

Northern Corridor Improvements

Assessment of
Environmental Effects
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Executive summary

The Northern Corridor Improvements Project (the Project) is an accelerated project that has been identified by the Government as being necessary to capitalise on the benefits of the Western Ring Route Project. The Western Ring Route is intended to provide an alternative route through the Auckland Region to that provided by the current route State Highway 1 (SH1) through metropolitan Auckland and its CBD. In doing so the Western Ring Route will provide an alternative motorway route from South Auckland via State Highway 20 (SH20), State Highway 16 (SH16), and State Highway 18 (SH18) and connecting to SH1 on the North Shore.

The Waterview Connection and SH16 causeway projects are currently under construction to complete this link. The Project will bring SH18 and its connection to SH1 up to full motorway standard, and thus assist in delivering the full benefits of the Western Ring Route once the Waterview connection is functioning.

The Project works on SH1 extend from Oteha Valley Road in the north to Constellation Drive in the south and on SH18 from the Albany Highway Interchange in the west to the SH1 connection. Key elements of the Project include capacity and safety improvements to SH18 and SH1 within the Project Area, including the construction of a motorway to motorway connection for northbound traffic at the SH18 to SH1 interchange and additional lanes and improved connections to the local roading network. These elements of the Project will necessitate alterations to both the SH18 and SH1 designations to provide sufficient footprint for the Project works.

Complementary to the above, the Project incorporates an extension to the Northern Busway from its current terminus at Constellation Bus Station to the Albany Bus Station. A shared pedestrian/cycleway path will also be provided along the eastern side of SH1. These elements of the Project will require new designations. An upgrade of the existing Constellation Bus Station is proposed which also requires an alteration to the existing bus station designation.

A preliminary design has been developed for the Project to accurately quantify the extent of land required and assess potential environmental effects. Further detailed design will occur once the Project moves into the construction phase. While the detailed design may differ from the preliminary design it is intended that the detailed design will not depart from the environmental effects parameters established by the preliminary design.

Consultation with directly affected landowners and key stakeholders has taken place prior to and through the development of the preliminary design. Stakeholders consulted include Mana Whenua, Auckland Council entities, affected business organisations and sports organisations, and utility operators with assets potentially affected by the Project. Engagement with the wider community has been undertaken by way of newsletters, social media, the development of a Project website and open days. Opportunities for the community to comment on the Project have been provided via feedback forms, a Project 0800 number and the operation of a Project office. Where practicable, the



development of the preliminary design has responded to the feedback received during the consultation process.

The Project area is within Auckland's North Shore and traverses established residential and commercial areas as well as areas currently undergoing development. The current designation corridor is constrained by surrounding land uses. In order to meet the objectives of the Project it is necessary for the works to extend beyond the existing designations and for land to be acquired at certain locations along the corridor. As a consequence of this, careful consideration has been given to alternative sites, routes and methods of undertaking the necessary work to minimise the amount of additional land required and also to avoid where practicable adverse environmental effects of the Project.

The preliminary design has also been developed to avoid where practicable adverse environmental effects of the Project. In this regard, the design includes comprehensive treatment of stormwater from both existing and new pavement, the provision of noise attenuation walls adjacent to those sensitive receivers which will be affected by operational noise, construction techniques to ensure that potential effects from works within the Rosedale Closed Landfill are contained and measures to protect identified habitat values.

Based on the preliminary design a comprehensive assessment of actual and potential environmental effects has been undertaken, commencing with an assessment of the existing environment and the identification of the resource consents required to undertake the necessary works. In this regard, all resource consents required for the Project are covered by the Auckland Unitary Plan Operative in Part as of 15 November 2016 and no other consents are considered necessary in terms of other operative district or regional planning instruments.

Construction activities to be undertaken for the Project will require a range of resource consents which include those for vegetation removal, works within Significant Ecological Areas, earthworks, works on contaminated land including the Rosedale Closed Landfill, extensions to culverts, reclamation of a watercourse, stormwater discharge and diversion, groundwater diversion, and discharges of contaminants. Overall, the resource consents have a non-complying activity status.

All of the Technical Assessments have concluded that any adverse environmental effects of the Project can be avoided through design or are capable of mitigation to an acceptable level. Accordingly, a suite of mitigation measures are proposed that will ensure that any adverse environmental effects are reduced to an acceptable level and comply with all relevant statutory tests.

An Urban Design and Landscape Framework has been prepared for the Project corridor which is provided with the Notices of Requirement and resource consent documentation. This document is to be used to inform subsequent more detailed Urban Design and Landscape Plans which are to be included with Outline Plans of Works prepared at the detailed design stage of the Project.

Beyond this, the Project brings a number of significant benefits. These include the wider regional transportation benefits that will accrue from the contribution the Project make to the completion of the Western Ring Route and the extension of the Northern Busway down to more local benefits provided by the shared use path and the improvement of local connections.

When assessed holistically it is considered that the Project makes efficient use of the existing physical resource of the State highway network such that its positive effects will significantly outweigh any adverse effects and accordingly achieve the purpose of the Resource Management Act.



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Glossary of Abbreviations

AAAQS	Auckland Ambient Air Quality Standards
AC	Auckland Council
ACDP:NS	Auckland Council District Plan North Shore Section
ACRP:ALW	Auckland Regional Plan: Air, Land and Water
ACRP:SC	Auckland Regional Plan: Sediment Control
ACRPS	Auckland Council Regional Policy Statement
AEE	Assessment of Environmental Effects
AEP	Annual Exceedance Probability
AFGL	Above Finished Ground Level
AMA	Auckland Motorway Alliance
ARI	Annual Recurrence Interval
AS/NZS	Australia/New Zealand Standard
AT	Auckland Transport
ATMS	Advanced Traffic Management System
AUP	Auckland Unitary Plan Operative in Part (15 November 2016)
Bol	Board of Inquiry
BPO	Best Practicable Option
CAQMP	Construction Air Quality (Dust) Management Plan
CAUs	Census Area Units
CBD	Central Business District
CCO	Council Controlled Organisation
CCTV	Closed-circuit Television
CEMP	Construction Environmental Management Plan
CESCPs	Construction Erosion and Sediment Control Plans
CHI	Cultural Heritage Inventory
CLCLR	Closed Landfill and Contaminated Land Response team
CMA	Coastal Marine Area
CNVMP	Construction Noise and Vibration Management Plan
CO ₂	Carbon dioxide
CPTED	Crime Prevention Through Environmental Design
CSAs	Construction Support Areas
CSMP	Contaminated Site Management Plan
CTMP	Construction Traffic Management Plan
CVA	Cultural Values Assessment
DBC	Detailed Business Case



