amenity and use of Victoria Park. The proposal for a third harbour crossing could have an impact of the waterfront depending on its location and form (road vehicle or passenger transport). To minimise any negative impact the masterplan favours a route that allows rail access to Wynyard Quarter and diverts non-CBD vehicle traffic away from the area."*

# North Shore City Council Strategies

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 have 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.

With respect to shortcomings in meeting the transport needs of the North Shore the Strategy identifies the following

- The Northern Motorway and Harbour Bridge are highly congested during the morning and evening peak periods, Saturdays, and special event days
- Access to the Northern Motorway is also congested during peak periods and this greatly hampers movement within the City, especially cross-city movements
- Local traffic congestion, such as access to the commercial and industrial centres, is also widespread during peak periods, including weekends.

## North Shore City Plan (2008)

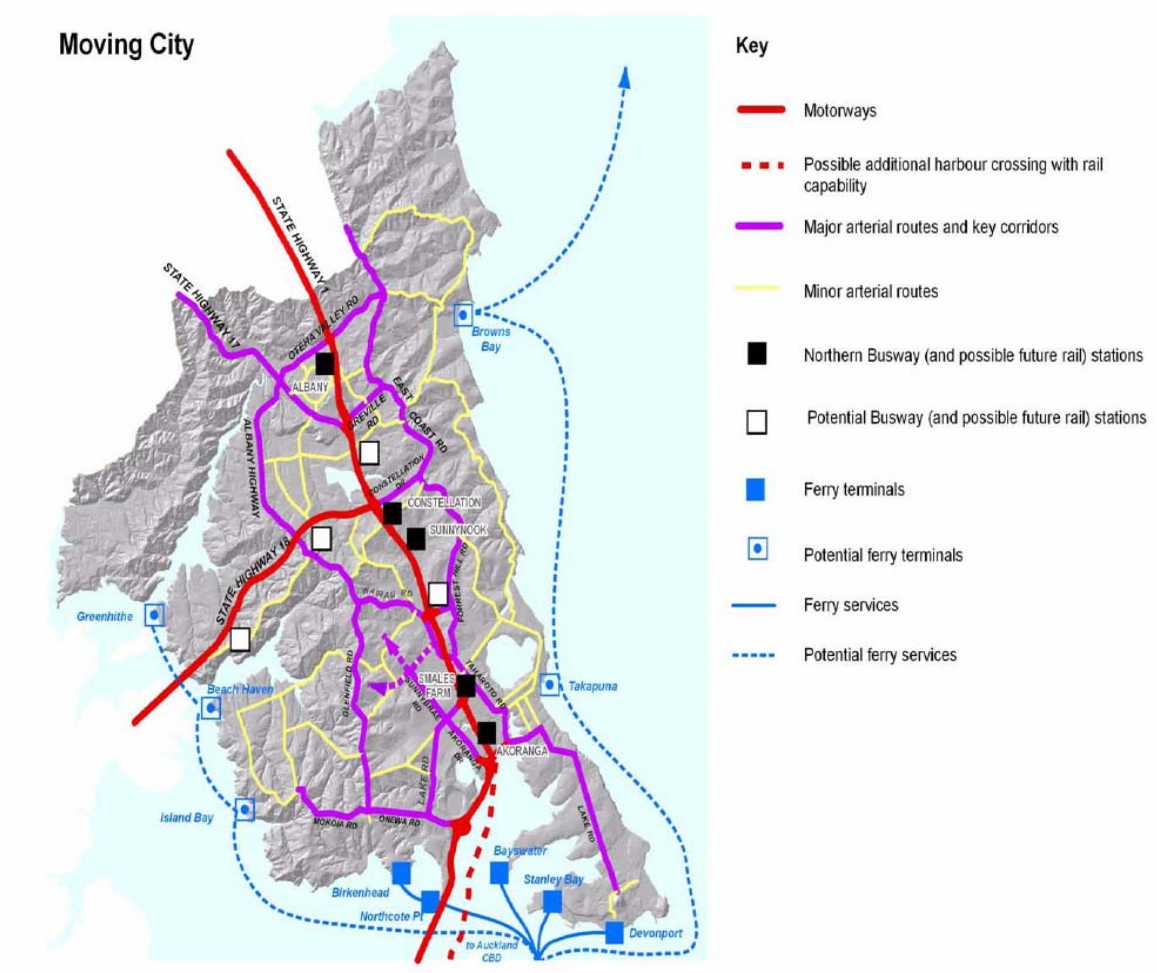
The City Plan is a framework that guides the medium to long term (30-year) change and development of North Shore City in a way that responds to global, regional and local challenges. It replaces the Strategic Plan (2001) and City Blueprint (2001), and describes what the community wants in the form of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

With respect to transportation the City Plan makes the following comments :

*"Together with the Northern Motorway and State Highway 18, the key transport network comprises a 'ladder' of arterial roads based on the main north-south routes of Onewa Road-Glenfield Road-Albany Highway to the west of the City and Wairau Road- Forrest Hill Road-East Coast Road to the east. These north-south corridors are subject to high demand and many sections comprise three*

