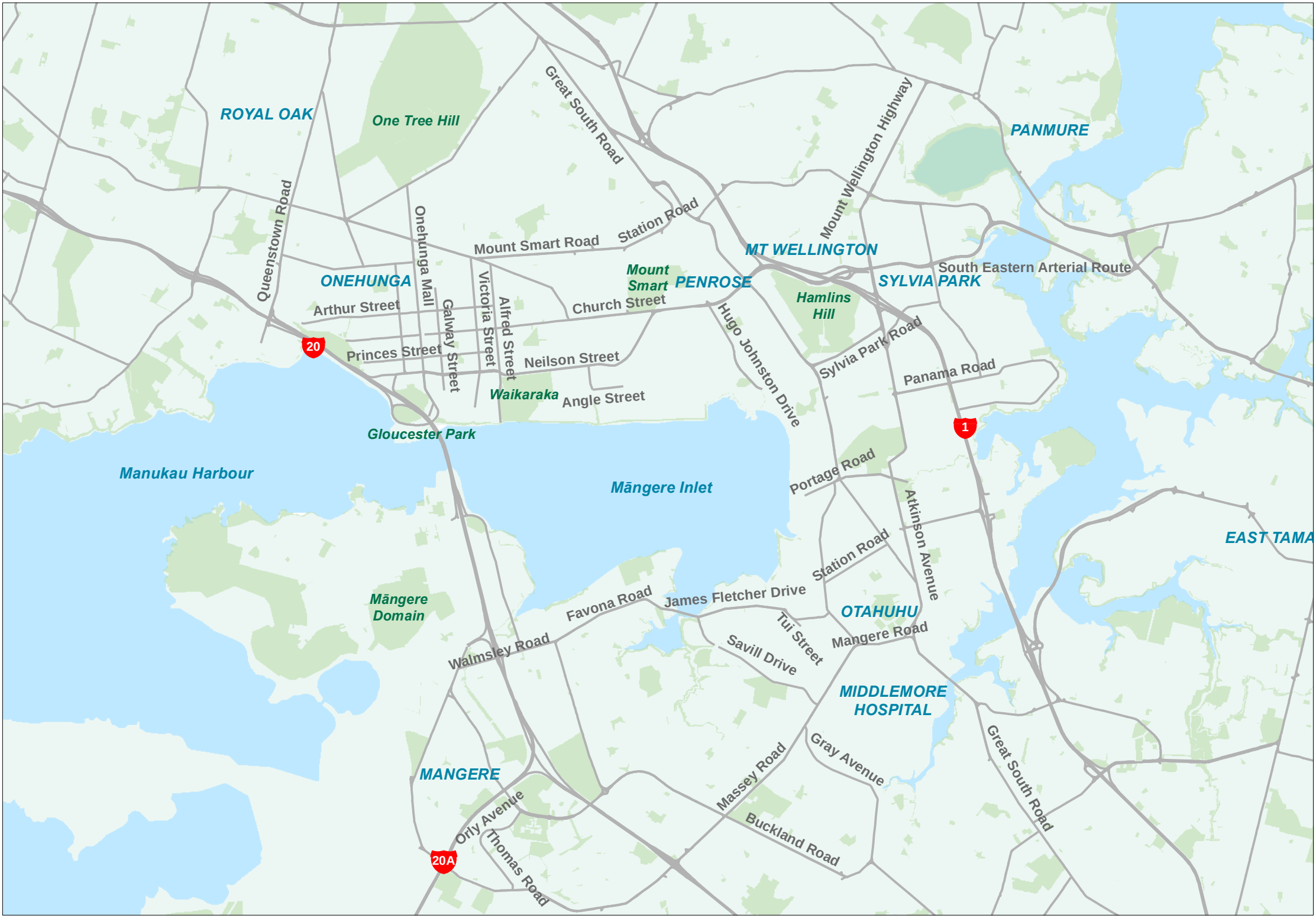
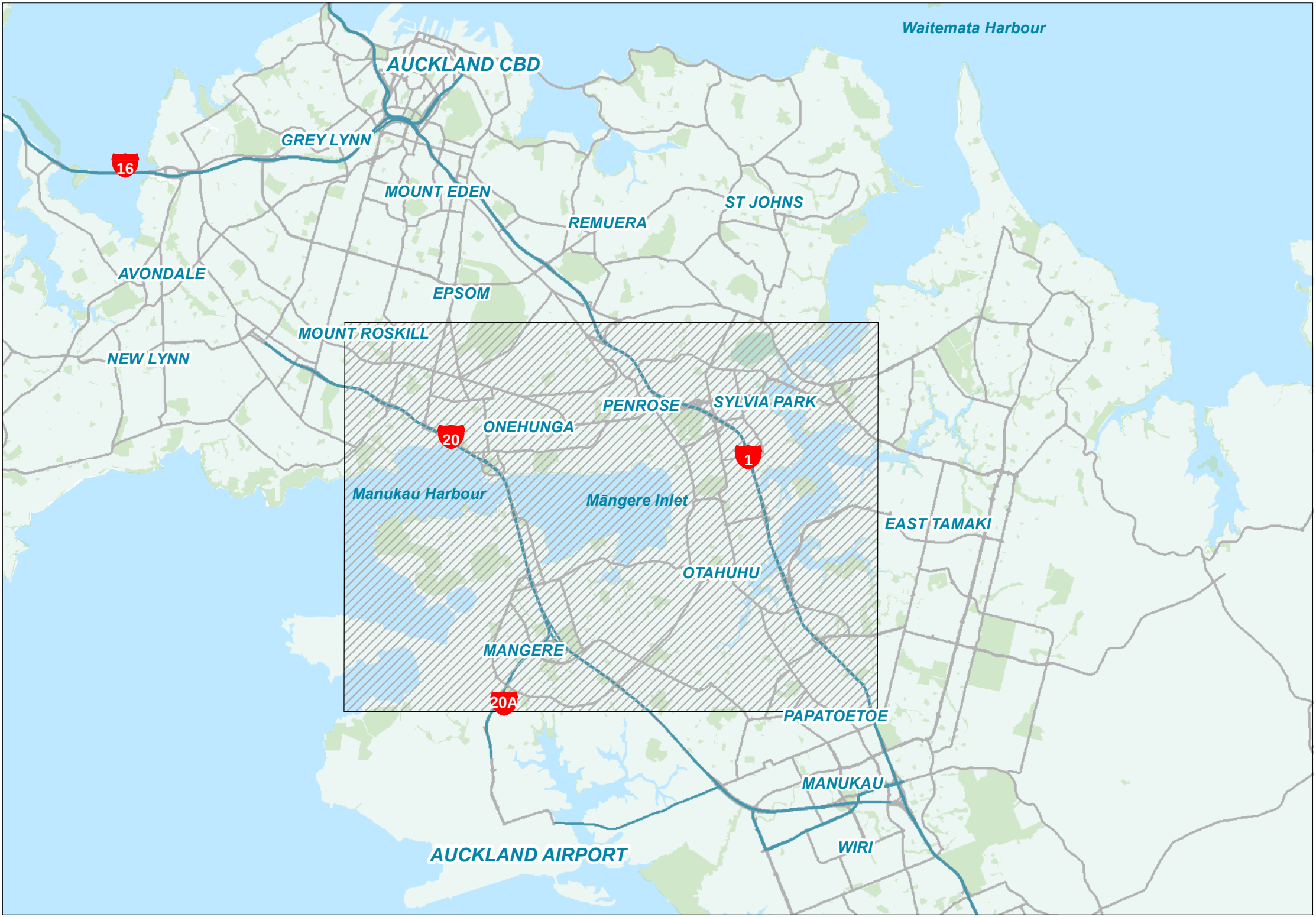
Appendix A

Maps of Area with Street Names


ROYAL OAK
One Tree Hill
Great South Road
PANMURE
Mount Wellington Highway
Queenstown Road
Onehunga Mall
Victoria Street
Alfred Street
Galway Street
Mount Smart Road
Station Road
MT WELLINGTON
ONEHUNGA
Mount Smart
PENROSE
SYLVIA PARK
South Eastern Arterial Route
Arthur Street
Church Street
Hamlins Hill
Hugo Johnston Drive
Princes Street
Neilson Street
Sylvia Park Road
Panama Road
20
Waikaraka
Angle Street
Gloucester Park
1
Manukau Harbour
Māngere Inlet
Portage Road
Atkinson Avenue
EAST TAMA
Station Road
Māngere Domain
Favona Road
James Fletcher Drive
OTAHUHU
Tui Street
Mangere Road
Walmsley Road
Savill Drive
MIDDLEMORE HOSPITAL
Gray Avenue
Great South Road
MANGERE
Massey Road
Orly Avenue
Buckland Road
20A
Thomas Road


Waitemata Harbour
AUCKLAND CBD
GREY LYNN
16
MOUNT EDEN
ST JOHNS
REMUERA
AVONDALE
EPSOM
MOUNT ROSKILL
NEW LYNN
PENROSE
SYLVIA PARK
20
ONEHUNGA
1
Manukau Harbour
Māngere Inlet
EAST TAMAKI
OTAHUHU
MANGERE
20A
PAPATOETOE
MANUKAU
WIRI
AUCKLAND AIRPORT

Appendix B

Strategic Case

1. Introduction

The East West Link (EWL) is a balanced, multi-modal transport programme including road, rail, bus, walking and cycling investments, planned for the area of Auckland between Penrose, Onehunga, the Airport and East Tamaki.

A Strategic Case was approved during 2013 following the development of an Investment Logic Map that articulates the problems and benefits.

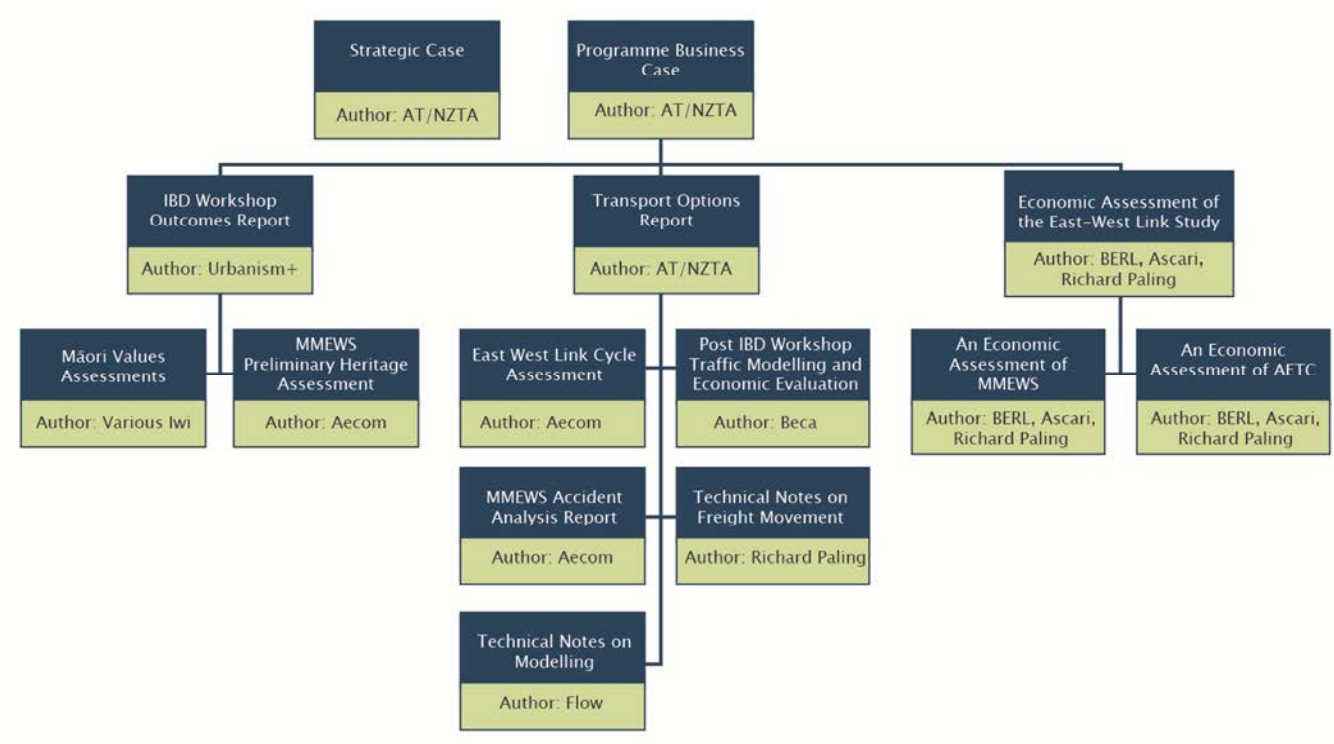
Part A of this business case briefly revisits the strategic case and reconfirms the case for investment following extensive evidence collection and analysis to support the programme development.

Part B discusses the development of the EWL programme, the recommended programme and its financial case.

This programme business case is supported by the following key documents:

- Strategic Case – Multi Modal East West Solution, March 2013 – Auckland Transport, Council and the Transport Agency
- An Economic Assessment of the East West Link Study Area, 25 October 2013 –Ascari, Berl, Richard paling Consulting.
- East West Link Transport Options Report, March 2014 – Auckland Transport and the Transport Agency
- East West Link: IBD Workshop Outcomes Report; December 2013 – Urbanism+
- East West Link: Post IBD Workshop Traffic Modelling and Economic Evaluation Report, March 2014 – Beca

Their relationship with the business case and each other is illustrated in the diagram below:



Partners and Key Stakeholders

Auckland Transport and the Transport Agency are the primary partners in the development of the EWL programme business case. Auckland Council also participated in the development of the programme. Key Stakeholders include mana whenua, Auckland Business Forum, and the four potentially affected Local Boards.

1.2 Project Partners

Auckland Transport and the Transport Agency are jointly leading the development of the EWL study and as such are primary partners in this endeavour.

Auckland Transport

Auckland Transport is responsible for all of the region's transport services (excluding state highways) – from roads and footpaths, to cycling, parking and public transport. Its main tasks are:

- To design, build and maintain Auckland's roads, ferry wharves, cycle ways and walkways.
- Co-ordinate road safety and community transport initiatives such as school travel
- Plan and fund bus, train and ferry services across Auckland.

The principal function of Auckland Transport is to give effect to the Auckland Plan and Auckland Transport is funded to undertake this role by the Auckland Council and the Transport Agency.

NZ Transport Agency

The NZ Transport Agency has the following relevant responsibilities assigned to it through the Land Transport Management Act 2003 (amended 2008):

- Contribute to an effective, efficient and safe land transport system in the public interest;
- Manage the state highway system, including planning, funding, design, supervision, construction and maintenance operation; and,
- Manage funding of the land transport system, including auditing the performance of organisations receiving land transport funding.

The Transport Agency undertakes these responsibilities through the core business functions of:

- Planning the land transport networks;
- Investing in land transport;
- Managing the state highway network; and
- Providing access to and use of the land transport system.

1.3 Key Stakeholders

Auckland Council

The Auckland Council is a territorial authority for Auckland and has, in relation to Auckland, the responsibilities, duties, and powers of a regional council.

The Auckland Council has a shared vision – to be the world's most liveable city. The Auckland Plan (adopted in March 2011) will guide Auckland's future over the next 30 years on issues such as:

- transport and housing shortages
- giving children and young people a better start
- creating more jobs
- protecting the environment.

A number of key stakeholders external to AT, the Transport Agency and Council also have influence on the project outcomes. These organisations and their anticipated role and interest in the project are summarised below:

Local Boards (Howick, Maungakiekie-Tāmaki, Māngere-Ōtāhuhu and Ōtara – Papatoetoe): The Local Boards are part of Auckland Council and have been crucial in providing input into how any proposals and options may impact on the local communities directly affected by the EWL study.

KiwiRail Group (KRG): The current and future operations of Kiwirail's Southdown freight terminal play an important role in the finalisation of the preferred programme.

Port of Auckland: The Port of Auckland is a significant trip generator and a key property owner in the study area.

Port of Tauranga: Port of Tauranga is a key trip generator in the area as owners of the MetroPort inland port (on property leased from KiwiRail), which is centrally located in the study area.

Auckland Business Forum: The business community has identified the improvement of east west connectivity in the study area as one of their highest priority issues and their members made valuable contributions in understanding the nature and scale of the problem, and the potential benefits of investment in the area.

National Road Carriers (NRC): Like the Auckland Business Forum, the NRC has long advocated for improvements to the transport network in the EWL study area, including the provision of a new link between SH1 and SH20. The working knowledge of the day-to-day operation of the transport network, as understood through their collective membership of operators, was highly valuable in understanding the nature and scale of the transport problem, and the potential benefits of investment in the area.

Mana whenua: The investment programme requires new alignment options, and these could be located within areas of cultural and environmental importance to Mana Whenua (Iwi) (for example Manukau Harbour, Tamaki Basin and tupuna maunga-volcanic cones).

2. Strategic Assessment – Outlining the Need for Investment

It is vital for the region's economy that reliable and resilient transport infrastructure is in place to support the on-going growth and expansion of industry and related activities now and into the future.

2.1 Defining the Problem

The EWL is located in a diverse area of Auckland with a very high level of industrial activity, a growing business services sector, significant areas of residential concentration and the international airport. The area has competing interests between industrial, commercial, air passenger and residential growth in an already developed area.

It is vital for the region's economy that reliable and resilient transport infrastructure is in place to support the on-going growth and expansion of industry and related activities now and into the future.

A facilitated Investment Logic Mapping workshop was held with key stakeholders on 8 November 2012 to gain a better understanding of the nature and scale of transport problems affecting the study area. The stakeholder panel[1] participated in workshops to identify and agreed the following three key problems.

Problem 1	Inefficient transport connections increase travel times and constrain the productive potential of Auckland and the upper north island (45%).
Problem 2	A lack of response to changes in industry's supply chain strategies contributes to greater network congestion, unpredictable travel times and increased costs (30%)
Problem 3	The quality of transport choices is inadequate and hinders the development of liveable communities (25%

2.2 The Benefits of Investment

The potential benefits that could be realised through successful investing to address the identified problems were also identified through a facilitated Benefit Mapping workshop held on 26 November 2012. The stakeholder panel identified and agreed the following potential benefits for the proposal, including the relative weighting in brackets which indicates the relative importance of fully realising the benefit:

[1] [1] included senior management from the Transport Agency, AT, Auckland Council as well as, KiwiRail, Port of Tauranga, Employers & Manufacturers Association

Benefit 1	Greater business connectivity (25%).
Benefit 2	Greater economic throughput in and out of the area (20%)
Benefit 3	Greater control over congestion (20%)
Benefit 4	More predictable travel times and lower average travel times (15%)
Benefit 5	Improved safety (10%)
Benefit 6	Improved accessibility (10%)

3. Strategic Context

The Auckland Plan identifies the EWL (in conjunction with AMETI) as one of the three priority projects for Auckland, and expresses a desire to have it implemented by 2021.

3.2 Organisational Outcomes, Impacts and Objectives

The Auckland Plan identifies the EWL (in conjunction with Auckland Manukau Eastern Transport Initiative - AMETI) as one of the three priority projects for Auckland, alongside the City Rail Link and the additional Waitemata Harbour Crossing.

The Auckland Plan describes the EWL area as having a critical gap in Auckland's transport network. The Plan has indicated a need for greater efficiency of freight movements between the industrial areas within the Onehunga/Penrose area and the surrounding areas.

There are also concerns around the lack of adequate provision of public transport, walking and cycling facilities to enhance the liveability of the area.

3.3 Alignment to Existing Strategies/Organisational Goals

The East West Link programme business case is supported by an extensive array of existing strategic priorities, at both the local and national levels.

Government Policy Statement on Land Transport Funding 2012-2015 (GPS)

The GPS requires both regional and national land transport programmes to prioritise activities that advance economic growth and productivity, value for money and road safety, including specific impacts sought through transport investment. In advancing these priorities the government expects the following impacts to be achieved:

- improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transportation through:

  - improvements in journey time reliability
  - easing of severe congestion
  - more efficient freight supply chains
  - better use of existing transport capacity
- better access to markets, employment and areas that contribute to economic growth
- more transport choices, particularly for those with limited access to a car
- a secure and resilient transport network

NZ Transport Agency

The NZ Transport Agency strategy sets out how the Transport Agency will work across business groups and with our public and private sector partners to ensure that New Zealand's transport activities are appropriately planned, invested in, and regulated to support the country's economic growth, productivity and social wellbeing. In order to achieve the organizational outcomes, the Transport Agency has established the following five key priorities:

1. Putting customers at the heart of our business
2. Making the most of urban network capacity
3. Moving more freight on fewer trucks
4. Safe speeds to reduce deaths and serious injuries
5. Efficient road maintenance investment and delivery

The East West Link programme of investment is focused primarily on improving freight efficiency and effectiveness at the heart of Auckland's urban network,

Auckland Plan

The Auckland Council has developed the Auckland Plan – a spatial plan which sets the strategic direction for Auckland and its communities. The plan integrates social, economic, environmental, and cultural objectives and outlines a high-level development strategy to give direction and enable coherent, coordinated decision-making by Auckland Council and other parties. The Auckland Plan recognises a large part of the study area as a regionally significant employment area.

The Auckland Plan identifies a range of principles for integrated land use and transport planning as set out in Box 13.1, which includes ensuring that long-term land use and activities drive long-term transport functionality, (taking into account the existing and proposed transport network) and that transport investment aligns with growth as envisaged in the Auckland Plan.

Chapter 13 of the Auckland Plan provide strategic direction on how investment in transport should be directed to create better connections and accessibility within Auckland, across New Zealand and to the world. It includes among a set of 5 transport related targets, a specific target to reduce congestion levels on the strategic freight network to at or below the average of 2006-2009 levels by 2021 (average daily speed of 45 km/h). The Plan also includes the following directive:

Directive 13.5

Jointly progress planning for AMETI and the East West Link and implementation by 2021

Auckland Transport – Statement of Intent

In order to align with the strategic direction of the Auckland Plan, Auckland Transport has identified the following overarching outcome: Auckland's transport system is effective, efficient, and safe. Contributing to that outcome are six impacts:

- Better use of transport resources to maximise return on existing assets;
- Increased customer satisfaction with transport infrastructure and services;
- Auckland's transport network moves people and goods efficiently;
- Increased access to a wider range of transport choices;
- Improved safety of Auckland's transport system; and
- Reduced adverse environmental effects from Auckland's transport system.

4. Changes/Updates to the Strategic Case

A number changes to the strategic environment occurred since the completion of the strategic case. This includes: Signing of a Housing Accord between Central Government and Council; Publishing of the Airport Master Plan; Issuing of the Proposed Auckland Unitary Plan; Prime Minister's announcement to back Auckland through the acceleration of transport projects.

These were assessed against the original strategic intent of the programme and have not resulted in the need to adopt / modify the ILM.

4.1 Housing Accord

The Auckland Housing Accord aims to accelerate delivery of housing across Auckland from when the Auckland Unitary Plan was notified on 30 September 2013 to when it becomes operative in about 2016. It's expected that around 39,000 new homes and sections will be consented throughout Auckland during this three year period.

Through the accord, Special Housing Areas (SHAs) are currently being identified for fast-tracked development. Council will put in place special consenting and approval processes and set requirements for affordable housing in these areas.

Three special housing accord areas were identified within this study area:

- **December 2013 announcement**:
    - **George Terrace, Onehunga**: The site on the corner of George Terrace and Church Street, Onehunga is proposed to be developed as new apartment buildings provide for a mix of housing types, along with ground floor commercial retail space. The site is zoned Mixed Use and occupied by several small warehouses, which is close to Onehunga Mall and the revitalised beachfront at the Onehunga Bay Reserve.
- **May 2014 announcement**:
    - **Ōtāhuhu Coastal Strategic Area**: It is intended that some of this area be developed into approximately 1000 new dwellings and sections.

- **Jordan Ave, Onehunga**: It is intended that some of this area be developed into approximately 202 new sections and dwellings.
- **Walmsley Road, Māngere**: It is intended that some of this area be developed into approximately 1,500 new sections and dwellings.

4.2 Airport Master Plan

The Airport has published their vision for the next 30 years. The vision is for the airport to become a hub for travel in Australasia and the Pacific Rim.

The master plan acknowledges the role the airport play in international trade – noting that more than 230,000 tonnes of freight ($13 billion in value) pass through their facilities every year.

Their growth projections signal the number of passengers flying in/out of the airport to double over the next 10 years (to 24 million passengers) and to almost triple over the next 30 years (to 40 million passengers per annum). The daily trips to and from the airport is forecasted to increase from 63,000 today to 140,000 in 2044.

Their 30 year vision, and the growth forecasted in passengers and flights is expected to create approximately 27,000 more jobs.

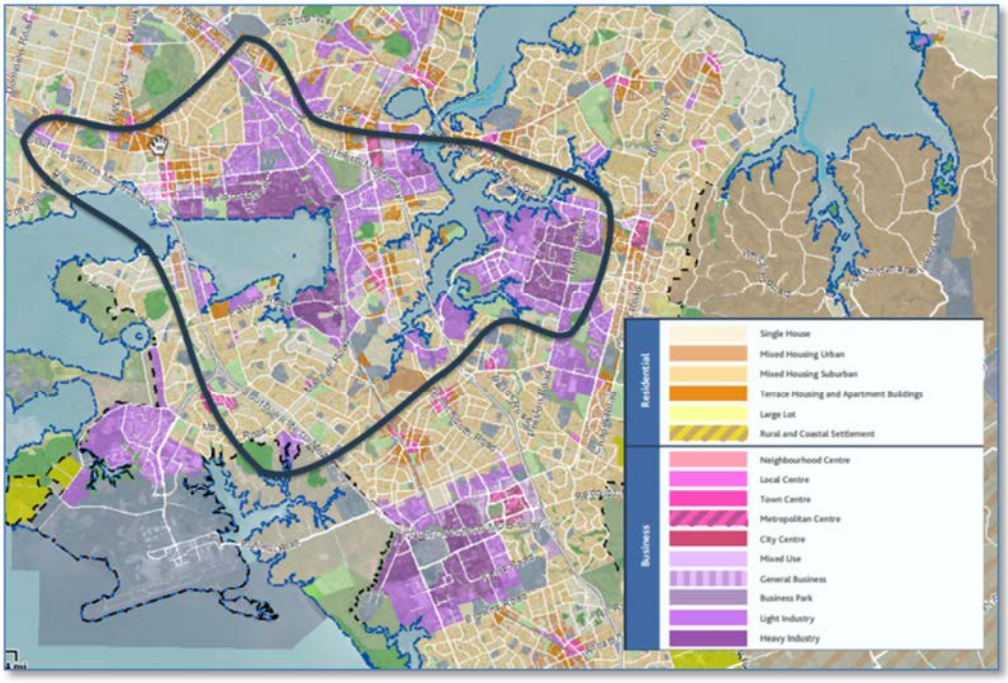
4.3 Proposed Auckland Unitary Plan (PAUP)

The PAUP was published during 2013 with a submission period running from 30 September 2013 to 28 February 2014. The Auckland Unitary Plan will ensure that Auckland can meet its economic and housing growth needs and help its centres meet their real potential, while protecting and enhancing what already makes the region great.

The unitary plan will determine:

- what can be built and where
- how to create a higher quality and more compact Auckland
- how to provide for rural activities
- how to maintain the marine environment.

The PAUP has reconfirmed the land use within the area to retain its focus on heavy and light industrial areas as illustrated in the diagram below.



4.4 Prime Minister – Backing Auckland

The Prime Minister has through his 28 June 2013 speech to Auckland Chamber of Commerce acknowledge the contribution made by industrial and logistics businesses within Onehunga, Mt Wellington and East Tamaki to the Auckland and national economy.

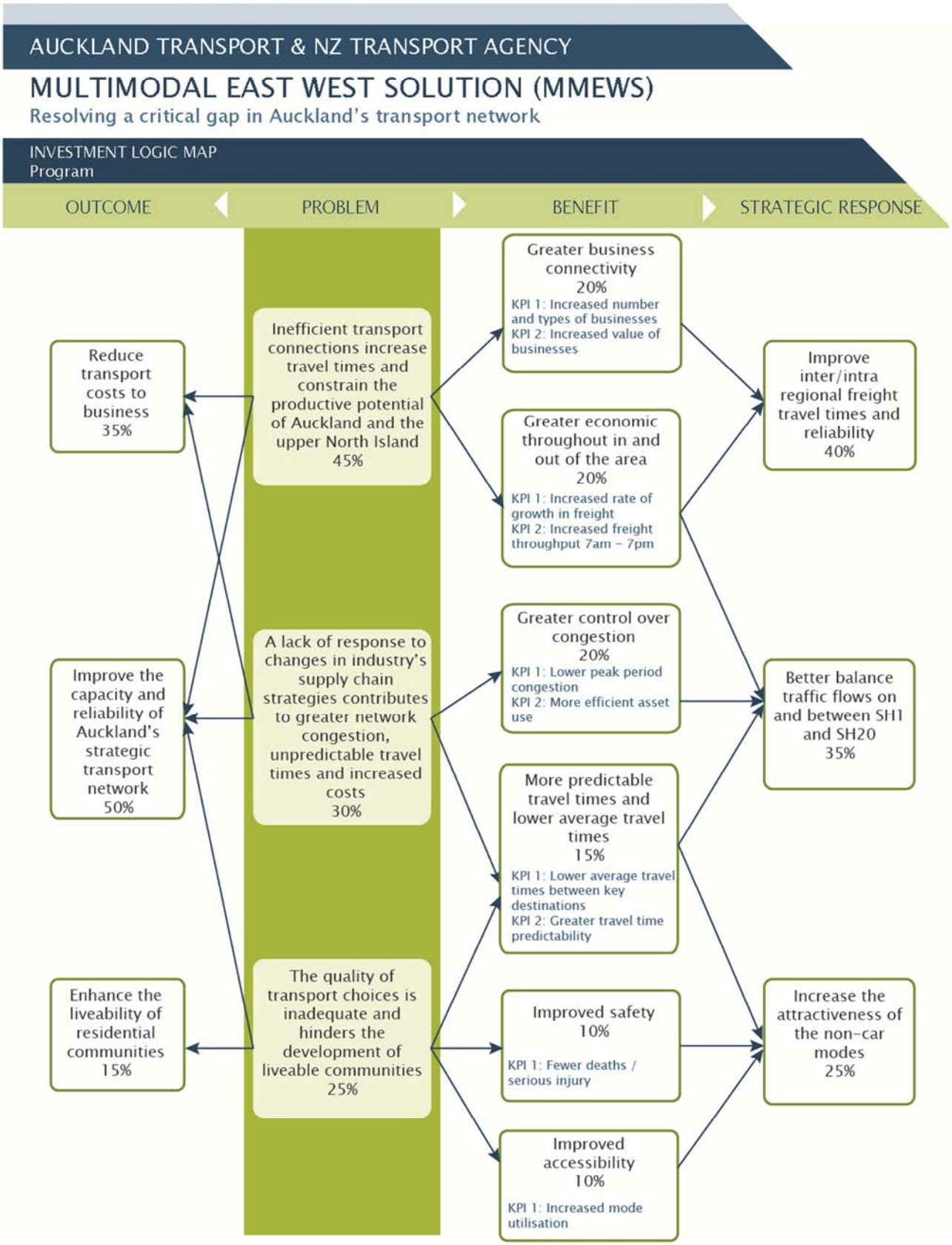
The speech signalled that given the economic importance of the area, delivering the East West Link projects over 20 years is simply not acceptable.

The Government has therefore asked the NZ Transport Agency to inform them which elements of the East-West Link can be accelerated with additional funding.

Appendix C

Investment Logic map (ILM)

Appendix C: Investment Logic map (ILM)



Appendix D

Multi Criteria Analysis – Key Result Areas and Criteria for Assessment

No.	MCA Topic	Key Result Area	Criteria
C1	Performance againts Objectives	To provide reliable freight linkages to the Penrose/Onehunga industrial area	Number of controlled stops between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).
C2		To provide efficient freight linkages to the Penrose/Onehunga industrial area	Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)
C3		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	Daily Volume of non-freight vehicles in Neilson St and Church St
C4		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change in % trucks on key freight and non-freight routes
C5		Support functionality by retaining accessability & to enable growth of town centres by removing conflicts between buses & freight	Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)
C6		To improve accessability to and between Sylvia Park and Mangere by improving passenger transport travel times and reliability	Bus travel times and reliability (Peak vs off peak) on route 32
C7		To enable growth in town centres by improving cycling and walking connections	% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park
C8		To enable growth in town centres by improving cycling and walking connections	Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection
C9		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)
C10		Provide enduring, efficient transport linkages	Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1
C11		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	General traffic travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)
C13		To provide resilient transport linkages to the Penrose/Onehunga industrial area	Provision of additional network choices/reduced reliance on single constrained points in the network
C14		To provide efficient, reliable and enduring transport linkages to the Penrose/Onehunga industrial area and the NIMT	How the constraints between industrial area nd freight terminal are addressed
C15	Cost / Ben	Relative costs of the Options	
C16		Relative Benefits of the options	
C19	Consent ability	Consenting Complexity of Project	Qualititative assessment of the number and nature of consent requirements including the consideration of zoning and Plan objectives and policies.
C20		Consenting Risks (wider consent requirements)	Qualitative assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)
C21	Constr uct- ability	Construction Impact on Businesses	Accessibility to businesses over construciton period
C22		Construction impacts on Utilities and lifeline infrastructure	Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction
C24	Urban Design & Townscape	Connectivity (circulation	The extent of effects on connectivity including disruption to the street network and walkability.
C25		Built Form	The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.
C26		Activities	The extent of effects on surrounding activities, with particular regard to public activities (such as town centres), land use, and character.
C27		Natural Landscape	The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.
C28		Visual Amenity	The extent of effects on visual amenity taking into account the character & visibility of the proposal, & the character of the existing environment, the sensitivity of audiences, & the exp. of future road users
C29		Associative Elements	The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or otherwise contribute to amenity.
C30	Social	Community cohesion	The extent of effects on community cohesion and connectedness.
C31		Open space	The extent of effects on passive and active recreation opportunities in the EWC study area.
C32		Community facilities	The extent of effects on community facilities in the EWC study area.
C34		Viability / productivity of business land areas	The extent of land take and severance of industrial and business land
C35		Community linkages and access to and along the coastal marine area	The extent of effects on linkages to and along the CMA and other mapped / identified linkages
C36	Natural Environment	Air quality	Extent of effects on air quality (airshed)
C37		Water resources	Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)
C38		Water quality	Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).
C39		Ecological resources (terrestrial biodiversity)	Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).
C40		Coastal environment and resources	Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.
C41		Natural character	Extent of effects on natural character based on technical report evaluation.
C42		Outstanding Natural Features & Landscapes	Extent of effects on natural character and outstanding natural features including geological features.
C43	Health	Air shed (human health)	Impact of air borne contaminants on sensitive receivers.
C44		Noise and vibration (human health)	Impact of operational noise and vibration on sensitive receivers.
C45		Contaminated land (human health)	Impact of contaminants from historical land uses (air discharges and groundwater impacts).
C46	Cultural and Heritage	Cultural values	Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.
C47		Customary rights	Extent of effects on areas of protected customary rights.
C48		Archaeological and built heritage	Extent of effects on sites and places of archaeological value, heritage buildings and places.

Appendix E

Detailed Description of Environmental and Social Features

1. Environmental Context

The IBC study area is bound to the west by the Manukau Harbour and the east by the Tamaki River, and is the narrowest part of not only the Auckland Isthmus, but also New Zealand, with a strong history of development and land use. This area includes a multitude of environmental issues and challenges that will need to be considered for any transport option. It should be noted that a full assessment of the environmental context has not been undertaken as part of the IBC and that the summarised information in Table E.1 below represents scoping of key matters for each theme rather than a detailed or complete assessment

TABLE E.1: NATURAL ENVIRONMENT FEATURES AND VALUES

Natural environment features and values	Description
Manukau Harbour	The Manukau Harbour is one of the largest inlets on the west coast of New Zealand (after the Kaipara Harbour). While a highly modified coastal environment, the Manukau Harbour retains some elements of natural form and character within its inner reaches. Historically there has been reclamation and landfilling along much of the northern coastline of the Māngere Inlet, resulting in an almost straight profile in the stretch between the Hopua Tuff Ring and Anns Creek. The landfilling activities have resulted in land and water contamination issues in the area. The Onehunga Foreshore area adjacent to (on the southern side) of SH20 west of the tuff ring is in the process of having a new beach and recreational area constructed.
Volcanic Heritage	Volcanic features include the Hopua Tuff Ring (which is a modified explosion crater that has been filled over time, having once been open to the sea), Māngere Mountain, Mount Richmond (Ōtāhuhu) and Mount Smart (Rarotonga). This volcanic heritage is a significant natural feature of Auckland. Lava caves are known to exist in the wider area – including within close proximity to Maungakiekie – One Tree Hill.
Mutukaroa / Hamlins Hill	This naturally formed, non-volcanic hill, is the largest of its kind in the Auckland Isthmus. It is a regional park identified by Auckland Council as a key recreation / open space asset. The area is subject to a current claim (for cultural redress).
Anns Creek	While highly modified by rail infrastructure and historic reclamation, this area is identified as having significant ecological value for salt marsh communities and stormwater management. The coastal margins of the creek are also afforded protection under regional planning documents (Coastal Protection Area 1) 1 – Operative Auckland Coastal Plan). Anns Creek is unique in this corner of the Māngere Inlet insofar as it retains some natural shape and appearance against the modified, reclaimed coastal edge to the west.
Onehunga Lagoon	This land-locked lagoon (Onehunga Bay Reserve) created by the construction of the SH20 causeway is used as a public reserve and stormwater management area. It contains play areas and walking tracks, for example.

Natural environment features and values	Description
Onehunga Aquifer	The Onehunga Aquifer is charged from rainfall soaking through the lava flows of the area and is a drinking water source for the City. There are also a number of industrial users with permits to take water for use.

2. Built form and Heritage Context

The area north of the Manukau Harbour has the following built form and heritage features and values:

TABLE E.2: BUILT FORM AND HERITAGE FEATURES AND VALUES

Built form and heritage issues and values	Description
Onehunga Town Centre	Onehunga developed as a residential and industrial suburb from the mid-1800s and exhibits a fairly regular grid pattern street layout. As a consequence of its long history, the town centre includes a number of heritage buildings and features. These include churches, public buildings and war memorial features. There is also a treatment plant for the Onehunga Aquifer water supply (Watercare).
Port of Onehunga	The Manukau Harbour is one of the largest inlets on the west coast of the country. It includes the Port of Onehunga, an historic port dating back to the 19th century. Its current uses include providing a port terminal for cement shipments. Barriers to port activity include the Harbour depth and the sand bar at the Manukau heads, meaning port activities are somewhat constrained compared to, the deeper Waitemata Harbour. The Aotea Sea Scouts is located to the west of the Port, in an historic timber building extending out over the coastal marine area. It is believed to remain in its original location and celebrated its *100th* birthday in 2011.
Old Māngere Bridge	Constructed in 1914, the Old Māngere Bridge is a notable heritage feature providing pedestrian connection between Māngere Bridge and Onehunga town centre. It is a popular fishing location and provides part of the Waikaraka / Kiwi Esplanade walkway linkage (around the Manukau Harbour).
Penrose	Penrose is an industrial suburb that began to establish with industrial land uses in around the 1920's. It is typified by large lots, large buildings and wide arterial streets.
State Highways	State Highway 20 was built in the 1970's and is continuing to be developed as the Western Ring Route is constructed. State Highway 1 is the key north-south route through Auckland and extends the length of the country.

Appendix E:Detailed Description of Environmental and Social Features

Built form and heritage issues and values	Description
Rail	The main trunk line runs parallel to SH1. The Onehunga branch line and the Southdown spur provide eastern access to Southdown and Onehunga. The recently re-opened Onehunga passenger line has involved construction of new station infrastructure including station buildings and access ramps, which provide good pedestrian linkages into Onehunga Mall. The Anns Creek area is where lines intersect, with the Southdown freight line, main trunk line and eastern passenger line (from Glen Innes-Panmure-Sylvia Park) meeting in this area. The Ōtāhuhu station is located to the South of the project area, with the Middlemore station the next station further south. Middlemore station is notable in that it provides for close access to Middlemore Hospital, Kings College and Ōtāhuhu College.
Waikaraka Park and Cemetary	Waikaraka Park is a stock and saloon car racetrack located on Nielson Street. Historic stone walls and stone gates are part of the complex – the stone walls having been previously relocated and restored as part of road widening works. The park's location in a largely industrial area means it has fewer noise restrictions at night compared with other similar facilities closer to more residential areas. To the rear (south) of the stock car track is the Waikaraka Cemetary which has graves dating back to the early 1900's. The Cemetary is accessed off Alfred Street from Nielson Street.
Transpower Lines	The narrow isthmus of this area has resulted in a confluence of infrastructure. The area includes both 220kV and 110kV overhead lines. The Co-Generation Plant on Hugo Johnston Drive connects to this transmission network. The Māngere – Roskill Transmission Line also provides 110kV lines through the southern part of the study area.
Māngere Town Centre	Māngere is one of the largest suburbs in Auckland, comprising the Māngere Bridge, Māngere Central, Māngere East and Favona areas. This area was largely established between the 1940s to 1960s, though older settlements include Māngere Bridge (developed in the early 1900s). The heritage of the Māngere area is characterised by its horticultural past.[2] The historic Metro Theatre on Massey Road (Māngere East) is one heritage building within the area of FN32. The suburb of Māngere is typified by a street form and layout of circular streets, cul-de-sacs with a few main arterials, as opposed to the more regular grid pattern of the older suburbs of Māngere Bridge and Onehunga.
Sylvia Park	Sylvia Park was originally developed as a defence barracks / storage area. Since 2004 the area has developed as a key business and retail hub, serving the wider eastern and southern suburbs of Auckland. The Auckland Plan identifies this area as a future Metropolitan Centre (alongside Newmarket, Albany and Manukau). The Sylvia Park

[2] Sons of the Soil: Chinese Market Gardeners in New Zealand, Lee L. and Lam R. 2012.

Built form and heritage issues and values	Description
	shopping centre is traversed by the South Eastern Arterial route (SEART), and comprises a large format retail shopping mall with large outdoor parking lots. It is served by a train station, and is a target area for further intensive mixed use development.
Ōtāhuhu	The suburb of Ōtāhuhu is located in the narrowest part of the North Island symbolised by the modern day Portage Road that roughly marks the location of one of three historic portages (discussed further below). Middlemore Hospital is located in Ōtāhuhu and is a significant medical facility for the whole Auckland region and the largest operated by the Counties Manukau District Health Board. It is also part of the Auckland University Medical School. Located in the suburb of Otāhuhu, Kings College is a long established (1896) private college and is located adjacent to Ōtāhuhu College a co-educational state school. Historically, Ōtāhuhu (and also south Penrose) was home to the Southdown and Westfield freezing works which were so located due to their close proximity to the main trunk rail line and the farms of South Auckland. They closed in the late 1980's when they were no longer economic, and have now been redeveloped with industrial, commercial and office land uses. The works were well known for discharging large quantities of untreated effluent into the Māngere Inlet – including in the vicinity of Anns Creek.
Auckland International Airport	The airport precinct is a major development area to the south west of the study area. The study area serves as a through route to and from the airport. The airport is becoming highly diversified with major industrial and commercial development occurring rapidly as it is a highly accessible greenfield location.

3. Cultural Context

When European visitors arrived in the Auckland Isthmus late in the 18th and early in the 19th century there were a large number of Māori settlements around the Manukau Harbour and on the inner reaches of the harbour and Tamaki River. Much like the later European settlements, these settlements would have made use of the rich volcanic soils, the opportunities for defensive positions on the cones and the rich marine resources of the harbour and waterways. Key cultural features, issues and values include:

TABLE E.3: CULTURAL ISSUES AND VALUES

Cultural issues and values	Description
Onehunga Area and Onehunga Bay coastal edge	Archaeological sites are dispersed from the shoreline and up onto the volcanic cones which surround Onehunga. They are evidence of pre-European settlement of this area. There is substantial archaeological evidence of Maori occupation of the area including extensive midden along the coastal edges. Much of the known midden has been modified by development, though there is, somewhat surprisingly, some evidence of very well-preserved midden in the vicinity of Arthur Street.
Mutukaroa/Hamlin's Hill	This settlement is a unique example of an undefended habitation area dated between 1400 and 1700. This area is identified as part of the cultural redress being sought by Ngai Tai Ki Tamaki (Waitangi Tribunal Claim). The site has a rich archaeological record and is covered with archaeological sites and evidence of habitation. Mutukaroa overlooks flat lands where there has been extensive evidence of Māori settlement, including that recorded in archaeological excavations throughout the 1980's prior to the re-development of the old Southdown and Westfield freezing works sites.
Volcanic Field	The Maunga of Auckland form the base of the Ngā Mana Whenua o Tāmaki Makaurau Collective (representing the historical Treaty claims in Tāmaki Makaurau of 13 iwi and hapu). The result of the Collective is the legislative recognition of shared interest in the maunga of Auckland reflected in shared management. In addition, the volcanic lava caves have cultural significance as they were used for hiding from enemies and in some cases burials. There is plenty of evidence of koiwi found in lava caves around Auckland, including in the One Tree Hill-Maungakiekie and Onehunga areas.

Appendix E:Detailed Description of Environmental and Social Features

Cultural issues and values	Description
Portages	There are three portages for moving waka between Tamaki River and the Māngere Inlet (Anns Creek) located in the vicinity of Onehunga and Māngere. These are: • The Karetu Portage – linking Anns Creek with Karetu, south of Panmure Basin. • The Ōtāhuhu portage was the most important in the Tamaki makaurau area because of its central position, and easy gradient. Today it is symbolized by Portage Road which is roughly where it was located. • The Pukaki Portage existed to the south of Ōtāhuhu, from the location of the Middlemore–Grange Golf Course, along Portage Road, Papatoetoe, to the eastern arm of Waokauri Creek.

4. Social Context

The IBC study area is home to a number of established residential communities. To the north of Māngere Inlet these include Onehunga, Oranga, Royal Oak, and Penrose (west of SH1) and Mt Wellington, Sylvia Park and Riverside (east of SH1). To the south of Māngere Inlet, residential communities include Māngere and Māngere Bridge (west of SH20, and Ōtāhuhu, Māngere East and Favona (east of SH20) as well as significant business and industrial land uses. Notable characteristics of the study area, particularly the area that would that would be serviced by the Māngere, Ōtāhuhu and Sylvia Park PT Connections include:

TABLE E.4: SOCIAL ISSUES AND VALUES

Social issues and values	Description
Demographics	The area comprises a relatively youthful population (particularly to the south of Māngere Inlet), a relatively high level of ethnic diversity relative to Auckland as a whole, a relatively low level of prosperity including lower incomes, lower car ownership and higher rates of occupants per household (again, to the south of Māngere Inlet).
Employment and Training opportunities	Despite the proximity to large industrial areas around the fringe of the Māngere Inlet extending eastwards through Penrose and Mt Wellington to East Tamaki, and therefore large employment hubs, there is a relatively high level of unemployment in the population to the south of the Māngere Inlet. There is potential to provide better access to training and employment opportunities for residents of this area.
Community facilities	The significant parks of Rarotonga (Mt Smart), Mutukaroa and Ambury Park, along with the cones of Ōtāhuhu and Māngere Mountain are located within the study area. There are two golf courses adjacent to Middlemore Hospital. The area is served by a number of local primary schools. Major public colleges/secondary schools in the area include Māngere College and Ōtāhuhu College (to the south of Māngere Inlet), and Onehunga High School and One Tree Hill College (to the north of the Inlet). Middlemore Hospital is a major healthcare precinct on the eastern fringe of the study area and is a training hospital as part of the Auckland University Medical School.