DHC	Double Hollow Core
DoC	Department of Conservation
DSI	Detailed Site Investigation
EPA	Environmental Protection Authority
FA	Fisheries Act 1983
FFR	Freshwater Fisheries Regulations 1983
GPSLT	Government Policy Statement on Land Transport 2015/16-2024/25
GRPA	Government Roding Powers Act 1989
HAIL	Hazardous Activities and Industries List
HUR	High Use Road
HCV	Heavy Commercial Vehicles
Hockey	Harbour Hockey Charitable Trust
IAP2	International Association for Public Participation
IBC	Indicative Business Case
IIG	Central-Northern Iwi Integration Group
ITP	Integrated Transport Programme 2012-2041
ITS	Intelligent Transport System
LCMS	Landfill Construction Management Plan
LHSP	Landfill Health and Safety Plan
LRWP	Landfill Reinstatement Works Plan
LTMA	Land Transport Management Act 2003
MCA	Multi Criteria Assessment
MCI	Macroinvertebrate Community Index
MfE	Ministry for the Environment
MPD	Maximum Probable Development
MSE	Mechanically stabilised earth
NBC	National Business Case 2015
NDC	Network Discharge Consent
NES	National Environmental Standard
NES _{ETA}	NES for Electricity Transmission Activities
NES _{AQ}	National Environmental Standards for Air Quality 2004
NES _{Soil}	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NH2	North Harbour 2 Watermain
NHHS	North Harbour Hockey Stadium
NIP	National Infrastructure Plan



NLTP	National Land Transport Programme
NoR	Notices of Requirement
NPS	National Policy Statement
NPS _{ET}	National Policy Statement on Electricity Transmission 2008
NPS _{FM}	National Policy Statement for Freshwater Management 2014
NZ Transport Agency	New Zealand Transport Agency
OGPA	Open Graded Porous Asphalt
OF	Outfall
OPW	Outline Plan of Works
PAUP	Proposed Auckland Unitary Plan Decision Version
PM ₁₀	Fine Particular Matter
PPF	Protected premises and facilities in accordance with NZS 6806:2010
PRG	Project Reference Group
PSI	PSI Preliminary Site Investigation
PWA	Public Works Act 1981
RA	Reserves Act 1977
RLTP	Regional Land Transport Programme
RMA	Resource Management Act 1991
RoNS	Roads of National Significance
RPS	Regional Policy Statement
RTN	Rapid Transport Network
RWWTP	Rosedale Wastewater Treatment Plant
SAR	Scheme Assessment Report
SEA	Significant Ecological Areas
SH x	State Highway (number)
SHS	State Highway Strategy of 2007
SMA	Stone Mastic Asphalt
SMAF	Stormwater Management Area Control - Flow
SOI	Statement of Intent 2015-2019
SRP	Sediment Retention Pond
SQMCI	Semi-Quantitative Macroinvertebrate Community Index
SUP	Shared Use Path
TP10	AC's Stormwater Treatment Devices: Design Guidelines Manual
TP90	Technical Publication 90: Erosion and Sediment Control Guidelines for Land Disturbing Activities
TSP	Total Suspended Particulate
TSS	Total Suspended Solids



UC	Universal Column
UDLF	Urban Design and Landscape Framework
UHH	Upper Harbour Highway
UV	Ultra Violet
WA	Wildlife Act 1953
WQV	Water Quality Volume
WRR	Western Ring Route
Watercare	Watercare Services Limited



Terms	Definitions
Alignment	The route or position of the proposed motorway, Busway and/ or SUP.
Ambient Air	The air outside that reflects the cumulative effect of all activities both human induced and natural. It does not refer to indoor air, air in the workplace, or to contaminated air as it is discharged from a source.
Amenity	As defined in section 2 of the RMA, amenity values means those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.
Archaeological site	As defined in Part 2 of the Heritage New Zealand Pouhere Taonga Act 2014: Any place in New Zealand that - (a) Either- Was associated with human activity that occurred before 1900; or Is the site of the wreck of any vessel where that wreck occurred before 1900; and (b) Is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand:
AS/NZS 1158	The Australia and New Zealand Standard for Lighting for Roads and Public Spaces.
Auckland Council	The unitary authority in terms of the Local Government (Auckland Council) Act 2009 and the Local Government (Auckland Transitional Provisions) Act 2010 which replaced the eight existing councils in the Auckland Region as of October 2010.
Best Practicable Option	Defined in Section 2 of the RMA. In relation to a discharge of a contaminant or an emission or noise, this means the best method for preventing or minimising the adverse effects on the environment.
Culvert	A pipe, designed to convey water under an embankment.
dBA	A measurement of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
Designation	Defined in Section 2 and Section 166 of the RMA as provision made in a district plan to give effect to a requirement made by a requiring authority under section 168 or section 168A or clause 4 of Schedule 1.
Discharge	An activity that results in a contaminant being emitted deposited or allowed to escape.
Diversion of Stormwater	Redirecting stormwater from its existing course of flow; causing it to flow by a different route.
Do Minimum	Term used in the context of a comparison between the effects of a project and the effects that would occur if the project was not undertaken (i.e. for the comparative evaluation of the effects 'with and without' the Project).
Erosion Control	Methods to prevent or minimise the erosion of soil, in order to minimise the adverse effects that land disturbing activities may have on a receiving environment.
Heritage Site	A site that contributes to an understanding and appreciation of New Zealand's history and cultures. A heritage site can be derived from



Terms	Definitions
	archaeological, architectural, cultural, historic, scientific and technological investigations.
Hydrology	The branch of science concerned with the properties of the earth's water.
Leq	The time averaged sound level (on a log/energy basis) over the measurement period (normally A-weighted).
Motorway	As defined in Part 2 of the Public Works Act 1981: A motorway declared as such by the Governor-General in Council under section 138 of this Act; and includes all bridges, drains, culverts, or other structures or works forming part of any motorway so declared; but does not include any local road, access way, or service lane (or the supports of any such road, way, or lane) that crosses over or under a motorway on a different level.
Noise Mitigation	An activity or structure which reduces/mitigates the impact or effect of noise.
Overflow	A discharge from a combined sewer or wastewater network resulting from the flows being greater than the conveyance capacity within the network.
Overland Flow Path	The natural flow path of stormwater over the ground.
Paul Matthews Road Interchange	A new interchange inclusive of the reconfiguration of the existing Caribbean Drive intersection, a new eastbound off-ramp from SH18 and a direct connection of Paul Matthews Road to Upper Harbour Highway via a new bridge structure.
Pedestrian/Cycleway	A dedicated facility for the shared-use of pedestrians and cyclists.
Pier	Vertical support structure for a bridge.
PM ₁₀	Fine particulate matter with an equivalent aerodynamic diameter of less than 10, 2.5 or 1 micrometres respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.
Project Area	The Project area is the Project corridor and immediate surrounds.
Project Corridor	The Project corridor is the extent of works contained on SH18 between Albany Highway and Constellation Drive, and SH1 between Upper Harbour Highway interchange and 90 m north of the Oteha Valley Road interchange. The Busway component of the works extends from Constellation Bus Station to the Albany Bus Station at Oteha Valley Road.
The Project or NCI Project	The Northern Corridor Improvements Project including alterations to designations, new designations and activities requiring regional resource consents.
Sediment Control	Capturing sediment that has been eroded and entrained in overland flow before it enters the receiving environment.
Western Ring Route (WRR)	A strategic State highway route which provides an alternative to SH1 as a regional route for traffic traversing Greater Auckland. The WWR requires the completion of links and new lanes to combine the South-western (SH20), North-western (SH16) and Upper Harbour (SH18) highways into a continuous 48km motorway. The WWR will link the North Shore, West and South Auckland.