*lanes or more. Important cross-city connections in the key transport network are Esmonde Road, Wairau Road, Constellation Drive, Rosedale Road and Oteha Valley Road.*

*Nationally and regionally there is a strong commitment to reducing the demand for car travel for sustainability, funding and health reasons. It is also a high priority for the council."*




## *Draft North Shore City Council Key Corridor Strategy*

North Shore City Council has recently been developing a strategic document that was intended to assist in the management of key corridors across North Shore City. The purpose of the North Shore Key Corridors Strategy was to establish an integrated framework for developing and managing transport corridors that best delivers community objectives and goals. This strategy was undertaken with the overarching premise that corridors are an urban space with multiple demands from various road users and adjacent land uses. The strategy was undertaken through the use of independent analysis for the corridors function e.g. landuse, transport, water and then a process of integration of these functions to identify areas of synergies and conflicts

In terms of transport the key corridor strategy identifies the key corridors within the North Shore and categorises them based on traffic characteristics. The three following categories have been assigned to all the assessed corridors in North Shore City:

- Key passenger transport routes;
- Key general transport routes; and
- Other key routes.

From a future planning perspective, an assessment was completed for each function effective within the corridor. This work identified the corridors that are of the highest priority for works, development or investigation of predicted deficiencies for each function e.g. land use and transport. Again these priorities for each function were compared against each in order to identify areas the priorities for each function of the corridor.

# *APPENDIX B*

## *Summary of Areas of Intensification*

# Summary of Areas of Intensification

## Wynyard Quarter

Wynyard Quarter, also known as the tank farm, is a large-scale (35 hectare) reclaimed area close to the central business district. The Quarter is currently part of a Council led plan change to allow significant redevelopment within the 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, accommodation (residential), retail and marine uses, along with public space.

This additional development compares with an existing development figure of over 76,000m2 GFA, set to increase to almost 112,000m2 GFA as a result of known committed developments.

The accessibility of Wynyard Quarter is very constrained, surrounded on three sides by water and Fanshawe Street on its southern boundary. Fanshawe Street is an important regional arterial route. It is one of only three traffic routes between the Auckland Harbour Bridge (AHB) and the Auckland CBD, and is also an important bus route.

As a result, while further development of this prime site can contribute significantly to the growth, prosperity and vitality of the Auckland Region, increased traffic movements along Fanshawe Street could lead to serious congestion issues if these movements are not adequately managed. This causes significant challenges in ensuring the land use mix within the Quarter is correct, as well as providing the necessary mechanisms to encourage residents and workers within the Quarter to use alternative modes of travel.

## Victoria Quarter

The Victoria Quarter within Auckland's CBD is bounded by Hobson, Fanshawe and Union Streets, the motorway, and includes Victoria Park. The aim of the quarter plan is to make the quarter into the CBD's dynamic western fringe, providing a diverse choice of alternative, intensive inner city urban living and working opportunities

The visions and principles that relate to traffic and transportation issues:

- Linking open spaces - a range of new parks, squares and plazas will provide a network of open space stretching from Victoria Park to the core of the CBD. This will require improvements to the amenity and streetscapes of Hobson, Nelson and Fanshawe streets, and the motorway;

- Connecting to the CBD - additional links over the arterial roads, the motorway and through existing large blocks will reconnect the Victoria Quarter and its future residents and workers

with the rest of the CBD and its neighbouring inner city suburbs. Improved passenger transport and pedestrian facilities will provide easy access to the CBD; and

– Improving walkability - the appearance and walkability of the main routes through the Victoria Quarter to the CBD - Nelson, Hobson, Victoria and Wellesley streets - will be improved. While the routes remain important for public and private transport, they will also become people places.

Two of the key transport actions identified in the Quarter Plan are:

– Develop a transport plan for the Victoria Quarter that shows how to meet traffic, passenger transport, pedestrian and car parking needs. This will include reviewing the street environment of Nelson and Hobson streets; and

– Work with Transit New Zealand to complete the harbour bridge to city motorway widening, and confirm the strategy for additional harbour crossings.

## *Learning Quarter*

The Learning Quarter covers the city campuses of The University of Auckland and AUT University. 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 10 years. The partners within the Learning Quarter are the two universities, Auckland City Council and the Committee for Auckland.

Both universities have prepared master plans to highlight the future growth within their respective campuses. Whilst the master plans are long term proposals they do give an indication of the development possibilities in the Learning Quarter. Both universities are focused on promoting sustainable travel for their students and staff and have worked with ARTA to produce a travel plan for the Learning Quarter outlining current trends (2007) and setting travel targets through to 2016

## *Highbury Centre plan Change*

One of the key roles of the Highbury Centre Plan is to help meet the outcomes set out in the City Blueprint, the Council's response to the Regional Growth Strategy. The City Blueprint (adopted by Council in July 2001) sets a framework for growth and change in North Shore City over the next 20 years.

The Highbury Centre Plan, released in July 2006, was developed with Community input and outlines the Council's vision for Highbury. It includes a number of proposals for the future land use mix, transport, pedestrian and cycle linkages.