Appendix F

2016 Integrated Transport Programme (ITP) Projects Table

Appendix F:2016 Integrated Transport Programme (ITP) Projects Table

Project Definition	2016 Basic Programme	2016 Base Programme
AT Projects		
Manukau City Rail Link (Manukau Station Interchange)	√	√
Murphys Road Bridge Improvements	x	√
Long Bay Ashley Ave Upgrade	X	√
Warkworth SH1 Intersection Improvements	√	√
Half Moon Bay Ferry Terminal Upgrade	X	√
Takanini Station Upgrade	X	√
EMU Procurement	√	√
Point Chevalier Bus Connection	X	√
Mt Albert Road Bus Connection Improvements	√	√
Mt Eden Village	X	√
Ellerslie Town Centre Interchange	X	√
Onehunga Interchange	X	√
Māngere Bridge Bus Connection	X	√
Highland Park Interchange	X	√
Glendene (bus connection improvements)	X	√
Westgate Park and Ride	√	√
Ormiston Road (East of Murphy Road) – Upgrade	X	√
PC 33 Manukau City Centre Implementation	X	√
Ōtāhuhu B/R interchange	√	√
Sarawia St level crossing	√	√
Tiverton/Wolverton Upgrade	√	√
Non – AT Projects		
SH Auckland – Seismic retrofit NZTA ITP	√	√
SH Auckland – HPMV Route NZTA ITP	√	√
SH AKL – Median X'over Gates NZTA ITP	√	√
SH Akl–Mway Wrong way Prevention NZTA ITP	√	√
Ngakoroa Realignment (Passing) NZTA ITP	√	√
Drury–Glenbrook Bay Treatments NZTA ITP	√	√
Akl Harbour Bridge Lighting Upgrade NZTA ITP	√	√
Hill Rd–Bridge Pier Protection NZTA ITP	√	√
Wellsford Walk & Cycle Improvements NZTA ITP	√	√
Alten Rd/St Lukes Lighting Improvements NZTA ITP	√	√

Appendix G

Māngere, Otahuhu, Sylvia Park PT Connections Options – Assessment

Appendix G: Māngere, Otahuhu, Sylvia Park PT Connections Options – Assessment

Long list Options	Description	Advantages	Disadvantages	Proceeds to Short List?	Comments
Option PT1	On-road; Light rail	• High capacity compared to all bus options • No major impact on adjacent properties • Lower constriction cost compared to centre of road and an off-line option	• Higher construction cost compared to an on-road bus option • Higher operating cost compared to all bus options	x	**Does not proceed to short list** • This option is not consistent with Auckland Transport's strategic plans for the corridor
Option PT2	On-road; Bus	• No major impact on adjacent properties • Lowest construction cost compared to all other options	• May require some road widening (within the existing road reserve) • Could increase queue lengths for other road users	√	**Proceeds to short list** • Strongly contributes to the transport objectives and has limited impact on the social, cultural and environmental outcomes
Option PT3	Centre of road; Light rail	• Trams segregated from other road users • High capacity compared to all bus options • Lower cost and modest impact on adjacent properties compared to an off-line option	• Higher construction cost compared to a centre of road bus option • Higher operating cost compared to all bus options • Impacts on Utilities and several notable trees adjacent to the road corridor • Centre of road tram stations less easy to access than roadside bus stops • Will create greater severance between communities located on either side of the road corridor	X	**Does not proceed to short list** • This option is not consistent with Auckland Transport's strategic plans for the corridor

Appendix G: Māngere, Otahuhu, Sylvia Park PT Connections Options – Assessment

Long list Options	Description	Advantages	Disadvantages	Proceeds to Short List?	Comments
Option PT4	Centre of road; Bus	• Buses segregated from other road users • Lower cost and modest impact on adjacent properties compared to an off-line option	• Relatively higher construction and whole of life costs compared to on – road bus option • Impacts on Utilities • Centre of road bus stops less easy to access than roadside bus stops • Will create greater severance between communities located on either side of the road corridor	X	**Does not proceed to short list** • This option contributes well to the transport objectives but is unlikely to provide value for money
Option PT5	New corridor; Light rail	• Trams fully segregated from other road users • High capacity compared to all bus options	• Higher construction cost compared to a new corridor bus option • Higher operating cost compared to all bus options • Significant impact on Utilities • Will create significant severance between communities located on either side of the road corridor	X	**Does not proceed to the short list** • This option is not consistent with Auckland Transport's strategic plans for the corridor
Option PT6	New corridor; Bus	• Buses fully segregated from other road users	• Higher construction cost compared to an on-road bus option • Significant impact on Utilities • Will create significant severance between communities located on either side of the road corridor	X	**Does not proceed to the short list** • This option strongly contributes to the transport objectives but is unlikely to provide value for money

Appendix H

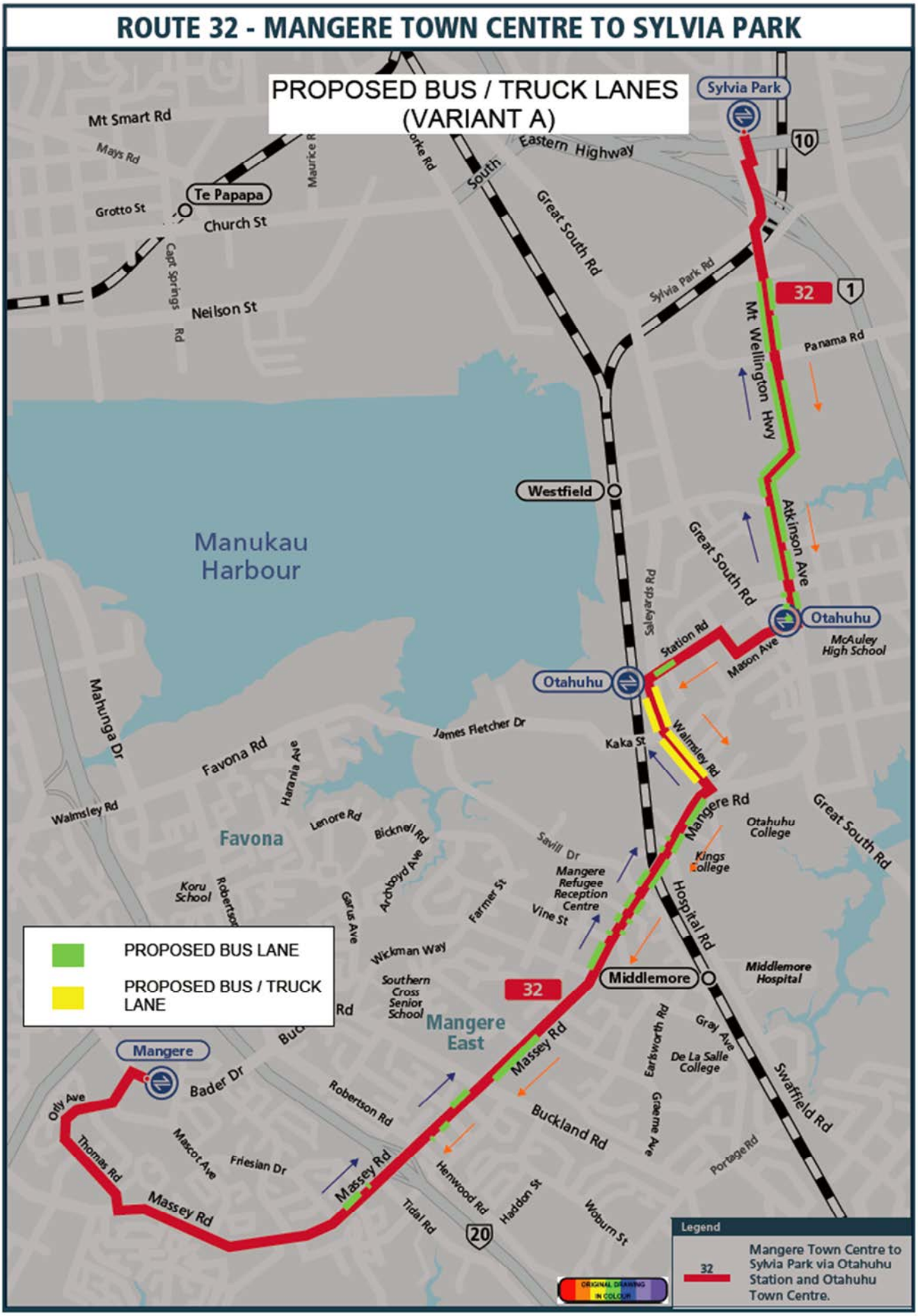
Māngere, Sylvia Park, Ōtāhuhu PT Connections Multi Criteria Analysis Summary

MCA Topic	FN1 On road; Light Rail	FN2 On Road; Bus	FN3 Centre of Road; Light	FN4 Centre of Road; Bus	FN5 New Corridor; Light	FN6 New Corridor; Bus
	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
Transport Benefits	High capacity compared to all bus options	Moderate benefits compared to other options	High capacity compared to all bus options and good segregation of public transport from other road users compared to on road option	Good segregation of public transport from other road users compared to on road option	High capacity compared to all bus options. Segregation of public transport from provate cars, enabling travel times to be high and consistent	Segregation of public transport from provate cars, enabling travel times to be high and consistent
Cost	High cost (>$100m)	Low cost (<$20m)	High cost (>$100m)	Moderately high cost ($20-50m)	High cost (>$100m)	High cost (>$100m)
Consentability	Unlikely to result in significant effects. Some activities could be permitted.	Unlikely to result in significant effects. Some activities could be permitted.	The widening of the road corridor will result in effects on communities (social impacts), notable trees, cultural redress land, the cemetery and heritage sites. The consenting period will involve a number of parties involved in the property acquisition and consent process	The widening of the road corridor will result in effects on communities (social impacts), notable trees, cultural redress land, the cemetery and heritage sites. The consenting period will involve a number of parties involved in the property acquisition and consent process	Off-line options will have significant effects on communities (social impacts), heritage and cultural site and values. The consenting period will be longer than for on road and centre of road options due to the number of parties involved in the property acquisition and consent process	Off-line options will have significant effects on communities (social impacts), heritage and cultural site and values. The consenting period will be longer than for on road and centre of road options due to the number of parties involved in the property acquisition and consent process
Constructability	Likely to have a moderate impact on traffic operations	Likely to have a moderate impact on traffic operations	Likely to have a major impact on traffic operations	Likely to have a major impact on traffic operations	Likely to have a moderate impact on traffic operations on roads adjacent to the corridor	Likely to have a moderate impact on traffic operations on roads adjacent to the corridor
Urban Design & Townscape	Some adverse effects including encroachment into property frontages, some loss of trees, and amenity effects from closer proximity of PT lanes to footpaths and residential properties. There would be opportunities to avoid effects at particular locations by fine-tuning the alignment or design.	Some adverse effects including encroachment into property frontages, some loss of trees, and amenity effects from closer proximity of PT lanes to footpaths and residential properties. There would be opportunities to avoid effects at particular locations by fine-tuning the alignment or design.	Some adverse effects including encroachment into property frontages, some loss of trees, and amenity effects from closer proximity of PT lanes to footpaths and residential properties. There would be limited opportunities to avoid effects at particular locations by fine-tuning the alignment or design.	Some adverse effects including encroachment into property frontages, some loss of trees, and amenity effects from closer proximity of PT lanes to footpaths and residential properties. There would be limited opportunities to avoid effects at particular locations by fine-tuning the alignment or design.	Would require a major intervention into the existing urban fabric including acquisition of properties, removal of buildings, and rebuilding street frontages.	Would require a major intervention into the existing urban fabric including acquisition of properties, removal of buildings, and rebuilding street frontages.
Social	No significant impact, but likely to result in positive accessibility benefits for residents (a high relative proportion who have limited access to private vehicles)	No significant impact, but likely to result in positive accessibility benefits for residents (a high relative proportion who have limited access to private vehicles)	Benefits as for FN1 and FN2, but scale of property impacts could increase severance between communities located on either side of the road corridor and residential take	Benefits as for FN1 and FN2, but scale of property impacts would likely result in residential take and impacts on some road edge community facilities along corridor (potential for design mitigation)	Benefits as for options FN 1 and FN2 (accessibility for residents and improved 'liveability'). However, could create greater severance between communities located on either side of the road corridor and scale of property take likely to impact residents and some community facilities and services along the corridor	**Benefits as for options FN 1 and FN2.** Could create greater severance between communities located on either side of the road corridor and scale of property take likely to impact residents and some community facilities and services along the corridor
Natural Environment	No significant impact	No significant impact	Possible adverse impact on several notable trees, some of which are located directly adjacent to the existing road corridor	Possible adverse impact on several notable trees, some of which are located directly adjacent to the existing road corridor	Adverse impact on several notable trees along the route, some of which are located directly adjacent to the existing road corridor	Adverse impact on several notable trees along the route, some of which are located directly adjacent to the existing road corridor
Public Health	Likely to result in mode shift and therefore reducing traffic generated pollution	Likely to result in mode shift and therefore reducing traffic generated pollution	Potential slight impact on contaminated land, notably in the Mt Wellington area. Mode shift will reduce traffic generated pollution	Potential slight impact on contaminated land, notably in the Mt Wellington area. Mode shift will reduce traffic generated pollution	Could impact on contaminated land, notably in the Mt Wellington area. Mode shift will reduce traffic generated pollution	Could impact on contaminated land, notably in the Mt Wellington area. Mode shift will reduce traffic generated pollution
Cultural and Heritage	Possible adverse impact on Ohahuhu town centre heritage area for works around stations	No major adverse impacts anticipated	Possible adverse impact on Ohahuhu town centre heritage area and several heritage buildings and structures along the route (including churches, halls and other buildings)	Possible adverse impact on several heritage buildings and structures along the route (including churches, halls and other buildings)	May impact on the Ōtāhuhu / Mount Richmond Treaty Redress Area to the west of Atkinson Road and the cemetery located on the corner of Luke Street and Atkinson Avenue. Possible adverse impact on several heritage buildings and structures along the route (including churches, halls and other buildings)	May impact on the Ōtāhuhu / Mount Richmond Treaty Redress Area to the west of Atkinson Road and the cemetery located on the corner of Luke Street and Atkinson Avenue. Possible adverse impact on several heritage buildings and structures along the route (including churches, halls and other buildings)

Appendix I

Māngere, Sylvia Park, Ōtāhuhu PT Connections Route Variant

Appendix I:Māngere, Sylvia Park, Ōtāhuhu PT Connections Route Variants



Appendix I:Māngere, Sylvia Park, Ōtāhuhu PT Connections Route Variants

Appendix I:Māngere, Sylvia Park, Ōtāhuhu PT Connections Route Variants

Appendix J

Onehunga-Penrose Connections Options - Long List Assessment Summary

Appendix J:Onehunga-Penrose Connections Options – Long List Assessment Summary

Long list Options	Description	Advantages	Disadvantages	Comments
Option 1	Existing Route Upgrade with Freight Lanes	• Provides some transport performance improvements (particularly at SH20) • 'Low-moderate' level of complexity for consentability • No major impacts on utilities and lifeline infrastructure • Construction impacts on business and traffic will be minor (comparatively) • Low effects on surrounding public facilities, land use and character and reinforces urban form (including severance issues at Onehunga Mall) • Does not pass through any areas of significant ecological value or coastal marine area • Relatively low cost	• Traffic conflicts (local and strategic) expected at Onehunga Mall and Nielson Street intersection • Traffic conflict with freight lane at Mt Wellington Hwy and Sylvia Park Road • Minor construction impacts related to accessibility to businesses and traffic • Reduces pedestrian/cycle connectivity in Onehunga town centre and between the centre and Māngere • Potential environmental, cultural and heritage effects associated with capacity improvements on SH20 (common to all options) and at the Hopua tuff ring (volcanic feature)	**Proceed to Short List** Option has some transport performance benefits and is a comparatively low investment option

Option 2	Existing Route Upgrade with New SH1 Ramps at SEART	• Provides general traffic and strategic transport performance improvements. • Provides a more direct route to SH1 South • 'Low-moderate' level of complexity for consentability • Relatively low effects on surrounding activities with regards to public activities, land use and character. • Compatible with the industrial land uses in the area • Largely avoids sensitive receptors. • Moderate (to low) cost	• Conflicts at Onehunga Mall / Nielson Street intersection. More traffic on Nielson and Church Streets will increase access conflict and challenges for pedestrian access and town centre outcomes. • Extra traffic attracted to Church Street • Accessibility issues during construction around SEART/Great South Road and adjacent properties between Aranui Road, Mt Wellington Highway and SH • Construction of ramps over Mt Wellington Highway is complex. Challenges at interface with Transpower towers and construction of rail over. • Uncertainty on impacts for viability of business land affected at Sylvia Park • Potential effects on cultural values associated with Te Hopua tuff ring and Hamlins Hill	**Proceed to Short List** Option is a moderate (to low) investment option, with some transport performance benefits (improved access to SH1 for traffic to/from the south). It has comparatively low impacts (similar to Option 1), but increased complexity and impacts for works at Hamlins Hill / SH1.

Option 3	Existing route upgrade to SH20 with new inland route to new SH1 ramps at Mt Wellington	• Transport performance benefits (improved access to SH1 for traffic to/from the south) and some freight movement improvements. • Reduces traffic and conflicts on Mt Wellington Hwy, and Sylvia Park Road intersection • 'Low-moderate' level of complexity for consentability • Improves cycle connectivity Waikaraka to Sylvia Park • Moderate impacts social impacts including SH20 (Onehunga Lagoon and Foreshore). • Does not affect any known archaeological or heritage sites (but along historic foreshore) • Moderate cost	• Conflicts at Onehunga Mall and Nielson Street intersection and on Onehunga Harbour Road. • Construction impact on Transpower pylons at Southdown and SH1/Mt Wellington Highway • Potential construction related traffic disruption around MetroPort area and Sylvia Park Road • Reduces pedestrian/cycle connectivity in Onehunga town centre and between the centre and Māngere • Potential for effects on natural and cultural features including SH20 (Onehunga foreshore), Hopua tuff ring, Anns Creek and coastal foreshore. • Affects foreshore at western end (Southdown) and will require some reclamation / structure. • Uncertain business impacts with land take at Angle Street / Port(s) land.	**Not to proceed** to short list Option has some good transport performance benefits, but challenges for construction and some potentially significant impacts particularly for business land impacts

Option 4	Existing route upgrade to SH20 with new foreshore route to new SH1 ramps at Mt Wellington	• Transport performance benefits (improved access to SH1 for traffic to/from the south) and some freight movement improvements. • Reduces traffic and conflicts on Mt Wellington Hwy, and Sylvia Park Road intersection • Moderate level of complexity for consentability • Compatible with the industrial land uses (reduced industrial land take with foreshore alignment) but some land acquisitions will be needed. • Improves cycle connectivity Waikaraka to Sylvia Park • Moderate impacts social impacts including SH20 (Onehunga Lagoon and Foreshore). • Does not affect any known archaeological or heritage sites. • High relative cost •	• Conflicts at Onehunga Mall / Nielson Street intersection • Moderate level of complexity for consentability • Construction of ramps over Mt Wellington Highway is complex. • Challenges at interface with Transpower towers at Southdown and SH1/Mt Wellington Highway • Acquisition of industrial and residential properties required • Outstanding natural features , natural landscape effects and ecological resources impacted as skirts Anns Creek pohuehue lava flow and potential effects on Te Hopua) • Coastal environment and resources impacted – requires reclamation along the foreshore • Natural character impacted adjacent to the shoreline. • Cultural value impacts (Anns Creek and Manukau Harbour) • Customary rights affected (impacts the foreshore)	**Not to proceed** to short list Option has some good transport performance benefits, but challenges for construction and some potentially significant impacts particularly Anns Creek area

Option 5	Galway St Link to SH20 with new inland route to new SH1 ramps at Mt Wellington	• Provides good transport performance improvements. Less traffic on Church Street, with more on Nielson Street West. • Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potentially improves localised connectivity for pedestrians and cyclists (Onehunga Harbour Road) • Reduces conflict at Onehunga Mall and Neilson Street intersection, compatible with the industrial land uses in the area but some acquisitions will be needed (Galway Street). • Moderate cost • Avoids impact on Waikaraka Walkway, but uncertainty of land requirement from Port	• Conflicts with freight lane at Sylvia Park Road/Mt Wellington Highway • Moderate level of complexity for consenting • Construction over Mt Wellington Highway is complex. Challenges at interface with Transpower towers at Southdown and Carbine Rd • Some acquisition of industrial and residential properties required, including uncertainty on extent of impacts at Metroport / Southdown area (detailed design issue) • Natural landscape effects and ecological resources –borders Anns' Creek (to east). Potential to manage via design solutions. Potential for effects on Hopua tuff ring • Affects the foreshore at the western end and will require some degree of reclamation or structure including potential impacts at Anns Creek, area of Māori value	**Proceed to Short List** Option has some good transport performance benefits, with challenges for construction (Transpower interface)

Option 6	Galway St Link to SH20 with new inland route to existing SH1 ramps at Mt Wellington	• Potentially improves pedestrian and cycle connectivity between Onehunga town centre and Māngere • Limited benefits at SH1 (Mt Wellington) due to conflicts of general traffic and freight • Likely to have some localised connectivity benefits • Compatible with the industrial land uses in the area but some acquisitions will be needed • Comparatively simpler to construct than other options – some challenges at interface with Transpower towers. • Moderate cost	• Provides transport performance improvements, but comparatively less beneficial than other options • Conflicts with freight lane at Sylvia Park Road and Mt Wellington Highway. Increases freight traffic onto SH1 without mitigating this effect by auxiliary lane construction. Conflicts with freight lane at Mt Wellington Hwy and Sylvia park Road • Some potential business disruption impacts around the MetroPort area and uncertain extent of works at Sylvia Park Road (with road upgrade) • Moderate (to low) level of complexity for consenting • Natural landscape effects and ecological resources –borders Anns' Creek (to east). Potential to manage via design solutions. Potential for effects on Hopua tuff ring • Affects the foreshore at the western end and will require some degree of reclamation or structure including potential impacts at Anns Creek, area of Māori value	**Not to proceed** to short list Option has fewer transport performance benefits compared to others and creates conflicts that adversely impact performance at SH1 (Mt Wellington)

Option 7	Galway St Link to SH20 with new Waikaraka/inland route to NEW SH1 ramps at Mt Wellington	• Provides good transport performance improvements. Less traffic on Church Street, with more on Nielson Street West. • Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potentially improves localised connectivity for pedestrians and cyclists (Onehunga Harbour Road) • Reduces conflict at Onehunga Mall and Neilson Street intersection, compatible with the industrial land uses in the area but some acquisitions will be needed (Galway Street). • High cost • Avoids impact on Waikaraka Walkway, but uncertainty of land requirement from Port	• Conflicts with freight lane at Sylvia Park Road/Mt Wellington Highway • Moderate level of complexity for consenting with Transpower lines requiring relocation • Construction over Mt Wellington Highway Highway is complex. Challenges at interface with Transpower towers at Southdown and Carbine Rd • Impacts on Waikaraka Park raise social and heritage impacts and may be difficult to justify compared to Option 5 • Some acquisition of industrial and residential properties required, including uncertainty on extent of impacts at Metroport / Southdown area (detailed design issue) • Natural landscape effects and ecological resources –borders Anns' Creek (to east). Potential to manage via design solutions. Potential for effects on Hopua tuff ring • Affects the foreshore at the western end and will require some degree of reclamation or structure including potential impacts at Anns Creek, area of Māori value	**Not to proceed** to short list Option has positive traffic performance benefits but creates significant impacts on Waikaraka Park public open space area. Consider these impacts hard to justify over Option 5 outcomes

Option 8	Galway St Link to new SH20 Interchange with NEW inland route to new SH1 ramps at Mt Wellington	• Provides for local connections, with a general reduction on rat running • Reduces potential for traffic conflicts on Onehunga Mall/Nielson Street by removing traffic west of Galway St • Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Reduction of through traffic in Onehunga town centre, but some diversion in trips for residents in Onehunga • Potentially improves pedestrian and cycle connectivity between Onehunga town centre and Māngere • May improve linkages to foreshore and Onehunga Harbour Road	• Moderate level of complexity for consenting • Comparatively difficult to construct with diamond interchange at Nielson Street and significant impact on Mt Wellington Highway during grade separation. • Construction impact on business same as for Option 5 • Construction impact on Transpower pylons at Southdown and SH1/Mt Wellington Highway and Neilson Street • Potential impacts of option for works at Hopua tuff ring and foreshore at Onehunga Harbour Road • Natural environment, ecological values and landscape affected at Anns Creek • Potential effects on cultural values associated with Te Hopua, Anns Creek • Ecological resources affected where option crosses a section of Anns Creek • Coastal environment and resources affected as reclamation likely for this option (Onehunga Harbour Road) • High cost	**Proceed to Short List** Option has positive traffic performance benefits and some positive environmental outcome opportunities (e.g. at Onehunga town centre). Potential impacts need to be considered further, with opportunities for mitigation and design development to address.

Option 9	Neilson St route to new SH20 Interchange with NEW inland route to new SH1 ramps at Mt Wellington	• Provides for local connections, with a general reduction on rat running • Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potentially improves pedestrian and cycle connectivity between Onehunga town centre and Māngere • May improve linkages to foreshore and Onehunga Harbour Road	• Increases traffic conflicts on Onehunga Mall/Nielson Street by diverting all traffic through this area • Moderate level of complexity for consenting • Comparatively difficult to construct with diamond interchange at Nielson Street and significant impact on Mt Wellington Highway during grade separation. • Construction impact on business same as for Option 5, but uncertainty on extent of impacts for Onehunga town centre • Construction impact on Transpower pylons at Southdown and SH1/Mt Wellington Highway and Neilson Street • Potential impacts of option for works at Hopua tuff ring and foreshore at Onehunga Harbour Road • Natural environment, ecological values and landscape affected at Anns Creek • Potential effects on cultural values associated with Te Hopua, Anns Creek • Ecological resources affected where option crosses a section of Anns Creek • Coastal environment and resources affected as reclamation likely for this option (Onehunga Harbour Road) • High cost	**Not to proceed** to short list Option similar to Option 8, but with reduced potential for positive outcomes at Onehunga town centre therefore not recommended to proceed to short-list

Option 10	Galway St Link to SH20 with new Rail Corridor route to new SH1 ramps at Mt Wellington	• Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potentially improves pedestrian and cycle connectivity between Onehunga town centre and Māngere • Does not affect known archaeological sites • Comparatively low impact option on natural environment (higher social, land use impacts) • Moderate cost	• Less traffic on Church Street but more on Nielson Street West – with conflict potential at MetroPort • High level of complexity for consenting given conflicts between road and rail on MetroPort and, along with a highly visible interchange at Onehunga Bay • Comparatively difficult to construct with diamond interchange at Nielson Street and connection along and over rail, plus ramps over Mt Wellington Highway. • Construction impact on Transpower pylons at Southdown and SH1/Mt Wellington Highway • Some acquisition of industrial and business properties required • Productivity of business land areas affected with significant land take required through and around MetroPort) • Natural landscape and ecology affected (edge of Anns Creek) • Potential effects on cultural values associated with Te Hopua, Anns Creek • Ecological effects at Anns Creek	**Not to proceed** to short list Option would be difficult to construct. Challenging balancing between space for the road and rail corridors, and industrial land take. Introduces potential for traffic conflict at MetroPort

Option 11	Galway St Link to SH20 with new Rail/Local Corridor route to new SH1 ramps at Mt Wellington	• Reduction in rat running. • Reduction of traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potential to improve pedestrian and cycle connectivity between Onehunga town centre and Māngere • Ecological values less effected • Reduces areas of coastal effects (SH20 only) • Does not affect any identified features or site of cultural value • No identified archaeological and built heritage sites affected	• Moderate level of complexity for consenting • Will have construction impact on businesses (Southdown/Hugo Johnson Dr/Greath South Road) • Some acquisition of industrial and residential properties required with disruptions to operations of MetroPort) • Productivity of business land areas affected significantly at MetroPort and to the east (Great South Road) • Potential natural character effects on Te Hopua • High cost	**Not to proceed** to short list Option would be difficult to construct. Challenging balancing between space for the road and rail corridors, and industrial land take.

Option 12	Galway St Link to SH20 with new inland route to new SH1 ramps near Panamna Road	• Reduction in rat running • Reduces traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Potential to improve pedestrian and cycle connectivity between Onehunga town centre and Māngere • None of the archaeological and built heritage sites affected	• High level of complexity for consenting • Significant construction impact on businesses at Great South Road and Vestry Drive • Construction impact on Vector's high pressure gas designation • Works traverse known contaminated land – reclamation and landfill • Involves construction of a new arterial adjacent to residential properties in Panama Road with associated air quality and acoustic considerations for sensitive receptors • Viaduct across Anns Creek will be a prominent structure • Potential effects on cultural values associated with Te Hopua, Anns Creek, portage area • Coastal environment, cultural values and Natural character affected where crosses Anns Creek • Option traverses residential area at Vesty Road (edge and potential take effects). Extent of ramps on SH1 and impact on school uncertain but potentially adverse. • High cost	**Not to proceed** to short list Option would be difficult to construct and is likely to have significant impacts on the natural and social environment

Option 13	New SH20 Onehunga Interchange with new foreshore route to new SH1 ramps near Panama road	• Reduction in rat running • Reduces traffic and conflicts at Mt Wellington Hwy and Sylvia Park Road intersection • Reduces traffic on Neilson/Onehunga Mall intersection • Improves connectivity of local road network • No identified archaeological and built heritage sites affected	• 'High level of complexity for consenting with significant reclamation involved but with opportunities for mitigation and land acquisition to manage impacts on the sensitive receptors • Significant construction impact on businesses at Great South Road and Vestry Drive • Construction impact on Vector's high pressure gas designation • Construction impact on Transpower's pylons at Neilson Street • Natural landscape affected at Anns Creek • Viaduct across Anns Creek will be a prominent structure • Option traverses residential area at Vesty Road (edge and potential take effects). Extent of ramps on SH1 and impact on school uncertain but potentially adverse. • Potential effects on cultural values associated with Te Hopua, Anns Creek • Ecological resources affected where crosses Anns Creek) • Coastal environment and Natural character affected with reclamation along foreshore • High cost	**Proceed to Short List** Option would be difficult to construct and is likely to have significant impacts on the natural and social environment. Has notable traffic benefits and opportunities for mitigation that would benefit from further investigation

Option 14	New SH20 Onehunga Interchange with new foreshore/Inland route to new SH1 ramps at Mt Wellington	• Provides for grade separated interchanges, plus local connections, with a general reduction on rat running. • Reduced conflicts and traffic on Mt Wellington Highway / Sylvia Park Road intersection. • Reduces traffic on Nielson and Church Streets and on Neilson/Onehunga Mall intersection • Improves connectivity of local road network • Does not affect known archaeological sites, but note potential impacts on Anns Creek and Hopua tuff ring (volcanic heritage).	• High level of complexity for consenting with significant reclamation / structures in CMA involved. • Interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings) • Significant construction impact on businesses at Mt Wellington Hwy and complexity due to impacts on Transpower pylons at Southdown SH1/Mt Wellington Highway and Neilson Street • Interchange will be in a prominent and highly visibility location (Onehunga) • Scale of social and economic impacts at Gloucester Park greater due to scale of interchange and potential impact on recreational land • affect known / listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek areaHigh cost	**Proceed to Short List** Option would be difficult to construct and is likely to have significant impacts on the environment, but delivers high level of transport performance.

Option 15	New SH20 Onehunga Interchange with new full foreshore route to new SH1 ramps at Mt Wellington	• Provides for grade separated interchanges, plus local connections, with a general reduction on rat running. • Reduced conflicts and traffic on Mt Wellington Highway / Sylvia Park Road intersection. • Reduces traffic on Nielson and Church Streets and on Neilson/Onehunga Mall intersection • Improves connectivity of local road network • Does not affect known archaeological sites, but note potential impacts on Anns Creek and Hopua tuff ring (volcanic heritage).	• High level of complexity for consenting with significant reclamation / structures in CMA involved. • Interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings) • Significant construction impact on businesses at Mt Wellington Hwy and complexity due to impacts on Transpower pylons at Southdown SH1/Mt Wellington Highway and Neilson Street • Interchange will be in a prominent and highly visibility location (Onehunga) • Scale of social and economic impacts at Gloucester Park greater due to scale of interchange and potential impact on recreational land • Affects known and/or listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek area • High cost	**Not to proceed** to short list Option would be difficult to construct and consent. It is likely to have significant impacts on the social and natural environment but delivers high level of transport performance. Effects on coastal edge greater than for Option 14 (consider the option effectively subsumed in consideration of mitigation effects for Option 14_

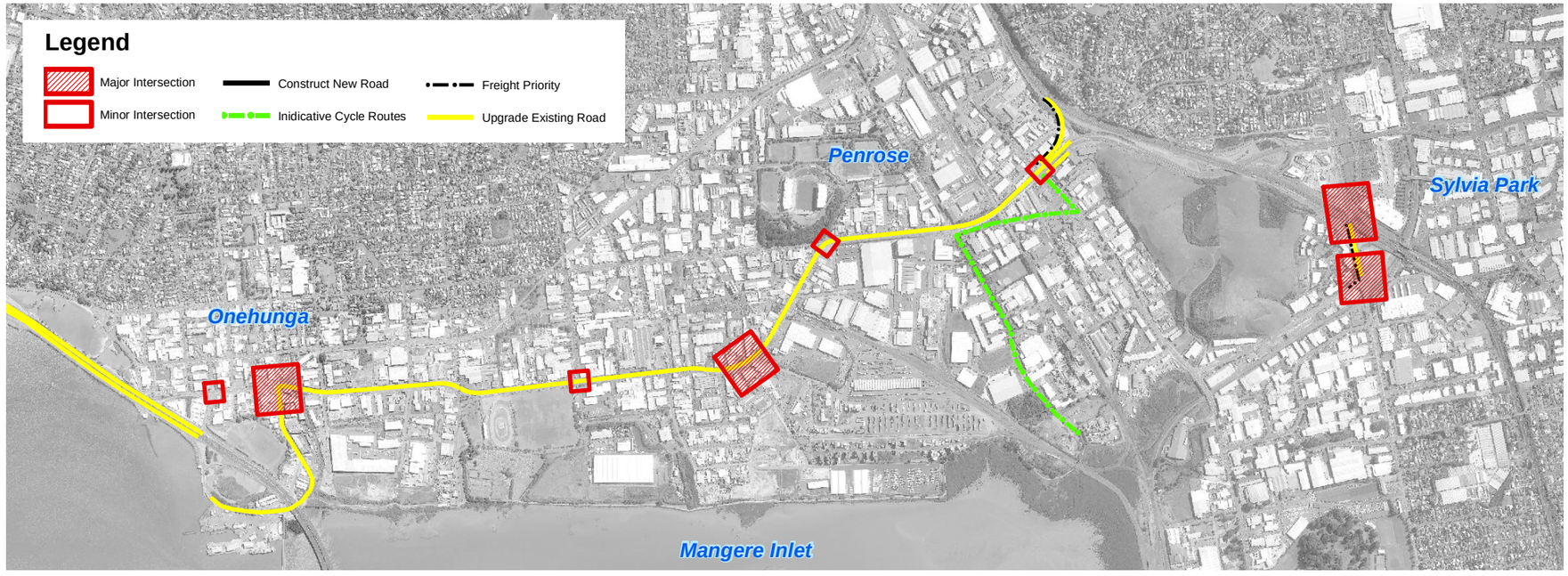
Option 16	New full foreshore Motorway connection SH20 to SH1	• Provides for grade separated interchanges, plus local connections, with a general reduction on rat running. • Reduced conflicts and traffic on Mt Wellington Highway / Sylvia Park Road intersection. • Reduces traffic on Nielson and Church Streets and on Neilson/Onehunga Mall intersection • Improves connectivity of local road network	• High level of complexity for consenting with significant reclamation / structures in CMA involved, including impacts at Gloucester Park / Onehunga. • Interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings) • High level of community interest in option (scale of effects at Onehunga foreshore) • Significant construction impact on businesses at Mt Wellington Hwy and complexity due to impacts on Transpower pylons at Southdown SH1/Mt Wellington Highway and Neilson Street • Interchange will be in a prominent and highly visibility location (Onehunga) • Scale of social and economic impacts at Gloucester Park including likely residential and open space impacts, due to scale of interchange and potential impact on recreational land • Affects known / listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek area	**Not to proceed** to short list Option has good transport performance benefits. However, the scale of improvements at Onehunga interchange significant and environmental impacts considered hard to mitigate. This option would be difficult to consent and construct and is likely to have significant impacts on the natural and social environment.

Appendix K

Onehunga-Penrose Connections Options - Long List Individual Option Assessment

OPTION 1

ONEHUNGA/PENROSE AREA
EXISTING ROUTE UPGRADE WITH FREIGHT LANES



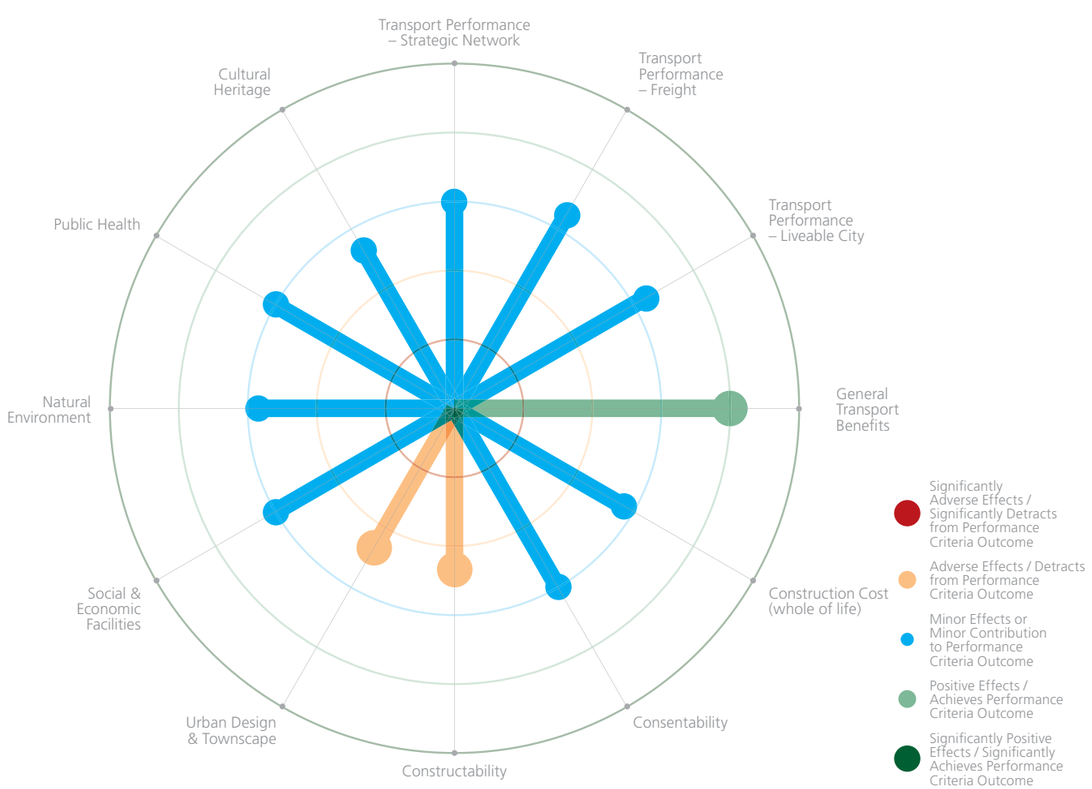
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga
- Improvements to Onehunga Mall / Neilson St intersection (some land take at Onehunga Harbour Rd and Neilson St)
- 4-laning of Neilson St
- Freight priority on SEART northbound to SH1 and Mt Wellington south bound to SH1
- Cycle link from Waikaraka to Sylvia Park through upgrades on existing Rd network.

Assessment Outcome

✓ Option to **proceed to Short-list**

This option is considered a low investment option using existing corridors, with some transport performance benefits (particularly general traffic and to SH20). It has comparatively low impacts. Key potential issue include impacts on Onehunga Lagoon / Foreshore (SH20) and transport / pedestrian conflicts in Onehunga town centre and pedestrian linkage at Onehunga Harbour Rd, as well as degree to which this option addresses the problems identified for the Onehunga Penrose area. These will need to be considered further in the short-list assessment.



Transport Performance

Contributes little to transport performance criteria connecting to SH1, but improvements for connections to and on SH20. Conflicts between through traffic and access traffic on Neilson /Church Sts. Congestion / conflict with freight Ln / general traffic at Mt Wellington and Sylvia Park.

Construction (technical)

Widening works on existing Rd network will have minor adverse impacts on business and traffic.

Consentability

Consenting will be relatively straightforward subject to impacts on the Hopua tuff ring and adjacent coastal marine area.

Cost (design, property and construction)

Comparatively low cost with works limited to Rd upgrades and limited property / land requirement.

Public / Stakeholder Issues

Avoids many features valued by the community but does not address transport issues identified by stakeholders, particularly for businesses

Urban Design & Townscape

Reinforces existing fragmentation of Onehunga town centre through heavy traffic flows and impacts with Onehunga Harbour Rd / Neilson St intersection upgrade. Other adverse impacts similar to existing environment.

Social and Economic Facilities

Adverse impacts of works on SH20 (common to all options) and impacts in the vicinity of the Gloucester Park (interchange). As works largely on existing Rds, other impacts minor.

Public Health

Largely avoids sensitive receptors, and as route on existing corridors only minor changes from existing environment.

Natural Environment

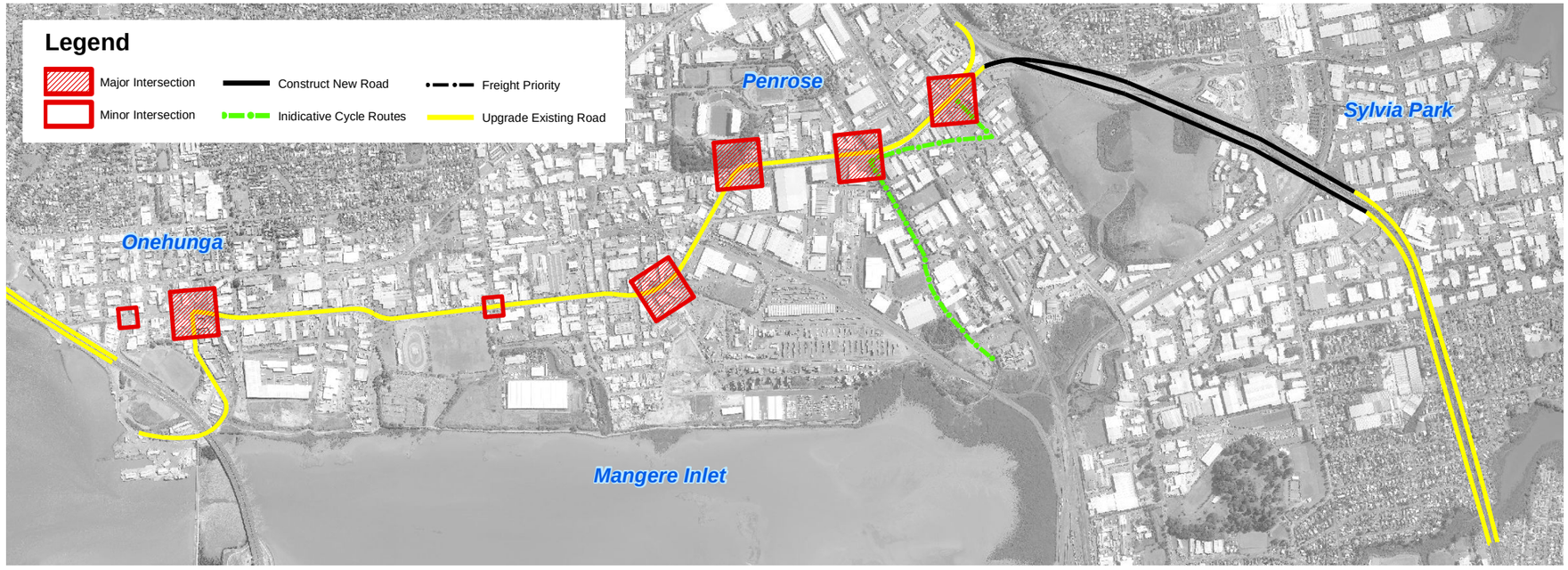
Adverse impacts of works on SH20 (common to all options) and potential for effects on Hopua tuff ring.

Culture / Heritage

Potential for effects on Te Hopua. No known archaeological or heritage sites affected.

OPTION 2

ONEHUNGA/PENROSE AREA
EXISTING ROUTE UPGRADE WITH NEW SH1 RAMPS AT SEART



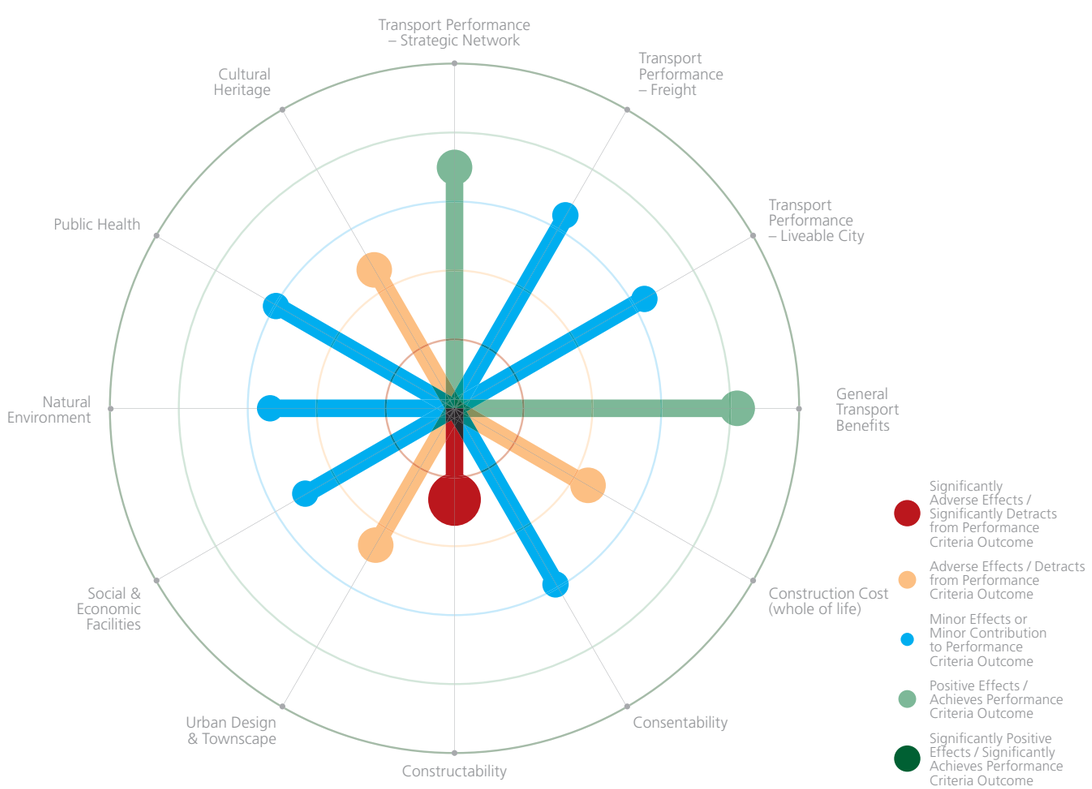
Description

- Capacity improvements to SH20 and improvements to Onehunga Mall / Neilson St intersection (some land take at Onehunga Harbour Rd and Neilson St)
- 4-laning of Neilson St
- Freight priority on Southeastern Highway northbound to SH1
- New ramps at Southeastern Highway / SH1 interchange for traffic to/ from south (land take required along SH1 alongside and potentially including Hamlins Hill land)
- Cycle link from Waikaraka to Sylvia Park through upgrades on existing Rd network.

Assessment Outcome

✓ Option to **proceed to Short-list**

This option is considered a low to moderate investment option in existing corridors, with improved transport connections to both SH20 and SH1. However, the extra traffic attracted to Church/Neilson St causes congestion and conflict with access traffic. Methods to address some o fthe induced congestion on Church St will need to be considred. It has comparatively low impact (similar to Option 1). Key potential issues include the impacts on Onehunga Lagoon / Foreshore (SH20), Onehunga town centre, and the extent and complexity of construction works at Hamlins Hill / SH1 interchange. These will need to be considered further in the short-list assessment.



Transport Performance

Provides improved strategic connections to both SH20 and SH1, but attracted traffic results in increased congestion on Church St and conflicts with access traffic on Neilson St .

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Challenges for construction of rail over.

Consentability

Moderate consenting challenges are likely to be able to be managed. Degree of impact on the Hopua tuff ring and the coastal environment will need to be managed.

Cost (design, property and construction)

Moderate cost option, given the complexity of the ramp connection at SH1 (SEART). Some property acquisition, but comparatively minor.

Public / Stakeholder Issues

Western portion uses mainly existing routes and follows existing pattern of development. Impacts on Hamlins Hill will be of particular interest to some in the community. Does not address transport issues identified by stakeholders, particularly for businesses

Urban Design & Townscape

Conflicts at the intersection of Onehunga Mall and Nielson St with town centre. Compatible with the industrial land uses in the area but some acquisitions will be needed.

Social and Economic Facilities

Adverse impacts of works on SH20 (common to all options) and impacts in the vicinity of the Gloucester Park (interchange). Potential adverse impacts dependent on scale of impact at Hamlins Hill. Remaining works largely on existing Rds (minor impacts).

Public Health

Largely avoids sensitive receptors. Further clarity around effects on residential neighbours adjacent to SH1 would improve certainty.

Natural Environment

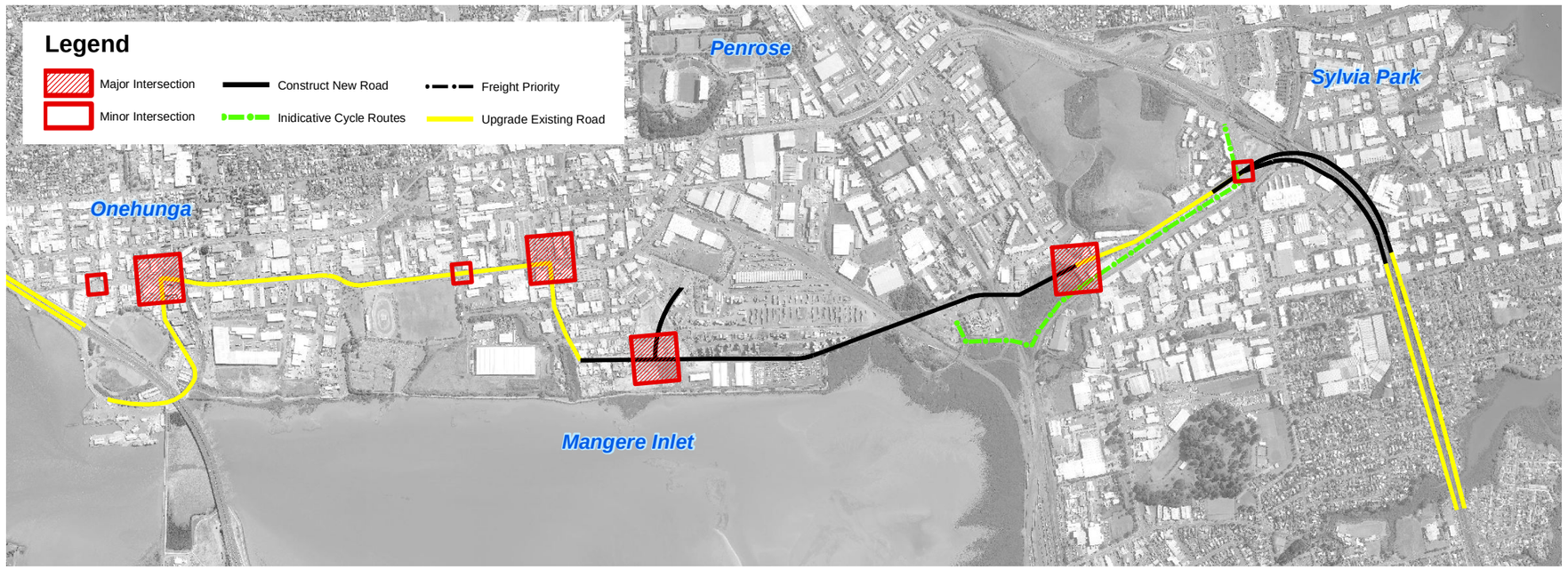
Potential for effects on Hopua tuff ring through widening of roads.

Culture / Heritage

The option cuts into the edge of Hamlins Hill. Site of cultural value. It is uncertain how it may affect known archaeological sites.

OPTION 3

ONEHUNGA/PENROSE AREA
EXISTING ROUTE UPGRADE TO SH20 WITH NEW INLAND ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



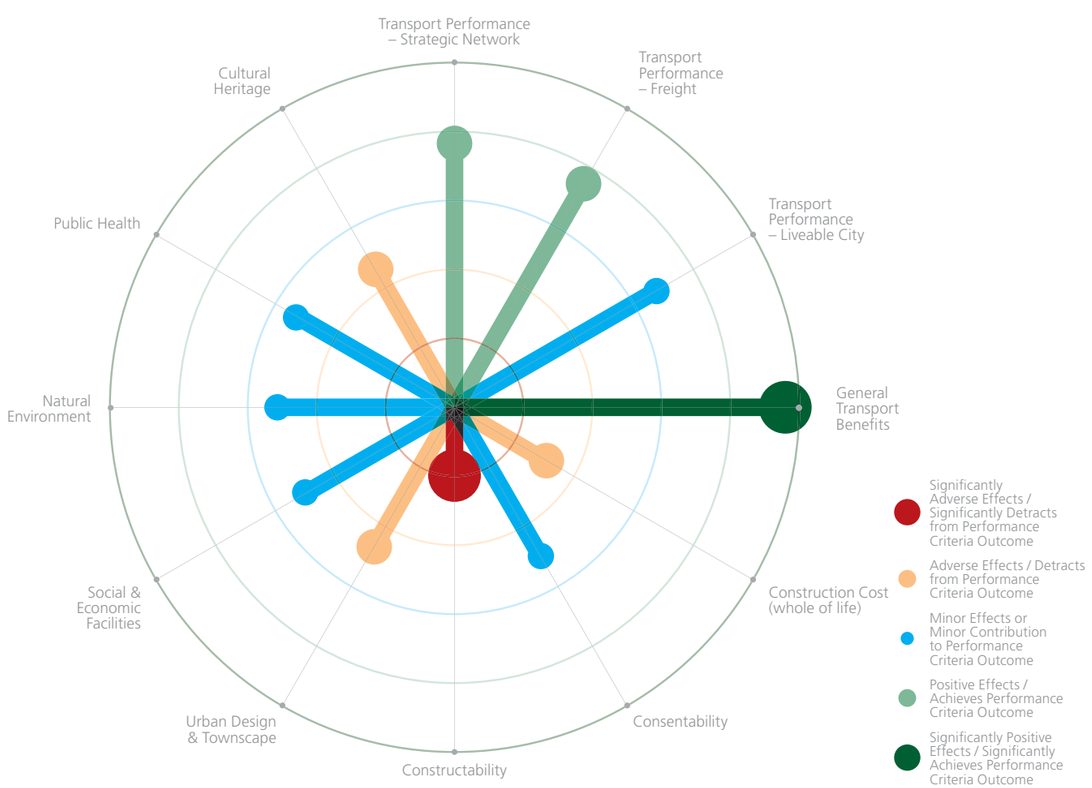
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga
- Improvements to Onehunga Mall / Neilson St intersection
- 4-laning of Neilson St
- New inland route from Southdown to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park Rd as new link from Southdown to Sylvia Park.

Assessment Outcome

× Option **not to proceed** beyond Long List

This option is considered a high level of investment, with some transport performance benefits (improved access to SH1 for traffic to/from the south) and some freight improvements but limited 'liveability' improvements (issues at Onehunga Mall and Onehunga Harbour Rd not addressed). It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20), works on or near Anns Creek and conflict with the Transpower and property access on Onehunga Harbour Rd.



Transport Performance

Provides improved strategic and freight transport connections to both SH1 and SH20 and diverts traffic form Church St and the eastern end of Neilson St. The required capacity upgrades on Onehunga Harbour Rd would conflict with the access and parking requirements of the adjacent land uses. This option retains conflict between strategic, local, buses and cyclists on Onehunga Harbour Rd.

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Risk that works on Onehunga Harbour Rd will require land take from commercial properties (to achieve appropriate design standards). Challenges at interface with Transpower towers and construction of rail over.

Consentability

Low to moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements and some impact on the Hopua tuff ring. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

Moderate cost option. Land take costs uncertain with potential for increased land take requirements of port land (Metroport area).

Public / Stakeholder Issues

Western portion uses mainly existing routes and follows existing pattern of development. May not address transport issues identified by stakeholders, particularly for businesses. Business impacts resulting from land requirements on industrial / port areas uncertain.

Urban Design & Townscape

Conflicts at the intersection of Onehunga Mall and Nielson St, impacts on liveable city / centre outcomes.. Compatible with the industrial land uses in the area but some acquisitions will be needed.

Social and Economic Facilities

Moderate impacts with SH20 / Gloucester Park works (common to all options) and interface at Waikaraka walkway. Scale of land requirements in Onehunga / Onehunga Harbour Rd to be confirmed.

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

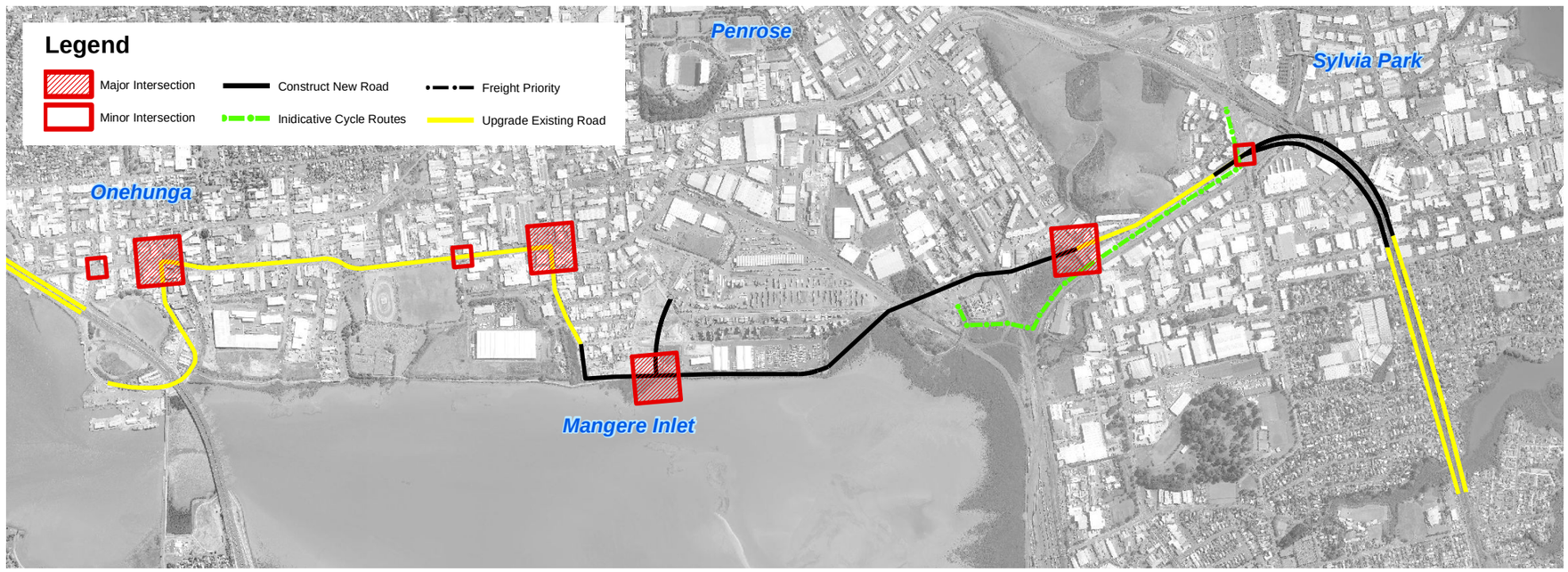
Potential for effects on Hopua tuff ring and Anns Creek landscape and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure. The option does not affect known archaeological sites.