1 Introduction

1.1 New Zealand Transport Agency

The New Zealand Transport Agency (NZ Transport Agency) is a Crown entity established on 1 August 2008 under the Land Transport Management Act 2003 (LTMA). As a Crown agent it must give effect to government policy as directed by the Minister of Transport.

The NZ Transport Agency's statutory objective under the LTMA is to undertake its functions in a way that contributes to an effective, efficient and safe land transport system in the public interest. In addition to this the NZ Transport Agency has the following function:

- To manage the State highway system, including planning, funding, design, supervision, construction, and maintenance and operations, in accordance with the LTMA and the Government Roadway Powers Act 1989 (GRPA).

In meeting its objective and undertaking its functions the NZ Transport Agency must adhere to, among others, the operating principle of the LTMA that it exhibits a sense of social and environmental responsibility.

In addition to the LTMA, the NZ Transport Agency must have regard to the content of the Government Policy Statement on Land Transport 2015/16-2024/25 (GPSLT) issued pursuant to the requirements of the LTMA, and which came into force on 1 July 2015. The GPSLT outlines the Government's strategic and policy goals for land transport, as well as the funding direction necessary to achieve them.

The overall strategic direction for land transport is to drive improved performance from the land transport system by focussing on:

- Economic growth and productivity;
- Road safety; and
- Value for money.

In its Statement of Intent 2015-2019 (SOI), the NZ Transport Agency identifies its purpose as being to create transport solutions for a thriving New Zealand on behalf of government. It states that its responsibility is to ensure an effective national transport network that integrates the various modes, services and systems to deliver a seamless 'one network' experience for transport users.

1.1.1 Roads of National Significance

In 2009, the Government identified Roads of National Significance (RoNS) and set priorities for investment in these as New Zealand's most important transport routes. The RoNS have been identified as roads which are critical to ensuring that users have access to significant markets and areas of employment and economic growth. The seven RoNS are the most visible elements of the NZ Transport Agency's investment to facilitate economic growth and productivity.

1.2 The Northern Corridor Improvements Project

The Northern Corridor is part of the primary route between Auckland and Northland, and forms the northernmost link of the Western Ring Route (WRR).

WRR was identified as a RoNS in 2009. The WRR comprises the State Highway 20 (SH20), State Highway 16 (SH16) and State Highway 18 (SH18) motorway corridors and, once completed, will consist of 48km of motorway linking Manukau, Auckland, Waitakere and North Shore.



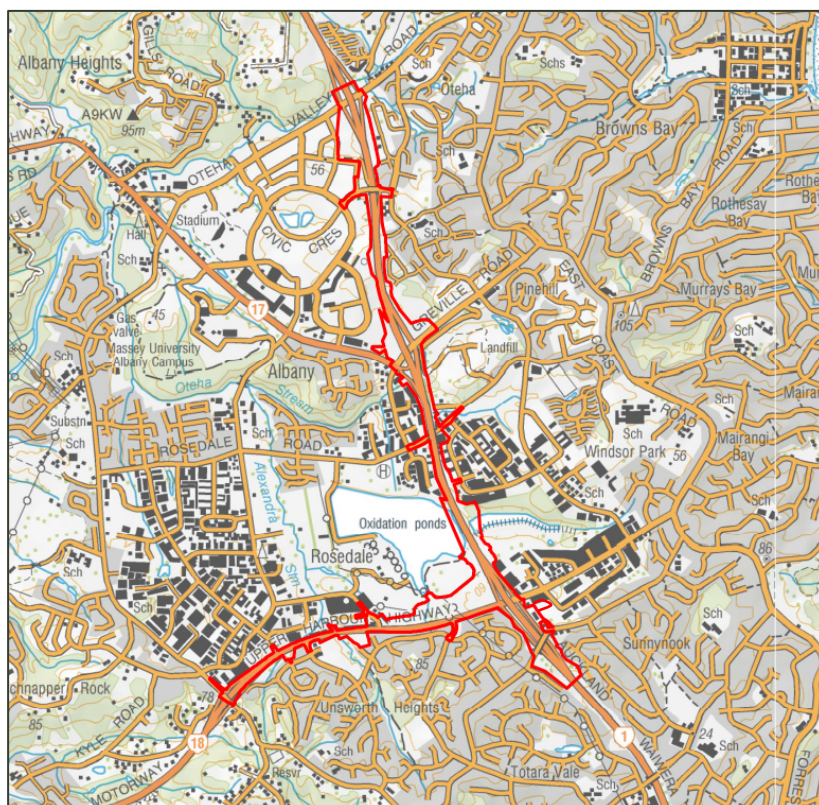
The strategic importance of the WRR is to provide an alternative route through the region to reduce dependency on State Highway 1 (SH1), particularly through the Auckland Central Business District (CBD) and over the Auckland Harbour Bridge. The WRR will also provide for economic growth, unlocking potential for development along its length by improving trip reliability and access from the west to the south and north of the region, and from the CBD to the airport.

Both SH1 and SH18 are classified as National (High Volume) roads pursuant to the One Network Road Classification, a framework that categorises all roads throughout the country. These are roads that make the largest contribution to the social and economic wellbeing of New Zealand by connecting major population centres, ports and international airports and have high volumes of heavy commercial vehicles or general traffic.

On 28 June 2013, the Prime Minister made an announcement regarding the Government's transport package for Auckland. The Government indicated an intention to accelerate three State highway projects in the Auckland region to address congestion and capitalise on the benefits of the WRR, and improve access to the airport. The 2014 Budget provided the new capital funding to the NZ Transport Agency to accelerate these projects.

The Northern Corridor Improvements Project (the Project) is one of these accelerated projects. The Project area covers the extent of SH18 between Albany Highway and Constellation Drive, and SH1 between Upper Harbour Highway (UHH) interchange to just beyond the Oteha Valley Road Interchange as indicated on **Figure 1** and **Figure 2** below and confirmed in the suite of plans provided in **Volume 5**.