## Takapuna

Takapuna is one of only two major growth centres on the North Shore identified in the Regional Growth Strategy (the other being Albany). The modelled scenario for 2021 reflects the City Blueprint vision of an increase of approximately 350 households and 3,300 jobs within Takapuna by 2021.

There are only three routes to/from the Takapuna centre, being Esmonde Road, Taharoto Road and Hurstmere Road. Lake Road could be termed a fourth, but this route only serves Devonport and does not connect to the external road network. The modelling undertakne in assessing the growth of the Takapuna centre indicates that the operation of the three routes serving Takapuna will be as follows:

- The bottlenecks along the Hurstmere Road/Kitchener Road route are beyond Takapuna, at Milford. There are no plans to provide additional capacity through Milford and the intersections at Milford Road and Shakespeare Road are predicted to be operating overcapacity before 2021;

- Conditions have recently improved along Taharoto Road as a result of the completion of the Esmonde Interchange Upgrade, with the provision of additional connections. However, the Taharoto Road/Northcote Road intersection is expected to be overcapacity again before 2021, due to new development in the Smales Farm / Westlake area, and due to the use of this route for increased access to Takapuna; and

- Conditions along Esmonde Road are affected by queues back from the motorway in the morning peak and queues extending back from the Harbour Bridge in the evening peak are expected to become more common place. These queues will affect the ability of vehicles to access the connections to/from Akoranga Drive and the new north facing ramps. Also, the intersection of Esmonde Road / Lake Road will be operating overcapacity in the evening peak before 2021.

## Wairau Valley

North Shore City Council is investigating the future redevelopment of the Wairau Valley area. The Wairau Valley is seen by the Council 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

The need for a strategic-level study of the Wairau Valley industrial area was first signalled in the 2001 City Blueprint[14]. The Blueprint identified the potential benefits of employment intensification

[14] "City Blueprint" (2001), North Shore City Council.

in the Wairau Road corridor and flowing from this, proposed a land use / transport study that would identify the issues involved in redevelopment of the area.

The focus on the Wairau Valley was prompted by a number of inter-locking factors:

- New and proposed regional transport infrastructure that passes through or is likely to affect the Wairau Valley area, including the Northern Busway, and in the future an additional harbour crossing (or crossings) which is (or are) expected to increase roading capacity and to introduce passenger rail, thereby significantly improving the accessibility profile of the area.

The revised 2009 Blueprint (as set out in the 'City Directions' module of the 2009 Long Term Council-Community Plan) has continued to identify the Wairau Valley area as an area for urban redevelopment, and has elevated the longer term importance of the area to the city's future development. The Wairau Valley area, along with the Smales Farm and Akoranga areas to the south, and the Constellation Drive, North Harbour and Rosedale business areas to the north, is seen as being part of a larger economic development corridor that sits in the middle of the city, linking Takapuna with Albany.

# *APPENDIX C*

## *Future Network Changes 2026 and 2041*

## Table C1: Local Roads

| Project | 2026 | 2041 | Comment |
|---|---|---|---|
| SH1 Warkworth-Wellsford expressway | No | Yes | |
| SH1 Puhoi-Warkworth motorway extension | Yes | Yes | |
| SH1 Wainui Interchange | Yes | Yes | |
| SH1-SH18 Rosedale Link | Yes | Yes | |
| SH1 Constellation to Greville 6 laning | Yes | Yes | |
| SH1 Greville Interchange upgrade | Yes | Yes | |
| SH1 widening Northcote to Sunnynook Rd | Yes | Yes | Completed |
| SH1: HOVs on Busway | No | No | Busway assumed to be full by 2041, according to page 91 of RLTS, so HOVs excluded |
| SH1: Truck restrictions on Harbour Bridge | No | No | |
| SH1 Victoria Park Tunnel | Yes | Yes | Under construction |
| SH1 Newmarket Viaduct | Yes | Yes | Under construction |
| SH1 widening Main-Ellerslie to Greenlane 4 lanes northbound | Yes | Yes | |
| SH1 Papakura Interchange improvements | Yes | Yes | |
| SH1 widening Hill Rd to Hingaia Rd | | | |
| SH16 Grafton Gully Stage 3 | Yes | Yes | |
| SH16 widening Waterview to Rosebank | Yes | Yes | |
| SH16 widening Rosebank to Te Atatu 8 laning | Yes | Yes | |
| SH16 widening Te Atatu to Royal Road 6 laning | Yes | Yes | |
| SH16 Te Atatu junction Improvements | Yes | Yes | |
| SH16 Brigham Creek Extension | Yes | Yes | Under construction |
| SH20 Manukau Extension | Yes | Yes | Under construction |
| SH20 Manukau Harbour Crossing | Yes | Yes | Under construction |
| SH20 Waterview Extension | Yes | Yes | |
| SH20 A Kirkbride Interchange | Yes | Yes | |
| SH20 B widening | Yes | Yes | |
| South Western to East Tamaki Stage 1 | Yes | Yes | |
| South Western to East Tamaki Stage 2 | No | Yes | |