OPTION 4

ONEHUNGA/PENROSE AREA
EXISTING ROUTE UPGRADE TO SH20 WITH NEW FORESHORE ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



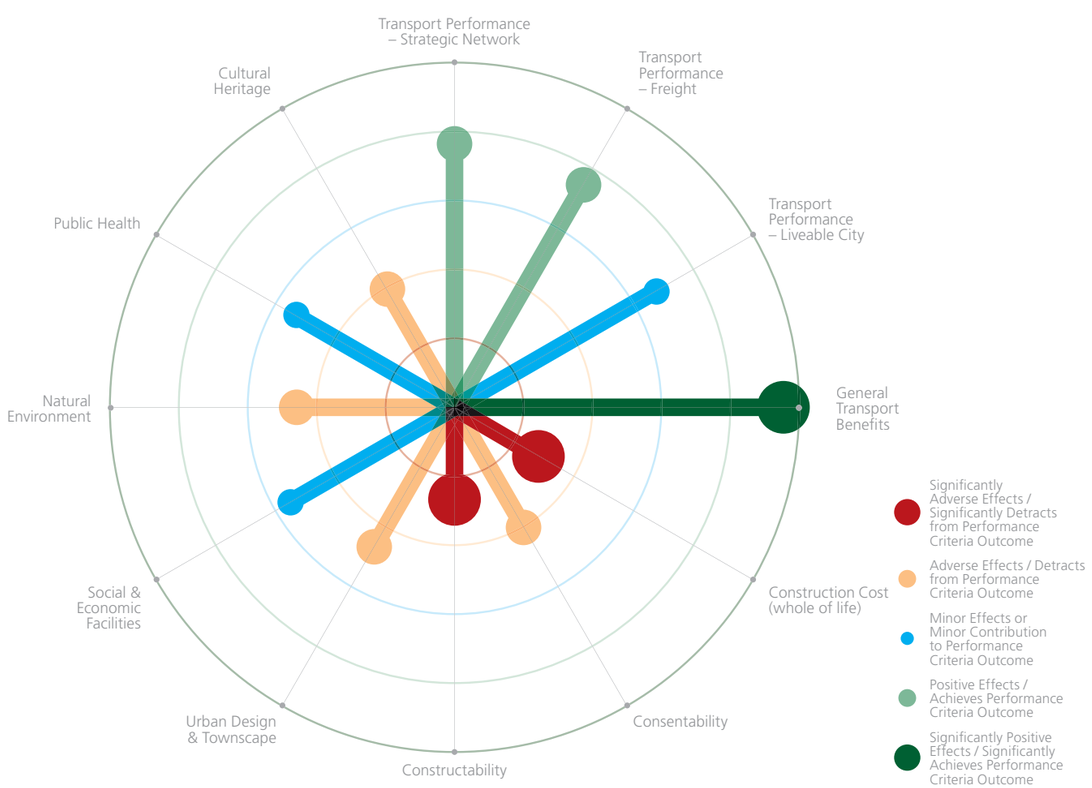
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga and use of Onehunga Harbour Rd onto Neilson St
- 4-laning of Neilson St
- New coastal / foreshore route from Southdown traversing inland to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park Rd as new link from Southdown to Sylvia Park.

Assessment Outcome

× Option **not to proceed** beyond Long List

This option is considered a high level of investment, with some transport performance benefits (improved access to SH1 for traffic to/ from the south) and some freight improvements but limited 'liveability' improvements (issues at Onehunga Mall and Onehunga Harbour Rd not addressed). It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20), the extent of foreshore reclamation and works on or near Anns Creek and some remaining conflict with the Transpower lines and property access on Onehunga Harbour Rd.



Transport Performance

Provides improved strategic and freight transport connections to both SH1 and SH20 and diverts traffic form Church St and the eastern end of Neilson St. The required capacity upgrades on Onehunga Harbour Rd would conflict with the access and parking requirements of the adjacent land uses.Conceptually the same as Option 3. This option retains conflict between strategic, local, buses and cyclists on Onehunga Harbour Rd.

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Risk that works on Onehunga Harbour Rd will require land take from commercial properties (to achieve appropriate design standards). Challenges at interface with Transpower towers and construction of rail over (close to Main Trunk and eastern line turnouts).

Consentability

Moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements and some impact on the Hopua tuff ring. Degree of foreshore reclamation will add complexity as will impacts at Anns Creek. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

High cost option due to extent of coastal / reclamation works. Land take costs somewhat uncertain with potential for increased land take requirements at Onehunga Harbour Rd (dependent on extent of upgrading required on this Rd for interchange).

Public / Stakeholder Issues

Western portion uses mainly existing routes and follows existing pattern of development. May not fully address transport issues identified by stakeholders, particularly business / freight.

Urban Design & Townscape

Conflicts at the intersection of Onehunga Mall and Nielson St, impacts on liveable city / centre outcomes. Compatible with the industrial land uses in the area but some acquisitions will be needed.

Social and Economic Facilities

Moderate impacts with SH20 / Gloucester Park works (common to all options) and interface at Waikaraka walkway. Scale of land requirements in Onehunga / Onehunga Harbour Rd to be confirmed.

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

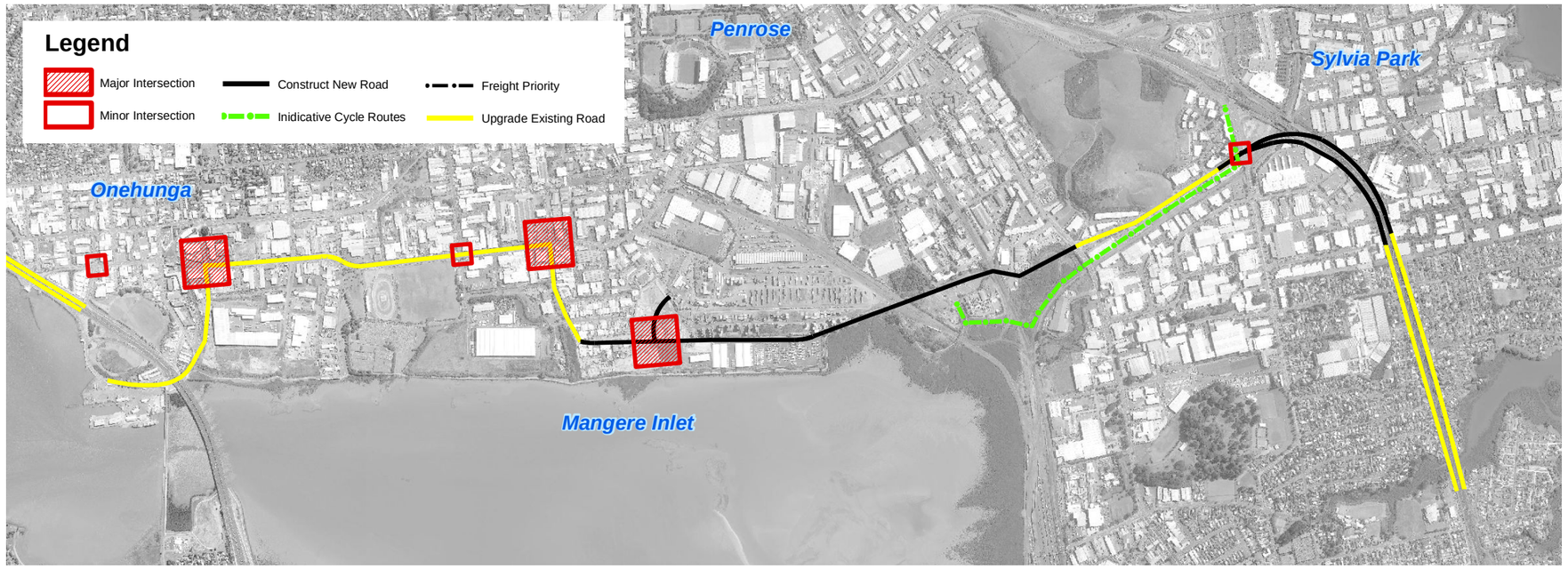
Potential for effects on Hopua tuff ring and significant impacts on Anns Creek area (ecological values) and natural environment features (for portion to the south and surrounds of the Co-Gen site).

Culture / Heritage

Option affects the foreshore from Angle St and will require some degree of reclamation and scale of impacts on Anns Creek. The option does not affect known archaeological sites but Anns Creek is identified as area of value.

OPTION 5

ONEHUNGA/PENROSE AREA
GALWAY ST TO SH20 WITH NEW INLAND ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



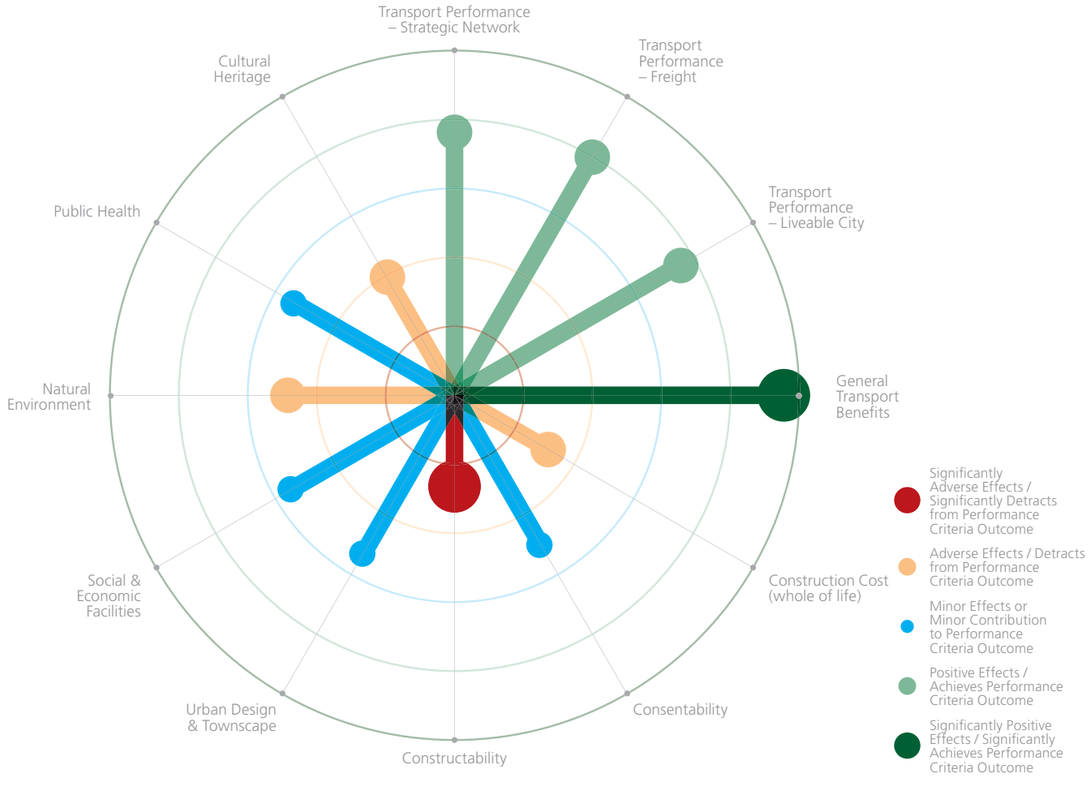
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga and use of Onehunga Harbour Rd with new link on Galway St to Neilson St
- 4-laning of Neilson St
- New inland route from Southdown to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park Rd as new link from Southdown to Sylvia Park.

Assessment Outcome

✓ Option to **proceed to Short-list**

This option is considered a high level of investment, with some transport performance benefits (improved access to SH20 and to SH1 for traffic to/from the south) and both freight improvements but 'liveability' improvements (addressing traffic impacts at Onehunga Mall and Onehunga Harbour Rd). It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20), inland port land impacts and works on or near Anns Creek and conflict with the Transpower towers.



Transport Performance

Provides improved strategic and freight transport connections to both SH1 and SH20 and diverts traffic form Church St and the eastern end of Neilson St. The Galway St link reduces traffic and conflicts on Onehunga Mall and Onehunga Harbour Rd.

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Risk that works on Onehunga Harbour Rd will require land take from commercial properties (to achieve appropriate design standards). Challenges at interface with Transpower towers and construction of rail over.

Consentability

Low to moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements with some impact on the Hopua tuff ring. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

Moderate cost option. Port land impacts (Metroport area) uncertain and some (limited) property requirement at Galway St link.

Public / Stakeholder Issues

Western portion uses new link (Galway St) and existing routes (Neilson St) and follows existing pattern of development. Business impacts resulting from land requirements on industrial / port areas uncertain.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St).

Social and Economic Facilities

Moderate impacts with SH20 / Gloucester Park works (common to all options) and interface at Waikaraka walkway (at Port area).

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

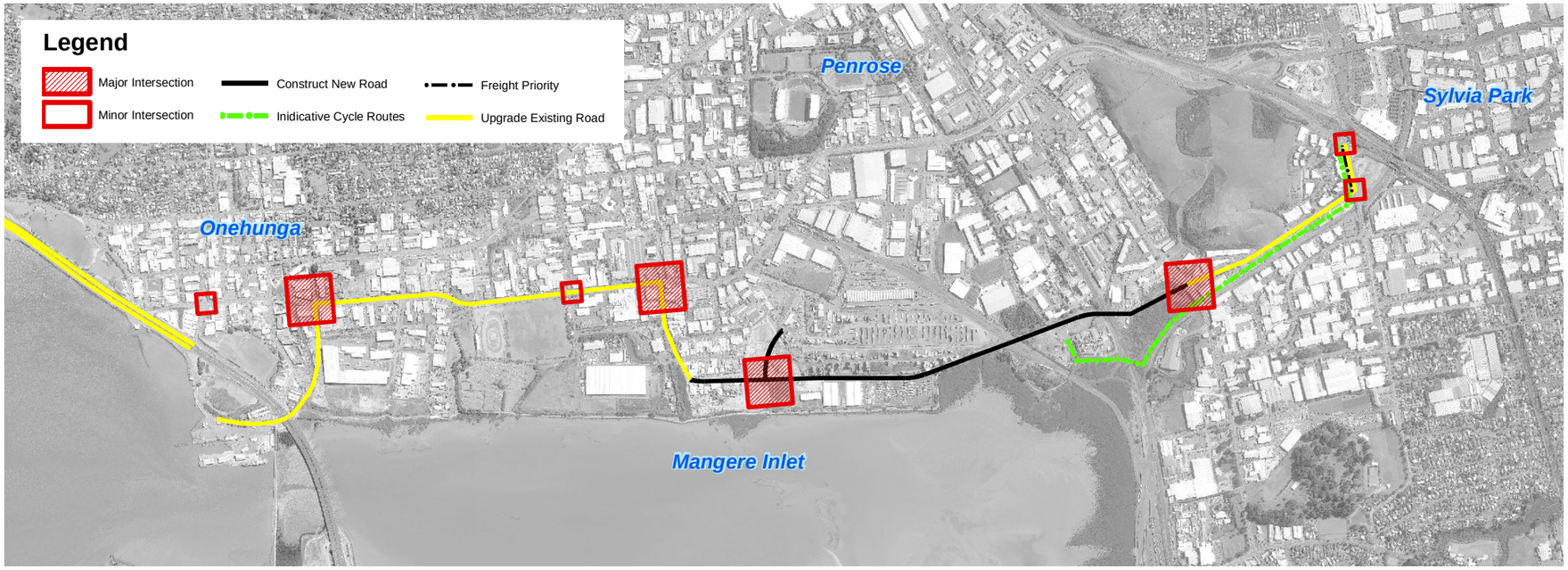
Potential for effects on Hopua tuff ring and Anns Creek environment and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure including Te Hopua. The option does not affect known archaeological sites.

OPTION 6

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO SH20 WITH NEW INLAND ROUTE TO EXISTING SH1 RAMPS AT MT WELLINGTON



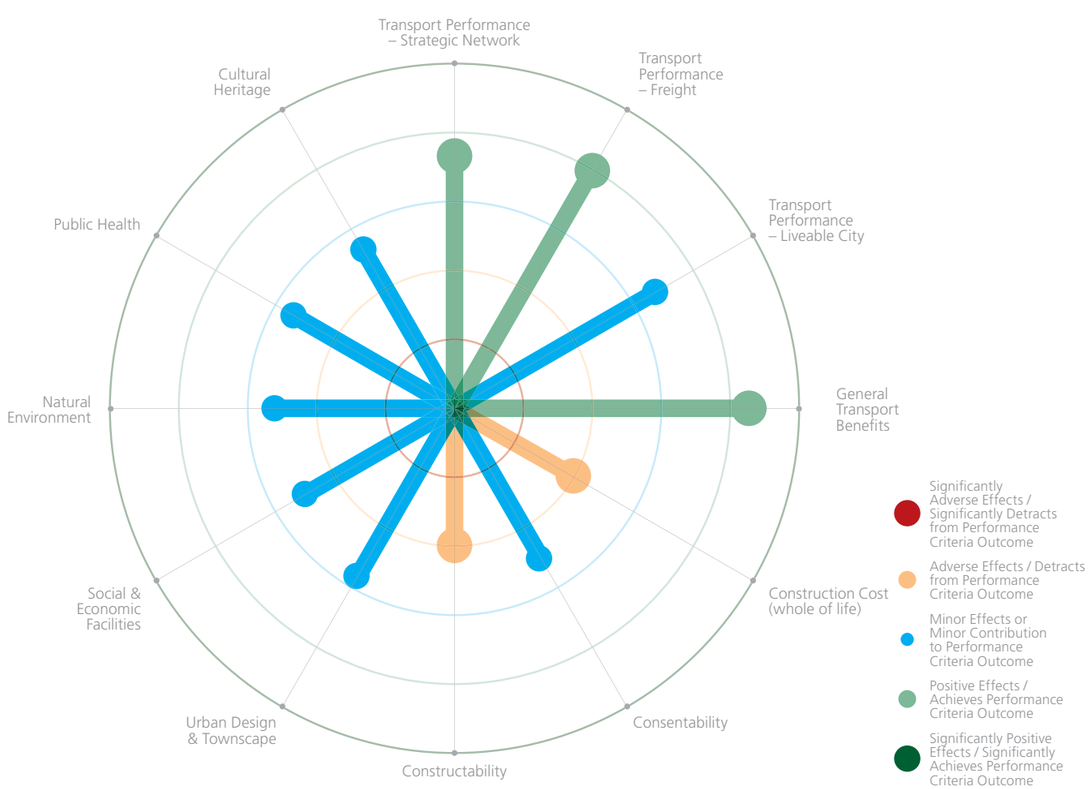
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga and use of Onehunga Harbour Rd with new link on Galway St to Neilson St
- 4-laning of Neilson St
- New inland route from Southdown to Sylvia Park Rd, using Sylvia Park Rd and freight lane priority at Mt Wellington interchange
- Requires works around and impacts on Transpower towers
- Cycle link from Waikaraka to Sylvia Park Rd as new link from Southdown to Sylvia Park Rd, with on-Rd upgrades from Sylvia Park Rd to Sylvia Park.

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a moderate level of investment, with some transport performance benefits (more direct route to SH1 for traffic to/from the south) and both freight improvements but 'liveability' improvements (addressing traffic impacts at Onehunga Mall and Onehunga Harbour Rd). It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20), inland port land impacts and works on or near Anns Creek and conflict with the Transpower.



Transport Performance

Provides improved access to SH20 and a more direct route to SH1. Complexity and conflicts of freight priority at Mt Wellington Interchange limit transport performance outcomes for connection at SH1.

Construction (technical)

Moderate complexity (low) with challenges mainly at interface with Transpower towers and construction of rail over.

Consentability

Low to moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements with some impact on the Hopua tuff ring. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations), but limited due to reduced scale of works.

Cost (design, property and construction)

Moderate cost option. Port land impacts (Metroport area) uncertain and some (limited) property requirement at Galway St link.

Public / Stakeholder Issues

Western portion uses new link (Galway St) and existing routes (Neilson St) and follows existing pattern of development. Business impacts resulting from land requirements on industrial / port areas uncertain.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St).

Social and Economic Facilities

Moderate impacts with SH20 / Gloucester Park works (common to all options) and interface at Waikaraka walkway (at Port area). Lesser business land requirement impacts (at Sylvia Park Rd), but scale of works required uncertain.

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

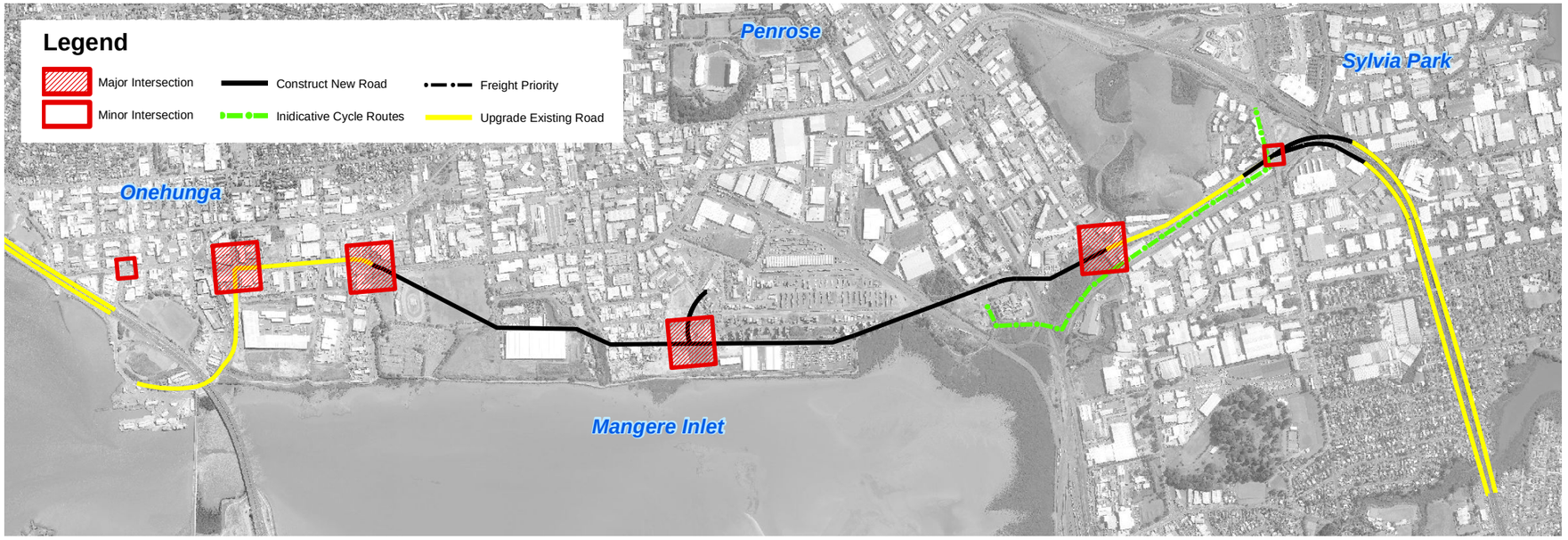
Potential for effects on Hopua tuff ring and Anns Creek environment and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure. Area includes Te Hopua (volcanic heritage). The option does not affect known archaeological sites.

OPTION 7

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO SH20 TO NEW WAIKARAKA / INLAND ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



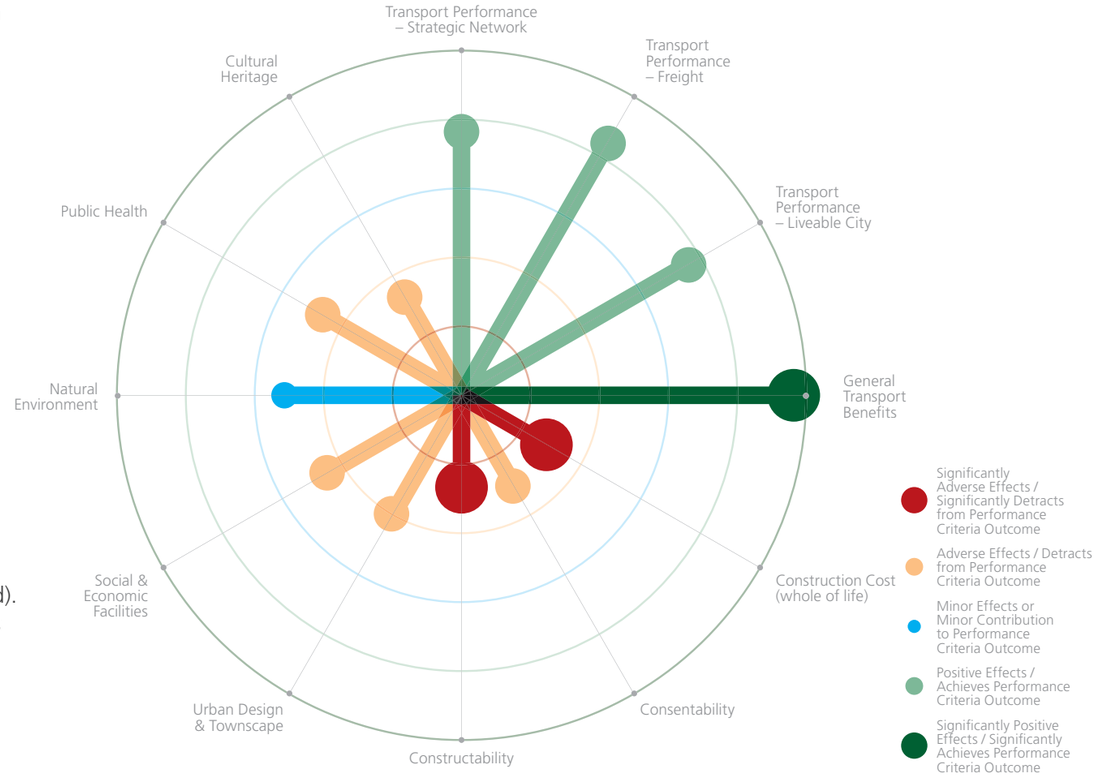
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga and use of Onehunga Harbour Rd and Neilson St, with new link on Galway St to Neilson St
- 4-laning of Neilson St
- New link from Neilson St across Waikara Park to inland route from Southdown to Sylvia Park Rd
- New grade separated connection from Sylvia Park Rd for traffic to/ from south at SH1 (land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park Rd as new link from Southdown to Sylvia Park.

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a high level of investment, with transport performance benefits (improved access to SH1 for traffic to/from the south) and both freight improvements and 'liveability' improvements (addressing traffic impacts at Onehunga Mall and Onehunga Harbour Rd). While this option has potentially significant impacts in a number of areas including land take, recreation (Gloucester Park), impacts on Onehunga Lagoon / Foreshore (SH20), inland port land impacts and works on or near Anns Creek and conflict with the Transpower, it is considered that there are opportunities for these effects to be mitigated and design development to respond.



Transport Performance

Provides improved strategic and freight transport connections to both SH1 and SH20 and diverts traffic form Church St and the eastern end of Neilson St. The Galway St link reduces traffic and conflicts on Onehunga Mall and Onehunga Harbour Rd

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Risk that works on Onehunga Harbour Rd will require land take from commercial properties (to achieve appropriate design standards). Challenges at interface with Transpower towers and construction of rail over.

Consentability

Moderate consenting challenges with good potential to be able to be managed, though impacts on Waikaraka Park significant and may be difficult to justify extent. SH20 capacity improvements with some impact on Hopua tuff ring. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

High cost option. Port land impacts (Metroport area) uncertain and some (limited) property requirement at Galway St link. Cost implications for relocation of Transpower lines.

Public / Stakeholder Issues

Business impacts including Galway and Sylvia Park Rd. The land requirements on industrial / port areas uncertain. Likely to be strong community sentiment regarding impact at Waikaraka Park.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St) and some key feature areas impacted (Waikaraka Park).

Social and Economic Facilities

Moderate to high adverse impacts with SH20 / Gloucester Park interchange works (degree / extent common to all options) and interface at Waikaraka walkway (at Port area). Adverse impacts at Waikaraka Park location, with challenge to justify requirement for this effect.

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

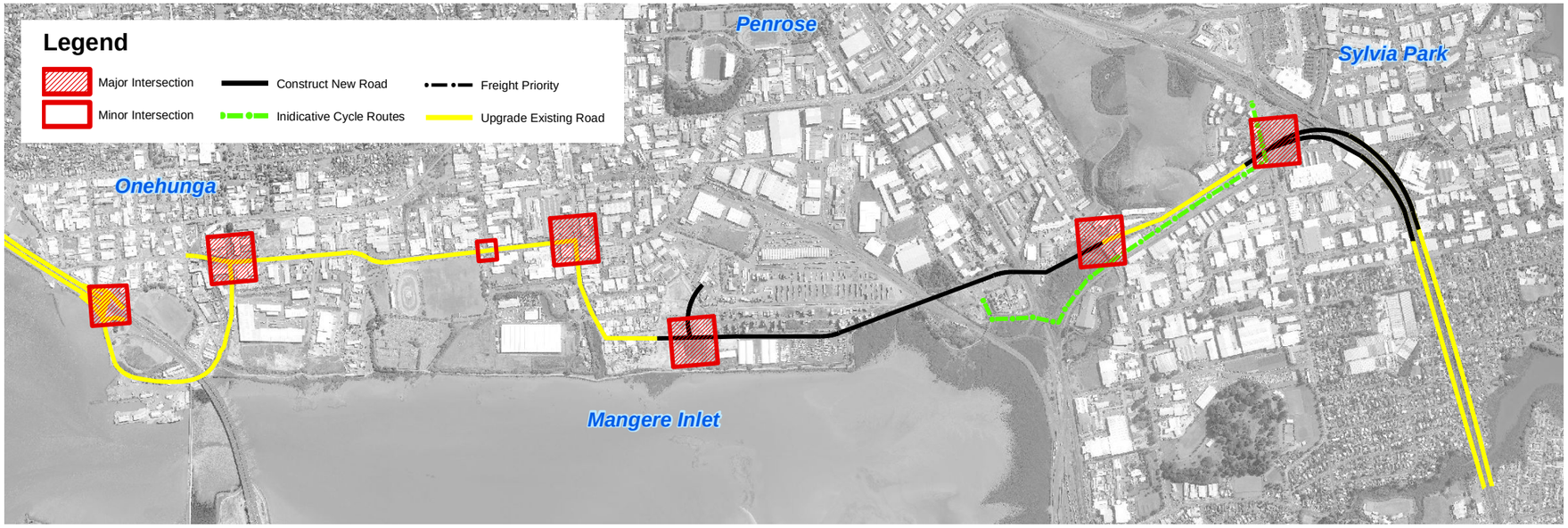
Potential for effects on Hopua tuff ring and Anns Creek environment and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure. The option has potential to impact on stone wall and sites around Waikaraka Park.

OPTION 8

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO NEW SH20 INTERCHANGE WITH NEW SH1 RAMPS AT MT WELLINGTON



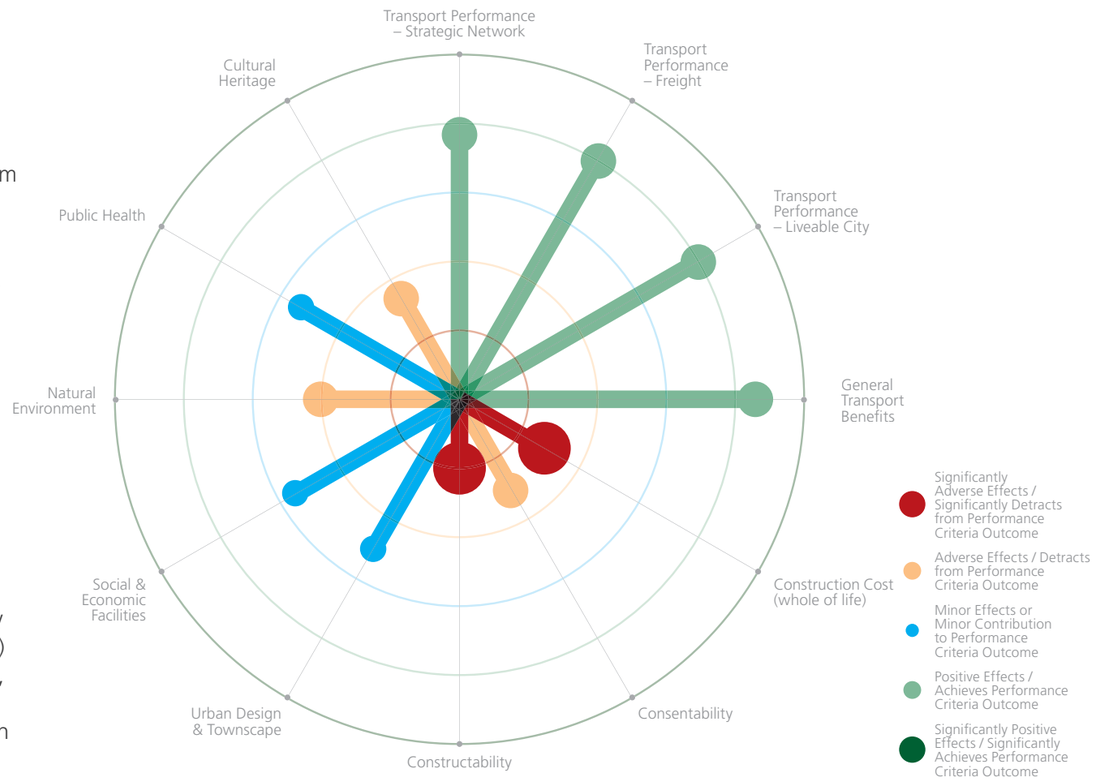
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga with new diamond interchange to Onehunga Harbour Rd with new link on Galway St to Neilson St
- 4-laning of Neilson St
- New inland route from Angle St, Southdown to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- New cycle link from Waikaraka from Southdown to Sylvia Park (along new link section).

Assessment Outcome

✓ Option **to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH1 for traffic to/from the south) and both freight and 'liveability' improvements (addressing traffic impacts at Onehunga Mall and Onehunga Harbour Rd). Local access to Onehunga centre is made less direct, so options to address this will need to be considered. It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20) through to foreshore at Onehunga Harbour Rd, inland port land impacts, Gloucester Park, works on or near Anns Creek and conflict with the Transpower towers. Opportunities for design development and mitigation of impacts identified.



Transport Performance

Provides improved connections to SH20 and SH1 for industrial area, however access for local traffic to Onehunga centre is reduced. Good performance for 'liveability' transport outcomes due to separation of traffic flows in Onehunga Town Centre, but some increases to trip length for traffic from Onehunga.

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Challenges at interface with Transpower towers and construction of rail over.

Consentability

Moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements and Gloucester Park interchange issues. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

Higher cost option. Port land impacts (Metroport area) uncertain and some (limited) property requirement at Galway St link.

Public / Stakeholder Issues

Western portion uses new link (Galway St) and existing routes (Neilson St) and follows existing pattern of development. Business impacts resulting from land requirements on industrial / port areas uncertain.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St). Good outcomes for Onehunga Town Centre (separation of local and through traffic).

Social and Economic Facilities

Moderate to high adverse impacts with SH20 / Gloucester Park new diamond interchange works (some uncertainty on extent of impacts on open space in this area). Land take and business disruption impacts for inland section of new link uncertain (potentially minor or adverse).

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

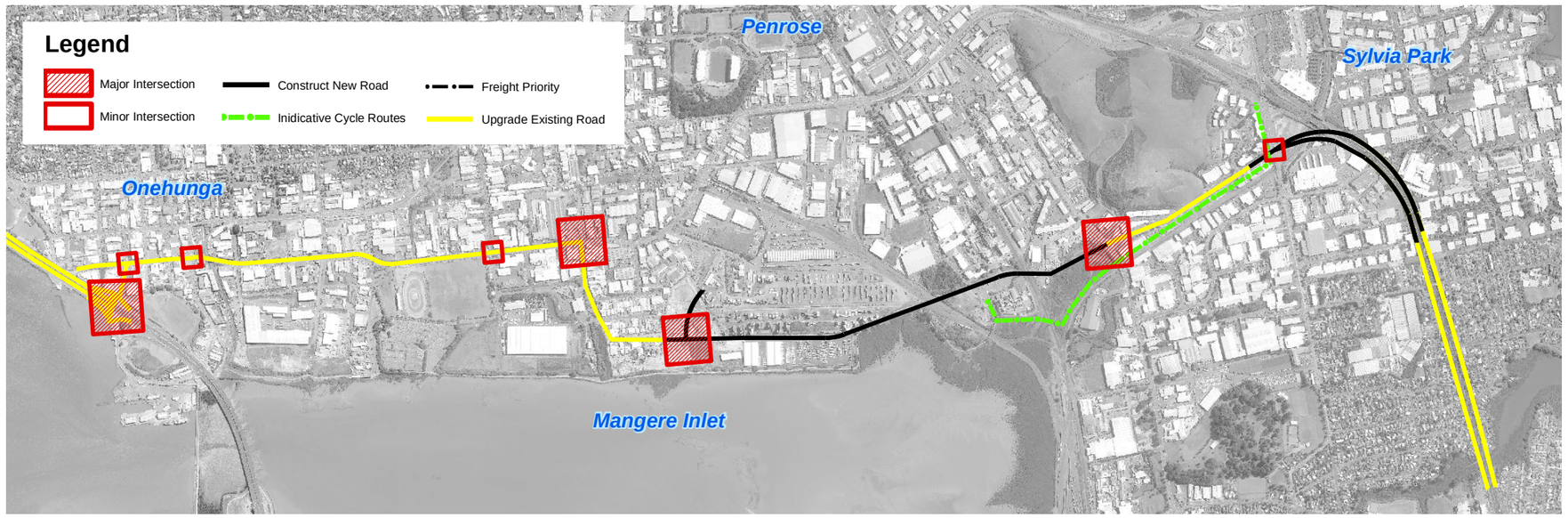
Potential for effects on Hopua tuff ring and extent of works at Onehunga Harbour Rd (with increased use of this Rd from new diamond interchange). Potential for this option to increase reclamation or structures at Onehunga Harbour Rd foreshore. Impacts also at Anns Creek environment and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure. The option does not affect known archaeological sites.

OPTION 9

ONEHUNGA/PENROSE AREA
NEILSON ST ROUTE TO NEW SH20 INTERCHANGE WITH NEW INLAND ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



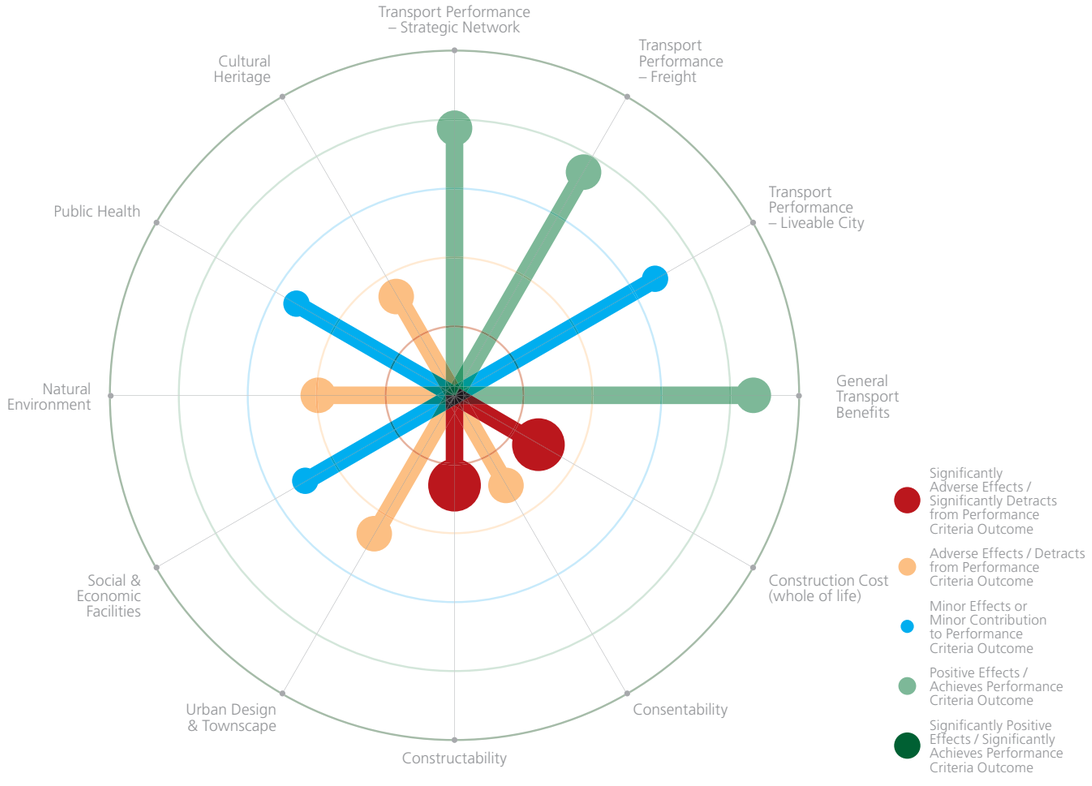
Description

- Capacity improvements on SH20 from Queenstown Rd to Onehunga with new diamond interchange linking only to Neilson St
- 4-laning of Neilson St
- New inland route from Angle St, Southdown to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/ from south at SH1 (with land take)
- Requires relocation to Transpower towers
- New cycle link from Waikaraka from Southdown to Sylvia Park (along new link section).

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a high level of investment, with improved connections to both SH20 and to SH1 for traffic to/from the south). However, reliance on Neilson St through Onehunga has adverse liveability impacts and traffic conflicts. It has potential impacts in a number of areas. Key potential issues include impacts on Onehunga Lagoon / Foreshore (SH20), business land at Onehunga, inland port land impacts, works on or near Anns Creek and conflict with the Transpower towers.



Transport Performance

Provides some strategic and freight transport performance improvements and general traffic benefits (moderate) but conflict between strategic and local traffic on the western end of Neilson St.

Construction (technical)

Construction of ramps over Mt Wellington Highway is complex. Challenges at interface with Transpower towers and construction of rail over.

Consentability

Moderate consenting challenges are likely to be able to be managed. SH20 capacity improvements and Gloucester Park interchange issues. Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

Higher cost option. Port land impacts (Metroport area) uncertain and some (limited) property impact at Onehunga.

Public / Stakeholder Issues

Reliance on Neilson St and Onehunga town centre likely to be of concern to business community in this area. Business impacts resulting from land requirements on industrial / port areas uncertain.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St). Poor outcomes for Onehunga Town Centre.

Social and Economic Facilities

Moderate impacts with SH20 / Gloucester Park works (common to all options) and interface at Waikaraka walkway (at inland Port area). Business impacts for Onehunga town centre and potential adverse impacts on facilities in this centre identified (though uncertain at this stage).

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

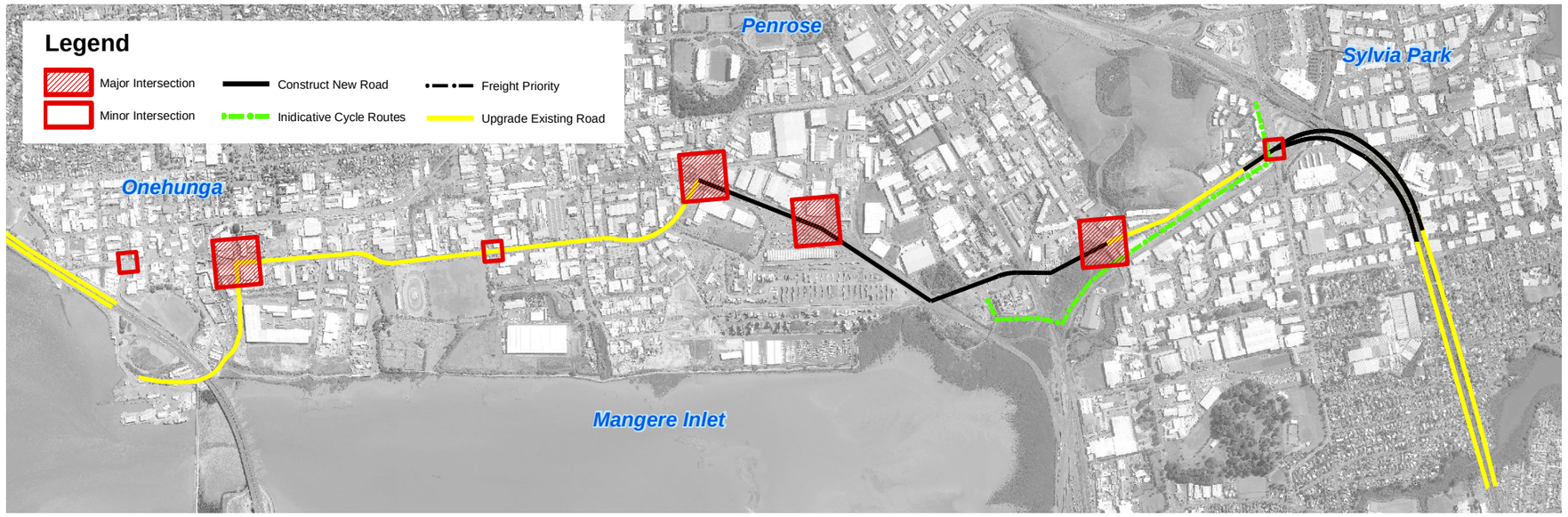
Potential for effects on Hopua tuff ring and works onto Neilson St (with increased use of this Rd from new diamond interchange). Potential for new diamond interchange to impact on coastal environment at interchange (reclamation or structure). Impacts also at Anns Creek environment and natural environment features (for portion to the east of the Co-Gen site).

Culture / Heritage

Option affects the M ngere Inlet at the western end and will require some degree of reclamation or structure. Potential for impacts on coastal marine area at Gloucester Park and Te Hopua (volcanic heritage). The option does not affect known archaeological sites.

OPTION 10

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO SH20 WITH NEW RAIL CORRIDOR ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



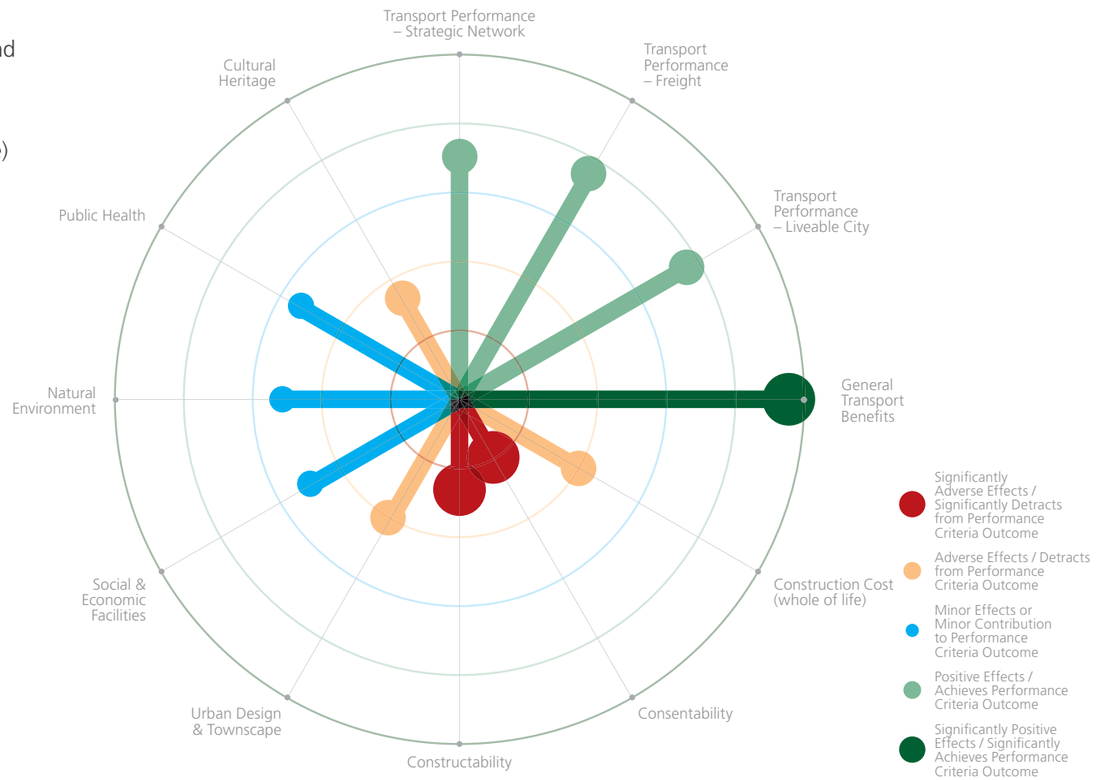
Description

- Capacity improvement on SH20 and use of Onehunga Harbour Rd and new link on Galway St to Neilson St
- 4-laning of Neilson St
- New link from Neilson St to Southdown via rail siding, (with land take)
- New inland route from Southdown to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- New cycle link from Waikaraka from Southdown to Sylvia Park (along new link section).

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH20 and SH1 for traffic to/from the south). However, the option retains high traffic flows on much of Neilson St and creates conflict between the road and rail operations. Complexity of impacts and integration of land use impacts at MetroPort and along the Southdown rail spur potentially significant (increasing consenting, land use and delivery of transport objective risks), though avoids natural environment impacts.



Transport Performance

Improved connections to both SH20 and SH1, with reduced traffic on Church St. However use of the rail corridor expected to constrain freight and vehicle operations between the Rd and rail..

Construction (technical)

Construction of connection along and over rail, plus ramps over Mt Wellington Highway and Transpower towers

Consentability

Higher consenting challenges with complexity of consenting at Metroport. SH20 capacity improvements with some impact on the Hopua tuff ring for consenting (scope to manage). Degree of foreshore structure and impacts at or near Anns Creek will add complexity. Some complexity where close to Transpower towers and rail (impacts on existing designations).

Cost (design, property and construction)

Moderate cost option. Port land impacts (Metroport area) uncertain but potentially significant. Less significant cost implications for coastal structures and for relocation of Transpower lines (reduced length).

Public / Stakeholder Issues

Business impacts including Galway and Sylvia Park Rd. The land requirements on industrial / port areas uncertain but potentially significant.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St). Increase adverse impacts of SH20 interchange on Onehunga town centre (with use of Neilson St).

Social and Economic Facilities

Moderate to low adverse impacts. Impacts at SH20 / Gloucester Park new interchange works is common to all options, remainder of option uses existing corridors / business land so less impact on community areas. Business impacts at MetroPort and integration of land use, rail and road likely to be complex and may give rise to adverse socio-economic effects.

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

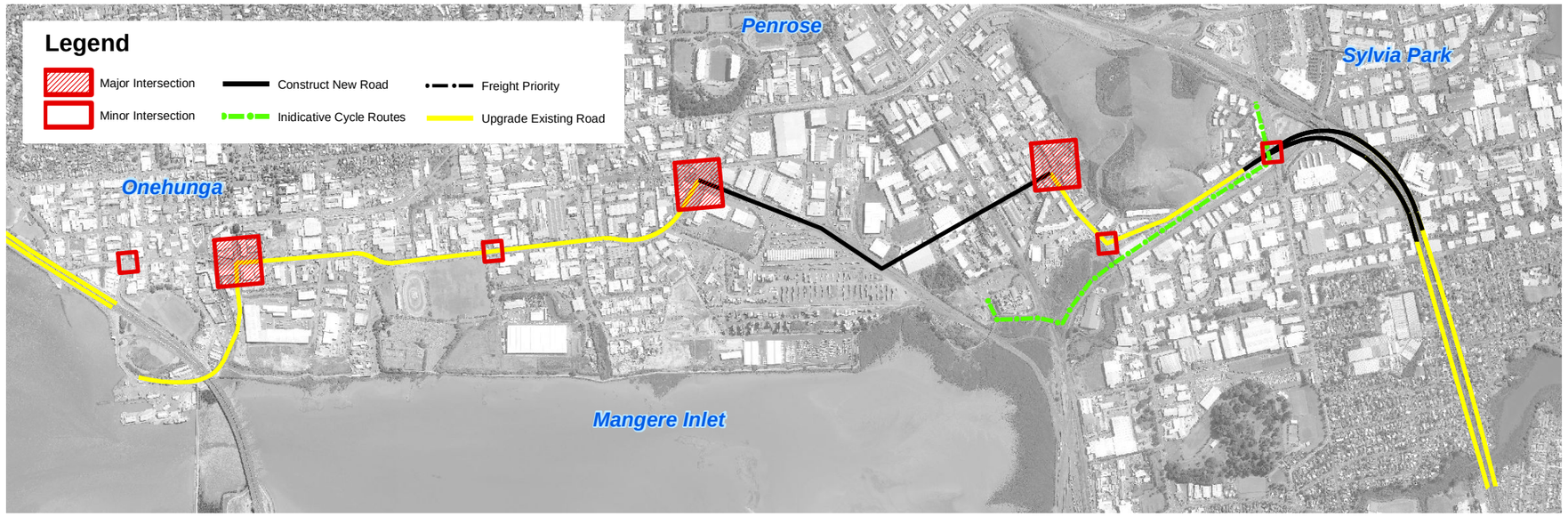
Potential for effects on Hopua tuff ring. Some potential for option to avoid other valued environments (such as Anns Creek) and coastal marine area. Lower impact option.

Culture / Heritage

Option affects the foreshore at the western end and will require some degree of reclamation or structure in area of value (Anns Creek).

OPTION 11

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO SH20 WITH NEW RAIL/LOCAL RD ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



Description

- Capacity improvement on SH20 and use of Onehunga Harbour Rd and new link on Galway St to Neilson St
- 4-laning of Neilson St
- New link from Neilson St to Southdown via rail siding (with land take)
- New link from Southdown to Great South Rd via Southdown Ln, with grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- New cycle link from Waikaraka from Southdown to Sylvia Park (along new link section).

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH20 and SH1 for traffic to/from the south). However, the option does not provide as high contributions to the strategic network and freight (objectives of the Project). Complexity of impacts and integration of land use impacts at MetroPort and Great South Rd area potentially significant (increasing consenting, land use and delivery of transport objectives risks), though reduced natural environment impacts.

Transport Performance

Improved connections to both SH20 and SH1, with reduced traffic on Church St. However a somewhat convoluted route to SH1 and use of the rail corridor expected to constrain freight and vehicle operations between the Rd and rail

Construction (technical)

Construction of connection along and over rail, plus connections to Great South Rd and ramps over Mt Wellington Highway.

Consentability

Higher consenting challenges with complexity of consenting at Metroport / Southdown. SH20 capacity improvements with some impact on the Hopua tuff ring for consenting (scope to manage). Reduced impact on coastal marine area / Anns Creek. Some complexity where close to Transpower towers (Sylvia Park Rd).

Cost (design, property and construction)

Moderate cost option. Port land impacts (Metroport area) uncertain but potentially significant. Less significant cost implications for coastal structures and for relocation of Transpower lines (reduced length).

Public / Stakeholder Issues

Business impacts including Galway, Great South Rd and Sylvia Park Rd. The land requirements on industrial / port areas uncertain but potentially significant which may increase concerns / opposition from business community.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St). Increase adverse impacts of SH20 interchange on Onehunga town centre (with use of Neilson St).