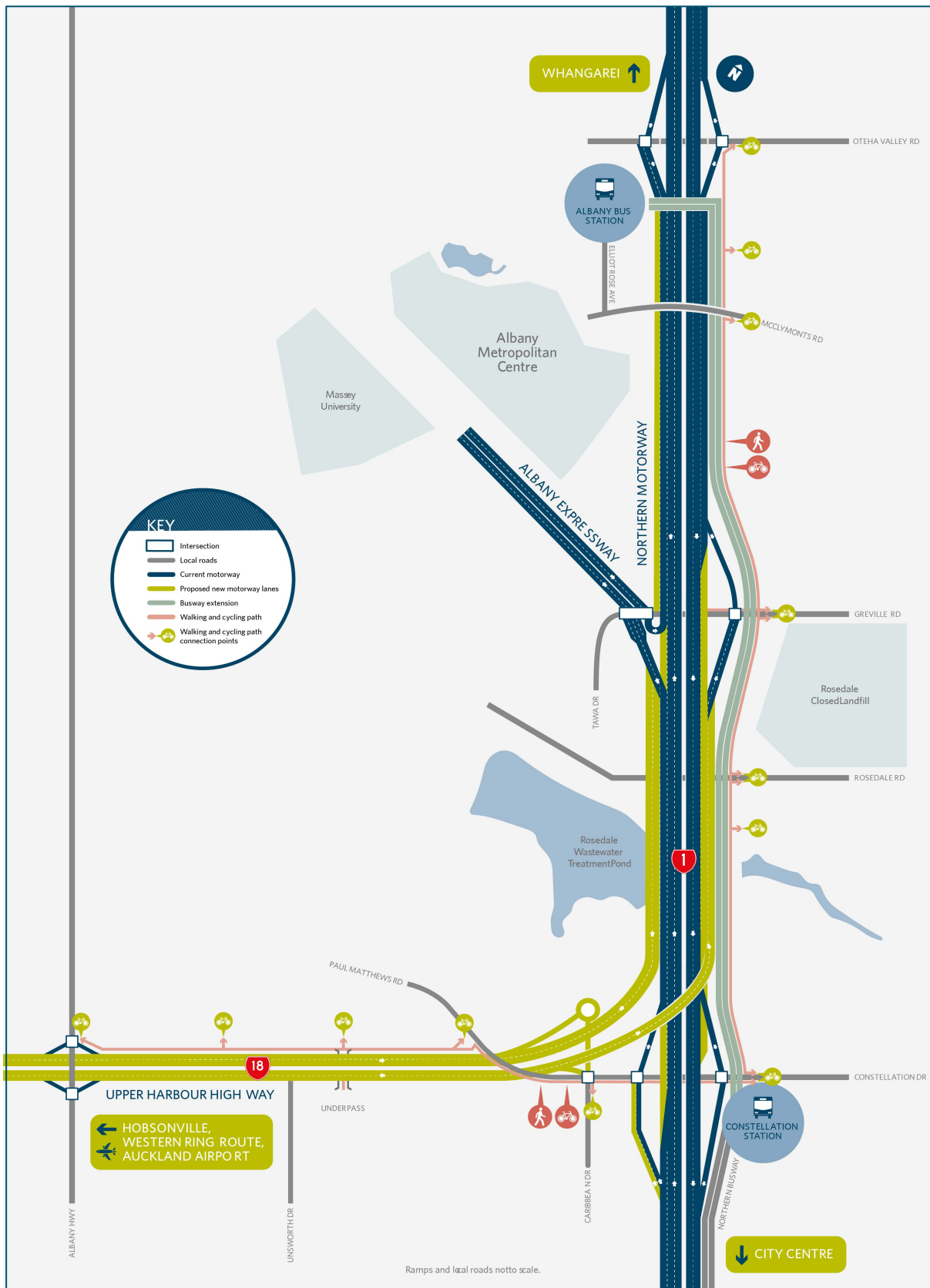
Figure 1 Extent of Project Area



Source: Base Map from LINZ



Figure 2 Schematic of the Project



Source: NZ Transport Agency



In summary, the key elements of the Project are as follows and are further described at **Section 5**:

- SH1 and SH18 Motorway Interchange connections;
- State highway capacity and safety improvements;
- Busway extension from Constellation Bus Station and a connection to Albany Bus Station;
- Shared Use Path (SUP) provision along existing SH1 and SH18 routes for the full extent of the Project:
 - Constellation Bus Station to Oteha Valley Road;
 - Constellation Drive to Albany Highway; and
 - Intermediate linkages to the local network.

As is apparent from the scope of the Project described above, there is a significant interface with elements of the local transport network of a multi-modal nature. Adopting a 'One Network' approach, the NZ Transport Agency has been working collaboratively with Auckland Transport (AT) to facilitate integration across all transport modes. Accordingly, connectivity to Albany Bus Station, and the existing and proposed local cycling network has informed the Project.

The objectives for the Project have been defined as follows:

- To help facilitate interregional travel between Auckland and Northland by completing the Western Ring Route to motorway standard;
- To improve connectivity of the SH1 and SH18 interchange;
- To improve safety, efficiency, reliability and the capacity of:
 - SH1 between SH18 and Albany; and
 - SH18 between SH1 and Albany Highway.
- To provide safe walking and cycling facilities adjacent to SH1 and SH18 and connections to local transport networks; and
- To extend the Northern Busway from Constellation Bus Station to the Albany Bus Station.

1.3 Notices of Requirement

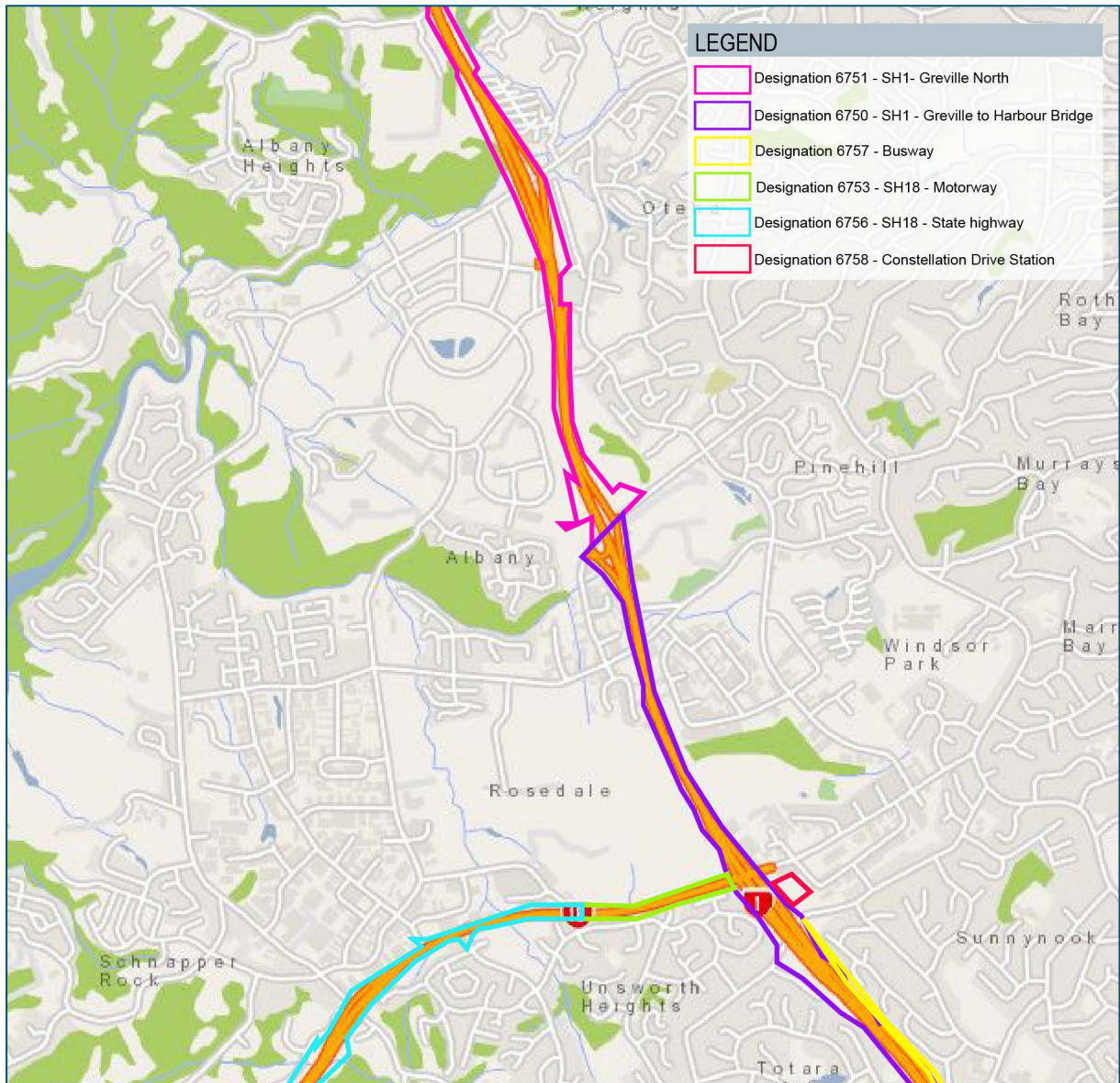
The NZ Transport Agency is a Requiring Authority as defined in section 166 of the Resource Management Act 1991 (RMA). Copies of the Gazette notices approving Transit New Zealand (NZ Transport Agency's predecessor) and the NZ Transport Agency as a requiring authority are attached as **Appendix A**.

The Project is the subject of Notices of Requirement (NoRs) for alterations to existing designations in the Auckland Unitary Plan Operative in Part (AUP) and new designations (Busway and SUP). In summary, the Project requires alterations to designations 6750 (SH1), 6751 (SH1), 6756 (SH18) and 6758 (Constellation Bus Station) and new designations for the Northern Busway extension and the new SUP. It is noted that designation 6753 is not being altered, but will be withdrawn once the alteration to 6756 (extending over the 6753 land area) is confirmed.

The Designation Plans in **Volume 1** show the described existing NZ Transport Agency designations and designations held by other Requiring Authorities, in addition to the required alterations to the NZ Transport Agency's designations and new designations proposed. **Figure 3** below is a schematic showing the location of the existing NZ Transport Agency designations as well as the Northern Busway designation.



Figure 3 Schematic showing the location of the existing NZ Transport Agency Designations in the Project Area



1.4 Outline Plans

The NZ Transport Agency will submit Outline Plan of Works (OPWs) once the Project's detailed design has been progressed to an appropriate level of detail and prior to the commencement of work. As such no OPW waiver is sought at this time.

1.5 Resource Consents

Regional resource consents are required to enable construction and operation of the Project. In particular, the following are required:

- Applications for land use consents pursuant to sections 9 and 13 of the RMA;
- Applications for the taking, using, damming and diversion of water pursuant to section 14 of the RMA; and
- Applications for discharge permits pursuant to section 15 of the RMA.



In addition, resource consent will be required under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES_{Soil}) (Regulation 11).

1.6 Purpose of the Assessment of Environmental Effects

This Assessment of Environmental Effects (AEE) is intended to support NoRs and applications resource consent as outlined above and detailed in **Sections 3 and 6** below. In accordance with the requirements of the RMA (particularly Schedule 4), this report provides the following information:

- A description of the Project;
- The objectives of the Project;
- An assessment of the Project in the context of relevant strategic documents;
- A description of the existing environment;
- An assessment of the actual and potential effects of the Project;
- An assessment of the Project in terms of the relevant statutory provisions;
- An assessment of the Project in terms of the provisions of the relevant planning documents;
- A summary of consultation undertaken;
- A consideration of alternatives; and
- Proposed conditions of consents and designation.

1.7 Supporting Documents

The supporting documentation for the designations and resource consents required for the Project is contained within the following volumes:

- Volume 1 - Notices of Requirement forms including a list of all owners and occupiers pursuant to Clause 2, Schedule 4 of the RMA, Resource Consent Applications and Other Statutory Approvals.
- Volume 2 - Assessment of Environmental Effects.
- Volume 3 - Technical Assessments:
 1. Assessment of Air Quality Effects
 2. Assessment of Archaeological Effects
 3. Assessment of Construction Noise and Vibration Effects
 4. Assessment of Construction Water Management
 5. Assessment of Freshwater Ecological Effects
 6. Assessment of Land Contamination Effects
 7. Assessment of Effects – Corridor Encroachment on Rosedale Landfill
 8. Assessment of Landscape and Visual Effects
 9. Assessment of Operational Noise and Vibration Effects
 10. Assessment of Social Effects
 11. Assessment of Stormwater Management
 12. Assessment of Surface Water Quality Effects
 13. Assessment of Terrestrial Ecological Effects
 14. Assessment of Transport Effects
 15. Design and Constructability Report



- Volume 4 – Urban Design and Landscape Framework
- Volume 5 – Scheme Plans and Drawings.



2 Justification for the Project

2.1 Overview

This Section provides background to the Project and sets out the following:

- The need for the Project;
- The strategic context;
- The development of the Project; and
- The benefits of the Project.

2.2 The Need for the NCI Project

As outlined in **Section 1**, both SH18 and SH1 are classified as National (High Volume) Roads. National (High Volume) Roads are components of the network that make the largest contribution to the social and economic wellbeing of New Zealand through serving a national function and having high volumes of both heavy commercial vehicles and general traffic.

Once the Waterview project is completed in 2017, the Project area will be the only section of the WRR that is not constructed to motorway standard. The Project will complete the WRR by bringing the final section of this route up to motorway standard.