Social and Economic Facilities

Moderate to low adverse impacts. Impacts at SH20 / Gloucester Park new interchange works is common to all options, remainder of option uses existing corridors / business land so less impact on community areas. Business impacts at MetroPort and Great South Rd may give rise to adverse socio-economic effects (uncertain).

Public Health

May involve traversing some contaminated sites. Avoids sensitive receptors.

Natural Environment

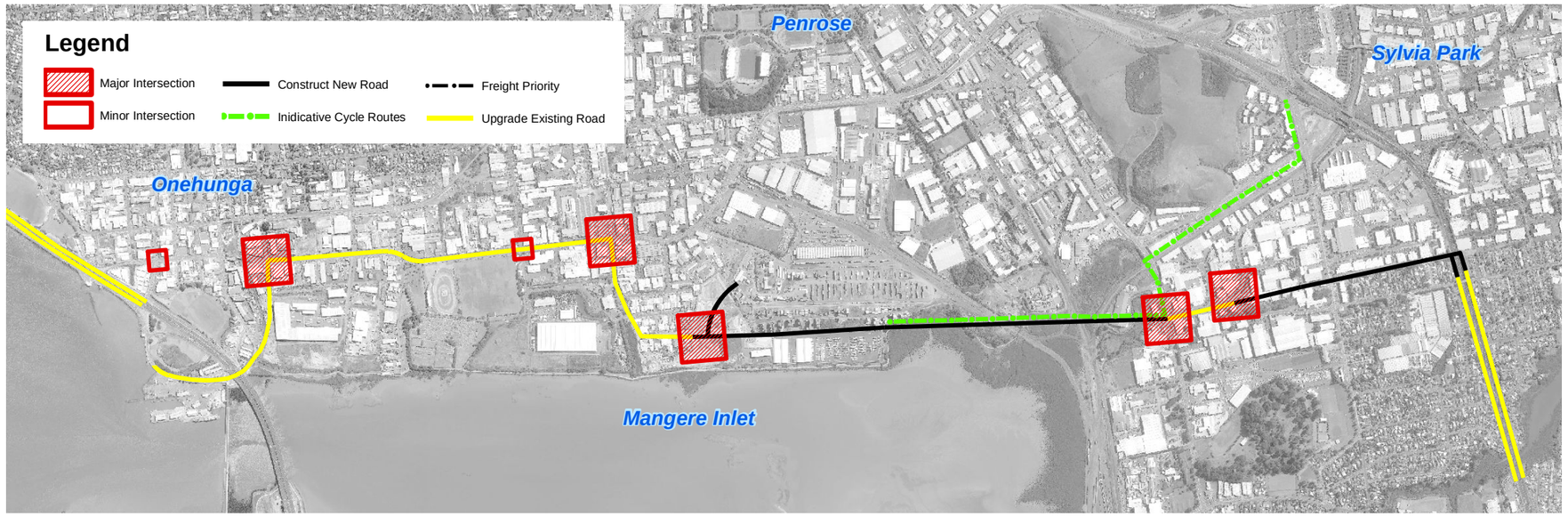
Potential for effects on Hopua tuff ring but avoids other valued environments (such as Anns Creek). Low impact option.

Culture / Heritage

Potential impacts at Te Hopua, avoids known archaeological sites and other areas of cultural value (e.g. Anns Creek / portage area).

OPTION 12

ONEHUNGA/PENROSE AREA
GALWAY ST LINK TO SH20 WITH NEW INLAND ROUTE TO NEW SH1 RAMPS NEAR PANAMA RD



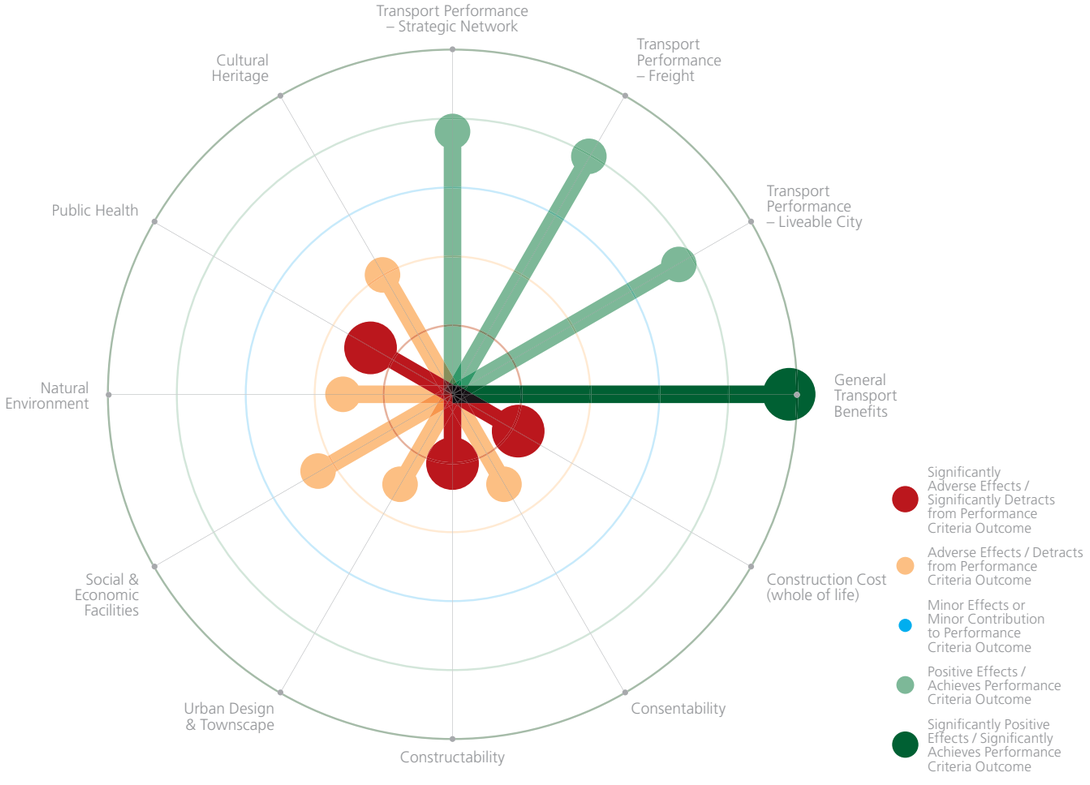
Description

- Capacity improvement on SH20 and use of Onehunga Harbour Rd and new link on Galway St to Neilson St
- 4-laning of Neilson St
- New inland link from Angle St to Great South Rd (with land take)
- New interchange for traffic to and from the south at SH 1 just north of Panama Rd (with land take)
- New cycle link from Waikaraka from Southdown to Great South Rd (along new link section) and onto Sylvia Park.

Assessment Outcome

× Option **not to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH20 and to SH1 for traffic to/from the south), provides for grade separated interchanges, plus local connections, with a general reduction on rat running. Option less preferred than Option 13, as level of investment to east but does not address the impacts of traffic on Neilson St near Onehunga town centre.



Transport Performance

Improved connections to SH20 and SH1 (south), and reduces traffic on Church St and eastern parts of Neilson St.

Construction (technical)

Significant accomodation works on connection into Vesty Drive. Impact on Vector high pressure gas main.

Consentability

Higher consenting challenges with impacts on many environmental features and within the coastal marine area SEA1 (Anns Creek). Some opportunities for mitigation and land acquisition to manage impacts on the sensitive receptors identified.

Cost (design, property and construction)

High cost option. Port land impacts (Metroport area) uncertain but potentially significant. Significant property required on Vesty Drive/ Panama Road. Less significant cost implications for coastal structures and for relocation of Transpower lines (reduced length).

Public / Stakeholder Issues

Business impacts including Galway, Metroport and east of Great South Rd. The land requirements on industrial / port areas uncertain but potentially significant which may increase concerns / opposition from business community. Residential impacts at Panama area likely to be significant (edge effect recognised).

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed (Galway St). New route through Panama Rd area create severance and change to existing urban form / landscape (Vesty Rd area).

Social and Economic Facilities

Moderate (some high) adverse impacts. Impacts at SH20 / Gloucester Park new interchange works is common to all options, remainder of option uses existing corridors / business land so less impact on community areas. Business impacts at MetroPort and Great South Rd may give rise to adverse socio-economic effects (uncertain). Option traverses residential area at Vesty Rd (edge and potential take effects). Extent of ramps on SH1 and impact on school uncertain but potentially adverse.

Public Health

Works traverse known contaminated land – reclamation and landfill. Involves construction of a new arterial adjacent to residential properties in Panama Rd with associated air quality and acoustic considerations for sensitive receptors.

Natural Environment

Option likely to affect known / listed natural features and ecological areas including Anns Creek, and involves structures / reclamation coastal SEA 1. Given alignment of option, opportunities to avoid impact in design considered more limited (e.g. cutting across Anns Creek area).

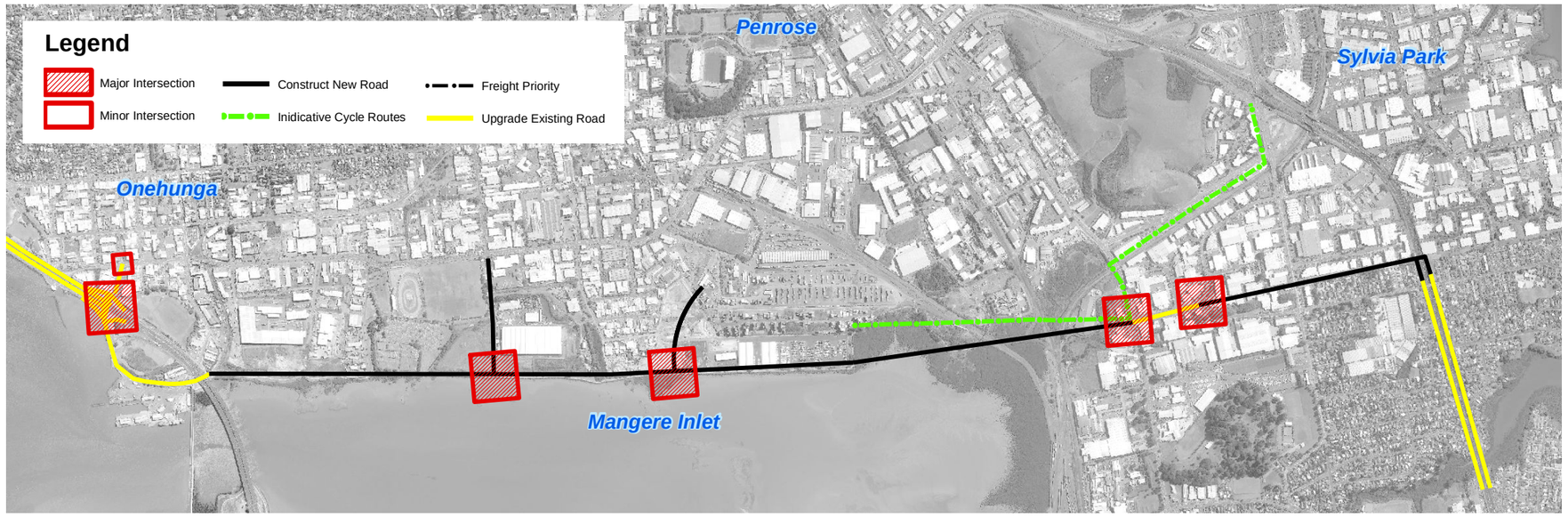
Culture / Heritage

Option affects the foreshore and will require some degree of structure reclamation. The option does not affect known archaeological sites, but impacts on Anns Creek / portage area.

OPTION 13

ONEHUNGA/PENROSE AREA

NEW SH20 ONEHUNGA INTERCHANGE WITH NEW FORESHORE ROUTE TO NEW SH1 RAMPS NEAR PANAMA RD



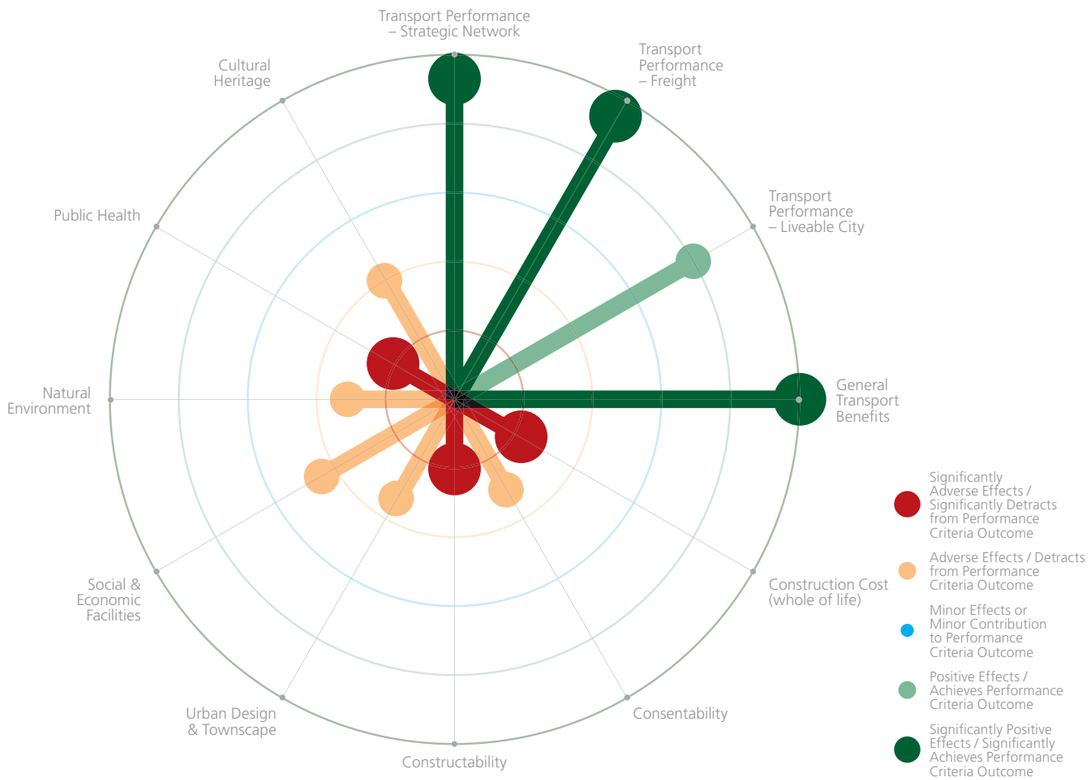
Description

- Capacity improvements on SH20 from Queenstown Road to Onehunga
- New diamond interchange at SH20 linking to Onehunga Harbour Rd
- New foreshore link from Onehunga Harbour Rd to Great South Rd (with land take)
- New interchange for traffic to and from the south at SH 1 just north of Panama Rd (with land take)
- Cycle link from Waikaraka to Sylvia Park, along new link to Great South Rd and connection from Great South Rd to Sylvia Park.

Assessment Outcome

✓ Option **to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH1 for traffic to/from the south), provides for grade separated interchanges, plus local connections, with a general reduction on rat running. With improvements at Onehunga interchange, this option provides a level of investment to improve connectivity to strategic network in both the west and east. This option would be difficult to construct and is likely to have significant impacts on the natural and social environment. There are opportunities for mitigation that would benefit from more detailed assessment.



Transport Performance

Improved connections to SH20 and SH1 and significant reduction in traffic on Neilson St and Church St aides local business access. New interchange at Onehunga separates local (via north) and industrial (via south) traffic

Construction (technical)

Comparatively difficult to construct with diamond interchange at Nielson St and connection into Vesty Drive. Impact on Vector high pressure gas main. Rail crossings include Southdown and Main Trunk lines.

Consentability

Higher consenting challenges with impacts on many environmental features and within the coastal marine area SEA1 (Anns Creek). Some opportunities for mitigation and land acquisition to manage impacts on the sensitive receptors identified. Uncertainty, scale of effects could increase consentability impact.

Cost (design, property and construction)

High cost option. Significant cost implications for coastal structures and for land requirements in vicinity of Vesty Drive, and Panama Road.

Public / Stakeholder Issues

This option is likely to achieve the outcomes that the some parts of the community expect from the East West Connections project, particularly business interests. The impacts on sensitive receptors and land acquisition (both residential and commercial/industrial) are likely to be of significant interest to others in the community.

Urban Design & Townscape

Compatible with the industrial land uses in the area but some acquisitions will be needed. New route through Panama Rd area create severance and change to existing urban form / landscape (Vesty Rd area).

Social and Economic Facilities

Moderate (some high) adverse impacts. Impacts at SH20 / Gloucester Park new interchange works is common to all options, remainder of option uses existing corridors / business land so less impact on community areas, but integration with Waikaraka cycleway needs to be considered. Option traverses residential area at Vesty Rd (edge and potential take effects). Extent of ramps on SH1 and impact on school uncertain but potentially adverse.

Public Health

Works traverse known contaminated land – reclamation and landfill. Involves construction of a new arterial adjacent to residential properties in Panama Rd with associated air quality and acoustic considerations for sensitive receptors.

Natural Environment

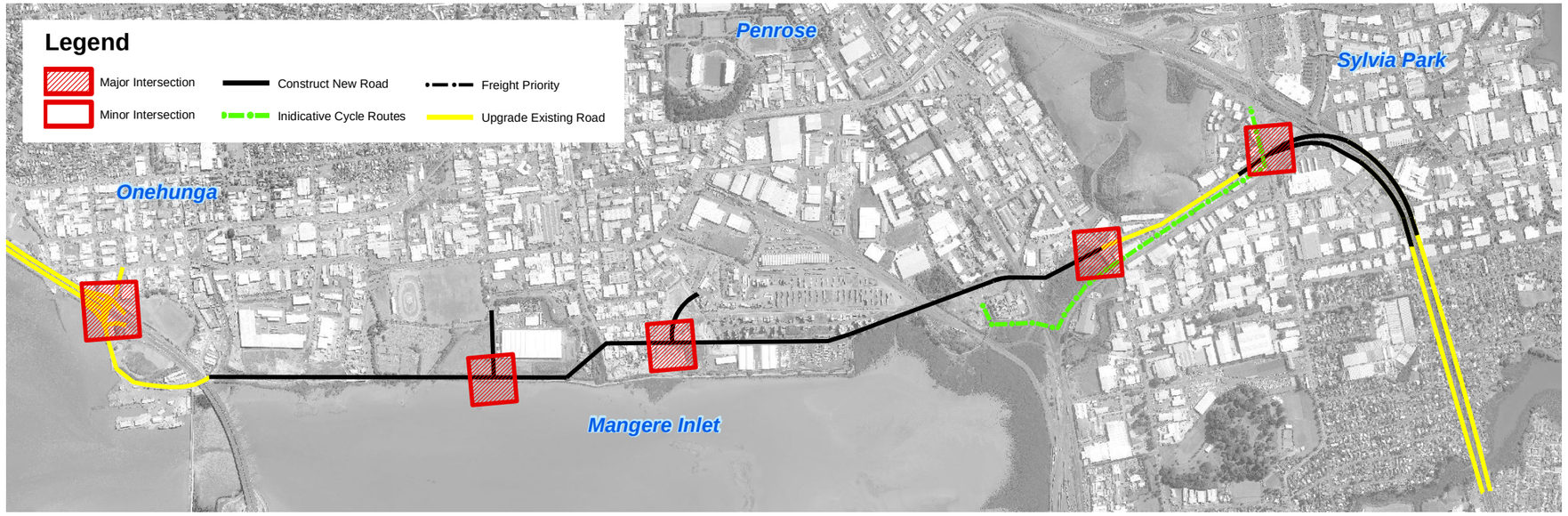
Option likely to affect known / listed natural features and ecological areas including Anns Creek, and involves structures / reclamation coastal SEA 1. Given alignment of option, opportunities to avoid impact in design considered more limited (e.g. cutting across Anns Creek area).

Culture / Heritage

Option affects the foreshore and will require some degree of structure reclamation. The option does not affect known archaeological sites, but impacts on Anns Creek / portage area

OPTION 14

ONEHUNGA/PENROSE AREA
NEW SH20 ONEHUNGA INTERCHANGE WITH NEW FORESHORE/ INLAND ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



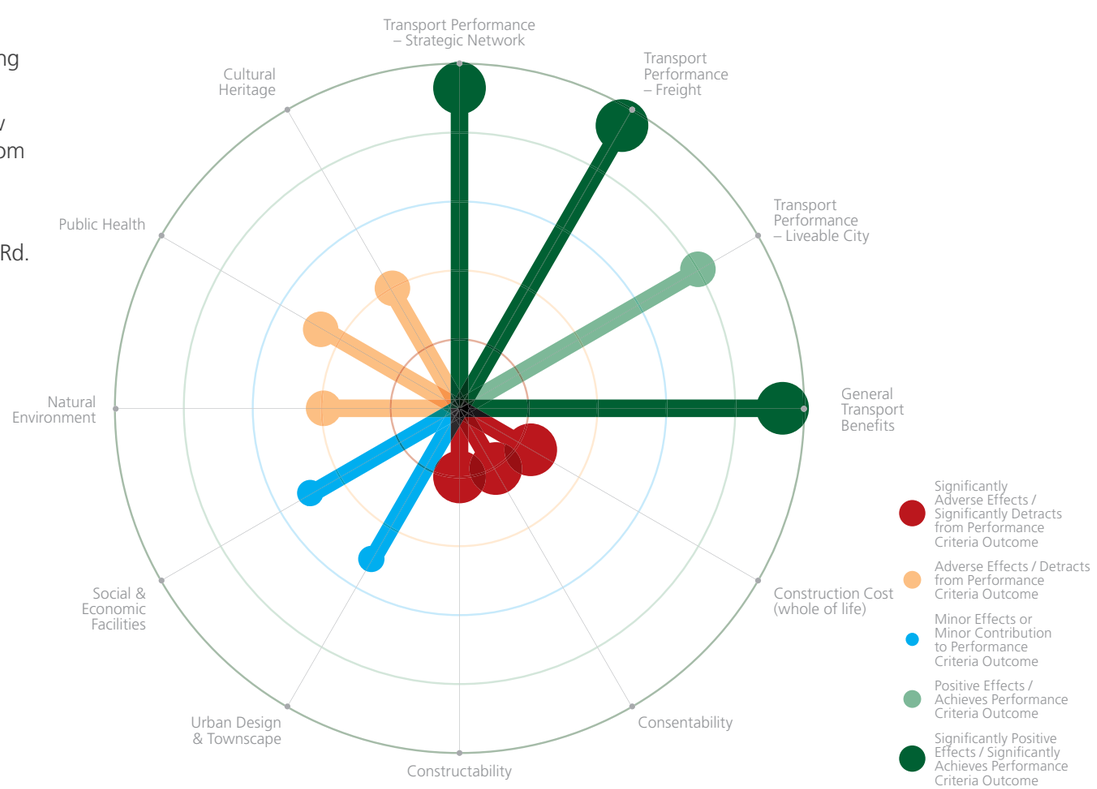
Description

- Capacity improvements on SH20 and new diamond interchange linking to Onehunga Harbour Rd
- New foreshore link from Onehunga Harbour Rd to Angle St then new link inland to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park along new link to Sylvia Park Rd.

Assessment Outcome

✓ Option **to proceed** to Short List

This option is considered a high level of investment, with good transport performance benefits (improved access to SH1 for traffic to/from the south), provides for grade separated interchanges, plus local connections, with a general reduction on rat running. With improvements at Onehunga interchange, this option provides a level of investment to improve connectivity to strategic network in both the west and east. This option would be difficult to consent and construct and is likely to have significant impacts on the natural and social environment. There are opportunities for mitigation that would benefit from more detailed assessment.



Transport Performance

Improved connections to SH20 and SH1 and significant reduction in traffic on Neilson St and Church St aids local business access. New interchange at Onehunga separates local (via north) and industrial (via south) traffic

Construction (technical)

Comparatively difficult to construct with diamond interchange at SH20 and viaduct over Mt Wellington Highway. Impacts Transpower towers.

Consentability

High consenting challenges, with significant impacts on many environmental and community features and within the coastal marine area (note previous consenting challenges in area of Gloucester Park). There is also interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings).

Cost (design, property and construction)

High cost option. Significant cost implications for coastal structures, land requirements and relocation of Transpower towers.

Public / Stakeholder Issues

This option is likely to achieve the outcomes that the some parts of the community expect from the East West Connections project, particularly business interests. The impacts on sensitive environments and potential land requirements (commercial/industrial) are likely to be of significant interest to others in the community.

Urban Design & Townscape

Compatible with the industrial land uses in the area. The interchange will be in a highly visible location within Onehunga Bay. There are some positive connectivity impacts in and around the local road environment.

Social and Economic Facilities

Moderate (some high) adverse impacts. Impacts at SH20 / Gloucester Park new interchange works are common to all options, though scale of interchange increases risk of impacts. Remainder of option uses business land so less impact on community areas, but integration with Waikaraka cycleway needs to be considered. Some positive impacts with removal of traffic from Onehunga Mall.

Public Health

Works traverse known contaminated land – reclamation and landfill.

Natural Environment

Option likely to affect known / listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek area).

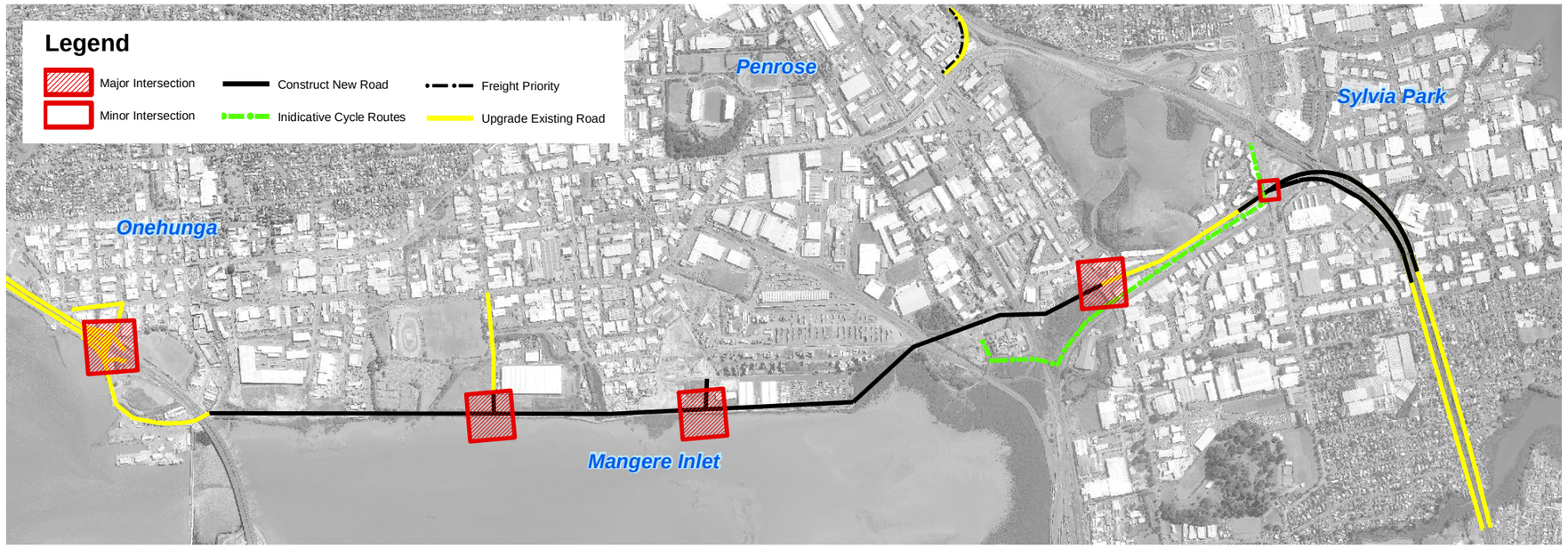
Culture / Heritage

Option affects the foreshore and will require some degree of structure reclamation. The option does not affect known archaeological sites, but note potential impacts on Anns Creek and Te Hopua (volcanic heritage).

OPTION 15

ONEHUNGA/PENROSE AREA

NEW SH20 ONEHUNGA INTERCHANGE WITH FULL FORESHORE ROUTE TO NEW SH1 RAMPS AT MT WELLINGTON



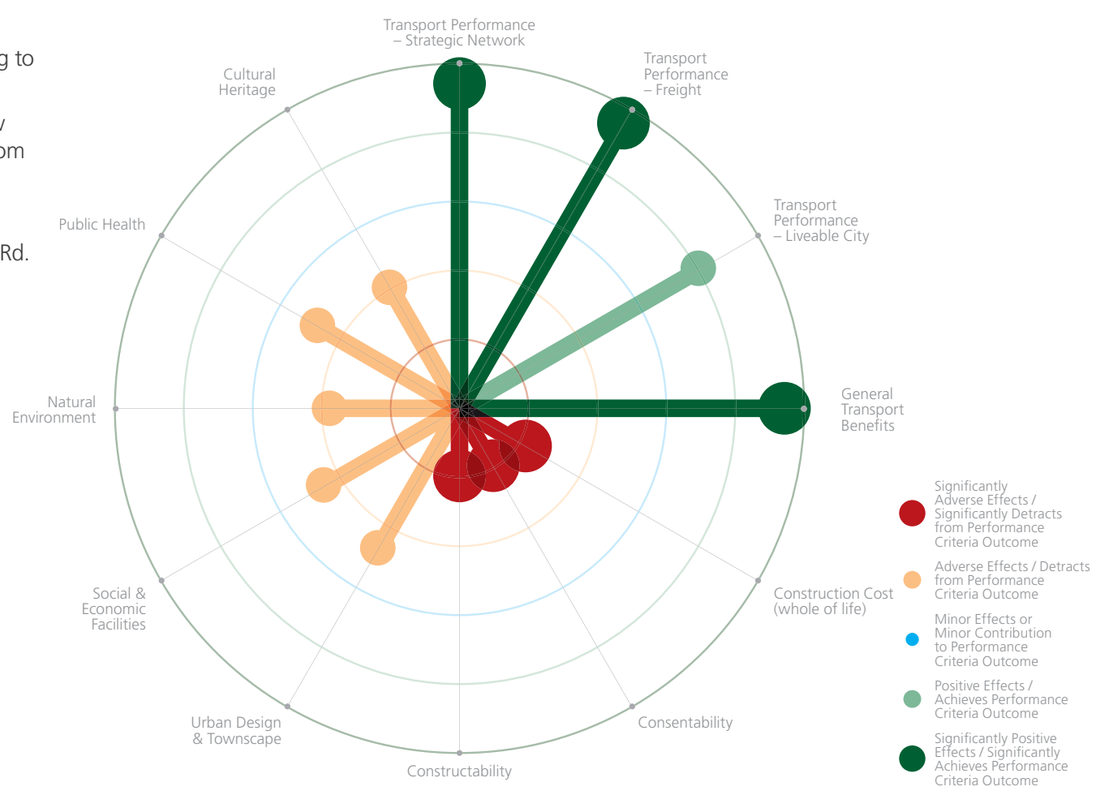
Description

- Capacity improvments on SH20 and new diamond interchange linking to Onehunga Harbour Rd
- New foreshore link from Onehunga Harbour Rd to Angle St then new link inland to Sylvia Park Rd, with new grade separated connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park along new link to Sylvia Park Rd.

Assessment Outcome

× Option **not to proceed** to Short-list (effectively subsumed into Option 14)

This option is considered a high level of investment, with good transport performance benefits (improved access to SH1 for traffic to/from the south), provides for grade separated interchanges, plus local connections, with a general reduction on rat running. With improvements at Onehunga interchange, this option provides a level of investment to improve connectivity to strategic network in both the west and east. This option would be difficult to consent and construct and is likely to have significant impacts on the natural and social environment. There are opportunities for mitigation that would benefit from more detailed assessment, effectively combining consideration with Option 14 (extent of foreshore works).



Transport Performance

Improved connections to SH20 and SH1 and significant reduction in traffic on Neilson St and Church St aides local business access. New interchange at Onehunga separates local (via north) and industrial (via south) traffic (conceptually as per Option 14)

Construction (technical)

Comparatively difficult to construct with diamond interchange at SH20 and viaduct over Mt Wellington Highway. Impacts Transpower towers.

Consentability

High consenting challenges, with significant impacts on many environmental and community features and within the coastal marine area (note previous consenting challenges in area of Gloucester Park). There is also interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings).

Cost (design, property and construction)

High cost option. Significant cost implications for coastal structures, land requirements and relocation of Transpower lines.

Public / Stakeholder Issues

This option is likely to achieve the outcomes that the some parts of the community expect from the East West Connections project, particularly business interests. The impacts on sensitive environments and potential land requirements (commercial/industrial) are likely to be of significant interest to others in the community.

Urban Design & Townscape

Compatible with the industrial land uses in the area. The interchange will be in a highly visible location within Onehunga Bay. There are some positive connectivity impacts in and around the local road environment.

Social and Economic Facilities

Moderate (some high) adverse impacts. Impacts at SH20 / Gloucester Park new interchange works are common to all options, though scale of interchange increases risk of impacts. Remainder of option uses business land so less impact on community areas, but integration with Waikaraka cycleway needs to be considered. Some positive impacts with removal of traffic from Onehunga Mall.

Public Health

Works traverse known contaminated land – reclamation and landfill.

Natural Environment

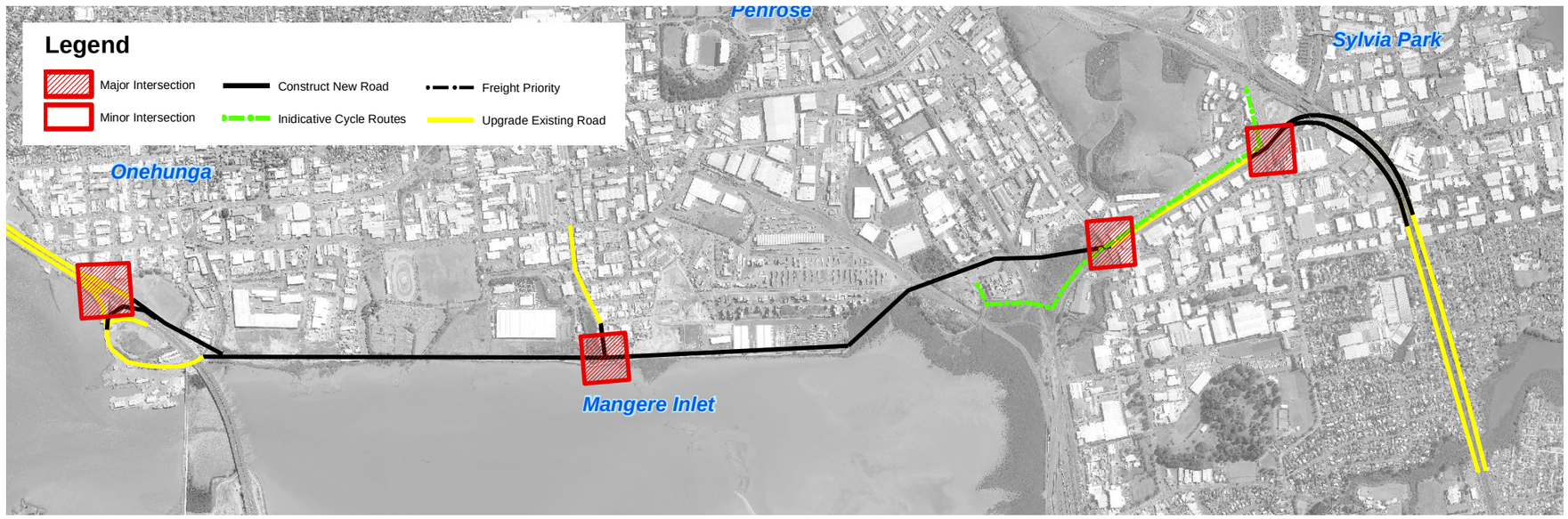
Option likely to affect known / listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek area).

Culture / Heritage

Option affects the foreshore and will require some degree of structure reclamation. The option does not affect known archaeological sites, but note potential impacts on Anns Creek and Te Hopua (volcanic heritage).

OPTION 16 ONEHUNGA/PENROSE AREA

NEW FULL FORESHORE MOTORWAY CONNECTION SH20 TO SH1



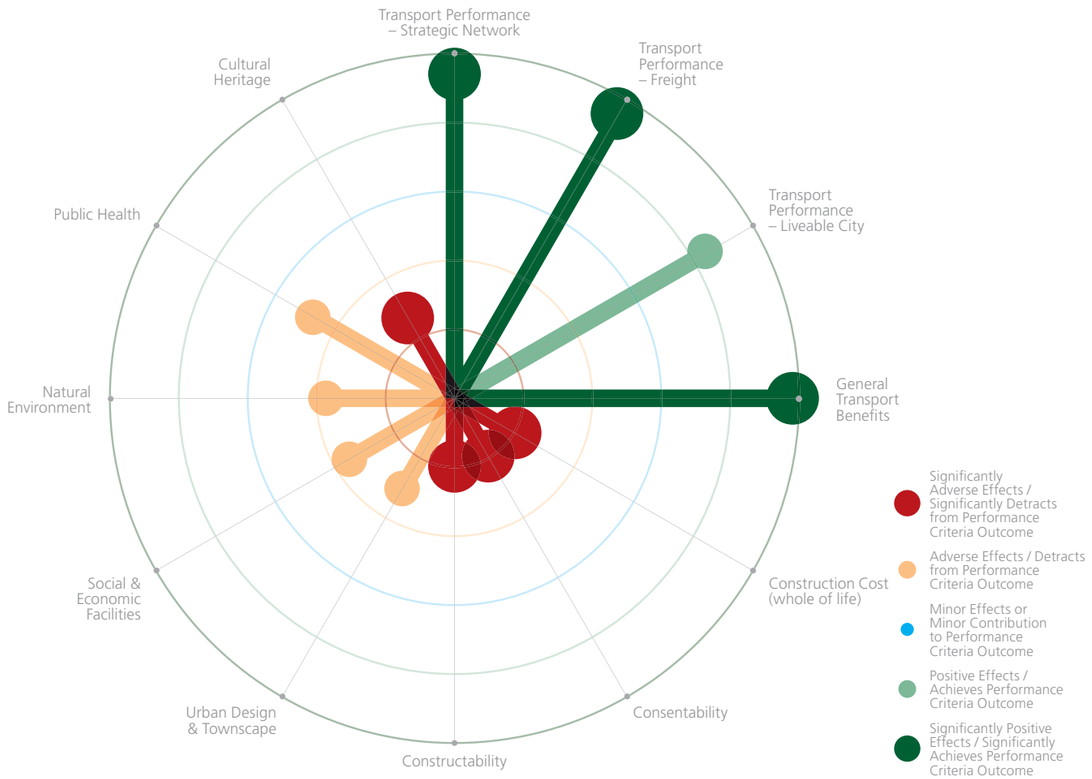
Description

- Capacity improvments on SH20 with a new system interchange at SH20 with Southdown Link to SH1
- New System interchange at SH20 linking to foreshore link
- New foreshore link from SH20 to SH1. New grade separated at Great South Road and connection from Sylvia Park Rd for traffic to/from south at SH1 (with land take)
- Requires relocation to Transpower towers
- Cycle link from Waikaraka to Sylvia Park along new link section.

Assessment Outcome

× Option **not to proceed** to Short-list

This option is considered a high level of investment, with good transport performance benefits (improved access to SH1 for traffic to/from the south) and provides for grade separated interchanges. However, the scale of improvements at Onehunga interchange significant and environmental impacts considered hard to mitigate. This option would be difficult to consent and construct and is likely to have significant impacts on the natural and social environment, both at Gloucester Park / Onehunga and along the M ngere Inlet foreshore.



Transport Performance

Option provides for grade separated connections, plus local connections, with a general reduction on rat running. Reduced conflicts and traffic on Mt Wellington Highway and Sylvia Park Rd and reduced on rat running trucks. Improved, high-speed connections to SH20 and SH1 comes at the expense of reduced local access through limited access points. Constraints on providing both local (Onehunga) and motorway connections at Onehunga mean a high likelihood of disbenefits to local traffic.

Construction (technical)

Comparatively difficult to construct with diamond interchange at SH20 and viaduct over Mt Wellington Highway. Impacts Transpower towers.

Consentability

High consenting challenges, with significant impacts on many environmental and community features and within the coastal marine area (note previous consenting challenges in area of Gloucester Park). There is also interaction with notable services and other utilities that would involve other consenting requirements (including Transpower towers and rail crossings).

Cost (design, property and construction)

High cost option. Significant cost implications for coastal structures and interchange at Onehunga, land requirements and relocation of Transpower lines.

Public / Stakeholder Issues

This option is likely to achieve the outcomes that the some parts of the community expect from the East West Connections project, particularly business interests. The impacts on sensitive environments and potential land requirements (commercial/industrial) are likely to be of significant interest to others in the community, particularly associated with the scale of impacts at the Onehunga Interchange.

Urban Design & Townscape

The interchange will be in a highly visible location in the vicinity of Onheunga and the Hopua tuff ring. There are some (lesser) positive connectivity impacts in and around the local Rd environment.

Social and Economic Facilities

Moderate (some high) adverse impacts. Impacts at SH20 / Gloucester Park new interchange works are common to all options, though scale of interchange increases risk of impacts and likely scale of requirements for facilities in this area. Remainder of option uses existing corridors / business land so less impact on community areas, but integration with Waikaraka cycleway needs to be considered. Some positive impacts with removal of traffic from Onehunga Mall.

Public Health

Works traverse known contaminated land – reclamation and landfill.

Natural Environment

Option likely to affect known / listed natural features and ecological areas including Anns Creek, and involves significant area of likely reclamation in coastal SEA 1. Opportunities to avoid impact or mitigate (through design considered) (e.g. northern edge of Anns Creek area), but scale of impact at Gloucester Park / Hopua tuff ring considered more constrained.

Culture / Heritage

Option affects the foreshore and will require some degree of structure reclamation. The option does not affect known archaeological sites, but note potential impacts on Anns Creek. Impacts on Te Hopua (volcanic heritage) and coastal marine area significant and of interest to mana whenua in earlier projects (Manukau Harbour Crossing).

Appendix L

Onehunga-Penrose Connections Options – Long List Multi Criteria Analysis Summary

No.	MCA Topic	Key Result Area	Criteria	O1 Lowest Change Option (A1/2, B1, C1, D1, E1, E7b)			O2 Reference West A1/A2, B1, C1, D1/E1, E13, E2, F1			O3 New East A1/2, B1, C1, E1, D4, E6, F1			O4 New East 2 A1/2, B1, C1, E1, D5, E6, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C1	Performance againts Objectives (AM)	To provide reliable freight linkages to the Penrose/Onehunga industrial area	Number of controlled stops between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).	minor improvement from freight lane, but same number of traffic light	existing bottlenet remains	0	more direct route to SH1 south but at grade intersection at church and neilson street	some bottlenet remains	grade seperation chruch st over great south road oroke road	improve to the east, but the remaining source of unreliability on neilson st	.	0	improve to the east, but the remaining source of unreliability on neilson st	.	as per option 3
C2		To provide efficient freight linkages to the Penrose/Onehunga industrial area	Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	minor improvement from freight lane, but same indirect route to SH1	.	0	more direct route to SH1 south but at grade intersection at church and neilson street	reduce some bottleneck. Performance of flyover is uncertain	grade seperation chruch st over great south road oroke road	improve to the east, but the remaining conflicts on neilson st	.	0	improve to the east, but the remaining conflicts on neilson st	.	as per option 3
C3		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	Daily Volume of non-freight vehicles in Neilson St and Church St	more through traffic on neilson and church - increase property access conflicts	.	0	lots more through traffic on neilson and church - increase property access conflicts	.	0	less traffic on church but more on neilson west	.	0	less traffic on church but more on neilson west	.	0
C4		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change in % trucks on key freight and non-freight routes	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0
C5		Support functionality by retaining accessability and to enable growth of town centres by removing conflicts between buses and freight	Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)	reduce congestion but still conflict with trucks	.	bus share with general traffic	reduce congestion but still conflict with trucks	.	bus share with general traffic	reduce congestion but still conflict with trucks	.	bus share with general traffic	reduce congestion but still conflict with trucks	.	bus share with general traffic
C6		To improve accessability to and between Sylvia Park and Mangere by improving passenger transport travel times and reliability	Bus travel times and reliability (Peak vs off peak) on route 32	conflict with freight lane at mt wellington hwy and sylvia park rd	.		reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0
C7		To enable growth in town centres by improving cycling and walking connections	% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park	new cycle link will help	.	cycle link is created between power station and sylvia park road	new cycle link will help	.	cycle link is created between power station and sylvia park road	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	cycle link is part of option	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0
C8		To enable growth in town centres by improving cycling and walking connections	Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection	no change	.		more traffic	.	0	increase in traffic	.	0	same as option 3	.	0
C9		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)	some go up and some go down	.		extra traffic attracted to church st	.	0	some go up and some go down	.	0	some go up and some go down	.	0
C10		Provide enduring, efficient transport linkages	Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1	increase truck onto SH1 but without mitigating auxiliary lane	.		auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20
C11		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	General traffic travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	same indirect route to SH1	.		more direct route to SH1 south but at grade intersection at church and neilson street	reduce some bottleneck. Performance of flyover is uncertain	grade seperation chruch st over great south road oroke road	improve to the east, but the remaining conflicts on neilson st	.	0	improve to the east, but the remaining conflicts on neilson st	.	as per option 3
C13		To provide resilient transport linkages to the Penrose/Onehunga industrial area	Provision of additional network choices/reduced reliance on single constrained points in the network	.	.	.	.	.	0	.	.	.	.	.	.
C14		To provide efficient, reliable and enduring transport linkages to the Penrose/Onehunga industrial area and the NIMT	How the constraints between industrial area nd freight terminal are addressed	.	.	.	.	.	.	.	.	.	.	.	.
C15		Relative costs of the Options		.	.	.	.	.	.	.	.	.	.	.	.
C16	Effic.	Relative Benefits of the options		.	.	.	.	.	.	.	.	.	.	.	.
C19	Consentability (AR)	Consenting Complexity of Project	Qualititative assessment of the number of consents and nature of consenting requirements for the Project including the consideration of zoning and Plan objectives and policies.	"low-moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	More design information in the vicinity of Hopus tuff ring and the interface with Ohga Mall will confirm some uncertainty and likely increase to a "2" relatively easily	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. "Sliver" of works within Hamlins Hill will need to be kept to an absolute minimum (or nil) in order to retain this consentability rating	"low-moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	More design information in the vicinity of Hopus tuff ring and the interface with Ohga Mall will confirm some uncertainty and likely increase to a "2" relatively easily	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. "Sliver" of works within Hamlins Hill will need to be kept to an absolute minimum (or nil) in order to retain this consentability rating	"low-moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 due to uncertainty in design in area of Anns Creek (ecological and ONF effects) - otherwise on a par	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. Clipping the edge of Anns Creek will need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area	"moderate" level of complexity - particularly in comparison to other options. Gets a "lower" rating than O5 O6 due to foreshore works. However, there are potentially signficant oportunities to "tidy" up the coastal edge and bring better accessibility to this environment - broad mitigation opportunity. The regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 due to uncertainty in design in area of Anns Creek (ecological and ONF effects) - detail of works in CMA and/or along coast need to be better quantified and mitigation opportunity developed	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. Clipping the edge of Anns Creek will need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area...assumes works to the north of the ciogen plant and therefore this option is the same or similar to O5
C20		Consenting Risks (wider consent requirements)	Qualitative assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)	.	.	Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings)….assume a "deed of grant" needed from Kiwirail (straightforward if plenty of time allowed)	.	.	Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings)….assume a "deed of grant" needed from Kiwirail (straightforward if plenty of time allowed)	.	.	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings)….assume a "deed of grant" needed from Kiwirail (reasonably straightforward if plenty of time allowed)	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.
C21	Constructability (NN)	Construction Impact on Businesses	Accessibility to businesses over construciton period	Small widening works will have minor impact on business and traffic	.	.	construction works around SEART /Great South Road and adjoining properties between Aranui Road, Mt Wellington Hgwy and SH1	.	Further design required to determine footprint	.Construction of Ramps over Mt Wellington Hgwy	.	.	.Construction of Ramps over Mt Wellington Hgwy	.	.
C22		Construction impacts on Utilities and lifeline infrastructure	Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction	No major services, impacted	.	.	No major service identified	.	.	Impact on Transpower pylons at southdown & Tip Top Corner	.	.	.Impact on Transpower pylons at South Down & Tip Top Corner	.	.

No.	MCA Topic	Key Result Area	Criteria	O1 Lowest Change Option (A1/2, B1, C1, D1, E1, E7b)			O2 Reference West A1/A2, B1, C1, D1/E1, E13, E2, F1			O3 New East A1/2, B1, C1, E1, D4, E6, F1			O4 New East 2 A1/2, B1, C1, E1, D5, E6, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C24	Urban Design & Townscape (GL)	Connectivity (circulation	The extent of effects on connectivity including disruption to the street network and walkability.	Reinforces existing network by concentrating traffic on existing Neilson Street. Increase in traffic and enlarging intersection of Neilson Street and Onehunga Mall will reduce pedestrian/cycle connectivity between Onehunga town centre and Mangere. Church Street Bridge over Great South Road will also reduce connectivity. (Worse than Option 1)	-	-	Reinforces existing network by concentrating traffic on existing Neilson Street. Increase in traffic and enlarging intersection of Neilson Street and Onehunga Mall will reduce pedestrian/cycle connectivity between Onehunga town centre and Mangere. Church Street Bridge over Great South Road will also reduce connectivity. (Worse than Option 1)	-	-	Mainly has little effect on local connectivity. Increase in traffic and enlarging intersection of Neilson Street and Onehunga Mall will reduce pedestrian/cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	-	-	Mainly has little effect on local connectivity. Increase in traffic and enlarging intersection of Neilson Street and Onehunga Mall will reduce pedestrian/cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	-	-
C25		Built Form	The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.	Works contained within existing corridor. Buildings mostly set back from road frontage.	-	-	Works contained within existing corridor. Buildings mostly set back from road frontage.	-	-	Mostly follows existing pattern of development. Potential effects on some industrial properties.	-	-	Follows existing pattern of development. Mostly in existing corridors or open land.	-	-
C26		Activities	The extent of effects on (compatibility with) surrounding activities, with particular regard to public activities (such as town centres), land use, and character.	Compatible with industrial character of surroundings. Road widening and increase in traffic at intersection of Neilson Street and Onehunga Mall will detract from amenity of main street. Some likely impacts on Te Hopua	-	-	Compatible with industrial character of surroundings. Road widening and increase in traffic at intersection of Neilson Street and Onehunga Mall will detract from amenity of main street.	-	-	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	-	That detailed alignment minimises effects on industrial properties, but that some acquisition required to avoid Anns Creek	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.
C27		Natural Landscape	The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.	Some likely impacts on Te Hopua and Hamlins Hill	Depends on detailed configuration of western interchange.	That there are some small encroachments Te Hopua and extensive cuts into side of Hamlins Hill	Some likely impacts on Te Hopua and Hamlins Hill	Depends on detailed configuration of western interchange.	That there are some small encroachments Te Hopua and extensive cuts into side of Hamlins Hill	Skirts Anns Creek. Potential effects	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign in a way that minimises effects on Anns Creek including lava features	Skirts edge Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features
C28		Visual Amenity	The extent of effects on visual amenity taking into account the character and visibility (prominence) of the proposal, and the character of the existing environment, the sensitivity of audiences, and the experience of future road users	Some localised visual amenity effects from increasing scale of existing roads, from encroaching into residential properties adjacent to SH1, but generally visually contained within existing corridor.	-	-	Some localised visual amenity effects from increasing scale of existing roads, from encroaching into residential properties adjacent to SH1, but generally visually contained within existing corridor.	-	-	Some localised visual amenity effects from increasing scale of existing roads, from encroaching into residential properties adjacent to SH1, and from ramps at eastern end, but generally visually contained within existing corridor.	Design details required to assess actual degree of effect	-	Reasonably high (but distant) visibility across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.
C29		Associative Elements	The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or which otherwise contribute to townscape amenity.	Potential effects on cultural values associated with Te Hopua	Potential effects on cultural values associated with Te Hopua	That there are some small encroachments Te Hopua and extensive cuts into side of Hamlins Hill	Potential effects on cultural values associated with Te Hopua	Depends on detailed configuration of western interchange.	That there are some small encroachments Te Hopua and extensive cuts into side of Hamlins Hill	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua
C30		Community cohesion	The extent of effects on community cohesion and connectedness.	Some impacts identified in the option, most adverse are in Segment A (common to all options and not assessed here), but also increased use of Onehunga Harbour Road. Other changes will increase degree of severance between communities across Neilson St, but overall an increase on existing issues.	Some uncertainty as scale of change could result in 'cummulative' impact of more significance than assessed here and uncertainty due to lack of detail on specific traffic management elements (e.g. road barriers) that might be used to achieve functioning of this option	-	Combined, scale of impacts at SH1 and at Onehunga harbour Road consider the cohesion impacts are adversely, but could be addressed through design	Significance of effect could be reduced by design, but integration of project with Sylvia Park, residential areas and river crossing likely to create adverse effects	-	Need to confirm extent of works on SH1 south of Sylvia Park, but scale reduced from Option O2 so assume edge effects and mitigation in place but assessed with that and Onehunga Harbour Road impacts in combination	-	-	As for Package Option 3	Opportunity with connection to be provided from Sylvia Park to Waikara walkway, has potential to be positive outcome if this included with mitigation	-
C31	Social (AL)	Open space	The extent of effects on passive and active recreation opportunities in the EWC study area.	Take in segment A (common to all options). Other areas of minor impact (e.g. Waikaraka park frontage). As works in existing corridor assume minor at this stage	-	-	Scale of impact at Hamlins hill will require careful management and not a 'no impact' option, but for purpose of comparative evaluation comparatively minor reserve impact requirements	depedent on scale of impact at Hamlins Hill and mitigation work proposed	-	impacts in Ann's Creek area, but assessment of impact predominantly ecological - assume edge effect	-	-	As for package option 3	-	-
C32		Community facilities	The extent of effects on community facilities in the EWC study area.	Some potential for disruption with Onehunga interchange (scout hall) but scale of works assume minor overall (e.g. disruption and relocation not overall loss).	Some uncertainty as scale of change could result in 'cummulative' impact of more significance than assessed here and uncertainty due to lack of detail on specific facilities that may be affected	-	None identified, but not issues at Sylvia Park land take, inclear whether works south will extend to schools and facilities on edge of SH1	Depends on scale of widening works at and south of Sylvia Park, edge effects but some facilities through this area	-	depedent on scale of works at Neilson Street in Onehunga Centre	Potential for increase in adverse effects depending on traffic works required in Onehunga Mall area	-	As for Package Option 3	Issues of impact at Onehunga Mall same as for O3	-
C34		Viability / productivity of business land areas	The extent of land take and severance of industrial and business land	Construction impacts likely to be significant in terms of disruption and the duration of consent would need to be considered further, but assumes most work in road reserve	Greater detail on the scale of works and duration of business disruption needed to assess. Note that this assessment has not considered the transport outcomes (assessed elsewhere)	Assumes work for option largely within road reserve	Scale of works at Sylvia Park recognised as edge effect, but as a Metro Centre still considered adverse	Scope to mitigate in design	-	Some effects at SH1 and potential for disruption and impacts at Metroport area, and Sylvia Park Road	Scope for impacts to be mitigated by design	-	With reclamation of foreshore rather than use of business land this option is considered less of an impact that Option 3, but still Sylva Park Road impacts to be considered	Scale of works at Syliva Park Road may increase adverse effects	-
C35		Community linkages and access to and along the coastal marine area	The extent of effects on linkages to and along the CMA and other mapped / identified linkages	Segment A potential impacts (common to all options and not factored here)	-	-	Works at Onehunga Interchange but scale and opportunity for effects to be mitigate	-	-	Assumes connection to Waikara Walkway addressed in Ann's Creek section	Not defined how access to Waikaraka walkway maintained over new link section, but assume includes linke to Waikaraka	-	-	-	-

No.	MCA Topic	Key Result Area	Criteria	O1 Lowest Change Option (A1/2, B1, C1, D1, E1, E7b) Assessment	O1 Certainty	O1 Assumptions	O2 Reference West A1/A2, B1, C1, D1/E1, E13, E2, F1 Assessment	O2 Certainty	O2 Assumptions	O3 New East A1/2, B1, C1, E1, D4, E6, F1 Assessment	O3 Certainty	O3 Assumptions	O4 New East 2 A1/2, B1, C1, E1, D5, E6, F1 Assessment	O4 Certainty	O4 Assumptions
C36	Natural Environment (AR)	Air quality	Extent of effects on air quality (airshed)			Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)			Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)			Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)			Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)
C37		Water resources	Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)			i			i	0		i			i
C38		Water quality	Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).	Space will be required for treatment for all options		if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options		if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options		if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options		if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39		Ecological resources (terrestrial biodiversity)	Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).	Option does not pass through any areas of significant ecological value.	Passes through existing highly modified road corridors. SEA are defined in the PAUP. There may be localised areas of ecological value (eg. trees)that will need to be considered during design development.	No particular assumptions.	Option does not pass through any areas of significant ecological value.	Passes through existing highly modified road corridors. SEA are defined in the PAUP. There may be localised areas of ecological value (eg. trees)that will need to be considered during design development.	No particular assumptions.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.
C40		Coastal environment and resources	Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.	The options does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route in located inland and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour for upgrade works.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	The options does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route in located inland and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour for upgrade works.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	The options does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route in located inland and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour for upgrade works.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	The option requires reclamation of or structures along the foreshore. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route in located inland and therefore physical works do not impact the coast.	The form of foreshore section has yet to be determined. The use of structures can minimise impacts. The are likely to be design solutions to avoid encroaching into the harbour adjacent to the Gloucester Park Interchange.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.
C41		Natural character	Extent of effects on natural character based on technical report evaluation.	Mostly remote from coastal environment. Some potential minor encroachments into CMA at Gloucester Park.		That any encroachments into CMA at Gloucester Park are minimal	Mostly remote from coastal environment. Some potential effects at western interchange but assume any encroachment into CMA is minimal. Also some minor effects at Tamaki River headwaters	Uncertainty of details at western interchange	That any encroachments into CMA are minimal	Largely remote from coastal environment, however eastern end skirts sensitive part of the coastal environment at Anns Creek. Also some potential for encroachment into CMA at Gloucester Park	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek	That measures are taken to realign in a way that minimises effects on Anns Creek.	Adjacent to shoreline between Angle Street and Great South Road. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.
C42		Outstanding Natural Features & Landscapes	Extent of effects on natural character and outstanding natural features including geological features.	Widening of roads may have effects on Te Hopua tuff ring identified in PAUP as an ONF. Otherwise no ONF/ONLs	Uncertainty over extent of encroachment at Te Hopua	That there are some encroachments	Widening of roads may have effects on Te Hopua tuff ring identified in PAUP as an ONF. Otherwise no ONF/ONLs. Possible encroachment on to Hamlins Hill ONF parallel to SH1.	Uncertainty over extent of encroachment at Te Hopua (Gloucester Park). Uncertainty over extent of encroachment into Hamlins Hill	Uncertainty over extent of encroachment at Te Hopua (Gloucester Park). Uncertainty over extent of encroachment into Hamlins Hill	Traverses Anns Creek pohuehue lava flow which is recognised as ONF. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Traverses area of Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua
C43	Public Health (AR)	Air shed (human health)	Impact of air borne contaminants on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact		0	Limited sensitive receptors and use of exising infrastructure limits impact				
C44		Noise and vibration (human health)	Impact of operational noise and vibration on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact		0	Limited sensitive receptors and use of exising infrastructure limits impact				
C45		Contaminated land (human health)	Impact of contaminants from historical land uses (air discharges and groundwater impacts).			Assumes work for option largely within road reserve. As such, assume soil disturbance is relatively minor			Works near Gloucester park have higher chance of encountering uncontrolled fill. However, relative to other options the contaminated land issues likely to be minor	Traverses Anns Creek pohuehue lava flow which is recognised as ONF. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua			Risk profile as for O3
C46	Cultural and Heritage (AR)	Cultural values	Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	The option will have physical impacts on Gloucester Park. This is a feature of cultural value.	Iwi engagement may identify further areas or values of significance.	No encroachment into the harbour.	The option will have physical impacts on Gloucester Park. This is a feature of cultural value.	Iwi engagement may identify further areas or values of significance. Further design of SEART south facing ramps will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have physical impacts on Anns Creek.	Iwi engagement may identify further areas or values of significance. Further design of SEART south facing ramps will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.
C47		Customary rights	Extent of effects on areas of protected customary rights.	This option does not encroach into any areas identified by Treaty Claims.		The use of the existing corridor means that Rarotonga (Mt Smart) not affected.	At the eastern end, the option may encroach into the Mukukaroa/Hamlins Hill redress area for the SEART south facing ramps.	Requires confirmation that the additional ramps will require land from the Mukukaroa site.	The use of the existing corridor means that Rarotonga (Mt Smart) not affected.	Along Sylvia Park Road the option may encroach into the Mukukaroa/Hamlins Hill redress area.	Requires confirmation that options will require land from the Mukukaroa site.	The use of the existing corridor means that Rarotonga (Mt Smart) not affected.	The option impacts the foreshore.	The form of foreshore section has yet to be determined. Requires confirmation that options will require land from the Mukukaroa site.	
C48		Archaeological and built heritage	Extent of effects on sites and places of archaeological value, heritage buildings and places.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are contained in the existing road corridor. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are contained in the existing road corridor. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park and the sites within Hamlins Hill.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park and the sites within Hamlins Hill.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.

No.	MCA Topic	Key Result Area	Criteria	O5 New East Inland A1/2, C6, C1, E1, D4, E6, F1			O6 Freight Lanes and New Links (A1/2, C6, C1, E1, D4, E7b)			O7 Reference & Waikaraka (A1/2, C6, C1(part), C16a, E1, D4, E6, F1)			O8 Reference East A1/2, B3B, C6, C1, E1, D4, E6, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C1	Performance againts Objectives (AM)	To provide reliable freight linkages to the Penrose/Onehunga industrial area	Number of controlled stops between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).	improve to the east, but the remaining source of unreliability on neilson st. marginerlly better than option 3 and 4	.	0	improve to the east, but the remaining source of unreliability on neilson st. marginerlly worse than option 5 without ramp to SH1	.	0	same as option 5	.	0	marginal improvement over option 5 because less conflict in onehunga	.	0
C2		To provide efficient freight linkages to the Penrose/Onehunga industrial area	Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	improve to the east, but the remaining conflict on neilson st. marginerlly better than option 3 and 4	.	0	improve to the east, but the remaining conflect on neilson st. marginerlly worse than option 5 without ramp to SH1	.	0	same as option 5	.	0	marginal improvement over option 5 because less conflict in onehunga	.	0
C3		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	Daily Volume of non-freight vehicles in Neilson St and Church St	less traffic on church but more on neilson west	.	0	less traffic on church but more on neilson west	.	0	less traffic on church and most of neilson st	.	0	less traffic on church but more on neilson west	.	0
C4		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change in % trucks on key freight and non-freight routes	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0
C5		Support functionality by retaining accessability and to enable growth of town centres by removing conflicts between buses and freight	Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)	reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south	reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south	reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south	reduce congestion with limited confict with trucks	.	assume bus slip lane from neilson street to southbound on-ramp
C6		To improve accessability to and between Sylvia Park and Mangere by improving passenger transport travel times and reliability	Bus travel times and reliability (Peak vs off peak) on route 32	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	conflict with freight lane at mt wellington hwy and sylvia park rd	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0
C7		To enable growth in town centres by improving cycling and walking connections	% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0
C8		To enable growth in town centres by improving cycling and walking connections	Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection	remove traffic	.	0	remove traffic	.	0	remove traffic to galway, but still have traffic on neilson	.	0	remove traffic	.	0
C9		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)	some go up and some go down	.	0	some go up and some go down	.	0	some go up and some go down	.	0	some go up and some go down but reduction on onehunga town centre	.	0
C10		Provide enduring, efficient transport linkages	Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	increase truck onto SH1 but without mitigating auxialiry lane	.	0	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20
C11		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	General traffic travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	improve to the east, but the remaining conflict on neilson st. marginerlly better than option 3 and 4	.	0	improve to the east, but the remaining conflect on neilson st. marginerlly worse than option 5 without ramp to SH1	.	0	same as option 5	.	0	marginal improvement over option 5 because less conflict in onehunga	.	0
C13		To provide resilient transport linkages to the Penrose/Onehunga industrial area	Provision of additional network choices/reduced reliance on single constrained points in the network	.	.	.	.	.	.	.	.	.	.	.	.
C14		To provide efficient, reliable and enduring transport linkages to the Penrose/Onehunga industrial area and the NIMT	How the constraints between industrial area nd freight terminal are addressed	.	.	.	.	.	.	.	.	.	.	.	.
C15	Effic.	Relative costs of the Options		.	.	.	.	.	.	.	.	.	.	.	.
C16		Relative Benefits of the options		.	.	.	.	.	.	.	.	.	.	.	.
C19	Consentability (AR)	Consenting Complexity of Project	Qualititative assessment of the number of consents and nature of consenting requirements for the Project including the consideration of zoning and Plan objectives and policies.	"moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Broad mitigation opportunity. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 due to uncertainty in design in area of Anns Creek (ecological and ONF effects)	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. Clipping the edge of Anns Creek will need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area...	"moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Broad mitigation opportunity. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 due to uncertainty in design in area of Anns Creek (ecological and ONF effects)	Assumes 4-laning works are largely within existing road corridor (and/or heavily modified area) and works affecting the Hopua tuff ring are negligible or nil. Clipping the edge of Anns Creek will need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area...	"moderate" level of complexity - particularly in comparison to other options…there will be complexity and issues that need working through. Waikaraka Park makes it complex for social/community reasons	removing useability of Waikaraka Park likely to be a significnat issue - community facility, heritage features present - and there are feasible alternatives that mean it would b ehard to justify from a social/community perspective	0	"higher" level of complexity than O4 O5 and O6 - due to interchange reqyuiring notable reclamation at GPI and complexity iwth access to port and impact on tuff ring. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 includes uncertainty in design in area of Anns Creek (ecological and ONF effects) - further certainty could be achieved with a better understanding of design in of the GP interchange and the degree of reclamation required	Assumes works affecting the CMA require reclamation and relocation of the scout hall. Clipping the edge of Anns Creek would need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area…
C20		Consenting Risks (wider consent requirements)	Qualitative assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.
C21	Constructability (NN)	Construction Impact on Businesses	Accessibility to businesses over construciton period	..Construction of Ramps over Mt Wellington Hgwy	.	.	.	.	.	..Construction of Ramps over Mt Wellington Hgwy	.	.	.Diamond interchange at SH20 & significant impact on Mt Wellington Hgwy durinmg fly grade separated ramp construction	.	.
C22		Construction impacts on Utilities and lifeline infrastructure	Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction	.Impact on Transpower pylons at South Down & Tip Top Corner	.	.	.	.	.	Impact on Transpower pylons at South Down & Tip Top Corner	.	.	Impact on Transpower pylons at Gloucester Park, South Down & Tip Top Corner	.	.

No.	MCA Topic	Key Result Area	Criteria	O5 New East Inland A1/2, C6, C1, E1, D4, E6, F1			O6 Freight Lanes and New Links (A1/2, C6, C1, E1, D4, E7b)			O7 Reference & Waikaraka (A1/2, C6, C1(part), C16a, E1, D4, E6, F1)			O8 Reference East A1/2, B3B, C6, C1, E1, D4, E6, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C24	Urban Design & Townscape (GL)	Connectivity (circulation	The extent of effects on connectivity including disruption to the street network and walkability.	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	.	.	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. However, offset by widening of Neilson Street across Onehunga Mall. Some improved local connectivity from Neilson street to SE.	.	.	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	.	.
C25		Built Form	The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.	Mostly follows existing pattern of development. Potential effects on some industrial properties.	.	.	Mostly follows existing pattern of development. Potential effects on some industrial properties.	.	.	Mostly follows existing pattern of development. But cuts diagonally across Waikaraka Park. Potential effects on some industrial properties.	.	.	Mostly follows existing pattern of development. Potential effects on some industrial properties.	.	.
C26		Activities	The extent of effects on (compatibility with) surrounding activities, with particular regard to public activities (such as town centres), land use, and character.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required. Would fundamentally compromise Waikaraka Park.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.
C27		Natural Landscape	The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.	Skirts Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	Skirts Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	Skirts Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	Crosses edge of Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features
C28		Visual Amenity	The extent of effects on visual amenity taking into account the character and visibility (prominence) of the proposal, and the character of the existing environment, the sensitivity of audiences, and the experience of future road users	Low views across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Reasonably high (but distant) visibility across Mangere Inlet. Some amenity effects from users of shoreline path. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Long views across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Interchange will be in a prominent and high visibility location in middle of Onehunga Bay. Distant views of eastern section across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.
C29		Associative Elements	The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or which otherwise contribute to townscape amenity.	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features. Will compromise park with community significance and affect historical stone walls	Design details required to assess actual degree of effect at Te Houa and Anns Creek	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua
C30		Community cohesion	The extent of effects on community cohesion and connectedness.	Reduced impacts at Onehunga Mall which may improve linkages to foreshore and Onehunga Harbour Road. Scale of works at Galway and bridge crossing of rail need to be confirmed	.	.	Need to confirm extent of works on SH1 south of Sylvia Park, but scale reduced from Option O2 so assume edge effects and mitigation in place. Not opportunities for improved linkage at Onehunga Harbour Road	.	.	As for O5 but through Waikaraka	.	.	As for O5 but with intersection at Onehunga Harbour Road, avoids traffic on Neilson Street in Onehunga	.	.
C31	Social (AL)	Open space	The extent of effects on passive and active recreation opportunities in the EWC study area.	As for O3	.	.	impacts in Ann's Creek area, but assessment of impact predominantly ecological - assume edge effect	.	.	Impact on Waikara Park would require mitigation	.	.	Minor take presumed at Gloucester Park, but design detail to confirm	Not active reserve impacted but unclear on space	.
C32		Community facilities	The extent of effects on community facilities in the EWC study area.	As for O3	.	.	depedent on scale of works at Neilson Street in Onehunga Centre, but less than for O3 and O5	Potential for increase in adverse effects depending on traffic works required in Onehunga Mall area	.	As for O5 but through Waikaraka	.	.	.	.	.
C34		Viability / productivity of business land areas	The extent of land take and severance of industrial and business land	As for O3, but recognise opportunity for land take mitigation with design options in this area, Sylvia Park Road too	.	.	Some effects at SH1 and potential for disruption and impacts at Metroport area, and Sylvia Park Road	Scope for impacts to be mitigated by design	.	As for O5 but through Waikaraka	.	.	Take required	.	.
C35		Community linkages and access to and along the coastal marine area	The extent of effects on linkages to and along the CMA and other mapped / identified linkages	Recognises impact at Waikaraka and how linkages to walkway are to be maintained, assumes provides link from Cycleway to Sylvia Park	Opportunity to mitigate if design solutions can address connectivity to foreshore from Onehunga community	.	Assumes connection to Waikara Walkway addressed in Ann's Creek section	Not defined how access to Waikaraka walkway maintained over new link section, but assume includes link to Waikaraka	.	As for O5 but through Waikaraka	.	.	.	.	.

No.	MCA Topic	Key Result Area	Criteria	O5 New East Inland A1/2, C6, C1, E1, D4, E6, F1 – Assessment	O5 – Certainty	O5 – Assumptions	O6 Freight Lanes and New Links (A1/2, C6, C1, E1, D4, E7b) – Assessment	O6 – Certainty	O6 – Assumptions
C36	Natural Environment (AR)	Air quality	Extent of effects on air quality (airshed)	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)
C37		Water resources	Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)		.	i		.	i
C38		Water quality	Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39		Ecological resources (terrestrial biodiversity)	Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).	Option passes to the South of the MRP co-generation plant and through a large area of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable but will still result in adverse effects.	A route to the south of the co-generation plant can be achieved although the form has yet to be determined.	Some impact on Anns Creek - skirts the edge	impacts could be managed with a design solution - opportunities for mitigation in CMA environment	.
C40		Coastal environment and resources	Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.	The option does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route is separated from the coast and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour at this location.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	.	impacts could be managed with a design solution - opportunities for mitigation in CMA environment	assumed limited coastal impact can be managed
C41		Natural character	Extent of effects on natural character based on technical report evaluation.	Adjacent to shoreline between Angle Street and Great South Road. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.	Adjacent to shoreline between Angle Street and Great South Road. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	.
C42		Outstanding Natural Features & Landscapes	Extent of effects on natural character and outstanding natural features including geological features.	Skirts Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Skirts Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	.
C43	Public Health (AR)	Air shed (human health)	Impact of air borne contaminants on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C44		Noise and vibration (human health)	Impact of operational noise and vibration on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C45		Contaminated land (human health)	Impact of contaminants from historical land uses (air discharges and groundwater impacts).	.	.	Risk profile as for O3	.	.	Risk profile as for O3
C46	Cultural and Heritage (AR)	Cultural values	Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	The option will have physical impacts on Anns Creek.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.
C47		Customary rights	Extent of effects on areas of protected customary rights.	The option does not affect ant Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route is separated from the coast and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour at this location.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.
C48		Archaeological and built heritage	Extent of effects on sites and places of archaeological value, heritage buildings and places.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park and the sites within Hamlins Hill.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.	The option is contained within the existing road corridor and will not have any physical impacts on the identified sites along the corridor including the Sea Scouts building and Waikaraka Park.	Existing sites are identified in the planning maps and none are affected. Further design will determine if there are any direct impact on the Sea Scouts building adjacent to Gloucester Park and the sites within Hamlins Hill.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building and the heritage features (eg. wall and gates) of Waikaraka Park.

No.	O7 Reference & Waikaraka (A1/2, C6, C1(part), C16a, E1, D4, E6, F1) – Assessment	O7 – Certainty	O7 – Assumptions	O8 Reference East A1/2, B3B, C6, C1, E1, D4, E6, F1 – Assessment	O8 – Certainty	O8 – Assumptions
C36	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)
C37		.	i		.	0
C38	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.
C40	The option does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route is separated from the coast and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour at this location.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	The option requires reclamation for the Orpheus Drive connection and the Gloucester Park Interchange works.	The only area located directly adjacent to the coastal environment is at Gloucester Park. Design solutions could minimise reclamation but are unlikely to eliminate it.	The changes to the Gloucester Park Interchange cannot be contained within the existing land.
C41	Adjacent to shoreline between Angle Street and Great South Road. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.	Adjacent to shoreline between Angle Street and Great South Road. Crosses north edge of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange. Potential encroachment into CMA at Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.
C42	Skirts Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Crosses edge of Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Potential effects on Te Hopua ONF from Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua
C43		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C44		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C45	.	.	Approx one third of alignment traverses Landfill sites and areas of uncontrolled fill	.	.	Risk profile as for O3 and additional risk related to reclamation on Onehunga bay that may need to deal with contaminated sediments
C46	The option will have physical impacts on Anns Creek.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have impacts on the intrinsic values and cultural assocaitations with Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.
C47	The option does not affect ant Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas but does affect the foreshore.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa
C48	The option crosses through Waikaraka Park, an identified heritage site.	The effects on the site cannot be avoided as the option run directly through it.	Assumed at this stage that the design can avoid direct impacts on the Sea Scouts Building.	The option will impacts the Sea Scouts building and may affect the Waikaraka Park Features and Woolen Mill.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the impact on the Sea Scout, Waikaraka Park and Woolen Mill can be avoided.	Assumed at this stage that the design will directly affect the Sea Scouts Building

No.	MCA Topic	Key Result Area	Criteria	O9 A1/2, B3a, C6, C1, D1/E1, D4, E6, F1			O10 A1/2, C6, C1, D1/D7/D4, E1, E6, F1 (Part D4)			O11 A1/2, C6, C1, D1/D7,E1, E13, D8, E6, E14, F1			O12 A1/A2, C6, C1, D4, E11, E1, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C1	Performance againts Objectives (AM)	To provide reliable freight linkages to the Penrose/Onehunga industrial area	Number of controlled stops between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).	marginally worse than option 8 and similar to option 5	.	at grade at onehunga mall	similar signals as option 5	.	0	similar to option 10	.	0	similar signals as option 5	.	at grade at great south road and grade sepertion at mt wellington
C2		To provide efficient freight linkages to the Penrose/Onehunga industrial area	Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	marginally worse than option 8 and similar to option 5	.	at grade at onehunga mall	similar time as option 5	.	0	similar to option 10	.	0	similar time as option 5	.	at grade at great south road and grade sepertion at mt wellington
C3		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	Daily Volume of non-freight vehicles in Neilson St and Church St	less traffic on church but more on neilson west	.		less traffic on church but more on neilson west including pass metro port	.	0	less traffic on church but more on neilson west including pass metro port	.	0	less traffic on church but more on neilson west	.	.
C4		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change in % trucks on key freight and non-freight routes	general reduction on rat running trucks	.		general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	0	general reduction on rat running trucks	.	.
C5		Support functionality by retaining accessability and to enable growth of town centres by removing conflicts between buses and freight	Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)	reduce congestion but still confict with trucks	.		reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south	reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south	reduce congestion with limited confict with trucks	.	assume bus only slip lane to onehunga mall south
C6		To improve accessability to and between Sylvia Park and Mangere by improving passenger transport travel times and reliability	Bus travel times and reliability (Peak vs off peak) on route 32	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.		reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	.	.
C7		To enable growth in town centres by improving cycling and walking connections	% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.		worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	.	.
C8		To enable growth in town centres by improving cycling and walking connections	Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection	more traffic	.		same as option 7	.	0	same as option 7	.	0	same as option 7	.	.
C9		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)	some go up and some go down	.		some go up and some go down	.	0	some go up and some go down	.	0	some go up and some go down	.	.
C10		Provide enduring, efficient transport linkages	Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	.	auxilary on SH1 and SH20
C11		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	General traffic travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	marginally worse than option 8 and similar to option 5	.	at grade at onehunga mall	similar time as option 5	.	0	similar to option 10	.	0	similar time as option 5	.	at grade at great south road and grade sepertion at mt wellington
C13		To provide resilient transport linkages to the Penrose/Onehunga industrial area	Provision of additional network choices/reduced reliance on single constrained points in the network	.	.	.	.	.	.	.	.	.	.	.	.
C14		To provide efficient, reliable and enduring transport linkages to the Penrose/Onehunga industrial area and the NIMT	How the constraints between industrial area nd freight terminal are addressed	.	.	.	.	.	.	.	.	.	.	.	.
C15		Relative costs of the Options		.	.	.	.	.	.	.	.	.	.	.	.
C16	Effic.	Relative Benefits of the options		.	.	.	.	.	.	.	.	.	.	.	.
C19	Consentability (AR)	Consenting Complexity of Project	Qualititative assessment of the number of consents and nature of consenting requirements for the Project including the consideration of zoning and Plan objectives and policies.	"higher" level of complexity than O4 O5 and O6 - due to interchange regyuiring notable reclamation at GPI and complexity with access to port and impact on tuff ring. Peripheral matters such as the impact of the regional PAUP provisions (e.g. stormwater treatment) will add complexity that we need to recognise and appropriately manage.	slightly lower level of certainty than for O1 and O2 includes uncertainty in design in area of Anns Creek (ecological and ONF effects) - further certainty could be achieved with a better understanding of design in of the GP interchange and the degree of reclamation required	Assumes works affecting the CMA require reclamation and relocation of the scout hall. Clipping the edge of Anns Creek would need to be carefully designed to avoid impacts on the ONF (lava) and ecological values of the area…	refer to assessments for O4 O5 and O6 - presence of rail spur adds complexity and land take from industrial land could be contrary to project objectives	refer to assessments for O4 O5 and O6 - presence of rail spur adds complexity and land take from industrial land could be contrary to project objectives	.	refer to assessments for O4 O5 and O6 - presence of rail spur adds complexity and land take from industrial land could be contrary to project objectives	refer to assessments for O4 O5 and O6 - presence of rail spur adds complexity and land take from industrial land could be contrary to project objectives	.	Works would carve through an existng industrial area (Vestey Dr etc - industrial land take is potentially contrary to the project objectives) and along the edge of a residential area - potential also to need land take on western side of SH1	Low level of certainty as this option may have oportunity for property (both residential and industrial) purchase in order to provide buffer and space for construction of road corridor - further, works cross Anns Creek ecological area far more extensively than other options (except 013)	assumptions include - that there is potential for broad mitigation along the coastal environment
C20		Consenting Risks (wider consent requirements)	Qualitative assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road.	Working in the vicinity of Transpower towers will add consenting complexity and cost. Crossings of rail lines will need to be grade-seaparated (definitely no new level crossings). A "deed of grant" needed from Kiwirail.	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road. Works within the railway corridor (southdown spur line into port site) will likely impact useability and functionality of rail - or alterntively notable land take from industrial land (potentally contrary to objectives)	Working in the vicinity of Transpower towers will add consenting complexity and cost.	Assessment could get worse once detailed design is completed - but it is certain that there will be complexity due to presence of towers	Transpower towers are present to the north of the cogen plant and akong Sylvia Park Road. Works within the railway corridor (southdown spur line into port site) will likely impact useability and functionality of rail - or alterntively notable land take from industrial land (potentally contrary to objectives)	Working in the vicinity of Transpower towers will add consenting complexity and cost.	crosses rail in several places	.	.
C21	Constructability (NN)	Construction Impact on Businesses	Accessibility to businesses over construciton period	.Construction of Ramps over Mt Wellington Hgwy	.	.	Construction of Ramps over Mt Wellington Hgwy	.	.	impact on businesses southdown / Hugo Johnson/ South down Lane and Great South, plus ramps over Mt Wellington Hgwy.	.	.	significant impact at Great South Road, Vestry Drive	.	.
C22		Construction impacts on Utilities and lifeline infrastructure	Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction	.Impact on Transpower pylons at Southdown & Tip Top corner.	.	.	Impact on Transpower pylons at Southdown & Tip Top corner.	.	.	Impact on Transpower pylons at Tip Top Corner	.	.	.Alignment on Vector's high pressure gas designation just south of Panama Road	.	.

No.	MCA Topic	Key Result Area	Criteria	O9 A1/2, B3a, C6, C1, D1/E1, D4, E6, F1			O10 A1/2, C6, C1, D1/D7/D4, E1, E6, F1 (Part D4)			O11 A1/2, C6, C1, D1/D7,E1, E13, D8, E6, E14, F1			O12 A1/A2, C6, C1, D4, E11, E1, F1		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C24	Urban Design & Townscape (GL)	Connectivity (circulation	The extent of effects on connectivity including disruption to the street network and walkability.	Increase in traffic and enlarging intersection of Neilson Street and Onehunga Mall will reduce pedestrian/cycle connectivity between Onehunga town centre and Mangere. Some improved local connectivity from Neilson street to SE.	-	-	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. However, offset by widening of Neilson Street across Onehunga Mall. Some improved local connectivity from Neilson street to SE.	-	-	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. However, offset by widening of Neilson Street across Onehunga Mall. Some improved local connectivity from Neilson street to SE.	-	-	Redirection of traffic to Galway Street could improve pedestrian and cycle connectivity between Onehunga town centre and Mangere. However, offset by widening of Neilson Street across Onehunga Mall. Some improved local connectivity from Neilson street to SE.	-	-
C25		Built Form	The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.	Mostly follows existing pattern of development. Potential effects on some industrial properties.	-	-	Mostly follows existing pattern of development. Potential effects on some industrial properties.	-	-	Mostly follows existing pattern of development. Potential effects on some industrial properties.	-	-	Generally follows existing pattern of development. But cuts across pattern of development at Vestey Drive area and across natural patterns at Anns Creek	-	-
C26		Activities	The extent of effects on (compatibility with) surrounding activities, with particular regard to public activities (such as town centres), land use, and character.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required. Disruption to operations of road-rail metroport.	-	-	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required. Disruption to operations of road-rail metroport.	-	-	Compatible with existing industrial activities at western end. But will bisect business park at Vestey Drive and run adjacent to residential properties near Panama Road.	Uncertainty over details of acquisition required	That considerable acquisition is necessary.
C27		Natural Landscape	The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.	Edge of Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	North edge Anns Creek	Uncertainty over detailed alignments at Anns Creek	That measures are taken to realign in a way that minimises effects on Anns Creek including lava features	Effects on natural aspects will be relatively minor	-	-	Traverses Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to reduce effects on Anns Creek including lava features
C28		Visual Amenity	The extent of effects on visual amenity taking into account the character and visibility (prominence) of the proposal, and the character of the existing environment, the sensitivity of audiences, and the experience of future road users	Interchange will be in a prominent and high visibility location in middle of Onehunga Bay. Long views of eastern section across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Some localised visual amenity effects from increasing scale of existing roads, from encroaching into residential properties adjacent to SH1, and from ramps at eastern end, but generally visually contained within existing corridor.	Design details required to assess actual degree of effect		Some localised visual amenity effects from increasing scale of existing roads, from encroaching into residential properties adjacent to SH1, and from ramps at eastern end, but generally visually contained within existing corridor.	Design details required to assess actual degree of effect.		Viaduct across Anns Creek will be a prominent structure that will add to clutter of existing infrastructure. Some amenity effects from residential properties adjacent to SH1, and from users of shoreline path.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.
C29		Associative Elements	The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or which otherwise contribute to townscape amenity.	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features.	Design details required to assess actual degree of effect at Te Houa and Anns Creek	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua
C30		Community cohesion	The extent of effects on community cohesion and connectedness.	Impacts at Onehunga and potentially along SH1 - recognised edge effect for community but scale adverse	Scale of impacts able to mitigated by design	-	Impacts at Onehunga Mall, but within scale of options, only limited changes to connectivity	-	-	As for O3 with respect to impacts at Onehunga Harbour Road / Mall	-	-	Detail to be confirmed but through community areas to link at Panama Road, recognised edge effect but adverse on communities	Impact could be greater if vector gas line makes alignment greater in this area	-
C31	Social (AL)	Open space	The extent of effects on passive and active recreation opportunities in the EWC study area.	-	-	-	-	-	-	-	-	-	to avoid double count of Ann's Creek, not assessed here for recreation value impacts	-	-
C32		Community facilities	The extent of effects on community facilities in the EWC study area.	Potential for higher adverse in Onehunga	-	-	-	Scale of ramps at Sylliva Park could impact on facilities at this Metro Centre / Centre	-	-	-	-	-	-	-
C34		Viability / productivity of business land areas	The extent of land take and severance of industrial and business land	Impacts at Onehunga, along mall and at Angle Street, Sylliva Park	Scale of impacts able to mitigated by design	-	Scale of take significant and likely to disrupt existing businesses through and around the Metro port	-	-	Disruption of businesses considered significant through Metro port and to the east	-	-	Cuts through and severs busines area scale of impact difficult to mitigate	-	-
C35		Community linkages and access to and along the coastal marine area	The extent of effects on linkages to and along the CMA and other mapped / identified linkages	-	-	-	-	-	-	-	-	-	-	-	-

				O9 A1/2, B3a, C6, C1, D1/E1, D4, E6, F1			O10 A1/2, C6, C1, D1/D7/D4, E1, E6, F1 (Part D4)		
No.	MCA Topic	Key Result Area	Criteria	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C36	Natural Environment (AR)	Air quality	Extent of effects on air quality (airshed)	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)
C37		Water resources	Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)		.	.		.	i
C38		Water quality	Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39		Ecological resources (terrestrial biodiversity)	Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.
C40		Coastal environment and resources	Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.	The option requires reclamation for the Orpheus Drive connection and the Gloucester Park Interchange works.	The only area located directly adjacent to the coastal environment is at Gloucester Park. Design solutions could minimise reclamation but are unlikely to eliminate it.	The changes to the Gloucester Park Interchange cannot be contained within the existing land.	The option does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route is separated from the coast and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. The are likely to be design solutions to avoid encroaching into the harbour at this location.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.
C41		Natural character	Extent of effects on natural character based on technical report evaluation.	Adjacent to shoreline between Angle Street and Great South Road. North edge of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange. Potential encroachment into CMA at Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.	Largely remote from coastal environment, however eastern end skirts sensitive part of the coastal environment at Anns Creek. Also some potential for encroachment into CMA at Gloucester Park, and at headwater Tamaki River.	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek	That measures are taken to realign in a way that minimises effects on Anns Creek. That any encroachments into CMA at Gloucester Park or Tamaki River are minimal
C42		Outstanding Natural Features & Landscapes	Extent of effects on natural character and outstanding natural features including geological features.	Edge of Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Potential effects on Te Hopua ONF from Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Close to Anns Creek pohuehue lava flow which is recognised as ONF. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua
C43	Public Health (AR)	Air shed (human health)	Impact of air borne contaminants on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C44		Noise and vibration (human health)	Impact of operational noise and vibration on sensitive receivers.		Limited sensitive receptors and use of exising infrastructure limits impact	.		Limited sensitive receptors and use of exising infrastructure limits impact	.
C45		Contaminated land (human health)	Impact of contaminants from historical land uses (air discharges and groundwater impacts).	.	.	Risk profile as for O3 and additional risk related to reclamation on Onehunga bay that may need to deal with contaminated sediments	.	.	Note that this option only includes the eastern part of D4 segment and as such does not impinge on known landfills
C46	Cultural and Heritage (AR)	Cultural values	Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have physical impacts on Anns Creek.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.
C47		Customary rights	Extent of effects on areas of protected customary rights.	The option does not affect any Treaty Settlement areas but does affect the foreshore.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa
C48		Archaeological and built heritage	Extent of effects on sites and places of archaeological value, heritage buildings and places.	The option will impacts the Sea Scouts building and may affect the Waikaraka Park Features and Woolen Mill.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the impact on the Sea Scout, Waikaraka Park and Woolen Mill can be avoided.	Assumed at this stage that the design will directly affect the Sea Scouts Building	The option will impacts the Sea Scouts building and may affect the Waikaraka Park Features and Woolen Mill.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the impact on the Sea Scout, Waikaraka Park and Woolen Mill can be avoided.	Assumed at this stage that the option will directly affect the Sea Scouts Building

	O11 A1/2, C6, C1, D1/D7,E1, E13, D8, E6, E14, F1			O12 A1/A2, C6, C1, D4, E11, E1, F1		
No.	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C36	.	.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)	.	.	land purchase could remove proximity of residential dwellings and result in reassessment fo this option
C37		.	i		.	i
C38	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39	Option does not affect any identified SEA Land.	There may be localised areas of ecological value (eg. trees)that will need to be considered during design development.	No particular assumptions.	Option passes to the South of the MRP co-generation plant and through a large area of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable but will still result in adverse effects.	A route to the south of the co-generation plant can be achieved although the form has yet to be determined.
C40	The option does not require works within the coastal area. The upgrading of the Gloucester Park Interchange will not encroach into the harbour. The remainder of the route is separated from the coast and therefore physical works do not impact the coast.	The only area located directly adjacent to the coastal environment is at Gloucester Park. There are likely to be design solutions to avoid encroaching into the harbour at this location.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.	The option requires coastal works within a SEA Marine 1 area associated with Anns Creek. The upgrading of the Gloucester Park Interchange will not encroach into the harbour.	The form of the section through the coastal area has yet to be determined. Further design will determine if the alignment can be designed to avoid the coast and whether structures could be used to minimise impacts on this area.	Changes to the Gloucester Park Interchange can be accommodated within the existing interchange without requiring additional structures in or reclamation of the adjacent harbour.
C41	Largely remote from coastal environment. Some potential for encroachment into CMA at Gloucester Park, and at headwater Tamaki River	Uncertainty over encroachments at Gloucester Park and Tamaki River	That any encroachments into CMA at Gloucester Park or Tamaki River are minimal	Cuts across sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange, and headwater Tamaki River	Uncertainty over detailed alignments at Anns Creek. But effects likely to be high regardless . Uncertainty whether reclamation needed elsewhere.	.
C42	Potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That there are some small encroachments Te Hopua	Traverse Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Also potential effects on Te Hopua (at Gloucester Park interchange).	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park	That measures are taken to realign in a way that reduces effects on lava feature. That there are some small encroachments Te Hopua
C43		Limited sensitive receptors and use of exising infrastructure limits impact	.		sensitive receptors adjacent in eastern end of alignment	.
C44		Limited sensitive receptors and use of exising infrastructure limits impact	.		sensitive receptors adjacent in eastern end of alignment	.
C45	.	.	Similar risk profile to Option 10 albeit with additional indurtial land affected by this alignment	.	.	As for option 5. Most uncertainty pertains to the industrial land in the eastern portion of the alignment (sgment E)
C46	The option doe not affect any identified features or site of cultural value.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	0	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.
C47	The option does not affect any Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa
C48	The option does not affect and known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the option impact on the Sea Scout Building, Waikaraka Park and Woolen Mill..	Assumed at this stage that the option will not directly affect these sites.	The option does not affect any known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the option impact on the Sea Scout Building, Waikaraka Park and Woolen Mill..	Assumed at this stage that the option will not directly affect these sites.

No.	MCA Topic	Key Result Area	Criteria	O13 A1/2, B3b, C9, D5, E11, F1			O14 A1/2, B3a, C8, D4, D1/E1, E6, F1			O15 A1/2, B3a/b, C7, D5, E1, E6, F1			O16 High Change Option (A1/2, B5, C8, D5, E6/8, F1)		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C1	Performance againts Objectives (AM)	To provide reliable freight linkages to the Penrose/Onehunga industrial area	Number of controlled stops between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).	-	depends on performance on new signals	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	similar to option 13	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	same as option 14	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	all grade seperated connections	-	assume expressway standard
C2		To provide efficient freight linkages to the Penrose/Onehunga industrial area	Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	better to the west connection	depends on performance on new signals	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	similar to option 13	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	same as option 14	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	all grade seperated connections	-	assume expressway standard
C3		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	Daily Volume of non-freight vehicles in Neilson St and Church St	full seperation road function with reduction on neilson and church	-	0	full seperation road function with reduction on neilson and church	-	0	full seperation road function with reduction on neilson and church	-	0	full seperation road function with reduction on neilson and church	-	assume onehunga interchange also have local connections
C4		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change in % trucks on key freight and non-freight routes	general reduction on rat running trucks	-	0	general reduction on rat running trucks	-	0	general reduction on rat running trucks	-	0	general reduction on rat running trucks	-	0
C5		Support functionality by retaining accessability and to enable growth of town centres by removing conflicts between buses and freight	Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)	reduce congestion with limited confict with trucks	-	0	reduce congestion with limited confict with trucks	-	0	reduce congestion with limited confict with trucks	-	0	reduce congestion with limited confict with trucks	-	0
C6		To improve accessability to and between Sylvia Park and Mangere by improving passenger transport travel times and reliability	Bus travel times and reliability (Peak vs off peak) on route 32	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	-	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	-	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	-	0	reduction traffic and conflicts on mt wellington hwy, esp at sylvia park rd intersection	depends on connection at great south road	assume no connection at great south road
C7		To enable growth in town centres by improving cycling and walking connections	% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	-	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	-	0	worse than option 1 and 2 because at grade intersection at great south road with heavy vehicles	-	0	better connectivity	less plesant for the cyclists next to the traffic	0
C8		To enable growth in town centres by improving cycling and walking connections	Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection	reduce traffic	-	0	remove most of traffic out of onehunga mall	-	0	same as option 13	-	0	same as option 13	-	0
C9		Enable growth of town centres by reducing through traffic and conflicts and delivering appropriate social outcomes	Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)	some go up and some go down	-	0	some go up and some go down	-	0	some go up and some go down	-	0	remove more traffic from onehunga mall and residential areal	-	assume all local connection remain
C10		Provide enduring, efficient transport linkages	Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1	auxilary on SH1 and SH20, mitigate extra traffic	-	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	-	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	-	auxilary on SH1 and SH20	auxilary on SH1 and SH20, mitigate extra traffic	-	auxilary on SH1 and SH20
C11		To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	General traffic travel times between Nelison/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)	better to the west connection	depends on performance on new signals	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	similar to option 13	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	same as option 14	-	at grade at great south road and grade sepertion at mt wellington 2 way access at onehunga dimand interchange North South	all grade seperated connections	-	assume expressway standard
C13		To provide resilient transport linkages to the Penrose/Onehunga industrial area	Provision of additional network choices/reduced reliance on single constrained points in the network	-	-	-	-	-	-	-	-	-	-	-	-
C14		To provide efficient, reliable and enduring transport linkages to the Penrose/Onehunga industrial area and the NIMT	How the constraints between industrial area nd freight terminal are addressed	-	-	-	-	-	-	-	-	-	-	-	-
C15		Relative costs of the Options		-	-		-	-		-	-		-	-	
C16	Effic.	Relative Benefits of the options		-	-	-	-	-	-	-	-	-	-	-	-
C19	Consentability (AR)	Consenting Complexity of Project	Qualititative assessment of the number of consents and nature of consenting requirements for the Project including the consideration of zoning and Plan objectives and policies.	Option is potentially worse (in unmitigated state) than O12 because there is signifcant reclamation needed at GPI and works along the foreshore requiring reclamation or structure. Works would carve through an existng industrial area (Vestey Dr etc - industrial land take is potentially contrary to the project objectives) and along the edge of a residential area - potential also to need land take on western side of SH1	Like O13 this option may have oportunity for property (both residential and industrial) purchase in order to provide buffer and space for construction of road corridor - further, works cross Anns Creek ecological area far more extensively than other options (except 012)	assumptions - this option is "unmitigated" but there is potential for broad mitigation along the coastal environment foreshore which could provide for offsetting opportunities - remains difficult from a consentability perspective but likely to fund favour with ABF et al	Signifcant reclamation needed at GPI is reason for -2 score - score could improve with less reclamation at GPI	design change could improve certainty	assumptions - this option is "unmitigated" but there is potential for broad mitigation along the coastal environment foreshore which could provide for offsetting opportunities - remains difficult from a consentability perspective but likely to find favour with ABF et al (?)	Signifcant reclamation needed at GPI is reason for -2 score - score could improve with less reclamation at GPI	design change could improve certainty	assumptions - this option is "unmitigated" but there is potential for broad mitigation along the coastal environment foreshore which could provide for offsetting opportunities - remains difficult from a consentability perspective but likely to find favour with ABF et al (?)	Better than O14 and O15 due to GPI design change (no reclamation)	design change could improve certainty	assumptions - this option is "unmitigated" but there is potential for broad mitigation along the coastal environment foreshore which could provide for offsetting opportunities - remains difficult from a consentability perspective but likely to find favour with ABF et al (?)
C20		Consenting Risks (wider consent requirements)	Qualitative assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)	crosses rail in several places	-	-	crosses rail in several places and interacts with Transpower towers to north of cogen plant and Sylvia Park Road	-	-	crosses rail in several places and interacts with Transpower towers to north of cogen plant and Sylvia Park Road	-	-	crosses rail in several places and interacts with Transpower towers to north of cogen plant and Sylvia Park Road	-	-
C21	Constructability (NN)	Construction Impact on Businesses	Accessibility to businesses over construciton period	Diamond interchange at SH20 plus significant impact at Great South Road, Vestry Drive	-	-	Diamond interchange at SH20 & significant impact on Mt Wellington Hgwy durinmg fly grade separated ramp construction	-	-	Diamond interchange at SH20 and new ramps over Mt Wellington hgwy	-	-	System interchange at Neilson Street, plus Viaduct over Mt Wellington Hgwy.	-	-
C22		Construction impacts on Utilities and lifeline infrastructure	Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction	Alignment on Vector's high pressure gas designation just south of Panama Road	-	-	Impacts on Transpover pylons at South down and Tip Top corner	-	-	Impacts Transpower at South down and Tip Top corner	-	-	Impacts Transpower at South down and Tip Top corner	-	-

No.	MCA Topic	Key Result Area	Criteria	O13 A1/2, B3b, C9, D5, E11, F1			O14 A1/2, B3a, C8, D4, D1/E1, E6, F1			O15 A1/2, B3a/b, C7, D5, E1, E6, F1			O16 High Change Option (A1/2, B5, C8, D5, E6/8, F1)		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C24	Urban Design & Townscape (GL)	Connectivity (circulation	The extent of effects on connectivity including disruption to the street network and walkability.	Improvements to connectivity of local road network by connections to Captain Springs, Great South Rd. Potential for further connections (Alfred Street, Angle Street, Hugo Johnston Drive).	Requires clarification of number of vehicle and pedestrian/cycle connections	That only the two listed connections are made	Redirection of traffic to Galway Street would improve pedestrian and cycle connectivity around Onehunga town centre. Improvements to connectivity of local road network by connections to Captain Springs, Great South Rd. Potential for further connections (Alfred Street, Angle Street, Hugo Johnston Drive).	Requires clarification of number of vehicle and pedestrian/cycle connections	That only the two listed connections are made	-	-	-	New road will be limited access (for instance motorway) so will have no benefits for local connectivity. Gloucester Park interchange will diminish connections between Onehunga and Mangere	-	-
C25		Built Form	The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.	Generally follows existing pattern of development. But cuts across pattern of development at Vestey Drive area and across natural patterns at Anns Creek	-	-	Mostly follows existing pattern of development. Potential effects on some industrial properties.	-	-	Some improvement to connectivity of local road network by connections to Captain Springs and Great South Rd. Potential for further connections (Alfred St, Angle St, Hugo Johnston Dr). Some potential improvement in connectivity between Onehunga and Mangere along lower Onehunga Mall, depending on a crossing of new road	Requires clarification of number of vehicle and pedestrian/cycle connections	That the two listed connections are made. That a good cycle/pedestrian connection is made at Mangere Bridge	Mostly follows existing pattern of development. Follows existing corridors or open land. Some acquisition of industrial and residential properties.	-	-
C26		Activities	The extent of effects on (compatibility with) surrounding activities, with particular regard to public activities (such as town centres), land use, and character.	Compatible with existing industrial activities at western end. But will bisect business park at Vestey Drive and run adjacent to residential properties near Panama Road.	Uncertainty over details of acquisition required	That considerable acquisition is necessary.	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.	Mostly follows existing pattern of development. Potential effects on some industrial properties to avoid Anns Creek	-	-	Compatible with existing industrial activities. But will be acquisition of industrial and residential properties required. Effects on shoreline recreation	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some acquisition is necessary.
C27		Natural Landscape	The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.	Traverses Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to reduce effects on Anns Creek including lava features	Skirts Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	Compatible with existing industrial activities. But some acquisition of industrial and residential properties required.	Uncertainty over details of acquisition required to avoid Anns Creek and provide additional lanes on SH1.	That some small acquisition is necessary (parts of yards, potentially some whole sites)	Significant effects at Te Hopua (Gloucester Park), along shoreline, and potentially at Anns Creek	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features
C28		Visual Amenity	The extent of effects on visual amenity taking into account the character and visibility (prominence) of the proposal, and the character of the existing environment, the sensitivity of audiences, and the experience of future road users	Viaduct across Anns Creek will be a prominent structure that will add to clutter of existing infrastructure. Some amenity effects from residential properties adjacent to SH1, and from users of shoreline path. Interchange will be in a prominent and high visibility location in middle of Onehunga Bay.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Interchange will be in a prominent and high visibility location in middle of Onehunga Bay. Distant views of eastern section across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Edge of Anns Creek which is sensitive coastal area with geological features.	Uncertainty over detailed alignments at Anns Creek.	That measures are taken to realign to north of Anns Creek in a way that minimises effects on Anns Creek including lava features	Interchange will be in a prominent and high visibility location at Gloucester Park, and along Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.
C29		Associative Elements	The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or which otherwise contribute to townscape amenity.	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features.	Design details required to assess actual degree of effect at Te Houa and Anns Creek	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Interchange will be in a prominent and high visibility location in middle of Onehunga Bay. Long views across Mangere Inlet. Some amenity effects from users of shoreline path and from residential properties adjacent to SH1. Otherwise low effects on adjacent industrial properties.	Uncertainty over details of road design adjacent to shoreline. Potential to accommodate road within an shoreline restoration project which could have positive visual amenity effects	That the road is set back from the shoreline. The enhancement work is not otherwise taken.	Effects on cultural values associated with Te Hopua and Anns Creek landscape features	-	-
C30		Community cohesion	The extent of effects on community cohesion and connectedness.	Detail to be confirmed but through community areas to link at Panama Road, recognised edge effect but adverse on communities	Impact could be greater if vector gas line makes alignment greater in this area	-	Positive removal of traffic at Onehunga Mall too, reinforce existing connections and valued links	Opportunities for enhancement in design	-	Potential effects on cultural values associated with Te Hopua and Anns Creek landscape features	Design details required to assess actual degree of effect.	That design and alignment measures are taken to minimises effects on Anns Creek and Te Hopua	Scale of interchange at Gloucester Park and disruption	Opportunities for enhancement in design	-
C31	Social (AL)	Open space	The extent of effects on passive and active recreation opportunities in the EWC study area.	To avoid double count of impacts on Ann's creek, recreation values only assessed here	-	-		Also scale for improvements	-		Also scale for improvements	-	Scale of impacts on reserve land at Gloucester Park	Also scale for improvements	-
C32		Community facilities	The extent of effects on community facilities in the EWC study area.		-	-	Improvements at Onehunga Mall	-	-	As for O14	-	-		-	-
C34		Viability / productivity of business land areas	The extent of land take and severance of industrial and business land	Cuts through and severs busines area scale of impact difficult to mitigate	-	-	Sylvia Park Road and potential impacts at Metroport	-	-	Sylvia Park Road and potential impacts at Metroport	-	-	Sylvia Park Road and potential impacts at Sylvia Park	-	-
C35		Community linkages and access to and along the coastal marine area	The extent of effects on linkages to and along the CMA and other mapped / identified linkages	-	-	-	Scale of impacts on Waikaraka positive with removal of traffic at Onehunga Mall too	-	-	Scale of impacts on Waikaraka positive with removal of traffic at Onehunga Mall too	-	-	-	Opportunities for enhancement in design	-

No.	MCA Topic	Key Result Area	Criteria	O13 A1/2, B3b, C9, D5, E11, F1			O14 A1/2, B3a, C8, D4, D1/E1, E6, F1			O15 A1/2, B3a/b, C7, D5, E1, E6, F1			O16 High Change Option (A1/2, B5, C8, D5, E6/8, F1)		
				Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions	Assessment	Certainty	Assumptions
C36	Natural Environment (AR)	Air quality	Extent of effects on air quality (airshed)	.		land purchase could remove proximity of residential dwellings and result in reassessment fo this option			Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)		.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)		.	Environment is largely industrial and it is assumed these are less sensitive receptors (than residential, community zones)
C37		Water resources	Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)					.			.			.	
C38		Water quality	Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).	Space will be required for treatment for all options		if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices	Space will be required for treatment for all options	.	if the PAUP rules remain unamended by decisions, space will be required for treatment for all options including those that use existing roads if the "behaviour" of stormwater flow is changed - "green" treatment options will need to be considered where practicable, along with proprietary devices
C39		Ecological resources (terrestrial biodiversity)	Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).	Option passes to the South of the MRP co-generation plant and through a large area of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable but will still result in adverse effects.	A route to the south of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the north of the MRP co-generation plans and crosses a section of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable.	A route to the north of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the South of the MRP co-generation plant and through a large area of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable but will still result in adverse effects.	A route to the south of the co-generation plant can be achieved although the form has yet to be determined.	Option passes to the South of the MRP co-generation plant and through a large area of Anns Creek, an identified SEA Land.	The form of the option within the Anns Creek area has yet to be determined. Designs that minimise impacts on this areas and mitigate effects will be favourable but will still result in adverse effects.	A route to the south of the co-generation plant can be achieved although the form has yet to be determined.
C40		Coastal environment and resources	Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.	The option requires extensive reclamation or structures along the foreshore, part of which is a SEA Marine 1 and 2 area. The upgrading of the Gloucester Park Interchange will also encroach into the harbour.	The form of the section along the foreshore has yet to be determined. While the use of structures for this section (rather than reclamation) will reduce impacts on the coastal area, the effects are likely to still be significant.	0	The option requires reclamation or structures along the foreshore, part of which is a SEA Marine 2 area. The upgrading of the Gloucester Park Interchange will also encroach into the harbour.	The form of the section along the foreshore has yet to be determined. The use of structures for this section (rather than reclamation) will reduce impacts on the coastal area.		The option requires extensive reclamation or structures along the foreshore, part of which is a SEA Marine 1 and 2 area. The upgrading of the Gloucester Park Interchange will also encroach into the harbour.	The form of the section along the foreshore has yet to be determined. While the use of structures for this section (rather than reclamation) will reduce impacts on the coastal area, the effects are likely to still be significant.	.	The option requires extensive reclamation or structures along the foreshore, part of which is a SEA Marine 1 and 2 area. The upgrading of the Gloucester Park Interchange will encroach into the harbour.	The form of the section along the foreshore has yet to be determined. While the use of structures for this section (rather than reclamation) will reduce impacts on the coastal area, the effects are likely to still be significant.	0
C41		Natural character	Extent of effects on natural character based on technical report evaluation.	Requires reclamation along foreshore (e.g. adjacent to Waikaraka Park) and traverses most sensitive part of coastal environment at Anns Creek. Also some potential effects at SH20 Interchange, at headwaters of Tamaki River	Potential to avoid features at Anns Creek by realignment. Potential to remedy natural character by shoreline reconstruction process.	.	Adjacent to shoreline Mangere Inlet. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange. Potential encroachment into CMA at Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.	Adjacent to shoreline Mangere Inlet. Skirts north side of sensitive part of coastal environment at Anns Creek. Also some potential effects at Gloucester Park Interchange. Potential encroachment into CMA at Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. There appear to be options to fine tune alignment to avoid or minimise effects at Anns Creek. Uncertainty whether reclamation needed elsewhere. Potential to remedy natural character by shoreline reconstruction process.	That measures are taken to realign in a way that minimises effects on Anns Creek. That works do not otherwise encroach into CMA, and that no enhancement work is carried out.	Adjacent to shoreline Mangere Inlet. Skirts north side of sensitive part of coastal environment at Anns Creek. Major reclamation at Gloucester Park Interchange.	Uncertainty over detailed alignments at Anns Creek and design at Glouceste Park. However effects will be high regardless.	.
C42		Outstanding Natural Features & Landscapes	Extent of effects on natural character and outstanding natural features including geological features.	Traverses Anns Creek pohuehue lava flow which is recognised as ONF. Also potential effects on Te Hopua (at Gloucester Park interchange).	Potential to avoid effects by realignment at Anns Creek and detailed configuration of Gloucester Park interchange,		Skirts Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Potential effects on Te Hopua ONF from Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That measures are taken to realign in a way that minimises effects on Anns Creek. That there are some small encroachments Te Hopua	Skirts Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Potential effects on Te Hopua ONF from Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. Uncertainty over extent of encroachment at Te Hopua (Gloucester Park).	That the two listed connections are made. That a good cycle/pedestrian connection is made at Mangere Bridge	Edge of Anns Creek pohuehue lava flow which is recognised as ONF. Potential effects on feature. Substantial changes to Te Hopua ONF from Gloucester Park interchange.	Uncertainty over detailed alignments at Anns Creek. However effects will be high regardless	.
C43	Public Health (AR)	Air shed (human health)	Impact of air borne contaminants on sensitive receivers.	.	sensitive receptors adjacent in eastern end of alignment	.		Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact	.
C44		Noise and vibration (human health)	Impact of operational noise and vibration on sensitive receivers.	.	sensitive receptors adjacent in eastern end of alignment	.		Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact			Limited sensitive receptors and use of exising infrastructure limits impact	.
C45		Contaminated land (human health)	Impact of contaminants from historical land uses (air discharges and groundwater impacts).	.		Approx half of this alignment traverses land that is known landfill or uncontrolled fill. If the alignment is constructed on new reclamation, the contaminated soft sediments may need to be removed/treated. Otherwise if design is along the existing land this will directly impinge on contaminated land. Scale of these effects will depend on design (vertical geometry and piling vs at grade) but cannot be avoided entirely. This alignment also crosses industrial land in segment E with higher level of uncertainty regarding contamination.	.	.	The risk profile for this Option is similar to Option 13.	.	.	The risk profile for this Option is similar to Option 13	.	The risk profile for this Option is similar to option 13	.
C46	Cultural and Heritage (AR)	Cultural values	Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.		The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.	The option will have physical impacts on Anns Creek and the Manukau Harbour.	Iwi engagement may identify further areas or values of significance. Further design will determine if and features of Mukukaroa/Hamlins are affected.	No encroachment into the harbour.
C47		Customary rights	Extent of effects on areas of protected customary rights.	The option does not affect any Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas. It affects the foreshore.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa	The option does not affect any Treaty Settlement areas. It affects the foreshore.	Requires confirmation that options will require land from the Mukukaroa site.	The option does not require addition land adjacent to Mukukaroa
C48		Archaeological and built heritage	Extent of effects on sites and places of archaeological value, heritage buildings and places.	The option does not affect and known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the option impact on the Sea Scout Building, Waikaraka Park and Woolen Mill..	Assumed at this stage that the option will not directly affect these sites.	The option does not affect and known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the option impacts on the Sea Scout Building.	Assumed at this stage that the option will not directly affect these sites.	The option does not affect and known archaeological or heritage sites.	Existing sites are identified in the planning maps and none are affected. Further design will determine if the option impact on the Sea Scout Building, Waikaraka Park and Woolen Mill..	Assumed at this stage that the option will not directly affect these sites.	The option will affect the Sea Scouts Building.	Existing sites are identified in the planning maps.	Assumed at this stage that, given the extent of works, that the o removal, relocation of the building will be required.