The Project is comprehensively described in the Project Description at **Section 5**.

The Project has its genesis in the strategic planning documents referred to in **Section 2.3**, below. In addition to these, the following more localised transport issues inform the need for the Project, as set out below.

2.2.1 Travel time reliability and congestion

The section of SH1 between Oteha Valley Interchange and the UHH Interchange along with the intermediate interchanges currently experience high levels of congestion, resulting in delays and unreliable journey times. Completion of other elements of the WRR including the Waterview tunnel and Interchange, and future land use growth in Albany, Massey North, Westgate and Hobsonville are expected to add further to these pressures, significantly increasing local congestion.

Congestion along the Northern Motorway is currently “tidal”, i.e. southbound in the morning peak and northbound in the evening peak. Northbound flow breaks down due to the reduction from three to two traffic lanes on SH1 prior to the UHH interchange. The forecast growth will have a greater impact during the contra-peak periods, as the available capacity is utilised.

This increased level of congestion will compromise the effectiveness of the SH18 to SH1 connection to operate as an alternative route for strategic inter-regional traffic through increased delays and reduced journey time reliability. This will impact on the ability to move inter-regional freight effectively, thus compromising the potential growth of the region.

Greville Road / Albany Expressway (SH17) and Constellation Drive / UHH (SH18) have historically functioned as local arterials. As development has occurred and traffic growth followed, the strategic function of these routes has degraded as a result of the increased congestion. Along with Rosedale Road, these routes provide the important east-west link function in the Project area.

For the SH18 corridor, between Albany Highway and Constellation Drive, there is an inherent conflict between ‘through-traffic’ and ‘local access’ traffic. There are three sets of traffic signals that restrict traffic flow between the SH18 and SH1 motorways, two of which provide local access.



SH18 also separates the North Harbour Industrial Area from the residential catchment (Unsworth Heights) to the south. Consequently, the corridor is used for local trips as well as interregional and cross regional trips. The existing traffic signals, and conflicting road and regional transport functions, contribute to congestion and unreliability for vehicles using SH18.

The following journeys are forecast to be subject to congestion during peak periods in 2021 resulting in low average speeds (less than 30 km/h) and unreliable travel times.

- SH18 to SH1 Northbound (PM Peak);
- SH1 (N) to SH18 (AM and PM Peaks);
- SH1 Southbound (AM Peak);
- SH1 South to SH17 (PM Peak);
- SH17 to SH1 Southbound (AM Peak);
- SH18 to SH1 Southbound (AM Peak); and
- SH1 South to SH18 (AM Peak).

2.2.2 Public transport

The Northern Busway currently extends from the Auckland Harbour Bridge to Constellation Bus Station (just south of Constellation Drive). It is located to the east of the Northern Motorway and includes five stations. Albany Bus Station is identified by AT in its Rapid Transport Network (RTN) plans as a key interchange for the RTN.

Between Constellation Bus Station and Albany Bus Station, buses are required to join general traffic on Constellation Drive and the Northern Motorway. Even with the additional third northbound lane and 1km-long southbound bus shoulder improvements between Greville Road and Constellation Drive which was completed in June 2015, northbound and southbound buses between these bus stations currently suffer from delays and a lack of journey time reliability. The current average journey time between the bus stations northbound and southbound is 4.5 and 6.3 minutes respectively. However, this journey time has been measured to be as long as 13.4 minutes during periods of peak congestion. See **Figures 4 and 5** below.

The average speed of buses using the existing Busway to the south of Constellation Bus Station is approximately 65km/h. Journey time reliability is an important factor for public transport. The current journey times between Albany and Constellation Bus Stations have a large variance, particularly southbound, with 95 percentile journey times 43% longer than the average and a standard deviation of 82 seconds. By comparison the standard deviation of journey times recorded between Smales Farm Bus Station and Constellation Bus Station in October 2014 was 21 seconds.

The opening of the southbound bus shoulder lane between Greville Road and Constellation Drive has reduced the variability to some extent, although travel time continues to be affected by the general traffic and at the Greville Road and UHH Interchanges.



Figure 4 Northbound Bus Travel times Smales to Constellation and Constellation to Albany

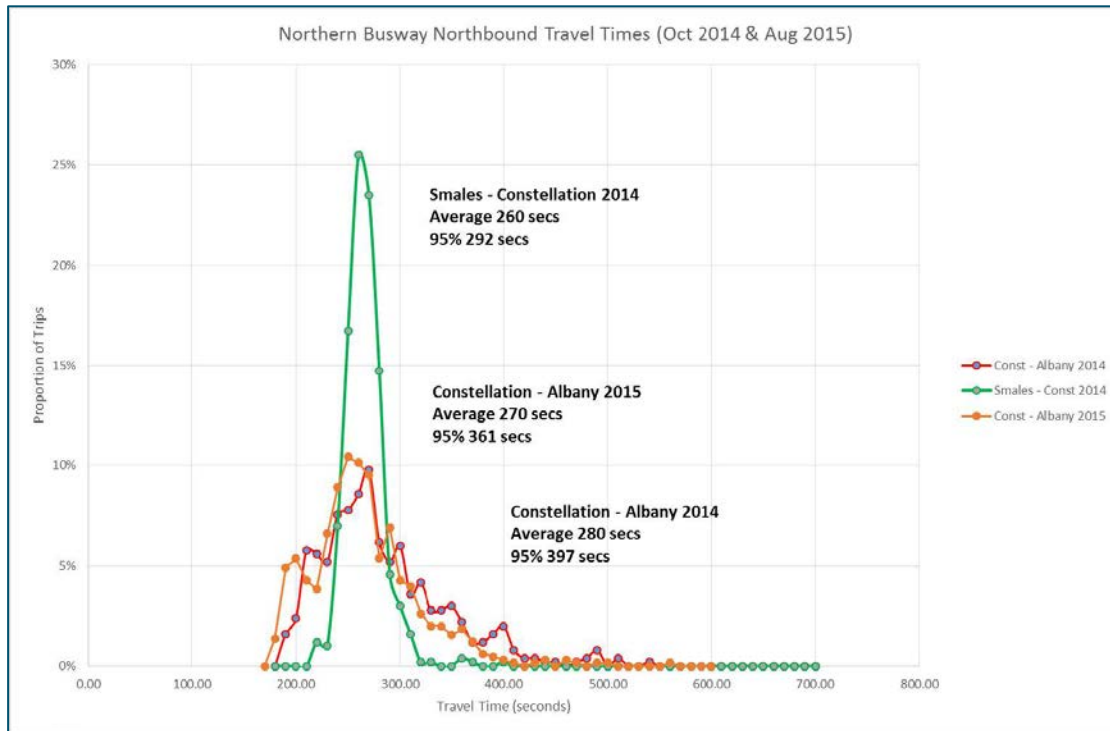
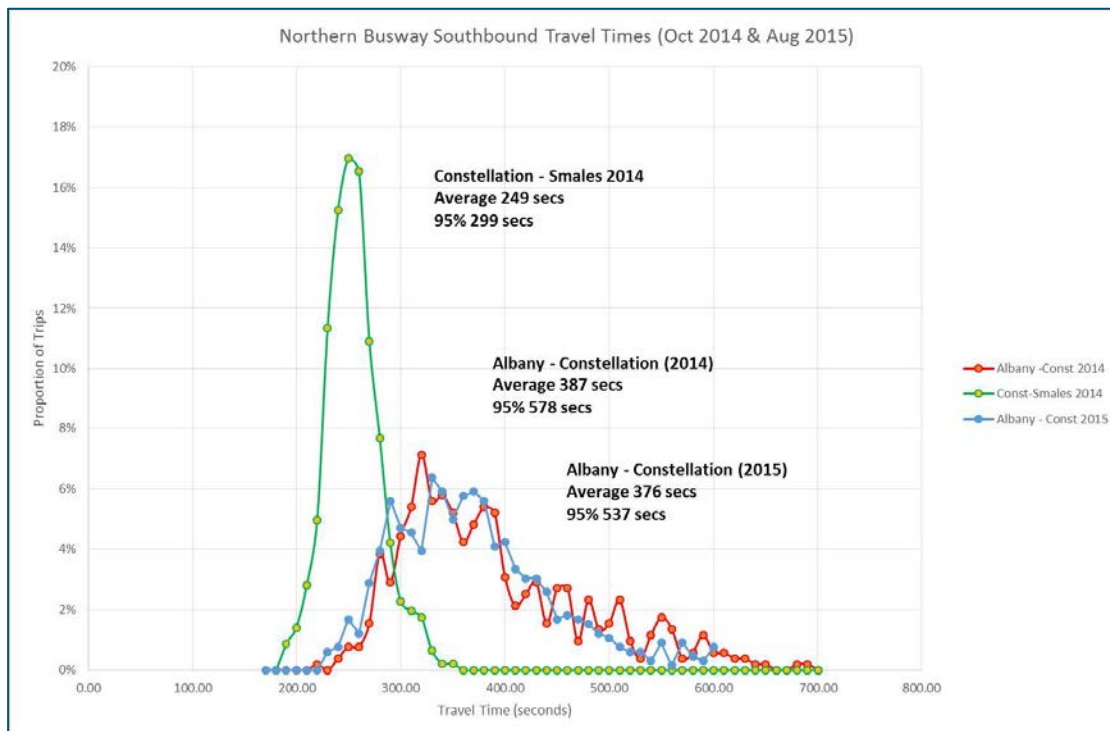


Figure 5 Southbound Bus Travel times Smales to Constellation and Constellation to Albany



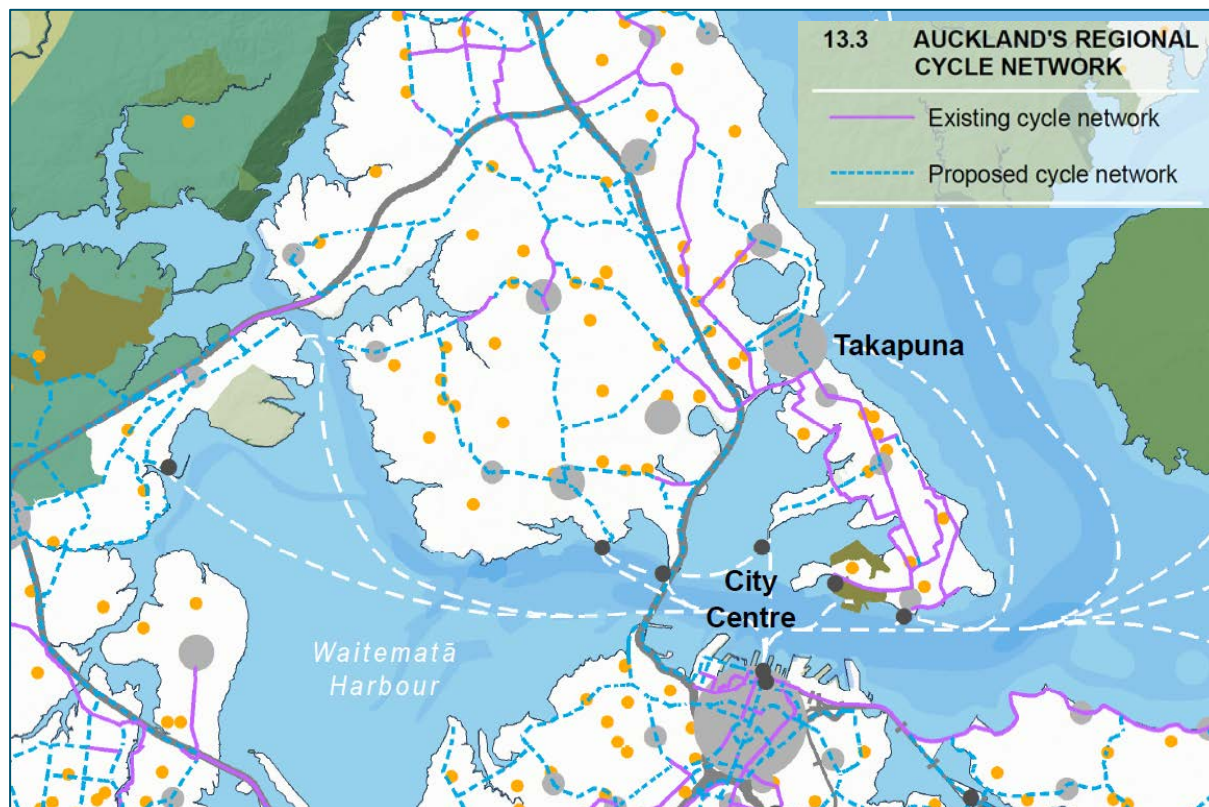
2.2.3 Walking and Cycling Accessibility

The SH1 and SH18 corridors both present significant barriers to walking and cycling accessibility, with a general lack of provision along or across these routes.



The UHH and Greville Road interchanges both form part of the existing or proposed Regional Cycle Network as shown in **Figure 6** below. There are currently no dedicated facilities through the UHH interchange, resulting in a dangerous environment, discouraging active modes.

Figure 6 Extract from the Proposed Auckland Cycle Network Plan



Source: Auckland Transport

Along SH18, there is a footpath on the southern side between UHH Interchange and Caribbean Drive, but no facilities further west. Therefore, there is no walking/cycling connection between Constellation Drive, Constellation Bus Station and the North Harbour Hockey Stadium (NHHS) or the employment area of the North Harbour Business Park (via Paul Matthews Road).