Appendix M

Onehunga-Penrose Connections Options – Short List
Transport Performance Assessment Detail

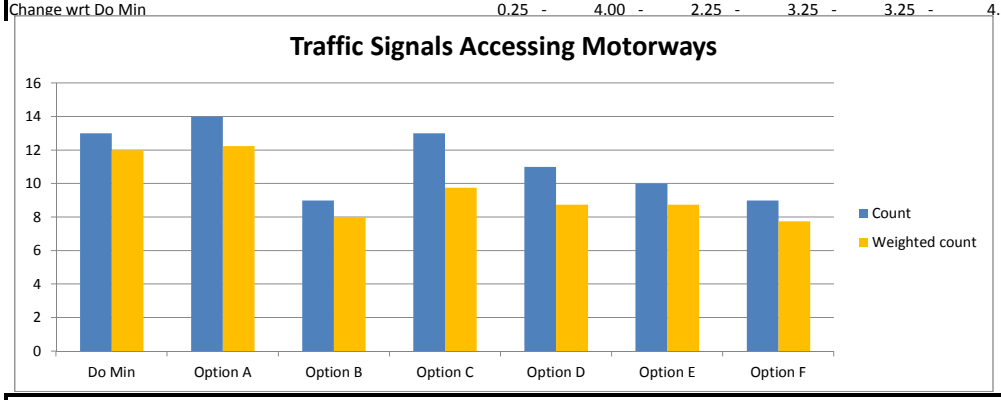
East West Connections
Scoring of Short-listed options in Indicative Business Case MCA
Transport Criteria (Objectives)

MCA Transport Spreadsheet Revision Control

Version	Date	By	Description
V1-3		APM	working files
V4	4/11/2014	APM	used in MCA workshop
V5	5/11/2014	APM	Enduring criteria updated
V6	13/11/2014	APM	2013 data added and text updated
v7	21/11/2014	APM	minor correction 'to sh1 south' travel time formula which missed some rows
v8	10/12/2014	APM	BCR values updated and formatting for IBC report

Criteria 1	**Trip Reliability Accessing Onehunga/Penrose Area**
Proxy Measure	**Intersections between Neilson/Captain Springs and motorways (freight)**
Notes:	Weighted by broad level of congestion
	This attribute also captures freight industry concern about costs of stop-start conditions for heavy vehicles

Signals to SH1 south	8	8	8	4	1	1	2	1
Intersection	**2013 Do Min**	**Do Min**	**Option A**	**Option B**	**Option C**	**Option D**	**Option E**	**Option F**
Neilson/Gloucester Park	50%	100%	75%	75%	75%	0%	0%	0%
Neilson/Selwyn	50%	100%	75%	75%	75%	0%	0%	0%
Neilson/Onehunga Mall	100%	100%	75%	75%	50%	0%	0%	0%
Neilson/Captain Springs	100%	100%	100%	100%	100%	100%	100%	100%
Neilson/Church	100%	100%	100%	100%	75%	75%	75%	75%
Church/Hugo Johnston	100%	100%	100%	100%	75%	75%	75%	75%
Church/Gt South Road	100%	100%	100%	75%	75%	75%	75%	75%
SEART/NBD On Ramp	100%	100%	100%	100%	100%	100%	100%	100%
Gt South/Church East	50%	50%	50%	0%	0%	0%	0%	0%
Gt South/Southdown	50%	50%	50%	0%	0%	0%	0%	0%
Gt South/Sylvia Park	100%	100%	100%	0%	100%	100%	0%	100%
Sylvia Park/Mt Wellington	100%	100%	100%	0%	0%	0%	0%	0%
Mt Wellington Interchange	100%	100%	100%	0%	0%	0%	0%	0%
Gloucester Park Interchange	0%	0%	0%	0%	0%	100%	100%	100%
Onehunga Harbour/Galway Link	0%	0%	0%	0%	50%	50%	0%	0%
Neilson/Galway Link	0%	0%	0%	0%	75%	75%	0%	0%
Neilson/Angle	0%	0%	0%	0%	75%	75%	0%	0%
Foreshore/Southport	0%	0%	0%	0%	50%	50%	75%	75%
Foreshore/Captain Springs	0%	0%	0%	0%	0%	0%	75%	75%
Gt South/Vestey	0%	0%	0%	0%	0%	0%	100%	0%
Vestey/Niall Burgess	0%	0%	0%	0%	0%	0%	100%	0%
Neilson/Southport	0%	0%	100%	100%	0%	0%	0%	0%
Count	13	13	14	9	13	11	10	9
Weighted count	11.0	12.0	12.3	8.0	9.8	8.8	8.8	7.8
Change wrt Do Min			0.25	-4.00	-2.25	-3.25	-3.25	-4.25



MCA Assessment:

Set relative to Do Min (0). Each 1 Reduction as 'noticeable' and hence set at 1 point.

	Score	comment
Option A	0	same as Do Min
Option B	4	Reduced signals with grade separation at GSR and new ramps to SH1
Option C	2	Extra signals in west but less to SH1. Could be 3 with Angle replaced with Captain Springs
Option D	3	Similar to C but less signals in west
Option E	3	Extra signals at Vestey/GSr and GPI
Option F	4	Less signals to SH1 and SH20

Criteria 2 — **Freight Access times to Strategic Network from Onehunga/Penrose Area**

Proxy Measure — **Travel time Between Neilson/Captain Springs and SH1/SH20 north and south**

Notes: Times weighted average across day.

AM PEAK

	2013 Mod	2026 Times							2026 Time Saved (wrt 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	5.5	6.8	8.0	7.2	7.6	7.8	7.3	7.6	-1.2	-0.4	-0.8	-1.0	-0.5	-0.8
To SH20 North	4.4	4.9	4.2	4.2	3.9	4.2	5.3	5.2	0.8	0.7	1.1	0.8	-0.4	-0.3
To SH1 South	18.2	20.5	21.2	9.8	8.8	8.8	9.2	9.4	-0.6	10.7	11.7	11.7	11.3	11.1
To SH1 North	11.8	11.9	10.1	10.6	9.9	9.8	10.4	10.4	1.8	1.3	2.0	2.1	1.5	1.5
From SH20 South	**10.8**	**12.8**	7.9	7.2	7.0	8.8	6.2	6.1	4.9	5.6	5.8	4.0	6.6	6.6
From SH20 North	4.7	11.7	6.0	7.5	7.2	8.3	7.3	7.0	5.7	4.3	4.5	3.4	4.4	4.7
From SH1 South	14.8	15.4	14.7	9.5	9.0	9.0	10.7	10.6	0.7	5.9	6.4	6.4	4.8	4.8
From SH1 North	8.0	8.0	7.8	6.3	7.0	7.0	7.1	7.0	0.1	1.7	1.0	1.0	0.9	0.9
								SUM	12.2	29.8	31.7	28.4	28.6	28.6
							Scale	2.5	4.9	11.9	12.7	11.3	11.4	11.5

INTERPEAK

	2013 Mod	2026 Times							2026 Time Saved (wrt 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	4.4	4.9	4.7	4.8	5.5	5.2	4.4	4.3	0.1	0.1	-0.6	-0.3	0.5	0.6
To SH20 North	4.1	4.3	4.1	4.2	4.0	4.2	5.2	5.1	0.2	0.1	0.3	0.1	-0.9	-0.7
To SH1 South	14.0	14.8	14.1	8.0	7.8	7.8	8.1	8.2	0.7	6.8	6.9	6.9	6.6	6.6
To SH1 North	6.2	6.5	6.0	6.1	6.0	5.9	6.4	6.4	0.6	0.4	0.5	0.7	0.2	0.2
From SH20 South	**5.6**	**6.7**	5.7	5.6	5.3	5.7	4.9	4.8	1.0	1.0	1.3	0.9	1.8	1.8
From SH20 North	4.0	4.9	4.6	4.5	6.1	5.6	5.1	4.9	0.4	0.4	-1.1	-0.7	-0.1	0.0
From SH1 South	10.2	10.8	10.4	7.7	7.5	7.5	7.9	8.1	0.5	3.1	3.4	3.4	2.9	2.8
From SH1 North	6.8	7.1	6.7	5.9	6.7	6.6	6.9	6.8	0.3	1.1	0.4	0.4	0.2	0.2
								SUM	3.8	13.2	11.1	11.5	11.2	11.4
							Scale	2.5	1.5	5.3	4.4	4.6	4.5	4.6

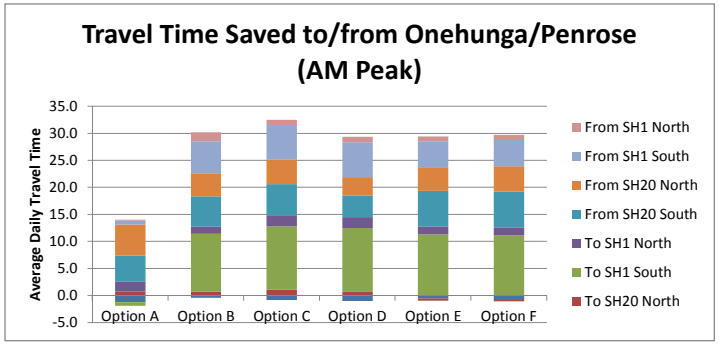
PM PEAK

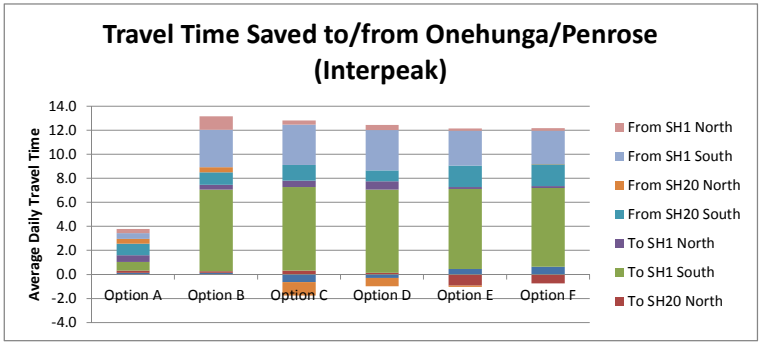
	2013 Mod	2026 Times							2026 Time Saved (wrt 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	6.3	7.1	5.9	5.9	6.3	6.4	5.6	5.4	1.2	1.2	0.7	0.6	1.4	1.6
To SH20 North	6.2	13.3	4.8	4.7	4.3	4.8	5.6	5.4	8.5	8.7	9.1	8.5	7.7	7.9
To SH1 South	19.9	20.2	19.6	11.6	10.3	10.4	10.8	10.5	0.6	8.5	9.9	9.8	9.4	9.7
To SH1 North	8.8	9.0	7.1	7.5	6.9	7.0	7.0	7.1	1.9	1.5	2.0	2.0	2.0	1.9
From SH20 South	**7.9**	**12.8**	10.4	9.0	8.8	9.1	8.2	8.4	2.4	3.8	4.0	3.7	4.6	4.4
From SH20 North	4.4	4.7	4.7	4.8	5.8	5.6	5.6	5.6	-0.1	-0.2	-1.1	-1.0	-1.0	-1.0
From SH1 South	10.7	11.9	11.0	8.2	8.0	8.0	9.1	8.6	0.9	3.7	3.9	3.9	2.8	3.3
From SH1 North	7.3	8.1	7.4	6.4	7.1	7.1	7.1	7.1	0.7	1.6	1.0	0.9	0.9	0.9
								SUM	16.0	28.9	29.5	28.5	27.9	28.7
							Scale	2.5	6.4	11.6	11.8	11.4	11.2	11.5

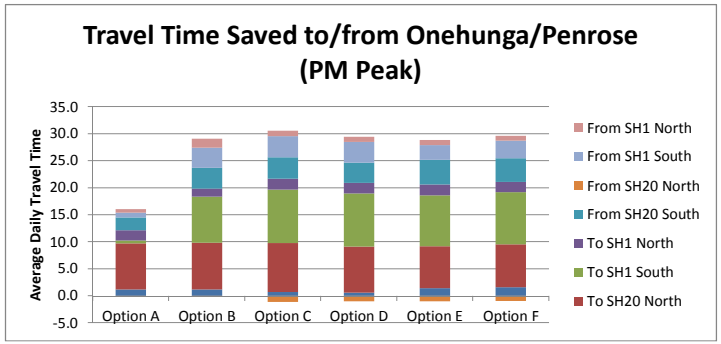
DAILY AVERAGE

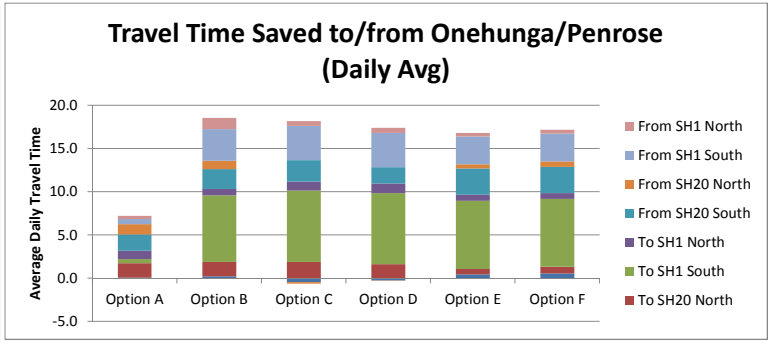
	2013 Mod	2026 Times							2026 Time Saved (wrt 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	4.9	5.6	5.5	5.3	6.0	5.8	5.1	5.0	0.1	0.2	-0.4	-0.3	0.5	0.6
To SH20 North	4.5	5.9	4.3	4.3	4.0	4.3	5.3	5.2	1.7	1.7	1.9	1.6	0.6	0.8
To SH1 South	15.7	16.6	16.2	8.9	8.4	8.4	8.7	8.8	0.5	7.7	8.2	8.2	7.9	7.8
To SH1 North	7.6	7.8	6.9	7.1	6.8	6.7	7.1	7.2	1.0	0.7	1.0	1.1	0.7	0.7
From SH20 South	**6.9**	**8.7**	6.8	6.4	6.2	6.8	5.6	5.6	1.9	2.3	2.5	1.9	3.0	3.0
From SH20 North	4.2	6.0	4.8	5.1	6.2	6.1	5.5	5.4	1.2	1.0	-0.2	0.0	0.5	0.7
From SH1 South	11.0	11.8	11.2	8.1	7.8	7.8	8.6	8.6	0.6	3.7	4.0	4.0	3.2	3.2
From SH1 North	7.1	7.4	7.0	6.1	6.8	6.8	6.9	6.9	0.4	1.3	0.6	0.6	0.4	0.5
								SUM	7.2	18.6	17.6	17.1	16.8	17.2
							Scale	**4**	1.8	4.6	4.4	4.3	4.2	4.3

Criteria 2 ctd









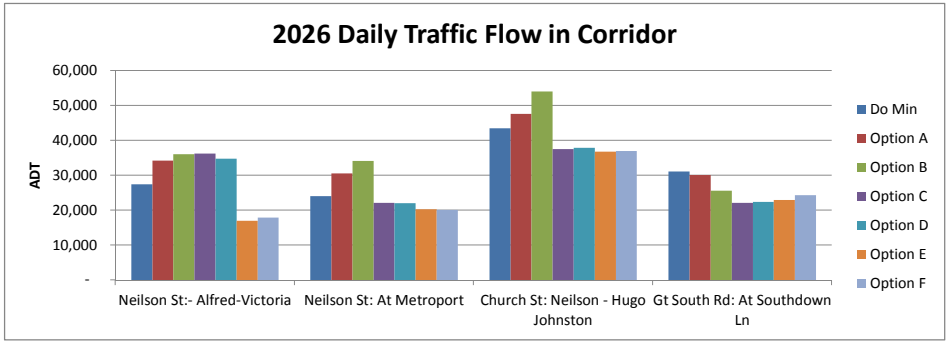
MCA Assessment:

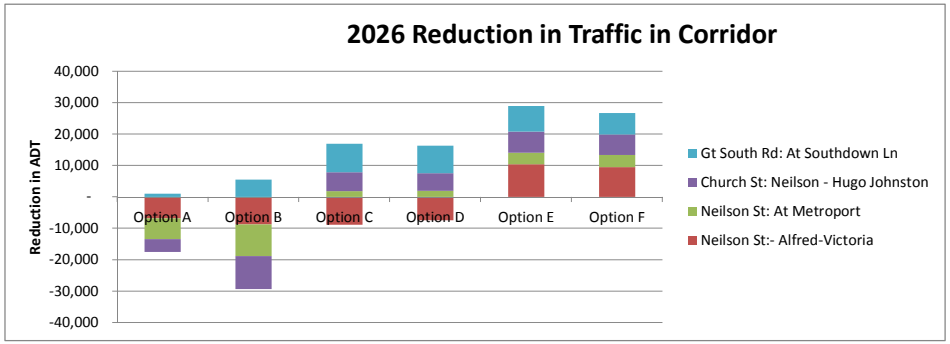
Set relative to Do Min (0). Each 1 min deemed noticeable but scale at 2.5 min as 1 point to cover range.

	Score	comment
Option A	2	less than half the savings of the other options
Option B	4	Significant time savings, especially to SH1 south
Option C	4	Significant time savings, especially to SH1 south
Option D	4	Significant time savings, especially to SH1 south
Option E	4	Significant time savings, especially to SH1 south
Option F	4	Significant time savings, especially to SH1 south

Criteria 3	**Ability to Access Neilson/Church St corridor from properties**
Proxy Measure	**Vehicles in Neilson/Church Corridor**
Notes:	Lowest volume is best for property access

# Rounded	2013 Mod	2026 ADT							2026 reduction in ADT (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
Neilson St:- Alfred-Victoria	26,700	27,400	34,200	36,100	36,200	34,800	17,000	17,900	- 6,800	- 8,700	- 8,800	- 7,400	10,400	9,500
Neilson St: At Metroport	22,600	24,000	30,600	34,100	22,100	22,000	20,300	20,100	- 6,600	- 10,100	1,900	2,000	3,700	3,900
Church St: Neilson - Hugo Johnstor	40,700	43,500	47,600	54,000	37,500	37,900	36,800	37,000	- 4,100	- 10,500	6,000	5,600	6,700	6,500
Gt South Rd: At Southdown Ln	30,700	31,100	30,100	25,600	22,100	22,400	22,900	24,300	1,000	5,500	9,000	8,700	8,200	6,800
									- 16,500	- 23,800	8,100	8,900	29,000	26,700
								5000	- 3.3	- 4.8	1.6	1.8	5.8	5.3





MCA Assessment:

Set relative to Do Min (0). Each 5,000 reduction deemed to impact access so set as 1 point.

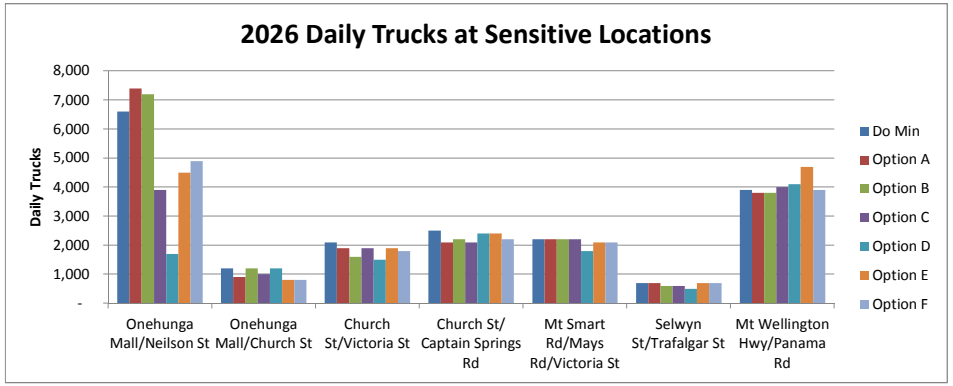
	Score	comment
Option A	-3	significant increases in traffic will compromise access function
Option B	-5	significant increases in traffic will compromise access function
Option C	2	Mostly reductions in corridor, except Galway to Angle St which increases
Option D	2	Mostly reductions in corridor, except Galway to Angle St which increases
Option E	5	Significant decreases on full corridor
Option F	5	Significant decreases on full corridor

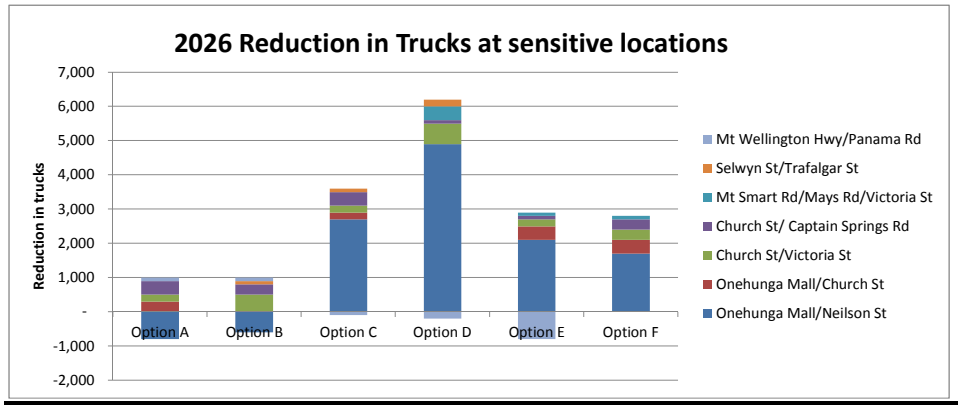
Criteria 4 — Access/Amenity/Safety at sensitive areas, with freight vehicles reduced on non-freight routes

Proxy Measure — Reduction in trucks at key locations

Notes:

# Rounded	2013 Mod	2026 Daily Trucks							2026 reduction in trucks					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
Onehunga Mall/Neilson St	4,500	6,600	7,400	7,200	3,900	1,700	4,500	4,900	- 800	- 600	2,700	4,900	2,100	1,700
Onehunga Mall/Church St	800	1,200	900	1,200	1,000	1,200	800	800	300	-	200	-	400	400
Church St/Victoria St	1,400	2,100	1,900	1,600	1,900	1,500	1,900	1,800	200	500	200	600	200	300
Church St/ Captain Springs Rd	2,100	2,500	2,100	2,200	2,100	2,400	2,400	2,200	400	300	400	100	100	300
Mt Smart Rd/Mays Rd/Victoria St	1,300	2,200	2,200	2,200	2,200	1,800	2,100	2,100	-	-	-	400	100	100
Selwyn St/Trafalgar St	300	700	700	600	600	500	700	700	-	100	100	200	-	-
Mt Wellington Hwy/Panama Rd	3,000	3,900	3,800	3,800	4,000	4,100	4,700	3,900	100	100	- 100	- 200	- 800	-
									200	400	3,500	6,000	2,100	2,800
								1000	0.2	0.4	3.5	6.0	2.1	2.8





MCA Assessment:

Set relative to Do Min (0). Each 1,000 reduction as 1 point.

	Score	comment
Option A	0	decreases offset by increases
Option B	0	decreases offset by increases
Option C	4	Significant decreases
Option D	5	Significant decreases
Option E	2	Moderate reductions but offset by some increase
Option F	3	Moderate reductions

Criteria 5	**Improved Bus Travel Times Accessing Onehunga**
Proxy Measure	**Improved Bus access between SH20 and Onehunga Mall**
Notes:	Qualitative - bus priority to be refined with detailed development

	Qualitative Assessment
Do Min	NBD buses congested on off-ramp. SBD buses congested at Onehunga Mall but priority lanes available on Neilson and ramp
Option A	Some improvement to bus times with increased Onehunga Mall/Neilson St intersection
Option B	Some improvement to bus times with increased Onehunga Mall/Neilson St intersection
Option C	Significant improvement to NBD bus times via Onehunga Mall South access and reduced traffic on Onehunga Mall/Neilson St intersection
Option D	Significant improvement to NBD bus times via Onehunga Mall South access and reduced traffic on Onehunga Mall/Neilson St intersection but longer route for SBD buses
Option E	Improvement from reduced congestion, however bus priority at interchange yet to be defined/confirmed
Option F	Improvement from reduced congestion, however bus priority at interchange yet to be defined/confirmed

MCA Assessment:

Qualitative, relative to Do Min (0).

	Score	comment
Option A	2	Some improvement to NBD buses.
Option B	2	Some improvement to NBD buses.
Option C	4	Best potential savings avoiding new interchange where priority could be constrained
Option D	2	Improved NBD offset by longer route SBD
Option E	3	Reduced congestion but bus-priority through Interchange could be constrained
Option F	3	Reduced congestion but bus-priority through Interchange could be constrained

Criteria 6	**Improved Pedestrian/Cycle Links Onehunga to Sylvia Park**
Proxy Measure	**Quality and directness of route between Onehunga and Sylvia Park**
Notes:	Qualitative

	Qualitative Assessment
Do Min	Poor quality route between termination at Hugo Johnston Drive to Sylvia Park
Option A	Improved but indirect route between termination at Hugo Johnston Drive to Sylvia Park
Option B	Improved but indirect, generally on-road route between termination at Hugo Johnston Drive to Sylvia Park
Option C	Direct, off-road route to Sylvia Park Road then Sylvia Park
Option D	Direct, off-road route to Sylvia Park Road then Sylvia Park
Option E	Less direct, off-road route to Mt Wellington Highway, but then needs to use busier Mt Wellington Highway (bus conflict). But potential for connection to Carbine
Option F	Direct, off-road route to Sylvia Park Road then Sylvia Park

MCA Assessment:

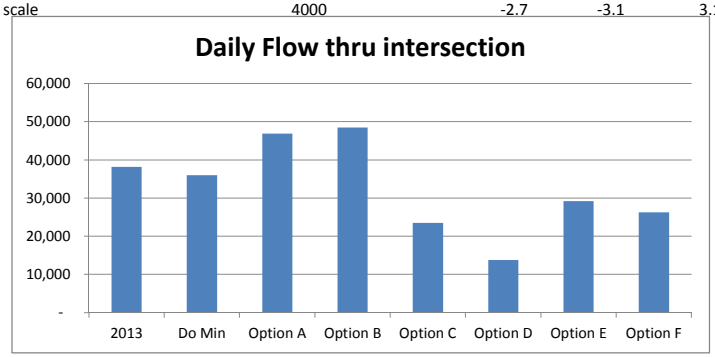
Set relative to Do Min (0).

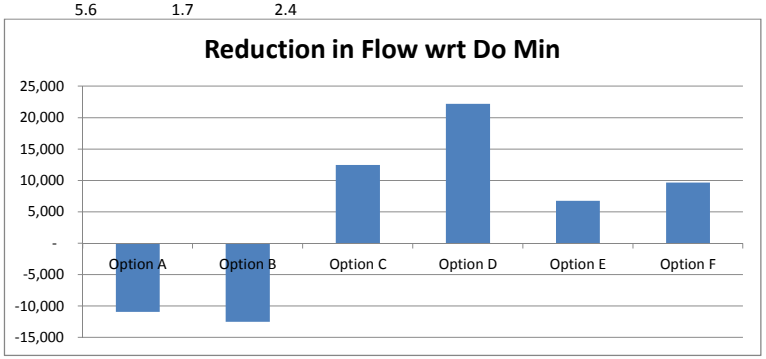
	Score	comment
Option A	1	Limited improvement
Option B	1	Limited improvement
Option C	4	Significantly improved and more direct route
Option D	4	Significantly improved and more direct route
Option E	3	New route but less direct to Sylvia Park. Some value in Carbine Connection
Option F	4	Significantly improved and more direct route

Criteria 7	**Improved Pedestrian/Cycle Links Old Mangere Bridge to Onehunga**
Proxy Measure	**Reduced Traffic at Onehunga Mall/Neilson St intersection**
Notes:	Reduction is best

 # Rounded

	2013	Do Min	Option A	Option B	Option C	Option D	Option E	Option F
Daily Flow thru intersection	38,200	36,000	46,900	48,500	23,500	13,800	29,200	26,300
Reduction wrt Do Min			- 10,900	- 12,500	12,500	22,200	6,800	9,700
scale	4000		-2.7	-3.1	3.1	5.6	1.7	2.4





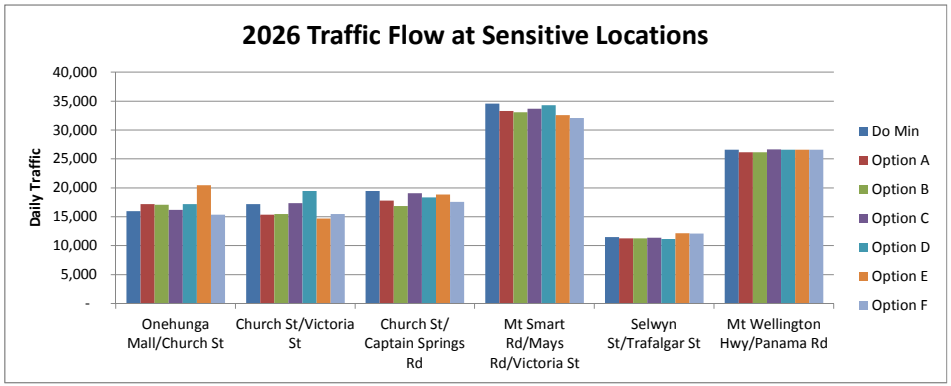
MCA Assessment:

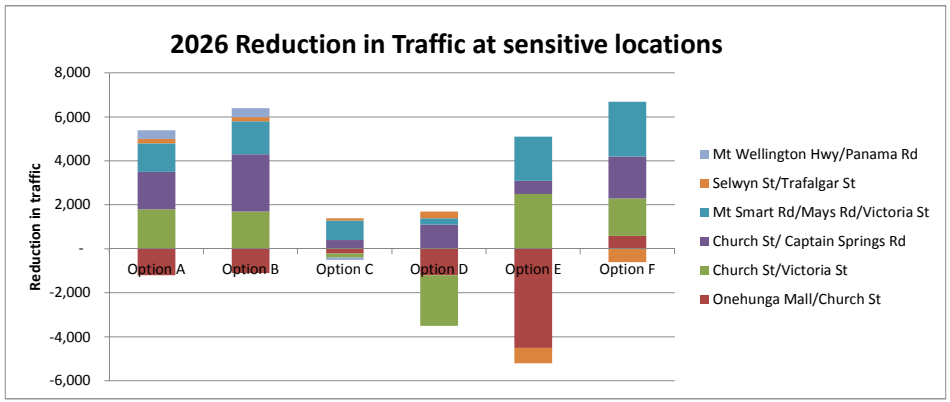
Set relative to Do Min (0). Each 4,000 reduction as 1 point (significant reductions allow road narrowing)

	Score	comment
Option A	-3	Increased traffic through intersection constrains ability to enhance facility
Option B	-3	Increased traffic through intersection constrains ability to enhance facility
Option C	3	Significant reduction in traffic and extra facility via Onehunga Mall south signals
Option D	5	Significant reduction in traffic and extra facility via Onehunga Mall south signals
Option E	2	Limited reduction in traffic
Option F	2	Limited reduction in traffic

Criteria 8	**Access/Amenity/Safety at sensitive areas**
Proxy Measure	**Reduction in general traffic at key locations**
Notes:	Onehunga Mall/Neilson excluded as covered in cycle/ped criteria

# Rounded	2013 Mod	2026 Daily Traffic							2026 reduction in trucks					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
Onehunga Mall/Church St	14,800	16,000	17,200	17,100	16,200	17,200	20,500	15,400	- 1,200	- 1,100	- 200	- 1,200	- 4,500	600
Church St/Victoria St	15,400	17,200	15,400	15,500	17,400	19,500	14,700	15,500	1,800	1,700	- 200	- 2,300	2,500	1,700
Church St/ Captain Springs Rd	18,900	19,500	17,800	16,900	19,100	18,400	18,900	17,600	1,700	2,600	400	1,100	600	1,900
Mt Smart Rd/Mays Rd/Victoria St	29,300	34,600	33,300	33,100	33,700	34,300	32,600	32,100	1,300	1,500	900	300	2,000	2,500
Selwyn St/Trafalgar St	9,400	11,500	11,300	11,300	11,400	11,200	12,200	12,100	200	200	100	300	- 700	- 600
Mt Wellington Hwy/Panama Rd	24,700	26,600	26,200	26,200	26,700	26,600	26,600	26,600	400	400	- 100	-	-	-
							Scale	4,000	4,200	5,300	900	- 1,800	- 100	6,100
									1.1	1.3	0.2	- 0.5	- 0.0	1.5





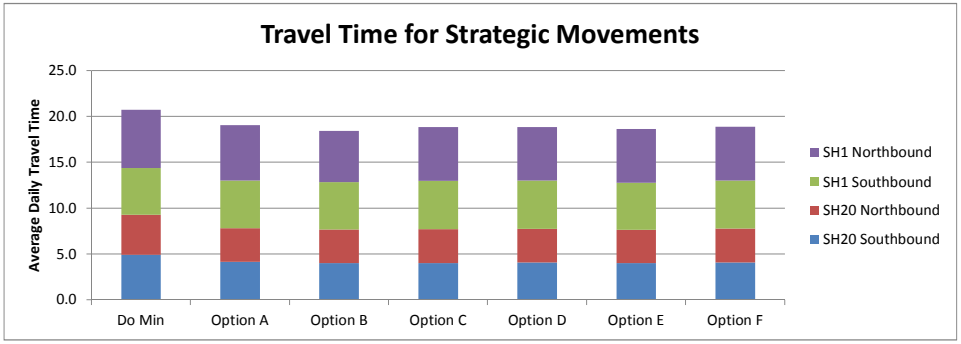
MCA Assessment:

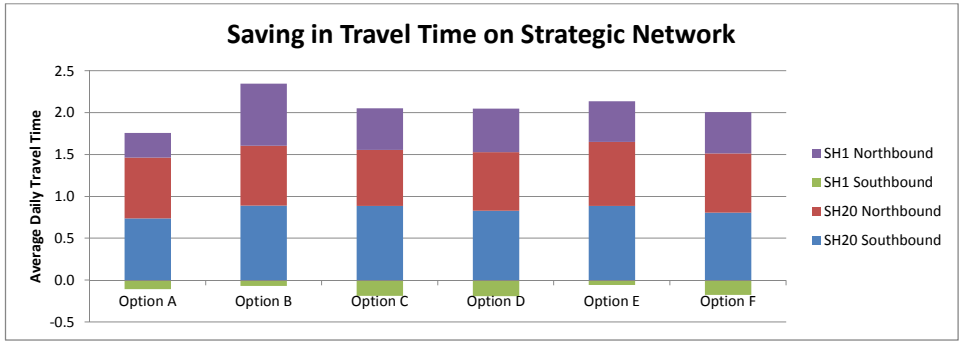
Set relative to Do Min (0). Each 4,000 reduction as 1 point.

	Score	comment
Option A	1	Mostly minor reductions at each location
Option B	1	Mostly minor reductions at each location
Option C	0	Mostly very minor reductions at each location
Option D	0	Minor reductions offset by some increase
Option E	0	reductions offset by increases
Option F	2	Moderate reductions

Criteria 9	**Maintain Travel on Strategic Routes**
Proxy Measure	**Travel time on SH20 and SH1 and East West**
Notes:	Times weighted average across day.

	2013 Mod	2026 Times							2026 Time Saved (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
SH20 Southbound	3.4	4.9	4.2	4.0	4.0	4.1	4.0	4.1	0.7	0.9	0.9	0.8	0.9	0.8
SH20 Northbound	2.7	4.4	3.7	3.7	3.7	3.7	3.6	3.7	0.7	0.7	0.7	0.7	0.8	0.7
SH1 Southbound	4.8	5.1	5.2	5.2	5.3	5.3	5.1	5.3	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2
SH1 Northbound	5.6	6.4	6.1	5.6	5.9	5.8	5.9	5.9	0.3	0.7	0.5	0.5	0.5	0.5
									0.0	0.0	0.0	0.0	0.0	0.0
									0.0	0.0	0.0	0.0	0.0	0.0
									0.0	0.0	0.0	0.0	0.0	0.0
									0.0	0.0	0.0	0.0	0.0	0.0
								1	1.7	2.3	1.9	1.9	2.1	1.8
									1.7	2.3	1.9	1.9	2.1	1.8





MCA Assessment:

Set relative to Do Min (0). Each 1 min as 'noticeable' and hence set at 1 point.

	Score	comment
Option A	2	
Option B	2	
Option C	2	
Option D	2	effects of extra ramps/traffic mitigated with small improvement. Similar effect across all options
Option E	2	
Option F	2	

Criteria 10 — **General Traffic Access to Strategic Network from Onehunga/Penrose Area**

Proxy Measure — **Travel time Between Neilson/Captain Springs and SH1/SH20 north and south**

Notes: Times weighted average across day.

AM PEAK

	2013 Mod	2026 Times							2026 Time Saved (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	5.8	7.8	8.3	7.5	7.9	7.8	7.6	7.9	-0.5	0.3	-0.1	0.0	0.2	-0.1
To SH20 North	4.4	5.0	4.2	4.2	3.9	4.2	5.3	5.2	0.8	0.8	1.1	0.8	-0.4	-0.3
To SH1 South	18.2	20.5	21.2	9.8	8.8	8.8	9.2	9.4	-0.6	10.7	11.7	11.7	11.3	11.1
To SH1 North	12.4	13.7	12.8	12.6	11.9	11.9	12.4	12.4	0.9	1.1	1.8	1.8	1.2	1.2
From SH20 South	**10.8**	**12.8**	7.9	7.2	7.0	8.8	6.2	6.1	4.9	5.6	5.8	4.0	6.6	6.6
From SH20 North	4.7	11.7	6.0	7.5	7.2	8.3	7.3	7.0	5.7	4.3	4.5	3.4	4.4	4.7
From SH1 South	14.8	15.4	14.7	9.5	9.0	9.0	10.7	10.6	0.7	5.9	6.4	6.4	4.8	4.8
From SH1 North	8.0	8.0	7.8	6.3	7.0	7.0	7.1	7.0	0.1	1.7	1.0	1.0	0.9	0.9
								SUM	12.0	30.3	32.2	29.1	29.0	29.1
							Scale	2.5	4.8	12.1	12.9	11.6	11.6	11.6

INTERPEAK

	2013 Mod	2026 Times							2026 Time Saved (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	4.6	5.0	4.9	4.9	5.7	5.2	4.7	4.5	0.1	0.1	-0.6	-0.2	0.4	0.5
To SH20 North	4.2	4.4	4.1	4.2	4.0	4.2	5.3	5.1	0.2	0.2	0.4	0.2	-0.9	-0.7
To SH1 South	14.0	14.8	14.1	8.0	7.8	7.8	8.1	8.2	0.7	6.8	6.9	6.9	6.6	6.6
To SH1 North	6.6	7.1	6.9	6.7	6.4	6.3	6.8	6.8	0.2	0.4	0.6	0.8	0.2	0.2
From SH20 South	**5.6**	**6.7**	5.7	5.6	5.3	5.7	4.9	4.8	1.0	1.0	1.3	0.9	1.8	1.8
From SH20 North	4.0	4.9	4.6	4.5	6.1	5.6	5.1	4.9	0.4	0.4	-1.1	-0.7	-0.1	0.0
From SH1 South	10.2	10.8	10.4	7.7	7.5	7.5	7.9	8.1	0.5	3.1	3.4	3.4	2.9	2.8
From SH1 North	6.8	7.1	6.7	5.9	6.7	6.6	6.9	6.8	0.3	1.1	0.4	0.4	0.2	0.2
								SUM	3.4	13.2	11.2	11.7	11.1	11.4
							Scale	2.5	1.4	5.3	4.5	4.7	4.4	4.6

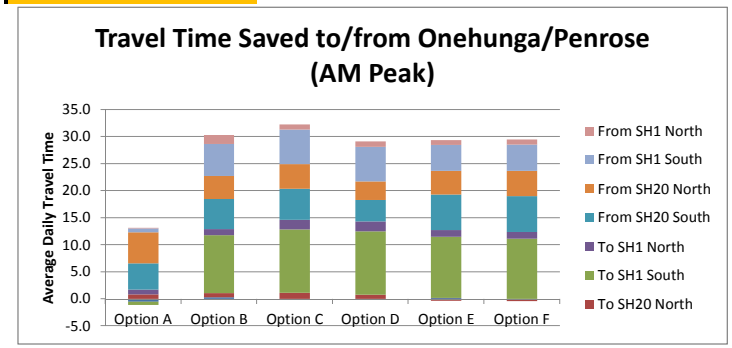
PM PEAK

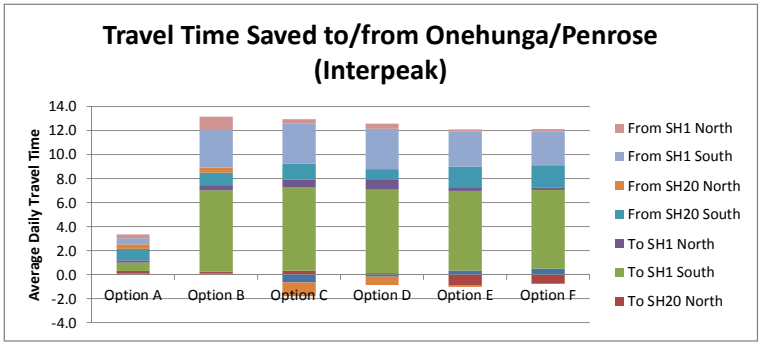
	2013 Mod	2026 Times							2026 Time Saved (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	6.5	7.3	6.1	6.1	6.6	6.4	5.9	5.7	1.2	1.2	0.7	0.8	1.4	1.6
To SH20 North	6.3	13.4	6.4	6.6	7.4	7.7	9.4	9.2	7.0	6.7	6.0	5.6	4.0	4.1
To SH1 South	19.9	20.2	19.6	11.6	10.3	10.4	10.8	10.5	0.6	8.5	9.9	9.8	9.4	9.7
To SH1 North	10.4	9.9	9.1	8.5	8.5	8.5	8.8	8.5	0.8	1.4	1.4	1.4	1.1	1.4
From SH20 South	**7.9**	**12.8**	10.4	9.0	8.8	9.1	8.2	8.4	2.4	3.8	4.0	3.7	4.6	4.4
From SH20 North	4.4	4.7	4.7	4.8	5.8	5.6	5.6	5.6	-0.1	-0.2	-1.1	-1.0	-1.0	-1.0
From SH1 South	10.7	11.9	11.0	8.2	8.0	8.0	9.1	8.6	0.9	3.7	3.9	3.9	2.8	3.3
From SH1 North	7.3	8.1	7.4	6.4	7.1	7.1	7.1	7.1	0.7	1.6	1.0	0.9	0.9	0.9
								SUM	13.3	26.9	25.7	25.2	23.2	24.4
							Scale	2.5	5.3	10.8	10.3	10.1	9.3	9.8

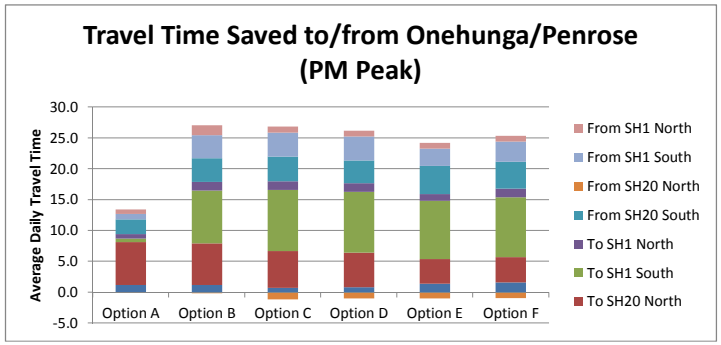
DAILY AVERAGE

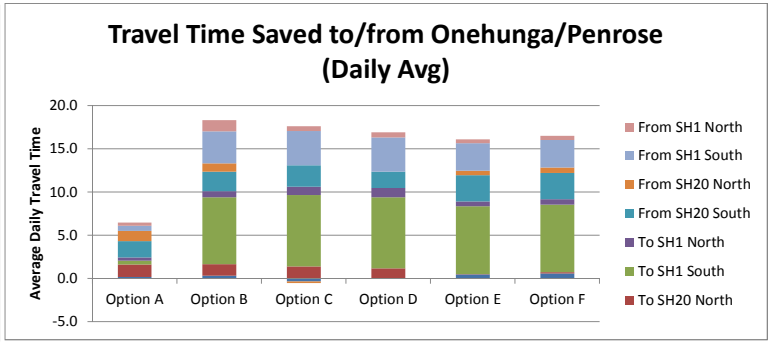
	2013 Mod	2026 Times							2026 Time Saved (relative to 2026 Do Min)					
	Do Min	Do Min	Option A	Option B	Option C	Option D	Option E	Option F	Option A	Option B	Option C	Option D	Option E	Option F
To SH20 South	5.1	5.9	5.7	5.5	6.2	5.8	5.4	5.3	0.2	0.3	-0.3	0.0	0.5	0.6
To SH20 North	4.6	6.0	4.5	4.6	4.5	4.8	6.0	5.8	1.4	1.4	1.4	1.2	0.0	0.2
To SH1 South	15.7	16.6	16.2	8.9	8.4	8.4	8.7	8.8	0.5	7.7	8.2	8.2	7.9	7.8
To SH1 North	8.2	8.6	8.3	8.0	7.7	7.6	8.1	8.0	0.4	0.7	1.0	1.1	0.5	0.6
From SH20 South	**6.9**	**8.7**	6.8	6.4	6.2	6.8	5.6	5.6	1.9	2.3	2.5	1.9	3.0	3.0
From SH20 North	4.2	6.0	4.8	5.1	6.2	6.1	5.5	5.4	1.2	1.0	-0.2	0.0	0.5	0.7
From SH1 South	11.0	11.8	11.2	8.1	7.8	7.8	8.6	8.6	0.6	3.7	4.0	4.0	3.2	3.2
From SH1 North	7.1	7.4	7.0	6.1	6.8	6.8	6.9	6.9	0.4	1.3	0.6	0.6	0.4	0.5
								SUM	6.5	18.3	17.1	16.9	16.1	16.5
							Scale	**4**	1.6	4.6	4.3	4.2	4.0	4.1

Criteria 10 ctd









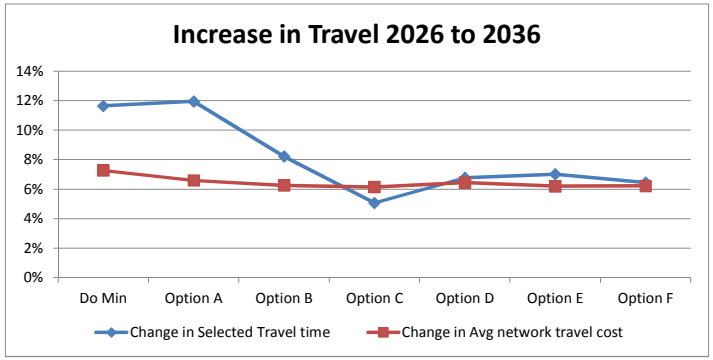
MCA Assessment:

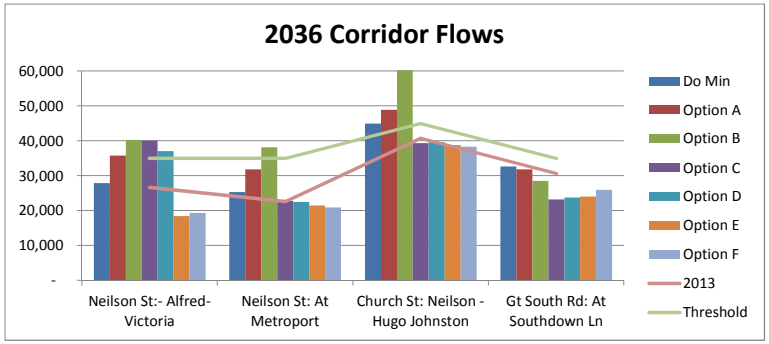
Set relative to Do Min (0). Each 1 min deemed noticeable but scale at 2.5 min as 1 point to cover range.

	Score	comment
Option A	1	Improvements to SH20 but negligible to SH1
Option B	4	Improvements to both SH1 and SH20
Option C	4	Improvements to both SH1 and SH20
Option D	4	Improvements to both SH1 and SH20
Option E	4	Improvements to both SH1 and SH20
Option F	4	Improvements to both SH1 and SH20

Criteria 11	**Enduring Benefits**
Proxy Measure	**Change in Travel Time 2026 to 2036, Max ADT on Neilson St in 2036 and change in $/km 2026 to 2036**
Notes:	Least Increase is best

Travel Times	**Increase 2026 to 2036**						
	Do Min	**Option A**	**Option B**	**Option C**	**Option D**	**Option E**	**Option F**
To SH20 South	1.4	0.6	0.5	0.4	0.5	0.4	0.4
To SH20 North	1.1	0.2	0.3	0.2	0.2	0.2	0.2
To SH1 South	0.5	1.7	0.9	0.4	0.3	0.7	0.5
To SH1 North	0.9	3.0	0.6	0.4	0.3	0.6	0.5
From SH20 South	2.4	1.3	1.4	1.2	1.5	1.2	1.3
From SH20 North	0.5	0.4	0.3	-0.2	0.6	0.2	0.2
From SH1 South	1.1	0.6	0.2	0.2	0.2	0.5	0.4
From SH1 North	0.4	-0.1	0.2	0.1	0.1	0.1	0.1
sum	8.3	7.7	4.3	2.7	3.7	3.8	3.5
% Increase over 2026	12%	12%	8%	5%	7%	7%	6%
	wrt Do Mir	0.6	3.9	5.5	4.6	4.4	4.7
scale	2	0.3	2.0	2.8	2.3	2.2	2.4
Cost per km							
2026 Average $/km	$ 0.884	$ 0.874	$ 0.862	$ 0.865	$ 0.866	$ 0.863	$ 0.862
2036 Average $/km	$ 0.949	$ 0.932	$ 0.916	$ 0.918	$ 0.922	$ 0.917	$ 0.915
% Increase	7.3%	6.6%	6.3%	6.2%	6.5%	6.2%	6.2%





MCA Assessment:

Set relative to Do Min (0).

	Score	comment	
Option A	1	travel times and costs increase noticeably, corridor flows exceed threshold (minor upgrades likely)	-3
Option B	0	travel times increase, corridor flows substantially exceed threshold (major upgrades likely)	-4
Option C	2	travel times and costs increase marginally, corridor flows exceed threshold in west (minor upgrades)	-2
Option D	2	travel times and costs increase marginally, corridor flows exceed threshold in west (minor upgrades)	-2
Option E	4	travel times and costs increase marginally, corridor flows below threshold	0
Option F	4	travel times and costs increase marginally, corridor flows below threshold	0

Criteria 12 — Freight/Industrial Interface

Proxy Measure

Notes: Not considered to be a differentiator of short-listed options so not assessed

	Qualitative Assessment
Do Min	
Option A	
Option B	
Option C	
Option D	
Option E	
Option F	

MCA Assessment:

Qualitative, relative to Do Min (0).

	Score	comment
Option A	0	
Option B	0	
Option C	0	
Option D	0	
Option E	0	
Option F	0	
	0	

Criteria 13 — Network Resilience

Proxy Measure **Provision of Additional Network choices**

Notes: Qualitative

	Qualitative Assessment
Do Min	
Option A	Increased traffic on existing network = no change in resilience
Option B	Continued loading of existing corridor with only limited extra choice with new SH1 ramps
Option C	Extra choices with Galway Link and new Southdown Link and new ramps to SH1
Option D	Extra choices with Galway Link and new Southdown Link and new ramps to SH1
Option E	Extra choices with Galway Link and new Southdown Link and new ramps to SH1
Option F	Extra choices with Galway Link and new Southdown Link and new ramps to SH1

MCA Assessment:

Set relative to Do Min (0).

	Score	comment
Option A	0	no change wrt do Min
Option B	1	small change with SH1 ramps
Option C	3	Galway link, Southdown Link, SH1 ramps
Option D	2	Southdown Link, SH1 ramps
Option E	4	Gloucester 2-way Interchange, Foreshore link, Southdown Link, SH1 ramps
Option F	4	Gloucester 2-way Interchange, Foreshore link, Southdown Link, SH1 ramps

SUMMARY

OBJECTIVES

Criteria	Problem1	Objective	WEIGHT1	Option A	Option B	Option C	Option D	Option E	Option F
1 Trip Reliability Accessing Onehunga/Penrose Area	2	1	1	0	4	2	3	3	4
2 Freight Access times to Strategic Network from Onehunga/Penrose Area	1	1	1	2	4	4	4	4	4
3 Ability to Access Neilson/Church St corridor from properties	1	1	1	-3	-5	2	2	5	5
4 Access/Amenity/Safety at sensitive areas, with freight vehicles reduced on non-freight r	3	2	1	0	0	4	5	2	3
5 Improved Bus Travel Times Accessing Onehunga	3	3	1	2	2	4	2	3	3
6 Improved Pedestrian/Cycle Links Onehunga to Sylvia Park	3	2	1	1	1	4	4	3	4
7 Improved Pedestrian/Cycle Links Old Mangere Bridge to Onehunga	3	2	1	-3	-3	3	5	2	2
8 Access/Amenity/Safety at sensitive areas	3	3	1	1	1	0	0	0	2
9 Maintain Travel on Strategic Routes	1	1	1	2	2	2	2	2	2
# General Traffic Access to Strategic Network from Onehunga/Penrose Area	1	1	1	1	4	4	4	4	4
# Enduring Benefits	2	1	1	1	0	2	2	4	4
# Freight/Industrial Interface	2	1	1	0	0	0	0	0	0
# Network Resilience	2	1	1	0	1	3	2	4	4
			WEIGHTED SUM	4	11	34	35	36	41
			WEIGHTED AVERAGE	0.3	0.8	2.6	2.7	2.8	3.2

Summary by Project Objectives

1 To improve travel times and travel time reliability between businesses in the Onehunga-Penrose industrial area and State highways 1 and 20.
2 To improve safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park.
3 To improve journey time reliability for buses between SH20 and Onehunga town centre.

Average Scores by Objective

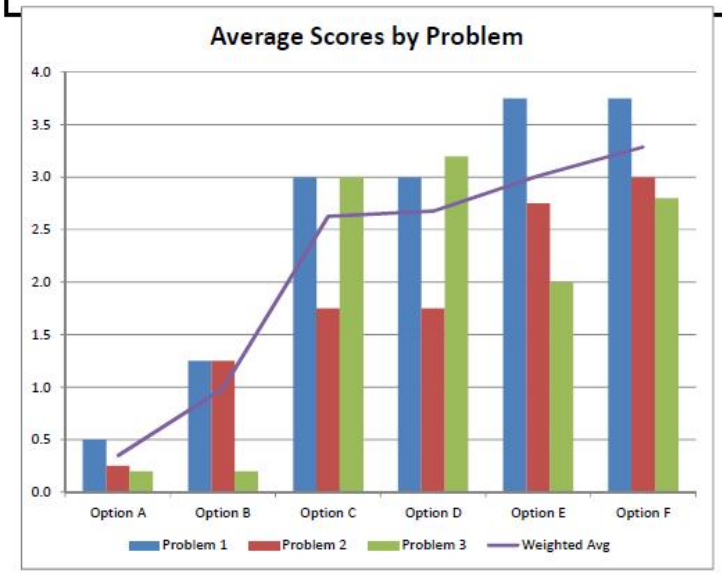
	Count	Weight	Objective	Option A	Option B	Option C	Option D	Option E	Option F
Weights based on ILM, with Objective 1 mapped to Problems 1 and 2	8	75%	**1**	0.4	1.3	2.4	2.4	3.3	3.4
and Objectives 2 and 3 mapped to Problem 3	3	12.5%	**2**	-0.7	-0.7	3.7	4.7	2.3	3.0
	2	12.5%	**3**	1.5	1.5	2.0	1.0	1.5	2.5
	13	Weighted Avg		0.4	1.0	2.5	2.5	2.9	3.2
		Unweighted SUM		1.2	2.1	8.0	8.0	7.1	8.9
		Straight Avg		0.4	0.7	2.7	2.7	2.4	3.0

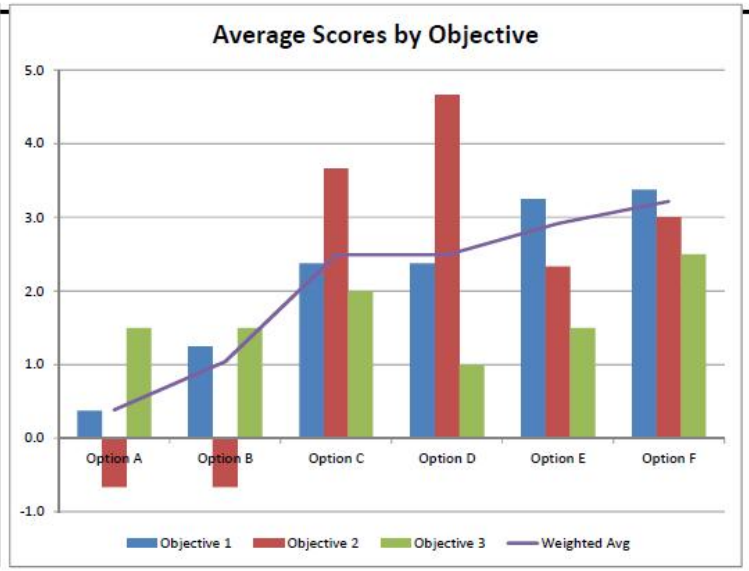
Summary by ILM Problems

1 Inefficient transport connections increase travel times and constrain the productive potential of Auckland and the upper north island (45%).
2 A lack of response to changes in industry's supply chain strategies contributes to greater network congestion, unpredictable travel times and increased costs (30%)
3 The quality of transport choices is inadequate and hinders the development of liveable communities (25%)

Average Scores by Problem

Count	Weight	Problem	Option A	Option B	Option C	Option D	Option E	Option F
4	45%	**1**	0.5	1.3	3.0	3.0	3.8	3.8
4	30%	**2**	0.3	1.3	1.8	1.8	2.8	3.0
5	25%	**3**	0.2	0.2	3.0	3.2	2.0	2.8
13	Weighted Avg		0.4	1.0	2.6	2.7	3.0	3.3
	Unweighted SUM		1.0	2.7	7.8	8.0	8.5	9.6


Average Scores by Problem
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Option A
Option B
Option C
Option D
Option E
Option F
Problem 1
Problem 2
Problem 3
Weighted Avg


Average Scores by Objective
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
Option A
Option B
Option C
Option D
Option E
Option F
Objective 1
Objective 2
Objective 3
Weighted Avg

Appendix N

Onehunga-Penrose Connections Options – Short List
MCA Summary

Appendix N:Onehunga-Penrose Connections Options – Short List MCA Summary

KRA	Criteria	*Measures*	Options						Sub Options	
			A	B	C	D	E	F	C_1	F_1
Performance against Benefits	To provide reliable freight linkages to the Penrose/Onehunga industrial area	*Number of controlled stops between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south).*	0	4	2	3	3	4	3	
	To provide efficient freight linkages to the Penrose/Onehunga industrial area	*Truck travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)*	2	4	4	4	4	4		
	To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessibility	*Daily Volume of non-freight vehicles in Neilson St and Church St*	-3	-5	2	2	5	5		
		Minimise impact on travel time on SH1 and SH20 for through traffic and between SH20 and SH1	2	2	2	2	2	2		
	Reducing through traffic and conflicts and delivering appropriate social outcomes	*Change in % trucks on key freight vs non-freight routes*	0	0	4	5	2	3		
	Support functionality by retaining accessibility and to enable growth of town centres by removing conflicts between buses and freight	*Bus travel times and reliability between SH20/Rimu Rd and Onehunga Mall/Princes Street (minutes)*	2	2	4	2	3	3		
	Improving cycling and	*% completion of quality strategic link Hillsborough to Onehunga to Sylvia Park*	1	1	4	4	3	4		

Appendix N:Onehunga-Penrose Connections Options – Short List MCA Summary

KRA	Criteria	*Measures*	Options						Sub Options	
			A	B	C	D	E	F	C_1	F_1
	walking connections	*Conflicting vehicle flow to cross on Neilson/Onehunga Mall intersection*	-3	-3	3	5	2	2		
	Reducing through traffic and conflicts and delivering appropriate social outcomes	*Change against do min of general traffic on cycle routes and at sensitive areas (schools, stations etc)*	1	1	0	0	0	2		
	To support functionality of the Onehunga/Penrose industrial area by retaining appropriate accessability	*General traffic travel times between Neilson/Captain Springs and the 'four corners' (SH1 north south and SH20 north south). (average speeds will also be calculated and used if more intuitive)*	1	4	4	4	4	4		
	To provide enduring, efficient and reliable transport linkages to the Penrose/Onehunga industrial area	*The rate to which the benefits are sustained (endure) through to 2036*	1	0	2	2	4	4		
	To provide resilient transport linkages to the Penrose/Onehunga industrial area	*Provision of additional network choices/reduced reliance on single constrained points in the network*	0	1	3	2	4	4		
	Benefit 1: To improve travel times and travel time reliability between businesses in the Onehunga-Penrose industrial area and State Highways 1 and 20.		**0.4**	**1.3**	**2.4**	**2.4**	**3.3**	**3.4**		
	Benefit 2: To improve safety and accessibility for cycling and walking between Māngere Bridge, Onehunga and Sylvia Park.		**-0.7**	**-0.7**	**3.7**	**4.7**	**2.3**	**3**		
	Benefit 3 – To improve journey time reliability for buses between SH20 and Onehunga town centre		**1.5**	**1.5**	**2.0**	**1.0**	**1.5**	**2.5**		

Appendix N:Onehunga-Penrose Connections Options – Short List MCA Summary

KRA	Criteria	*Measures*	Options						Sub Options	
			A	B	C	D	E	F	C_1	F_1
Consentability	Consenting Complexity of Project	*Qualitative assessment of the number of consents and nature of consenting requirements for the Project including the consideration of zoning and Plan objectives and policies. Included assessment of likely / anticipated secondary consenting requirements (including conflicting / overlapping designations)*	0	-5	-2	-3	-5	-4	-4	-5
		Overall Assessment for Result Area	0	-5	-2	-3	-5	-4	-4	-5
Constructability	Construction Impact on Businesses	*Accessibility to remaining businesses and activities over the construction period (assessed by local traffic management requirements)*	-2	-4	-3	-4	-4	-4		
	Construction impacts on Utilities and lifeline infrastructure	*Requirements for relocation / design of alternative major infrastructure, including consideration of Safety impacts of such requirements and risk of continuity of service over construction*	0	-3	-3	-4	-3	-4		
		Overall Assessment for Result Area	-2	-4	-3	-4	-4	-4		
Urban Design & Townscape	Connectivity (circulation	*The extent of effects on connectivity including disruption to the street network and walkability.*	-1	-3	1	-1	-3	-2		
	Built Form	*The extent of effects on urban form including lot pattern, street frontages, significant buildings and other structures.*	0	-1	-2	-2	-3	-1		
	Activities	*The extent of effects on (compatibility with) surrounding activities, with particular regard to public activities (such as town centres), land use, and character.*	-1	-2	-2	-2	-3	-1		
	Natural Landscape	*The extent of effects on the natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography.*	0	-4	-1	-2	-4	-3		
	Visual Amenity	*The extent of effects on visual amenity taking into account the character and visibility (prominence) of the proposal, and the character of the existing environment, the sensitivity of audiences, and the experience of future road users*	0	-4	-1	-2	-4	-3		

Appendix N:Onehunga-Penrose Connections Options – Short List MCA Summary

KRA	Criteria	*Measures*	Options						Sub Options	
			A	B	C	D	E	F	C_1	F_1
	Associative Elements	*The extent of effects on elements of townscape amenity with historical or cultural associations, recreational significance, or which otherwise contribute to townscape amenity.*	-1	-2	-1	-2	-3	-1		
	Overall Assessment for Result Area		-1	-3	-1	-2	-3	-2		
Social	Community cohesion	*The extent of effects on community cohesion and connectedness.*	-1	-3	-2	-1	-4	1		
	Open space	*The extent of effects on passive and active recreation opportunities in the EWC study area.*	0	-2	-1	-2	-2	-1		
	Community facilities	*The extent of effects on community facilities in the EWC study area.*	0	0	0	-1	-1	-1	-1	
	Viability / productivity of business land areas	*The extent of land take and severance of industrial and business land*	0	-3	-2	-2	-4	-3	-2	-2
	Community linkages and access to and along the coastal marine area	*The extent of effects on linkages to and along the CMA and other mapped / identified linkages*	-1	-1	1	0	1	2		
	Overall Assessment for Result Area		-1	-3	-2	-2	-4	-2	-1	-1
Natural Environment	Air quality	*Extent of effects on air quality (airshed)*	0	0	0	0	-1	1		
	Water resources	*Extent of effects on surface freshwater and groundwater resources (including mauri of water resource)*	1	1	2	2	2	2		
	Water quality	*Impact of operational stormwater in regards to quantity and quality (including life supporting capacity).*	1	1	2	2	3	3		
	Ecological resources (terrestrial biodiversity)	*Extent of effects on significant indigenous vegetation and significant habitats of indigenous fauna (terrestrial).*	0	-2	-2	-2	-4	-3		
	Coastal environment and resources	*Extent of effects on significant marine areas, existing coastal processes, and physical footprint within the coastal marine area.*	0	0	-2	-2	-4	-3	-3	-4
	Natural character	*Extent of effects on natural character based on technical report evaluation.*	0	0	0	-2	-4	-3		

Appendix N:Onehunga-Penrose Connections Options – Short List MCA Summary

KRA	Criteria	*Measures*	Options						Sub Options	
			A	B	C	D	E	F	C_1	F_1
	Outstanding Natural Features & Landscapes	*Extent of effects on natural character and outstanding natural features including geological features.*	0	-5	-1	-3	-4	-4		
	Overall Assessment for Result Area		0	-4	-2	-3	-4	-4	-3	-4
Public Health		*Impact of air borne contaminants on sensitive receivers.*	0	0	1	1	-1	2		
	Noise and vibration (human health)	*Impact of operational noise and vibration on sensitive receivers.*	0	-2	0	-1	-2	1		
	Contaminated land (human health)	*Impact of contaminants from historical land uses (air discharges and groundwater impacts).*	0	0	0	0	2	2	1	3
	Overall Assessment for Result Area		0	-1	0	0	-1	2	0	2
Cultural & Heritage	Cultural values	*Extent of effects on the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.*	-1	-5	-1	-2	-4	-2	-1	0
	Customary rights	*Extent of effects on areas of protected customary rights.*								
	Archaeological and built heritage	*Extent of effects on sites and places of valued heritage buildings and places.*	-1	-2	-2	-2	-1	-1	0	0
		Extent of effects on sites and places of archaeological value.	-1	-5	-2	-2	-2	-1	0	0
		Extent of effects on sites and places of cultural heritage value.	-1	-5	-2	-2	-2	-1	0	0
	Overall Assessment for Result Area		-1	-5	-2	-2	-4	-2	0	0

Appendix O

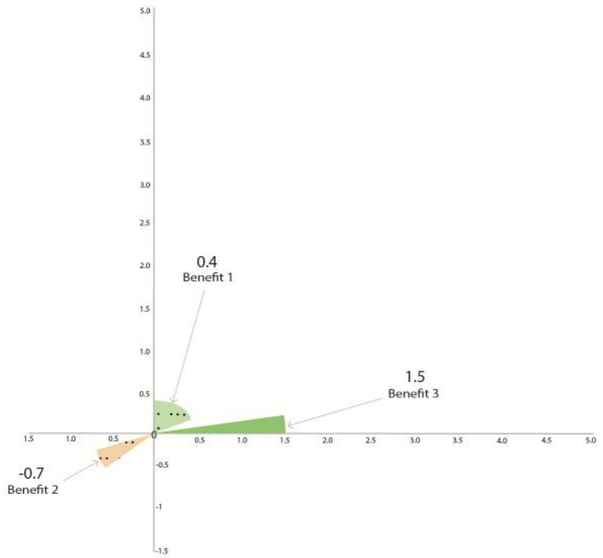
Onehunga-Penrose Connections Options – Short List
Individual Option Assessment

Option A

This option provides an upgrade of the existing roads. This includes improving capacity on SH20, Neilson and Church Streets. It also provides freight lanes

Overall this Option:

- Has little / no change to improving travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Has minor reduction in improving safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park; and
- Small improvements to journey time reliability for buses between SH20 and the Onehunga Town Centre.



Overall, it was concluded that this option **did not adequately address the identified problems** related to improving connections to SH1.

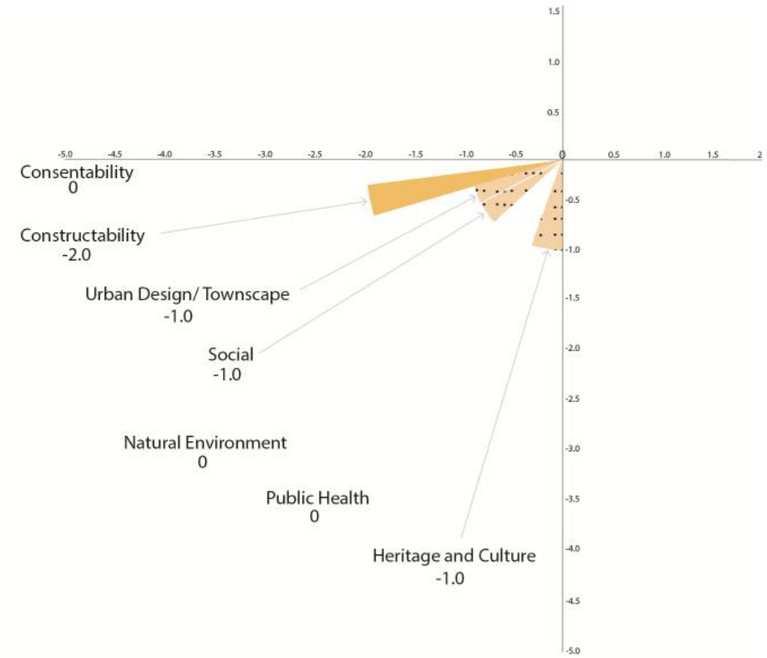
Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Benefits are derived from improved access to SH20 is improved via the auxiliary lanes and upgraded Onehunga Mall/Neilson St intersection, while capacity along the corridor is improved with widening of Neilson St to provide a continuous 4-lane-corridor between Onehunga and Penrose. Time savings (relative to the 2026 Do Minimum) are up to 8 minutes heading to SH20 north and nearly 5 minutes from SH20 south.
- There is no improvement to connections to SH1, especially the tortuous route to SH1 south, with 8 sets of traffic lights between Metroport and SH1
- The improved connection to SH20 attracts more traffic into the Neilson/Church corridor (some 6,800 added to Neilson Street and 4100 vpd added to Church St. The resulting traffic flows will make it more difficult to access properties
- The option does not facilitate improved pedestrian/ cycle connections between Onehunga and the old Mangere Bridge as it adds some 10,900 vpd to the Neilson St/Onehunga Mall intersection.
- The cycle/pedestrian connection to Sylvia Park is via limited enhancements to the existing on-road route via Hugo Johnston Drive and Church St East (then connecting to the SEART cycle path).
- There is reduced congestion for buses accessing Onehunga from SH20, with time savings of 4.4 minutes predicted
- This option results in negligible reduction in freight vehicles in sensitive areas (a net reduction of 200 vpd aggregated across 7 locations).
- The benefits are not considered ‘enduring’; as the time savings benefits deteriorate quite quickly over time (a 12% increase in travel times between 2026 and 2036). This option also has high traffic flows in the Neilson/Church corridor and residual congestion problems connecting to SH1.
- The network resilience is not enhanced with this option as all access points continue through single locations at each end of the corridor.

The transport benefits are significant ($670m), however the majority of these benefits accrue from the SH20 auxiliary lanes.

Summary of Social/Environmental Screen of Option:

- Generally this option scores ‘neutral’ to minor adverse on the basis of the social / environmental assessment, given its general minor change to the existing environment.
- The consenting risks are low but the construction impacts of the option, particularly for existing businesses are recognised.
- The cycle/pedestrian connection to Sylvia Park is via limited enhancements to the existing on-road route via Hugo Johnston Drive and Church St East – as such some urban design and social impacts are scored adversely in this respect.
- Options A largely reinforces the existing development grid and overall fragmentation of the area increasing the visibility and prominence of the road corridor through widening and upgrading of major intersections. While this is considered to have adverse social and urban design impacts, they are a reinforcement of existing poor quality environment and therefore need to consider the additional adverse effects over the ‘existing environment’ impacts.

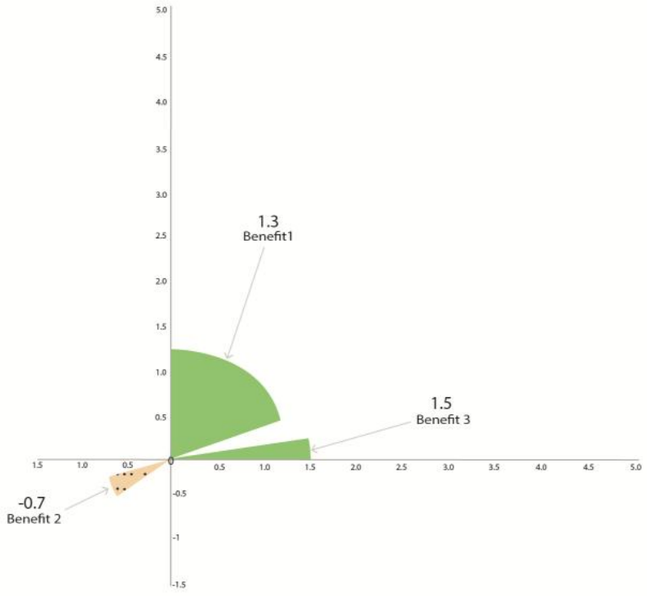


Option B

This option proposes an upgrade of existing roads with a new ramp connection from Church Street to SH1 at South Eastern Highway

Overall this Option:

- Improves travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Has minor reduction in improving safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park; and
- Small improvements to journey time reliability for buses between SH20 and the Onehunga Town Centre.



Overall, it was concluded that this option **does adequately address some identified problems but does not achieve improved safety and accessibility outcomes for cyclists and pedestrians**.

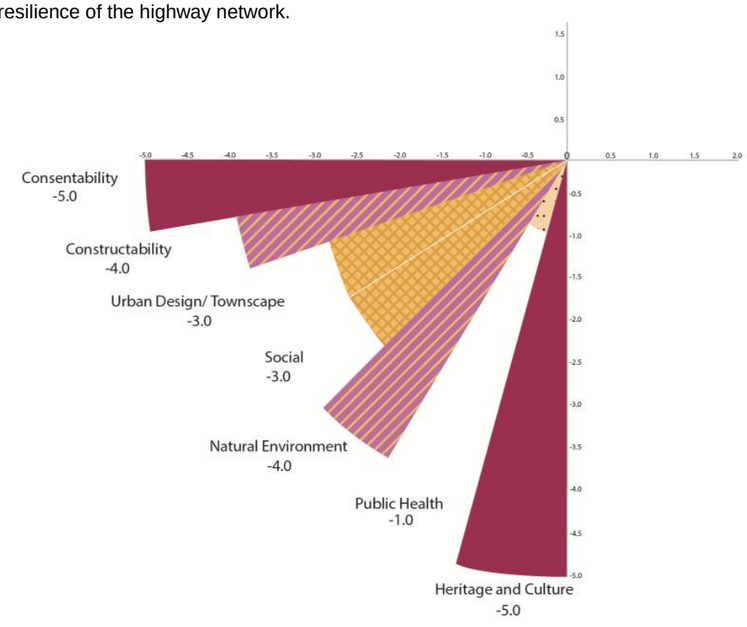
Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Access to SH20 is improved via the auxiliary lanes and upgraded Onehunga Mall/Neilson St intersection, while capacity along the corridor is improved with widening of Neilson St to provide a continuous 4-lane-corridor. Time savings (relative to a 2026 Do Minimum) are predicted to be 8.7 minutes to SH20 north and 5.6 minutes from SH20 south.
- The new ramps to connecting to SH1 provide more direct route, with time savings of up to 10.7 minutes to SH1 south. There would however still be 4 sets of traffic lights between Metroport and SH1 south, providing a relatively high level of trip variability
- However the improved access to SH1 attracts significant additional traffic into the corridor, with over 10,000 vpd added to Neilson St and Church St. This would make property access very difficult and could require further upgrades at Great South Road and on Church Street, and to side-road access points.
- The cycle/pedestrian connection to Sylvia Park is via limited enhancements to the existing on-road route via Hugo Johnston Drive and Church St East (then connecting to the SEART cycle path).
- The option does not facilitate improved pedestrian/ cycle connections between Onehunga and the old Mangere Bridge as it adds some 12,500 vpd to the Neilson St/Onehunga Mall intersection:
- There is reduced congestion for buses accessing Onehunga from SH20 with time savings of 5 minutes expected.
- This option results in very small reductions in freight vehicles in sensitive areas, expected as only some 400 vpd aggregated across 7 locations.
- The benefits are somewhat enduring, although time savings deteriorate over time (an 8% increase between 2026 and 2036), especially around the very busy Great South Road area. The very high traffic flows in the Neilson/Church corridor will mean property access becomes even more difficult over time, likley to require mitigation (such as traffic signals), which would reduce strategic access and reliability.
- The network resilience is enhanced slightly via provision of the new connection point to SH1, however this is somewhat off-set by the high concentration of traffic on Church Street.

The transport benefits are significant ($1330m), but it does not score well against the objectives for the Project due to the increases in through traffic on existing urban networks.

Summary of Social/Environmental Screen of Option:

- This option scores as ‘highly adverse’ due to its impacts on Mutukaroa / Hamlin’s Hill. These adverse effects relate to:
  - Heritage and historic significance impacts;
  - Cultural impacts (both in terms of historic heritage but also cultural associations and current management structures for this reserve). This area is identified as wahi tapū.
  - Landscape and visual impact; and
  - Open space / recreation impacts (not considered significantly adverse).
- The increase in traffic volumes on Neilson Street / Church Street are also considered adverse (to highly adverse). These impacts include:
  - Business disruption both during construction and more traffic on Nielson and Church will increase waits getting out of driveways
  - Increases in traffic flow along these roads resulting in impacts on community cohesion, increasing the barriers this road creating between these areas.
  - Increased adverse impacts on employment and business due to significant increases in traffic on local road networks resulting in impacts on business access / functioning
- The consenting risks are considered high to very high given the values and impacts at Mutukaroa / Hamlin’s Hill.
- The cycle/pedestrian connection to Sylvia Park is via limited enhancements to the existing on-road route via Hugo Johnston Drive and Church St East – as such some urban design and social impacts are scored adversely in this respect.
- Overall, constructability is considered challenging, particularly for works at Great South Road.
- While there are no current plans for increasing capacity on SH1 between the Mt Wellington and South Eastern Arterial interchanges, it is noted that this option effectively removes flexibility for this option and is therefore considered to also have impacts on the overall resilience of the highway network.

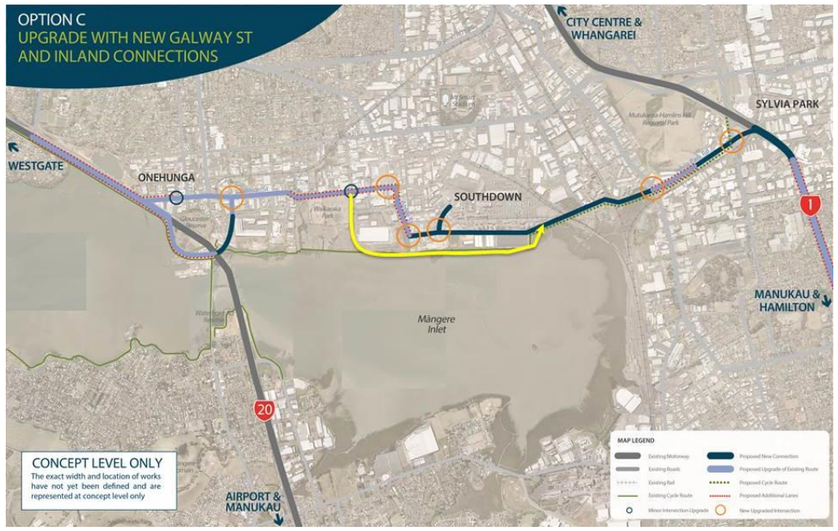


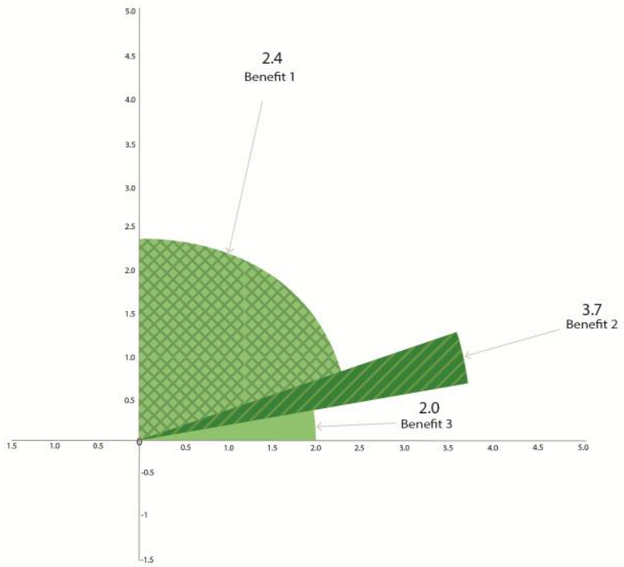
Option C

This option proposes a new connection from Onehunga Harbour Road to Galway Street, an upgrade of Neilson and Angle Streets and Sylvia Park Road, and a new connection from Angle Street to Sylvia Park Road and to SH1 – A sub-option alternative is shown in yellow

Overall this Option:

- Notably improves travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Improves safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park; and
- Notably improves journey time reliability for buses between SH20 and the Onehunga Town Centre.





Overall, it was concluded that this option **adequately address identified problems in the Project Area (being between Penrose and Onehunga)**.

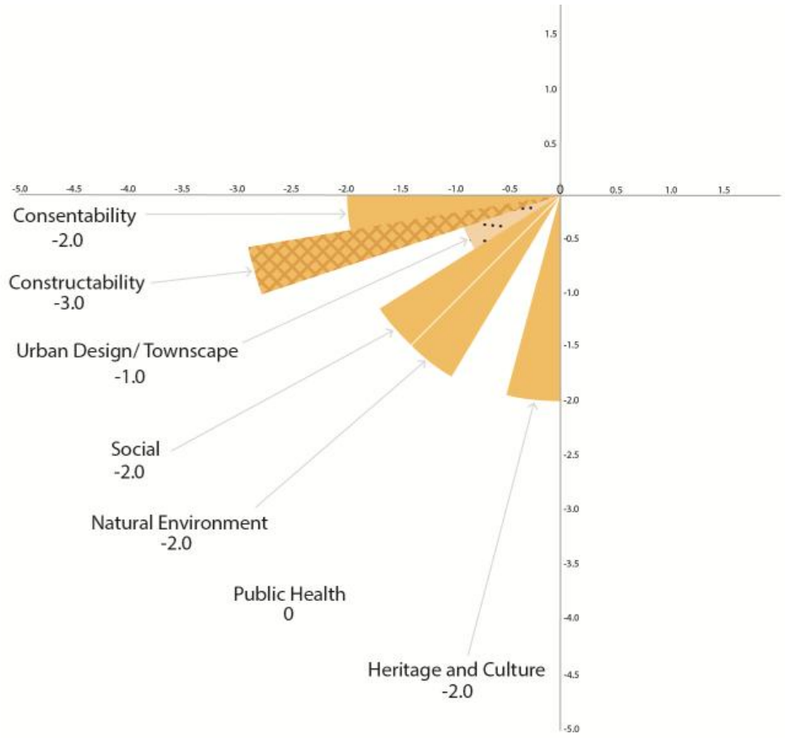
Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Access to SH20 is improved via the auxiliary lanes and new Galway St link, while capacity along the corridor is improved with widening of Neilson St and the new southdown link at Angle St. Time savings (relative to a 2026 Do Minimum) are predicted to be 9.1 minutes to SH20 north and 5.8 minutes from SH20 south.
- The improved motorway connections attract greater traffic into the western section of Neilson between Galway Street and Angle St (an extra 8,800 vpd), making it difficult to access properties.
- This option separates access to SH1 north (via SEART and Church St) and south (via the new connections south of Mt Wellington), reducing traffic on the eastern part of Neilson St (a 1900 vpd reduction) and on the Church street corridor (6000 vpd reduction).
- The improved connections to SH1 result in only a single set of traffic lights between Metroport and SH1 south, with time savings of up to 11.7 minutes
- The cycle/pedestrian connection to Sylvia Park is a direct, mostly off-road route connecting to Sylvia Park Road, then to Mt Wellington Highway.
- The option facilitates improved pedestrian/ cycle connections between Onehunga and the old Mangere Bridge by removing 12,500 vpd from the Neilson St/Onehunga Mall intersection.
- This options removes freight vehicles from sensitive locations, predicted to be some 3500 vpd aggregated across 7 locations
- There is reduced congestion for buses accessing Onehunga from SH20, with time savings of 4.9 minutes
- Some benefits are reasonably enduring, with limited deterioration in key travel times with traffic growth (travel times only increase by 5% between 2026 and 2036). However, the high traffic flows in the western section of Neilson St (36,200 vpd in 2026) will mean property access becomes more difficult over time and may require additional investment in the future to address.
- The network resilience is enhanced greatly via the new Galway St Link, the new southdown link to Great South Road and the new connection point to SH1

The transport benefits are significant ($1180m), and it performs well against the transport performance criteria.

Summary of Social/Environmental Screen of Option:

- Specialist design will need to be employed for all works on land that has been filled and where contamination is present(contaminated land works will be complex). Leachate pathways will need to be managed so effects on groundwater aquifers are managed.
- Improved connections for pedestrians and cyclists, particularly along the Waikaraka cycleway to Sylvia Park are identified, with the potential for this to also improve connections to Mutukaroa / Hamlin's Hill.
- Socially there are benefits are identified with the separation of through traffic and the Onehunga Mall / town centre area.
- Works in the area of Waikaraka Park are identified for both community values and potential disruption of historic heritage.
- From a consenting perspective, key issues include potential works at the foreshore, particularly for any foreshore reclamation which has a high policy test for consenting and consenting requirements for works adjoining Anns Creek (ecological area) and the complexity of consenting due to the multiple designations along the route.
- Constructability issues include: disruption during construction and complexity of works around the Transpower towers. The works over closed landfills are considered complex (and with some contaminated land impacts too).

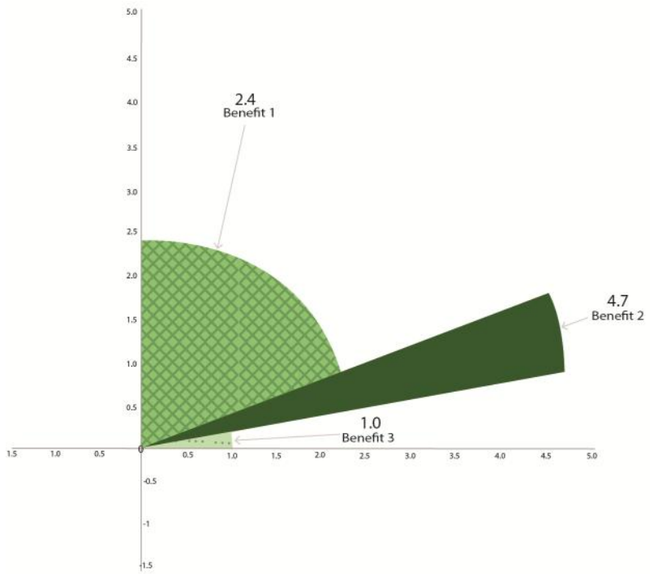


Option D

This option proposes an upgrade at Gloucester Park interchange with a new connection from Onehunga Harbour Road to Galway Street. The remainder is the same as Option C

Overall this Option:

- Notably improves travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Improves safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park; and
- Notably improves journey time reliability for buses between SH20 and the Onehunga Town Centre.



Overall, it was concluded that this option **adequately address identified problems in the Project Area (being between Penrose and Onehunga)**.

Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Access to SH20 is improved via the auxiliary lanes and new Galway St link, while capacity along the corridor is improved with widening of Neilson St and the new southdown link at Angle St. Time savings (relative to a 2026 Do Minimum) are predicted to be 8.5 minutes to SH20 north and 4.0 minutes from SH20 south.
- The new Gloucester Park interchange significantly reduces traffic in the vicinity of the Onehunga Mall/Neilson Street area (an expected reduction of 22,000 vpd), but increases access time to SH20 for some local movements from Onehunga. This does however result in over 50,000 vpd expected on Onehunga Harbour Road;
- The improved motorway connections attract greater traffic into the western section of Neilson between Galway Street and Angle St (an extra 7,400 vpd), making it difficult to access properties.
- The improved connections to SH1 result in only a single set of traffic lights between Metroport and SH1 south, with time savings of up to 11.7 minutes. This option separates access to SH1 north (via SEART and Church St) and south (via the new connections south of Mt Wellington), reducing traffic on the eastern part of Neilson St (2,000 vpd reduced) and on Church Street (5,600 vpd).
- The cycle/pedestrian connection to Sylvia Park is a direct, mostly off-road route connecting to Sylvia Park Road, then to Mt Wellington Highway.
- The option facilitates improved pedestrian/ cycle connections between Onehunga and the old Mangere Bridge by removing 22,200 vpd from the Neilson St/Onehunga Mall intersection). This options removes freight vehicles from sensitive locations, predicted to be some 6,000 vpd aggregated across 7 locations

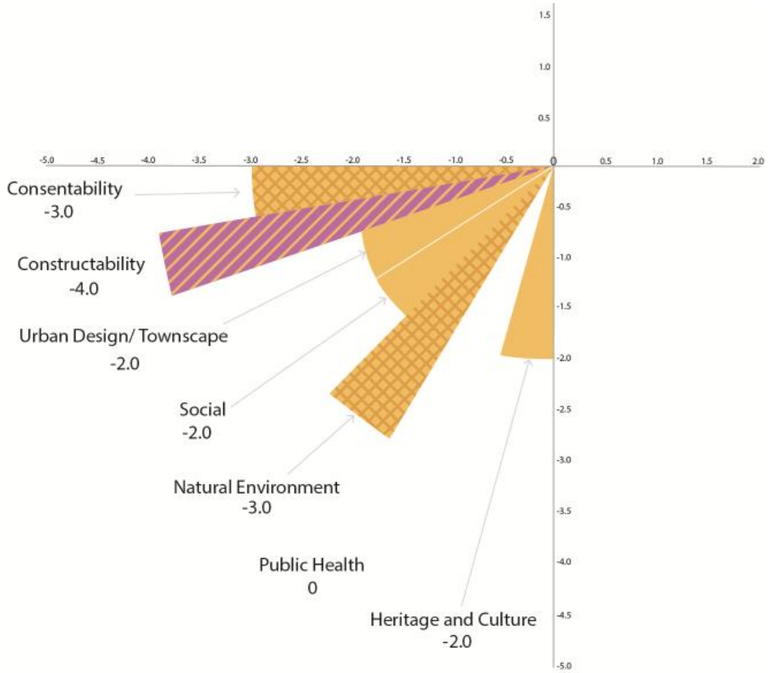
  There is reduced congestion for buses accessing Onehunga from SH20 with time savings of 4.8 minutes expected
- The benefits are reasonably enduring, with limited deterioration in key travel times with traffic growth (7% increase in travel time between 2026 and 2036). The high traffic flows in the western section of Neilson St (34,800 vpd in 2026) will mean property access becomes more difficult over time and may require additional investment in the future to address.
- The network resilience is enhanced greatly via the new Galway St Link, the new southdown link to Great South Road and the new connection point to SH1. The interchange design does not promote resilience.

The transport benefits are notable ($980m), but lower than for C (due to the diversion of Onehunga local traffic through the new interchange).

Summary of Social/Environmental Screen of Option:

The impacts of the Gloucester Park interchange are considered adverse, particularly:

  - The impacts on the Hopua Tuff Ring (though not cutting into the tuff ring is considered to be less adverse);
  - Visual and amenity impacts for the Onehunga town centre and connectivity to the foreshore;
  - Business and open space impacts in this area.
- Specialist design will need to be employed for all works on land that has been filled and where contamination is present(contaminated land works will be complex). Leachate pathways will need to be managed so effects on groundwater aquifers are managed.
- Improved connections for pedestrians and cyclists, particularly along the Waikaraka cycleway to Sylvia Park are identified, with the potential for this to also improve connections to Mutukaroa / Hamlin's Hill.
- Socially there are benefits are identified with the separation of through traffic and the Onehunga Mall / town centre area.
- Works in the area of Waikaraka Park are identified for both community values and potential disruption of historic heritage.
- From a consenting perspective, key issues include potential works at the foreshore, particularly for any foreshore reclamation which has a high policy test for consenting and consenting requirements for works adjoining Anns Creek (ecological area) and the complexity of consenting due to the multiple designations along the route.
- Constructability issues include: disruption during construction and complexity of works around the Transpower towers. The works over closed landfills are considered complex (and with some contaminated land impacts too).

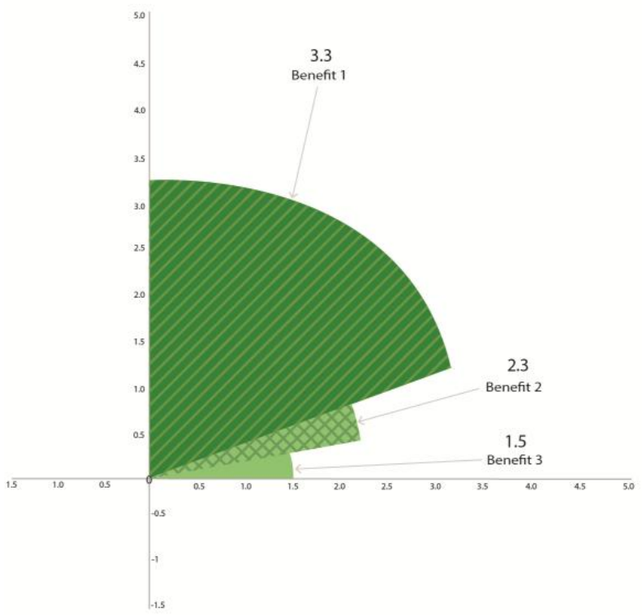


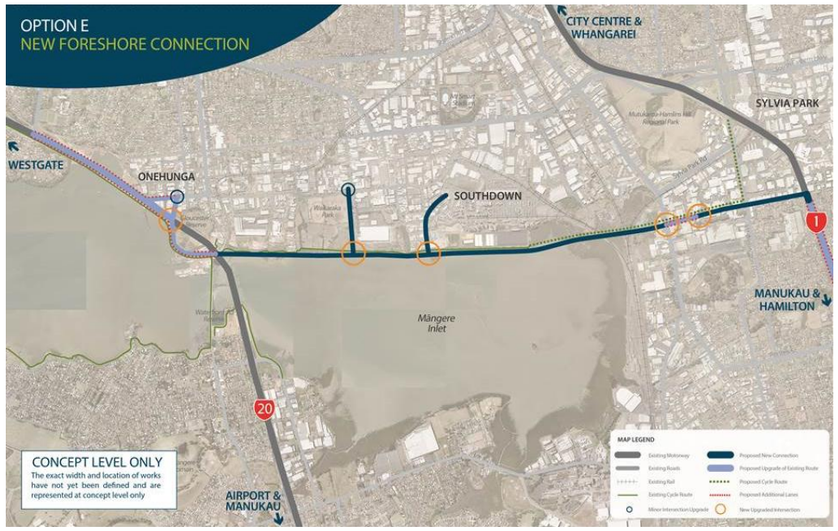
Option E

This option proposes an upgrade at Gloucester Park interchange and a new connection from SH20 to SH1 along the foreshore

Overall this Option:

- Notably improves travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Improves safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and Sylvia Park; and
- Improves journey time reliability for buses between SH20 and the Onehunga Town Centre.





Overall, it was concluded that this option **addresses identified problems in the Project Area (being between Penrose and Onehunga)**.

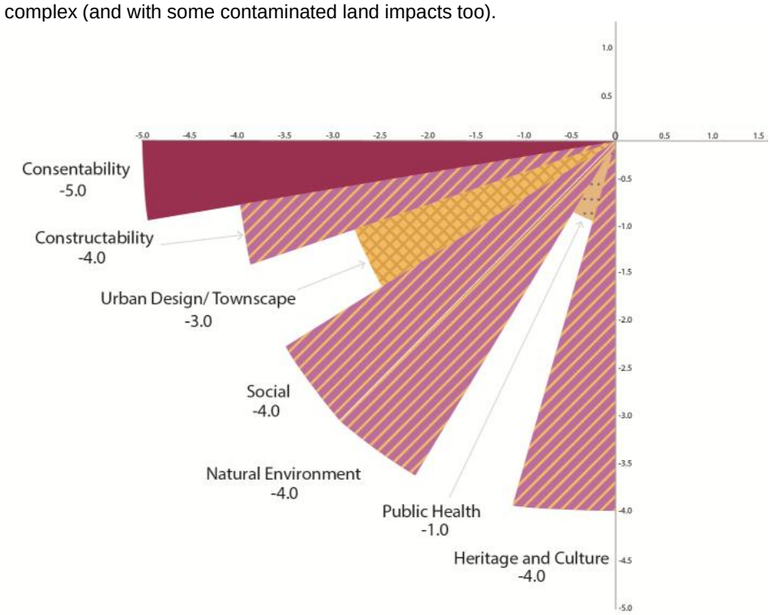
Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Access to SH20 is improved via the auxiliary lanes, new interchange which separates industrial and local Onehunga traffic, and new foreshore link connecting into Captain Springs Road or metroport areas. The new southdown link to Great South Road (and onto SH1) provides the most direct route to SH1 south. Time savings (relative to a 2026 Do Minimum) are predicted to be 7.7 minutes to SH20 north and 6.6 minutes from SH20 south.
- This option separates access to SH1 north (via SEART and Church St) and south (via the new connections south of Mt Wellington), thereby improving network resilience and congestion. It also separates access to SH20 for local and industrial traffic via the new interchange.
- The new foreshore route reduces traffic on the length of the Neilson St/ Church St corridor (up to a 10,400 vpd reduction) making it easier to access properties.
- The at-grade connections on Vestey drive attract some traffic from east of Mt Wellington Highway wanting to access the new ramps, which could increase congestion at these intersections.
- This options removes freight vehicles from sensitive locations, predicted to be some 2,100 vpd aggregated across 7 locations
- The cycle/pedestrian connection to Sylvia Park is via a new, off-road route connecting to Great South Road but then relies on on-road facilities from Vestey Drive and onto the Mt Wellington Highway (constraints in this area for cyclists are noted).
- There is reduced congestion for buses accessing Onehunga from SH20, with time savings of some 3.3 minutes.
- The new southdown link to Great South Road then to SH1 provides a direct route to SH1 south, with 2 sets of traffic signals between metroport and SH1 south
- There is a reduction in traffic at the Onehunga Mall/Neilson St intersection (6800 vpd reduction), facilitating improved pedestrian/cycle connections between Onehunga and the old Mangere Bridge
- The benefits are enduring, with limited deterioration in key travel times with traffic growth (travel times increase by only 7% between 2026 and 2036), and the lowered traffic flows on Neilson and Church Streets will resolve local through and access conflicts.
- The network resilience is enhanced via the new Gloucester Park interchange, foreshore routes and new connection point to SH1.

The transport benefits are significant ($1290m). There is an increase in benefits over the other 'new link' option (Option F) due to the accessibility created by the link at Vesty Drive

Summary of Social/Environmental Screen of Option:

- The social impacts of this option are considered highly adverse, particularly due to the residential and community disruption (around Panama Road) and the business loss and disruption in the area of Vesty Drive. Associated with these impacts, the adverse public health impacts are also identified including noise and air quality due to the increased number of residential (sensitive) receivers.
- The impacts of the Gloucester Park interchange are considered adverse, including impacts on the Hopua Tuff Ring, visual and amenity impacts for the Onehunga town centre and connectivity to the foreshore, and business and open space impacts in this area.
- Other environmental impacts are also adverse, in particular due to impacts at Ann's Creek and potentially to the foreshore.
- Specialist design will need to be employed for all works on land that has been filled and where contamination is present (contaminated land works will be complex). Leachate pathways will need to be managed so effects on groundwater aquifers are managed.
- Improved connections for pedestrians and cyclists, particularly along the Waikaraka cycleway to Sylvia Park are identified, with the potential for this to also improve connections to Mutukaroa / Hamlin's Hill.
- Urban design benefits include with the separation of through traffic and the Onehunga Mall / town centre area, but conversely adverse effects due to changes in urban form around Panama Road.
- Works in the area of Waikaraka Park are identified for both community values and potential disruption of historic heritage.
- From a consenting perspective, there are a number of potentially significant issues. These include potential works at the foreshore, particularly for any foreshore reclamation which has a high policy test for consenting and consenting requirements for works adjoining Ann's Creek (ecological area) and the complexity of consenting due to the multiple designations along the route (Vector gas).
- Constructability issues include: disruption during construction and complexity of works around the Transpower towers. The works over closed landfills are considered complex (and with some contaminated land impacts too).

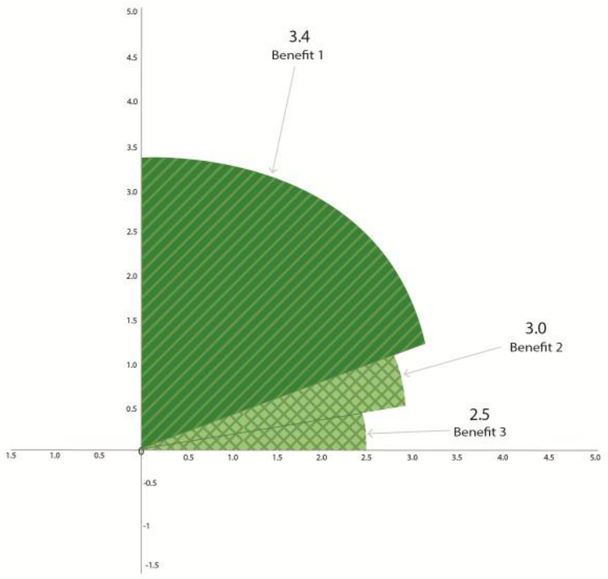


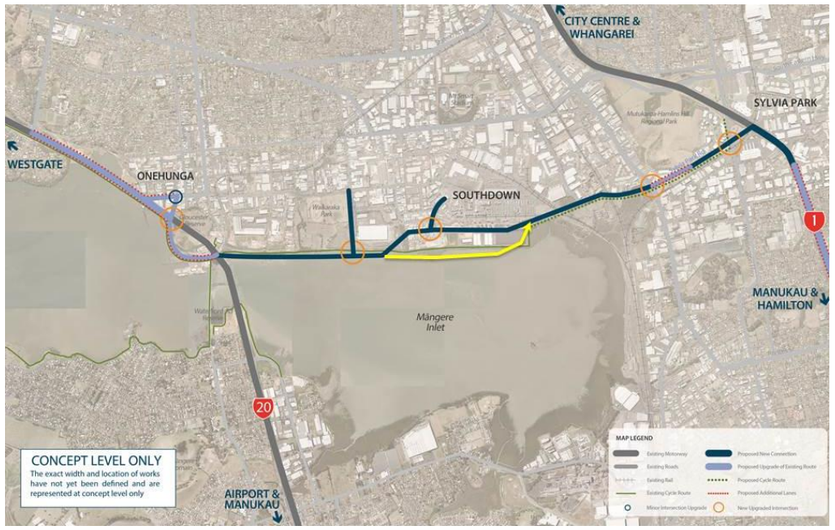
Option F

This option proposes a new connection from SH20 to SH1 (partly along the foreshore and partly inland). – A sub-option alternative is shown in yellow, to be considered further if this option is preferred

Overall this Option:

- Notably improves travel time savings and travel reliability between Onehunga – Penrose area and SH1 and SH20;
- Notably improves safety and accessibility for cycling and walking between Mangere Bridge, Onehunga and through to Sylvia Park; and
- Improves journey time reliability for buses between SH20 and the Onehunga Town Centre.





Overall, it was concluded that this option **addresses identified problems in the Project Area (being between Penrose and Onehunga)**.

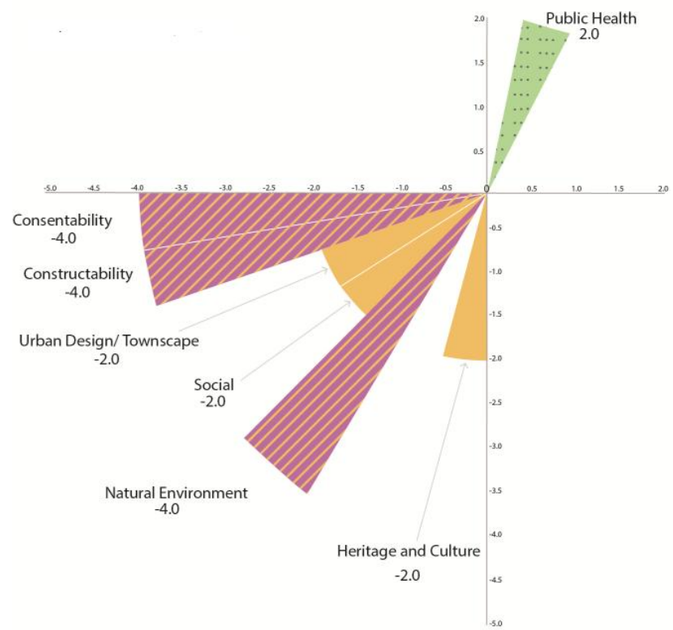
Key assessment of the option against the transport objectives, and the specific transport performance criteria concluded:

- Access to SH20 is improved via the auxiliary lanes, new interchange which separates industrial and local Onehunga traffic, and new foreshore link connecting into Captain Springs Road or metroport areas. Time savings (relative to a 2026 Do Minimum) are predicted to be 7.9 minutes to SH20 north and 6.6 minutes from SH20 south.
- The new southdown link to Great South Road then to SH1 provides a direct route to SH1 south, with only 1 set of traffic signals between metroport and SH1 south
- This option separates access to SH1 north (via SEART and Church St) and south (via the new connections south of Mt Wellington), reducing traffic in the Church street corridor), thereby improving network resilience and congestion. It also separates access to SH20 for local and industrial traffic via the new interchange
- The new foreshore route reduces traffic on the length of the Neilson St/ Church St corridor (up to a 9,500 vpd reduction) making it easier to access properties.
- The cycle/pedestrian connection to Sylvia Park is a direct, mostly off-road route connecting to Sylvia Park Road and onto Sylvia Park (Centre).
- There is reduced congestion for buses accessing Onehunga from SH20 with time savings of some 3.2 minutes;
- This options removes freight vehicles from sensitive locations, predicted to be some 2,800 vpd aggregated across 7 locations
- The expected reduction in traffic at the Onehunga Mall/Neilson St intersection (of some 9700 vpd) will facilitate improved pedestrian/cycle connections between Onehunga and the old Mangere Bridge
- The benefits are enduring, with limited deterioration in key travel times with traffic growth (travel times increase by only 6% between 2026 and 2036). The traffic flow reductions on Neilson and Church Streets will resolve local through and access conflicts.
- The network resilience is enhanced by the new southdown link to Greatt South Road and the new connection point to SH1.

The transport benefits are significant ($1240m).

Summary of Social/Environmental Screen of Option:

- The impacts of the Gloucester Park interchange are considered adverse, particularly:
  - The impacts on the Hopua Tuff Ring (though not cutting into the tuff ring is considered to be less adverse);
  - Visual and amenity impacts for the Onehunga town centre and connectivity to the foreshore;
  - Reclamation over basalt rock exposed at the Onehunga foreshore;
  - Business and open space impacts in this area.
- Specialist design will need to be employed for all works on land that has been filled and where contamination is present (contaminated land works will be complex). Leachate pathways will need to be managed so effects on groundwater aquifers and sensitive receiving environments are managed.
- Improved connections for pedestrians and cyclists, particularly along the Waikaraka cycleway to Sylvia Park are identified, with the potential for this to also improve connections to Mutukaroa / Hamlin's Hill.
- Socially there are benefits are identified with the separation of through traffic and the Onehunga Mall / town centre area.
- Works in the area of Waikaraka Park are identified for both community values (cemetery and park land areas) and potential disruption of historic heritage.
- From a consenting perspective, key significant issues include the scale of reclamation and works at the foreshore, which has a very high policy test for consenting.
- Other consenting issues include for works in the Anns Creek area (ecological area) and the complexity of consenting due to the multiple designations along the route.
- Constructability issues include: disruption during construction and complexity of works around the Transpower Towers (SH1 and Sylvia Park Road).



Appendix P

Economic Analysis Approach and Assumptions

1. KEY ASSUMPTIONS

1.1. Economic Assessment Approach and Assumptions:

The evaluation is based on the NZ Transport Agency's Economic Evaluation Methodology (EEM). The estimated benefits are derived from the project traffic model developed for this work (the EWC SATURN model). That model derives its travel demands from Auckland Council ART3 model.

For the base case, the underlying analysis assumed:

- A 40-year analysis period with a 6% discount rate;
- Agglomeration benefits of 25% of the transport benefits (this is conservatively set below the 30-36% calculated in the Programme Business Case);
- Growth as derived from the Auckland Council ART3 Model (subject to below specifications), using 2026 and 2036 forecasts.

Further key assumptions used in the evaluation are as follows:

- Regional land use inputs from Auckland Transport's Scenario I-8b forecasts;
- Investment Scenarios: ITP Basic Programme plus TiGA (2016, 2026, 2036 and 2046) and ITP Auckland Plan Network (2036, 2046)
- A Base date for of 1 July 2014 for costs, 1 July 2013 for benefits[3] and a Time Zero date for discounting of 1 July 2016;
- Earliest major construction in 2017, with varying construction duration (see below);
- Modelled years of 2026 and 2036. Benefits for intermediate years were interpolated between these values;
- Model results were used for the weekday AM, Interpeak and PM peak periods. These were expanded to annual values separately for light and heavy vehicles, to reflect the lower truck activity in the off peak and weekend periods;
- A fixed-trip matrix method was used, whereby the travel demand matrices from the Do Minimum option were assigned to all options[4];
- The evaluation has been undertaken separately for trucks and light vehicles;
- Travel time values for light vehicles and trucks are based on a typical Urban Arterial composite traffic mix;
- Vehicle operating costs assessed were Base Running Costs, with rates (c/km) based on an assumed average network speed of 40kph. This gave rates of 26c/km for light vehicles and 102c/km for trucks (in $2008); Vehicle costs while stopped were included as 3c/min for light vehicles and 5.8 c/min for trucks.

[3] This is because the annual update factors have not yet been released by NZTA.

[4] A specific test was undertaken on one option testing the effect of using full Variable trip Demand analysis. This used a matrix-based approach using skimmed travel times. This showed that the benefits using VTM were 3% higher than those using an FTM method (based on the Do Minimum demands). As such, the simpler FTM method was adopted.

- Base travel time and vehicle operating rates were updated to current ($2013) values using the published update factors of 1.40 for travel time and 1.06 for vehicle operating costs;
- CRV benefits[5] were based on all delay at intersections and the delay time on links. Trip reliability benefits were assumed to be 5% of travel time benefits'
- CO_2 benefits were assessed at 4% of the vehicle operating cost benefits;
- Crash costs were not assessed;
- Route 32 bus benefits were estimated using the following assumptions and inputs:
    - Estimated patronage volumes from the year 2011 ART3 model;
    - An assumed 25% increase in patronage due to the upgrade (this estimate is based on an expected 33% uplift for the similar Dominion Road project and a 77% increase in the higher-standard AMETI Busway);
    - Estimated bus time savings of 5 minutes in the peak and 1 minute off peak
    - Traffic decongestion benefits of $1.56 per vehicle-km removed, using a car-driver diversion rate of 72% and an average trip length of 10km[6]
    - User benefits to new bus passengers of $10.16 per boarding in peaks and $6.77 per boarding off peak[4]

Benefits to trip reliability using EEM procedures

[5] These are additional travel time premium applied to congested conditions.
[6] Based on EEM procedures

Appendix Q

Commercial Case Framework

1. RISK ASSESSMENT

The procurement risks outlined in the table below were identified at the IBC stage.

TABLE P.1 KEY RISKS RELEVANT TO PROCUREMENT

Risk category	Description
Design Risk	• Delays in obtaining sign-off for design
Consenting Risk	• Delays in consenting • Delays in property acquisition
Stakeholder Risk	• Risk of stakeholders objecting to delivery model selected
Construction Risk	• Construction requirements insufficiently defined • Costs exceed initial projections • Cultural risk (e.g. archaeological delays) • Geotechnical risk (e.g. ground conditions) • Interface with design is unclear, resulting in additional cost/delay • Legal/contracting risk
Financial Risk	• NLTF revenue risk • Interest rate risk • Inflation (CPI and Property) • Counterparty credit risk • Tolling revenues (if applicable)
Operational Risk	• Interface with construction and operation is unclear • Unforeseen consequences in other areas (e.g. increased congestion) • Higher than expected maintenance cost requirements (e.g. due to changing usage from original design)
Commissioning / Decommissioning Risk	• Only likely to be relevant to options that involve tolling
Deliverability Risk	• Lack of institutional capacity • Market capacity / interest

The risk assessment criteria to be considered at the DBC stage, includes:

- The probability that each risk will occur, ranked as high, medium or low.
- **The expected impact of each risk if it does occur**
- Which party is likely to be affected by the risk and which party is best positioned to manage the risk
- Whether there is a value proposition to be gained from sharing risk or transferring risk entirely

- Whether the identified risk can be further categorised as systematic or non-systematic risk for financial evaluation purposes

An example of the framework that will be applied at the DBC stage is included below.

TABLE P.2 RISK FRAMEWORK

Risk Category	Risk	Probability L / M / H	Impact L / M / H	Optimal Allocation	Systematic?
Category A	Risk A Risk B Risk C				
Category B	Risk A Risk B Risk C				
Category C	Risk A Risk B Risk C				

The below table includes example thresholds for the risk assessment framework for illustrative purposes only. These will be confirmed at the DBC stage.

TABLE P.3 DRAFT THRESHOLDS

Key	Description
Probability	• Low – less than 33% • Medium – between 33% and 66% • High – higher than 33%
Impact	• Low – less than $10 million • Medium – between $10 million and $90 million • High – greater than $90 million
Optimal Allocation	• Retained • Transferred • Shared
Systematic Risk?	• Yes • No

Procurement Delivery Models – Advantages and Disadvantages

TABLE P.4 TRADITIONAL

Advantages	Disadvantages
Is well understood by the supply market	Has the potential to create adversarial relations
Has relatively simple contractual terms and a clear allocation of responsibilities	Has few inherent incentives to optimise the design
Provides for greater client control	Has limited scope or incentive for constructor and designer collaboration

Source: Transport Agency State Highway Procurement Strategy 2014

TABLE P.5 DESIGN & CONSTRUCT

Advantages	Disadvantages
Allows a more collaborative approach between designer and constructor	Increased tendering costs for both principal and suppliers
Provides good incentives for optimisation of design and construct practices	Where the scope is varied post-award, the consequences can be magnified and costs difficult to maintain
Provides the client with a single point of responsibility	Reduces flexibility and ability for client to influence the detailed design post award
Reduces the effects of the traditionally adversarial relationship between designer and constructor	Encourages design to minimum standards, which requires outcomes to be well defined.
Facilitates a greater transfer of risk to the constructor	Places demands on suppliers in accepting and making adequate allowances for managing risks
	Can be difficult to administer to ensure best outcomes are always achieved

Source: Transport Agency State Highway Procurement Strategy 2014

TABLE P.6 ALLIANCE

Advantages	Disadvantages
Allows collaboration between designer, constructor and client	Can place a large demand on senior client resources
Allows more tasks to be completed in parallel, expediting the time to delivery	Can increase costs during project development phases
Incorporates the constructor's skills earlier, and provides all parties with a better overall understanding of project risks and opportunities	Not suitable for all client personnel – it can be a highly challenging and demanding work environment

Appendix Q:Commercial Case Framework

Source: Transport Agency State Highway Procurement Strategy 2014

Evaluation Criteria

The following evaluation criteria taken from the Transport Agency State Highway Procurement Strategy 2014 were used in the preliminary assessment of the procurement delivery models.

TABLE P.7 EVALUATION CRITERIA

#	Evaluation Criteria	Description
1	Scale	The overall scale or value of the activity.
2	Complexity	Consideration of the overall complexity of the activity, including the number of components within the activity and how they may interact, and the level of complexity of technical issues.
3	Innovation potential	The ability to enhance the outcomes sought through supplier innovation.
4	Timing and urgency of the activity	Consideration of programme constraints or hold points and the overall benefits of early completion or achievement of intermediate milestones.
5	Supplier market conditions	Consideration of the current supplier market conditions, including the number and depth of possible suppliers in the market.
6	Risk profile	Consideration of the overall quantum and nature of risks and opportunities for the activity, and who is best placed to manage them.
7	Stakeholder involvement and customer requirements	This recognises the variability of the number and nature of stakeholders, and the level of influence they might have on achieving the desired activity outcomes.
8	Level of client involvement	Consideration of the demands on Transport Agency and AT personnel throughout the delivery phase.
9	Focus on non-cost areas	The extent to which incentivisation of performance is required in non-cost areas such as environmental, social, sustainability, communications and public relations.
10	Tangible demonstration of value for money	The ability to tangibly demonstrate that the chosen procurement option represents best value for money spent
11	Flexibility to deal with change	Consideration of the potential for scope changes or unresolved issues that will have significant effects during the course of the activity

Source: State Highway Procurement Strategy 2014

Appendix Q:Commercial Case Framework

Application of Criteria

In applying these criteria we have used the following scale, principally based on Transport Agency guidance.

TABLE P.8 EVALUATION SCALE

#	Evaluation Criteria	Description		
1	Scale	Small (<$20 million)	Medium ($20m to $100m)	Large (>$100m)
2	Complexity (construction and interface)	Simple	Moderate	Complex
3	Innovation potential	Low	Medium	High
4	Timing and urgency of the activity	Constrained	Moderate	Unconstrained
5	Supplier market conditions	Unconstrained	Moderate	Constrained
6	Risk profile	Low	Medium	High
7	Stakeholder involvement and customer requirements	Low	Medium	High
8	Level of client involvement needed and availability/expertise	Low	Medium	High
9	Need for focus on non-cost areas	Low	Medium	High
10	Need to tangibly demonstrate value for money	Low	Medium	High
11	Need for flexibility to deal with change	Low	Medium	High

Appendix R

Financial Case – Assumptions/Methodology

TABLE R.1 KEY ASSUMPTIONS

Category	Shortlisted Options Assessment	Preferred Option (Option F)
Project Costs	Project costs estimates based on initial Project Team cost analysis of options. Asset improvement costs have been rounded to the nearest $20 million. Property costs have been rounded to the nearest $5 million. Property costs are an element that is subject to a high degree of variability based on recent experience. Total project costs have also been rounded to the nearest $20 million. Key uncertainties include: • Geotechnical, (further investigation in the next phase) • Property, (further analysis in the next phase) • Route/Lane configuration/capacity, (Investigation & modeling in the next phase) • Environmental mitigation/ enhancement, (not allowed at this stage)	All project costs (property, construction, renewal capex, operating) are at the 50th/95th percentile, and real, as at 30 June 2015, based on current cost inputs. Risk adjusted project costs are also available at the P5, P85, and P95 percentiles. All costs are rounded to the nearest $50M for OPC and $5M for FN32, and are inclusive of contingency.
Funding Assistance Rate	53% of eligible Local Roads costs funded by NLTF contributions.	51% of eligible Local Roads costs funded by NLTF contributions. AT to fund 100% of upfront Local Roads property costs, eligible for FAR rebate of 51% of spent property costs once construction begins.
Asset Maintenance Costs	Assumed to be equivalent to 5% of capital costs per annum commencing in the outer years of the construction period, rounded to the nearest $5 million.	Assumed to be spent annually, beginning post construction period, despite the works being completed on a periodic basis (e.g. every 10 years).
Operating Costs		Assumes that operating and maintenance costs are incurred annually from construction completion (30-Jun-22), through to the end of the modelled period

Appendix R:Financial Case – Assumptions/Methodology

Category	Shortlisted Options Assessment	Preferred Option (Option F)
		(30-Jun-54).
Development Timeframes	Construction timeframes based on individual project characteristics and Project Team estimates Property purchases assumed to start one year prior to construction	Assumed timing assumptions: 1. Property: 1-Jul-15 2. Construction: 1-Jul-15 – 30-Jun-22 3. Operations: 1-Jul-22 – 30-Jun-54
Funding Costs	Funding costs not included in project costs as they are dependent on analysis of funding solutions to be developed at the DBC stage	Currently no assumed funding or financing costs. This will be explored at the DBC stage depending on selection of preferred procurement method.

Appendix S

Governance Plan

East West Connections

Governance Plan

Version 2.1

Last Updated 05 November 2014

Revision History

Revision #	Prepared by	Description	Date
1.0	Scott Wickman	First draft – for PCG approval in principle	28 May 2014
2.0	Scott Wickman	Draft for PGG approval	10 Sept 2014
2.1	Scott Wickman	Final draft for inclusion in IBC	05 Nov 2014

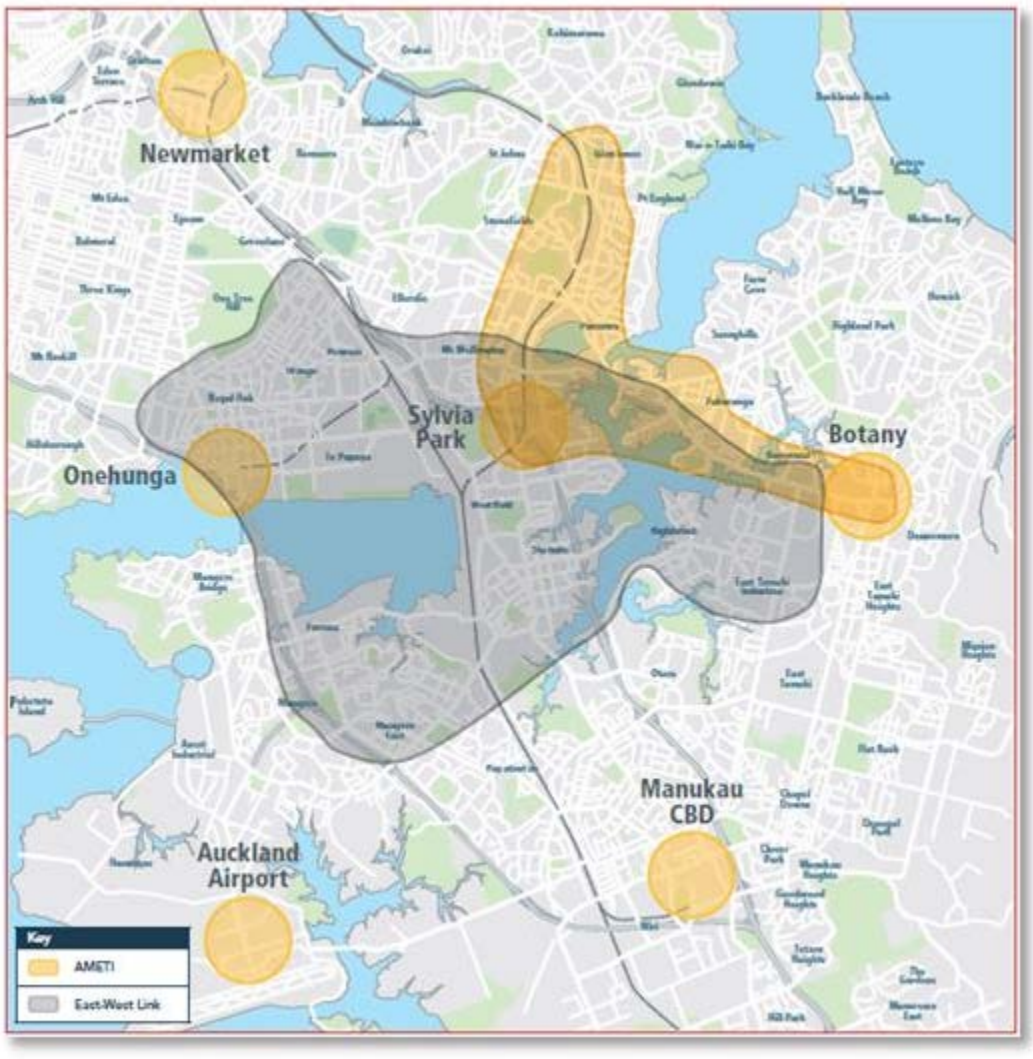
Contents

1. INTRODUCTION

This Governance Plan describes the governance structure and role for the East West Connections programme. The Governance Plan provides transparency to the strategic leadership and accountabilities for the overall East West Connections programme and projects to be progressed from within that programme. This Plan sets out the ways in which the various partner organisations are going to interact with one another and provide the necessary guidance and support to drive the programme to achieving the overall strategic vision for the programme.

What is the East West Connections?

The East West Connections (also previously known as East West Link and Multi-Modal East West Strategy (MMEWS)), is an umbrella term used to describe a number of improvements to the transport network (all modes) within the project area (shown below). These improvements have been identified through a programme business case, which was developed in response to the Auckland Plan identifying the East West Link as the #2 transport priority project (with AMETI) for the Auckland region. The East West Connections programme covers a 30 hear horizon, in line with the Auckland Plan, and seeks to provide the necessary transport investment programme to support and enable the planned growth in the Auckland Plan.



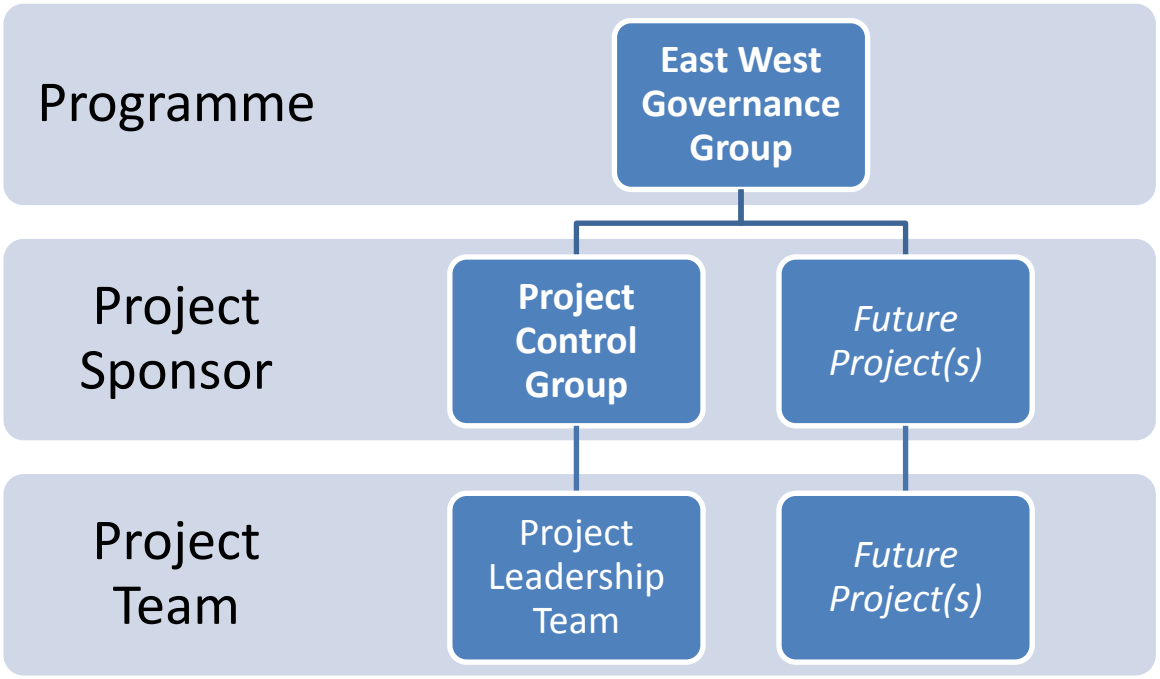
Status of East West Connections

The Programme Business Case for East West Connections was supported in part by the NZ Transport Agency Board in July 2014.

Mission Statement

To realise the productive potential of New Zealand's premier industrial heartland.

2. Governance Structure



2.1. Partners

Delivery of the wider East West Connections programme will require close coordination and organisational buy-in from the primary programme partners, being Auckland Council, Auckland Transport, and NZ Transport Agency. It should also be noted that there are other providers of critical infrastructure with strategic assets in the study area, including (but not limited to) KiwiRail, Watercare, Transpower, and Vector.

Auckland Council

The Auckland Council is a territorial authority for Auckland and has, in relation to Auckland, the responsibilities, duties, and powers of a regional council.

The Auckland Council has a shared vision - to be the world's most liveable city. The Auckland Plan (adopted in March 2011) will guide Auckland's future over the next 30 years on issues such as:

- transport and housing shortages
- giving children and young people a better start
- creating more jobs
- protecting the environment.

Auckland Transport

Auckland Transport is responsible for all of the region's transport services (excluding state highways) - from roads and footpaths, to cycling, parking and public transport. Its main tasks are:

- To design, build and maintain Auckland's roads, ferry wharves, cycle ways and walkways.
- Co-ordinate road safety and community transport initiatives such as school travel
- Plan and fund bus, train and ferry services across Auckland.

The principal function of Auckland Transport is to give effect to the Auckland Plan and Auckland Transport is funded to undertake this role by the Auckland Council and NZTA.

In accordance with s47 of the Local Government (Auckland Council) Act 2009, Auckland Transport is a requiring authority for the purposes of "constructing or operating or proposing to construct or operate roads in relation to the Auckland transport system…"

NZ Transport Agency

The NZ Transport Agency has the following relevant responsibilities assigned to it through the Land Transport Management Act 2003 (amended 2008):

- Contribute to an effective, efficient and safe land transport system in the public interest;
- Manage the state highway system, including planning, funding, design, supervision, construction and maintenance operation; and,
- Manage funding of the land transport system, including auditing the performance of organisations receiving land transport funding.

NZTA undertakes these responsibilities through the core business functions of:

- Planning the land transport networks;
- Investing in land transport;
- Managing the state highway network; and
- Providing access to and use of the land transport system.

The Transport Agency is a network utility operator approved as a requiring authority under s167 of the Resource Management Act 1991.

Others

The following stakeholders are not involved in the current governance arrangements for the East West Connections programme, but have been identified as potentially affected stakeholders, depending on the shape of future investment decisions from the EWC programme. Consideration should be given at the appropriate time as to whether the following stakeholders should be included in future governance arrangements, and if so, how that might look.

Kiwirail – Kiwirail is a statutory corporation operating as a single entity with multiple business units, including Kiwirail Freight, Kiwirail Interislander, Kiwirail Passenger, and Kiwirail Infrastructure and Engineering. Kiwirail is increasingly targeting investments to improve the competitive advantage of rail for long-haul freight movement. The effectiveness and efficiency of the current and future operations of Kiwirail's Southdown freight terminal plays an integral role in determining the overall ability of New Zealand to be internationally competitive.

Transpower – Transpower plans, builds, maintains and operates New Zealand's high voltage electricity transmission network. A number of Transpower corridors extend through the study area, including the strategically significant Otahuhu to Henderson line.

Vector – Vector is a privately owned infrastructure provider as well as distributor of energy across NZ. Vector is owned jointly by the Auckland Energy Consumer Trust (AECT) and private investors. With regard to the EWC area, Vector owns and operates electricity distribution assets which deliver power to more than half a million customers in the Auckland region. Vector also own and operate high pressure gas pipelines throughout the north island, including a strategic pipeline that runs through the EWC area.

Watercare – Watercare is a Council Controlled Organisation tasked with the treatment and supply of drinking water to the residents and businesses of Auckland. Watercare also collects, treats, and disposes of wastewater and trade waste for the Auckland region. The company works to ensure the Auckland of tomorrow and its people continue to enjoy dependable services by planning, constructing, and delivering new water and wastewater infrastructure in a cost-efficient manner.

2.2. Partner Roles and Delegations

Auckland Council – Auckland Development Committee (ADC)

As defined by the Terms of Reference for Auckland Council Committees, the Auckland Development Committee is responsible for guiding "the physical development and growth of Auckland through a focus on land use planning, housing and the appropriate provision of infrastructure and strategic projects associated with these activities." The Auckland Development Committee is made up of the whole of the Auckland Council governing body. The committee meets monthly.

An Infrastructure Committee has been established by the Mayor to "overview the strategic direction and key projects of Auckland Transport, Watercare and Stormwater department to ensure alignment with the growth of Auckland and the Unitary Plan." The Infrastructure Committee reports to the ADC.

The Auckland Development Committee will be informed of key decisions on the EWC programme and projects and will be provided an opportunity to influence investment decisions once approved by the NZ Transport Agency and Auckland Transport.

Auckland Transport Board

The Board of Directors for Auckland Transport has overall responsibility for delivering transport in Auckland; this includes managing and controlling public transport and local roads, as well as preparing the Auckland Regional Land Transport Programme.

All decisions relating to the operation of Auckland Transport are made by, or under, the authority of the board in accordance with the Local Government (Tamaki Makaurau Reorganisation) Amendment Act 2009, the Local Government (Auckland Council) Act 2009, and the Local Government (Auckland Transitional Provisions) Act 2010.

The board is made up of 8 members, 5 of whom are appointed by central government and 2 of whom are appointed by Auckland Council. A representative of the Transport Agency serves as an advisor to the board.

NZ Transport Agency Board

The Transport Agency Board is responsible for making independent decisions on allocating and investing funds from the NLTF. The Board is comprised of eight members who are independently appointed by the Minister of Transport. The Chief Executive of the Transport Agency reports to the Board. The Board meets monthly and reports to the Minister.

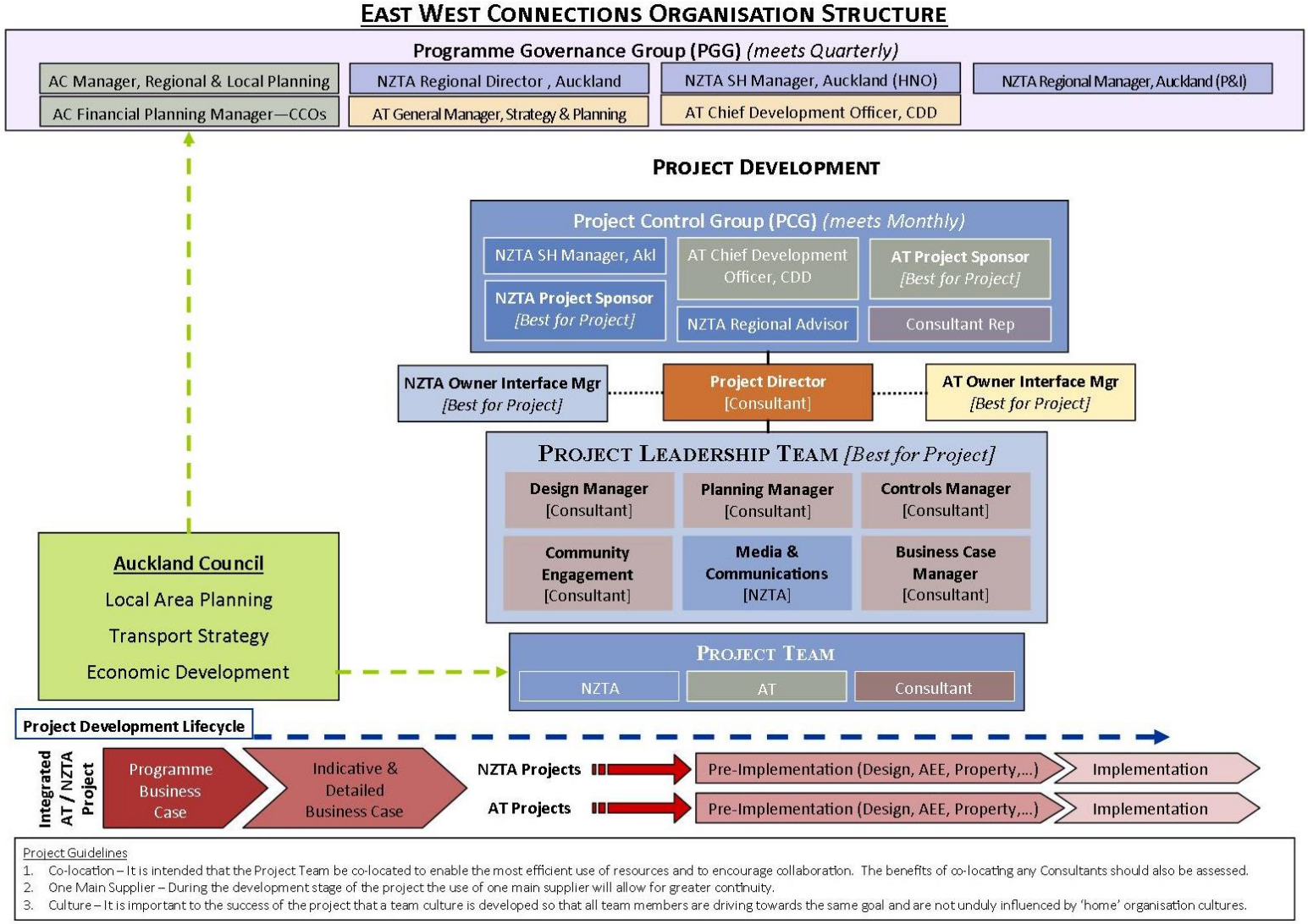
The Transport Agency Board is responsible for significant investment decisions. This includes approvals for the preferred option of large and complex projects within the EWC programme area. Particular regard will be had to the financial implications of such decisions on the NLTF.

2.3.Principles

The NZ Transport Agency and Auckland Transport will be guided by the following principles in developing a high performing culture for projects developed under the East West Connections programme:

- **One person with accountabilities.** Accountabilities shall be defined for each role in the project team and there shall be no shared accountabilities. Clearly defined and allocated accountabilities eliminate doubt and uncertainty in delivery expectations and drive performance.
- **Aim for consensus.** Governance teams should aim for consensus in all decision-making. Where consensus cannot be reached, the risks of not reaching consensus shall be considered and recorded prior to any decisions being made.
- **Best personnel for the role.** Given the complexity of the East West Connections programme and scale of issues to be considered, the composition and makeup of each project team is likely to be quite varied. In order to achieve successful project outcomes, it is going to be critical that the project team has the most appropriate skill set and relevant experience to deliver. When considering project resourcing, and prior to going to market, the organisations should first and foremost identify the critical roles and define whether that role is best filled by the Transport Agency/AT, or by industry.
- **Skill transfer.** Professional development and learning are an active and dynamic process. It is critical to ensure opportunities for transfer of skills and knowledge are accommodated and promoted within the project team.

2.4. East West Connections Organisation Structure



3. Programme Governance Group

The complete Terms of Reference for the Governance Group is attached as Appendix A.

3.1. Purpose

The purpose of the Governance Group is to provide strategic leadership and perform an oversight (monitoring, evaluation and reporting) role to ensure current and future transport plans and projects within the area shown below are well-aligned with other investments (including other infrastructure) and coordinated with planned growth in the Auckland region.

3.2. Accountability

The East West Connections Programme Governance Group will update the relevant management team of each partner organisation.

Recommendations and delegated decisions by the Governance Group are made on a consensus basis. In the event of disagreements or disputes, the Governance Group will elevate the matter to CEO level.

3.3. Responsibilities

Strategic leadership

- Ensure a clear and concise vision is in place
- Approve the outcomes and strategic responses of the Programme Business Case and subsequent business cases.
- Approve high level Communication Strategy and Engagement Plan
- Ensure that the Project Control Group (PCG) develop the project in a way that coordinate and integrate well with the strategic direction of each organisation.
- Assess the effect on the programme due to changes in the external environment.
- Assist in relationship management with central agencies

Oversight (monitoring, evaluation and reporting)

- Provide a discussion forum between the member organisations to respond to requests for decisions or recommendations received from the PCG.
- Provide linkage to other AT and NZTA projects and strategic corridors
- Review the impact of the programme on the NLTF and LTP.
- Monitor the efficiency (and co-ordination) of the resource allocation from each organisation to achieve the outcomes sought in the business case.
- Ensure accuracy and timeliness of reporting processes and systems are maintained at a high level at all times.
- Agree key messages for reporting to Boards and Committees

4. Project Control Group (PCG)

The organisation structure that has been established for development of the initial project development and associated business cases is attached as Appendix B. Refer to the Organisation Structure for more clarity on reporting lines and membership of the PCG and PLT.

4.1. Purpose

The purpose of the Project Control Group (PCG) is to ensure projects achieve the objectives and the participants fulfill all of their project obligations, whilst also satisfying the corporate requirements and constraints of all project participants.

4.2. Accountability

The PCG will report to the East West Connections Programme Governance Group on at least a quarterly basis. The PCG will ensure project direction and key project related decisions are in line with the overall strategic direction and vision set by the Governance Group.

Recommendations and delegated decisions by the PCG are made on a consensus basis. In the event of disagreements or disputes, the PCG will elevate the matter to the Governance Group.

4.3. Responsibilities

Strategic leadership

- Create a vision for the Project and set the strategic direction
- Establish the principles and set challenging objectives
- Own the business case
- Support the NZ Transport Agency and AT objectives and systems
- Set policy & delegations
- Champion and support the project charter
- High level support / stakeholder interface

Oversight (monitoring, evaluation and reporting)

- Agree / approve cost and other performance targets
- Set key messaging for communications (external)
- Review / approve the Project Management Plan
- Appoint / empower the Project Director
- Appoint and / or approve the members of the Management Team
- Ensure funds are available
- Ensure the project is adequately resourced
- Monitor team performance
- Confine / resolve inter-participant conflict within the PCG
- Ensure risk processes and procedures exist and are applied
- Ensure the necessary board approvals are gained

4.4. Reporting

The PCG will meet as required during the course of project development to ensure sufficient guidance and decision-making is provided to the project team. At a minimum, the PCG will meet on a monthly basis and will have the following items included as standard items to be discussed at each meeting (unless otherwise indicated below):

Strategic Vision & Objectives: Quarterly

This principle is to provide a constant review process that reflects the strategic direction of the project and how this meets the vision of the overall programme and the strategic direction of the Transport Agency and Auckland Transport organisations. This principle is reflected through the following criteria:

- Review implementation of the project charter
- Regular evaluation and planning of project development processes
- Overview of strategy for measuring performance targets and milestones
- Ensure alignment between project objectives and KPIs

Leadership to add value: every 6 months

This principle reflects activities which can be undertaken by the PCG and Leadership Team to ensure the leadership provided contributes towards successful delivery of the project. This principle is reflected through the following criteria:

- Ensure clear roles, responsibilities and accountabilities are defined for management and leadership teams
- Set expectations for interactions between leadership teams and management
- Performance review and assessment of PCG and Leadership Team effectiveness
- Promote the work of the project team internally and externally to key stakeholders

Effective decision-making: monthly

This principle is about ensuring a robust and transparent decision-making process and framework is established which prioritises the needs for the project over the needs of the individual organisations. This principle is reflected through the following criteria:

- Quality decision making protocols are implemented
- Decision-making is balanced and well-documented
- Decisions are based on objective data and assessed against a thorough understanding of risks and opportunities

Monitoring, evaluation, and reporting: monthly

This principle serves to ensure that processes influencing the success of the organizations are monitored, evaluated, and reported upon in an accurate, timely, and effective manner. This principle is reflected through the following criteria:

- Monitor and evaluate the implementation of strategies, performance criteria, and business plans
- Review internal systems to ensure effectiveness
- Ensure management and leadership levels are to have access to key information and reports when required

- Establishment of an audit committee (where appropriate)

Stakeholder relations and interests: monthly
This principle focuses on the establishment of effective protocols for engaging with and communicating to key stakeholders. This principle is concerned with ensuring that the interests of stakeholders are appropriately weighed and considered in all actions throughout the project development lifecycle. This principle is reflected through the following criteria:

- Development of a communication plan to ensure effective communication with stakeholders
- Ownership of the key messages related to project development
- Timely and effective communication with stakeholders

Risk Management: monthly
This principle is intended to ensure key risks are identified, analysed, reported, reviewed, and managed in an effective manner. This principle is reflected through the following criteria:

- Key risk areas are identified and actively monitored
- Risk management practices are established, implemented, and reviewed in accordance with organisational guidance
- Performance indicators are benchmarked against industry norms and best practice
- Detailed risk assessments occur in each area of operation
- Regular reports on the implementation of risk management

Human resources: monthly
This principle aims to consider the individual performances and needs as well as organisational resource requirements of the Transport Agency and Auckland Transport to deliver on the agreed expectations of project development. This principle is reflected through the following criteria:

- Employee development and performance management processes are implemented and reviewed
- Employee compliance with the charter and code of conduct to be reviewed regularly
- Establishment of agreed principles and protocols to encourage knowledge/skill transfer between employees and project team
- Ensure alignment between project objectives and KPIs

4.5. Project Sponsor

The role of the Project Sponsor is to:

- Own the macroscope for the project (during project development phase)
- Champion the project within the sponsor's organisation
- Manage key internal relationships within sponsor's organization, as specified in the Communications and Engagement Strategy
- Key stakeholder interface for elected members (NZTA - MPs; AT - local body officials)
- Manage interface between project team and Ministry of Transport, including owning all direct formal communications to Ministry officials
- Provide support and resourcing (as required) for the Owner Interface Managers and other Agency/AT officials in project team

5. Project Leadership Team (PLT)

5.1. Purpose

The purpose of the Project Leadership Team (PLT) is to develop, sustain, and drive a project team that is able to deliver on the overall contract programme. The role of the PLT is to develop a culture of accountability and ownership of the project deliverables which best enables the project team to meet the expectations placed on them. Membership of the Project Leadership Team will be determined by the scale and complexity of the project

5.2. Accountability

The PLT will report to the PCG on at least a monthly basis through the Team Leader. The PLT will ensure project direction and key project related decisions are in line with the overall strategic direction and vision set by the Governance Group.

5.3. Leadership Team Behaviours

In order to develop and foster the culture of a high performing team, the PLT will adopt and exhibit the following behaviours:

- Share the bigger picture
- Use of “above the line” language
- Create a sense of urgency
- Be open and transparent
- Free & frank discussion
- Encourage innovation
- Share in successes and mistakes

5.4. Responsibilities

- Development of the strategic framework for the Project
- Leadership of the project plan for the job
- Development and deployment of job descriptions for all Project team members
- Removal of roadblocks impacting on the success of the Project
- Development of performance management system that includes targets based around the project plan
- Develop and sustain a motivated Project team
- Lead the Wider Program Team to drive initiatives to meet program performance
- Development and deployment of an issue escalation and decision making protocol for our Project
- The management system most appropriate to support the achievement of the project deliverables
- Development and deployment of management plans necessary to deliver the program
- Producing accurate, complete and timely reporting for PCG
- Communication of the project plan for the job (e.g. at inductions, job descriptions etc.)
- Development of resource plans in alignment with the plan and project structure

- Development of transition plan for the next phase as per the detailed business plan requirements
- Ensure knowledge transfer occurs where required
- Establishment and deployment of an Project performance measurement procedure
- Obtaining personal commitments to contribute to the project objectives from all Project team members
- Development and deployment of a culture development and maintenance plan
- Ensure cost estimates are accurate and timely
- Development and deployment of an internal communications strategy and plan for our Project and its stakeholders
- Monitor contracts and agreements that support the delivery of the project plan
- Provide support to the Wider Program Team in order to assist in the delivery of the project plan
- Drive change and innovation through the Project
- Model the way with the Wider Program Team
- Lead and inspire the Wider Program team
- Provide the team with acknowledgement, recognition and performance feedback

5.5. Reporting

The PLT will meet on a weekly basis over the course of project development to track the overall health of the project and ensure project leadership provides sufficient oversight, guidance, and support. The Chair of each meeting will rotate on a weekly basis among PLT members. Minutes and actions will be recorded on a weekly basis. The PLT will have the following items included as standard items to be discussed at each meeting (unless otherwise indicated below):

Project Development

This principle is to provide a constant review process that reflects the overall development of the project and ensure the project remains on track to deliver to agreed scope and programme. This principle is reflected through the following criteria:

- Status updates from each of the project team disciplines
- Review key issues and progress against milestones
- Ensure alignment of messaging across project
- Drive accountability across project team
- Champion the project charter

Human Resources: Weekly

This principle aims to consider the resource requirements associated with the proposed methodology to deliver on the agreed expectations of project development. This principle is reflected through the following criteria:

- Review project resourcing to appropriately manage workforce capacity and capability to deliver
- Employee development is encouraged and opportunities actively explored within the project team
- Consideration and implementation of methods/practices/accountabilities across the project team which encourage knowledge/skill transfer across project team

Monitoring, evaluation, and reporting: weekly

This principle serves to ensure that processes influencing the success of the project are monitored, evaluated, and reported upon in an accurate, timely, and effective manner. This principle is reflected through the following criteria:

- Monitor team culture and commitment to project charter
- Monitor and evaluate performance against the key result areas
- Review internal systems to ensure effectiveness
- Key risk areas are identified and actively monitored
- Risk management practices are established, implemented, and reviewed in accordance with organisational guidance
- Coordinate controls reporting between project team and client
- Review project progress against programme and budget

5.6.Project Team Leader

The function of the Project Team Leader is to provide the interface and reporting line between the Project Leadership Team and the PCG. The Team Leader is accountable for the overall performance and delivery of the project team.

6. Measuring Success

The GDP growth of the study area has outpaced the Auckland average over the past 30 years.

What does success look like?

The GDP growth of the study area has outpaced the Auckland average over the past 30 years.

6.1. Success for the EWC Programme Governance Group

Success for the governance group looks like:

- Arrive at decisions that are universally supported around the table.
- Participants feel views have been considered and valued
- Aware of risks and mitigations
- This GG is used as the blue print for future projects
- Seen as a project that transforms Auckland and is not just another roading project
- Why we are going this project is clearly understood by all (outcome clearly defined)
- Vision is clearly defined and the project name reflects the vision (outcome)
- The vision is achieved, whatever it may be, with acceptance for our organisation leaders and stakeholders
- We play to our strengths and we know how each of us add value
- We remain loyal to the team with a defined and agreed vision, outcomes and success factors
- We front up to hard conversations
- There have been no surprises
- Effective communications that set the benchmark for future projects

6.2. Success for the EWC project team (PA3879)

A professional services contract has been let to a team to develop Indicative and Detailed Business Cases for the first projects in the EWC programme. The contract (PA3879) is an NZTA contract, but which covers both the AT/NZTA network in the continued progression of a coordinated project team. The contract has also been developed to provide advice to the Ministry of Transport on the preferred scope and costs in what is an incredibly compressed timeframe. In order to incentivise the project team to create a culture of high performance that can meet the high expectations, the NZTA contract has included a clause which allows for additional work beyond the main contract to be negotiated directly with the project team, if and only if the project team delivers exceptional performance. In order to measure this performance, the NZTA and AT have identified several key result areas which are expected to be critical in terms of achieving the desired outcome. The project team has reviewed these Key Result Areas and has defined key performance indicators. A performance clause set of KRAs has provisionally been developed by AT and NZTA. The KRAs have been developed to encourage and drive consultant team performance in the delivery of the contract deliverables. The KRAs are to be revisited and confirmed upon appointment of the PS consultant team. This will also include the development of the KPIs against which performance will be measured in terms of delivering to the KRAs.

- 'The Big Tick'
  - Explored the idea of 1 month early being an excellent outcome to create further 'wiggle room' for NZTA and AT

- Innovation
  - New technology solutions
  - Think outside the box through networks
  - Design is responsive to the ACTUAL problems with regards to environmental (don't take the easy route)
  - Innovation around soft measures to 15% - 10 % off the Network
- Culture
  - May include NZTA/AT development and knowledge transfer measures
- Stakeholders
  - Measured through traditional surveys etc.
  - Buy in to the project (internal and external)

APPENDIX A – Terms of Reference for the EWL Governance Group

EAST WEST LINK - GOVERNANCE GROUP (EWGG)

TERMS OF REFERENCE

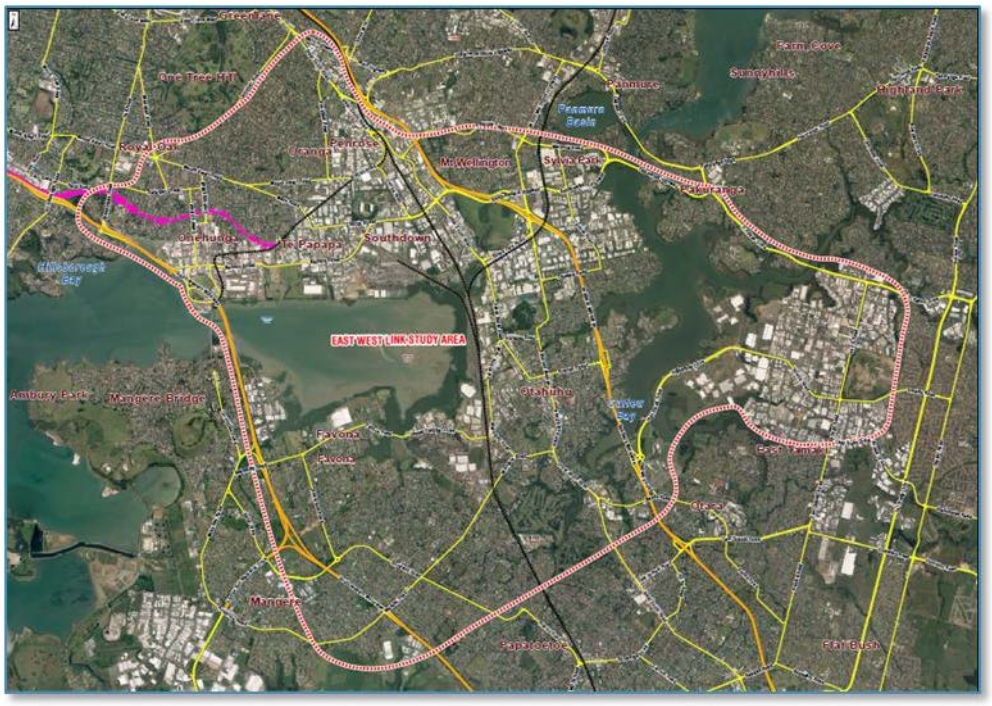
30 April 2014

1. Name

The group shall be known as the East West Link Governance Group (EWGG) and comprise the members set out in Section 6 below.

2. Purpose

The purpose of the GG is to provide strategic leadership and perform an oversight (monitoring, evaluation and reporting) role to ensure transport infrastructure improvements within the area shown below are well-aligned with other investments and coordinated with planned growth in the Auckland region.



3. Accountability

The EWGG will update the ELT/EMT or relevant management team of each individual organisation.

Recommendations and delegated decisions by the EWGG are made on a consensus basis. In the event of disagreements or disputes, the EWGG will elevate the matter to CEO level if such matters cannot be resolved within the EWGG.

4. Responsibilities

Strategic leadership

a. Ensure a clear and concise vision is in place

b. Approve the strategic response and outcomes of the programme business case and subsequent business cases.

c. Approve the high level communication strategy and engagement plan and assist the PCG members with building/maintaining effective relationships with central agencies.

d. Assess the effect on the programme due to changes in the external environment.

Oversight (monitoring, evaluation and reporting)

a. Provide a discussion forum between the member organisations to respond to requests for decisions or recommendations received from the PCG.

b. Ensure that the Project Control Group (PCG) develop the project in a way that coordinate and integrate well with the strategic direction of each organisation.

c. Review the impact of the programme on the NLTF and LTP.

d. Monitor the efficiency (and co-ordination) of the resource allocation from each organisation to achieve the outcomes sought in the business case.

e. Ensure accuracy and timeliness of reporting processes and systems are maintained at a high level at all times.

f. Approve key messages to report back to NZTA/AT Boards and Council Committees.

5. Chair

NZ Transport Agency's Highway Manager for Auckland and Northland will chair the EWGG, or in his absence, AT's General Manager Strategy and Planning.

6. Membership

Membership will consist of:

NZTA	Auckland Transport	Auckland Council
Chair: Brett Gliddon (Highway Manager Auckland and Northland)		
Ernst Zollner (Regional Director: Auckland and Northland)	Claire Stewart (Chief Development Officer)	Penny Pirrit (Manager Regional and Local Planning)
Peter Casey Regional Manager: Planning and Investment	Pete Clark (General Manager Strategy and Planning)	Robert Irvine (Financial Planning manager - CCOs)

The EWGG Chair may co-opt temporary members onto the Group as required.

7. In Attendance

The EWGG may invite others to attend meetings as required.

9. Meeting Time & Frequency

The EWGG will meet once a quarter. Ad-hoc meetings may also be required to address urgent matters. The three essential components to the regular meeting agenda will cover

- Strategic matters;
- Performance monitoring and review (oversight); and
- Decision making.
- Risks and Opportunities

10. Code of Conduct

The EWGG will be governed by a code of conduct, the principles of which require members to:

- fulfil their obligations with the highest standards of professionalism, impartiality, ethics and integrity;
- perform their duties honestly, faithfully and efficiently, respecting the rights of the community and colleagues;
- be accountable and trustworthy

11. Records

The EWGG will hold records of at least the following – agendas and papers circulated with them; minute sheets; correspondence, papers tabled at meetings and papers circulated other than with the agendas.

12. Adoption & Amendment of Terms of Reference

These Terms of Reference shall be altered only with the approval of the EWGG.

APPENDIX B – Project Team Organisation Structure (PA3879)