With a few exceptions, the majority of local corridors in the area provide footpaths on both sides of the road. Existing cycle facilities are provided along a few routes, or sections of routes, with several significant gaps present. The gaps prevent cyclists from having a continuous, well-connected route to their destination and often leave cyclists with no safe facility in the most challenging locations, e.g. at intersections and interchanges.

The NZ Transport Agency has completed a National Business Case (2015) (NBC) for investment to make cycling a safer and more attractive transport choice, which concludes that investment in cycling facilities has a range of wider benefits beyond just transport, including safety, participation, societal and individual benefits. The NBC identifies that lack of connectivity of cycle networks is the second main reason people give for not cycling.

The SUP components of the Project provide for greater network connectivity, both north to south and east to west within the Project area.

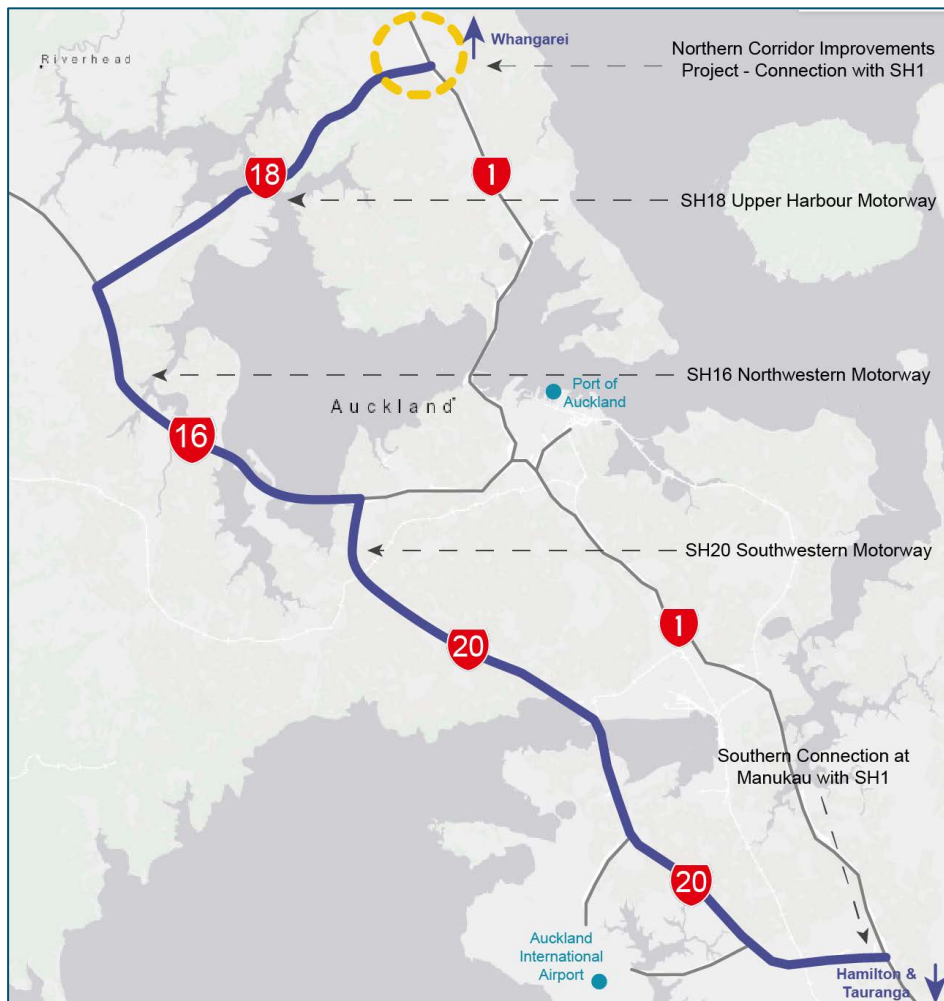


2.2.4 Resilience

The National Infrastructure Plan (NIP) defines resilience as ‘wider than natural disasters and covering the capacity of public, private and civic sectors to withstand disruption, absorb disturbances, act effectively in a crisis, adapt to changing conditions, including climate change, and grow over time’. The NZ Transport Agency has determined that a resilient transport network enables it to be responsive to unforeseen events and provide customers with confidence that they will be able to undertake their journeys in a timely manner, by targeting the risk of anticipated disruption on the network.

The WRR provides such resilience for the Auckland urban area and its region, by providing alternative access to major nodes such as Auckland International Airport.

Figure 7 Diagram indicating the Alternative Connectivity provided by the completed WRR-RoNS



As illustrated in **Figure 7** above, the WRR RoNS is comprised of various projects which together will provide an alternative route to SH1 through Auckland to motorway standard. When the Waterview Connection project is completed in 2017, the WRR will commence in Manukau at the interchange between the Southern Motorway (SH1) and the South-Western Motorway (SH20) and will continue through to where the UHH currently terminates at the interchange with Albany Highway and the SH18 expressway.

The Project will complete the WRR at its northernmost extent by upgrading the connection between SH18 and SH1. When complete, the WRR will add resilience to the Auckland State highway network



by providing an alternative route to SH1. The resilience of the network provided by this alternative route constructed to motorway standard through the Auckland region is highlighted in **Figure 7** above.

2.3 Strategic Context of the Project

2.3.1 Strategic History

The long-term strategy for the State highway network in Auckland has been developed over a number of years, aligned with the development of Auckland Council's strategic transport direction. A critical component of this strategy is the development of the WRR to provide an alternative route for traffic through Auckland. As noted above, the WRR will provide an alternative to SH1, which passes through Auckland's CBD. The WRR will ultimately, upon completion, comprise a 48km continuous motorway encompassing SH 16, 18 and 20, which is intended to improve travel times and reliability through the region, take pressure off local roads and SH1, reduce traffic congestion and enhance network resilience. It will also provide an alternative western route for light and heavy freight vehicles moving through or around Auckland, and contribute to better links for business and freight between the key industrial and transport hubs of Manukau (including Auckland Airport), central Auckland, Waitakere and the North Shore.

The importance placed on the WRR in achieving Auckland's transport strategy is reflected in the high priority it is assigned in the 2012-2015 National Land Transport Programme (NLTP), the State Highway Activity Management Plan and the Auckland Regional Land Transport Plan. On 28 June 2014, this priority was confirmed by the Government announcement that \$375m of funding was to be allocated to accelerate a package of regionally important State highway projects. This included the Project to complete the northern end of the WRR, extending the UHH (SH18) to its intersection with the Northern Motorway (SH1), with appropriate new links.

The Project also looks to address a number of critical transportation deficiencies and constraints within the Project area that affect both inter-regional and intra-urban traffic movement; these are largely attributable to the rapid on-going development of the Albany Centre and surrounding commercial areas, and the wider urban growth of the North Shore and beyond.

The Project was identified in the Auckland Plan as a priority project for the first decade of the 30 year plan, bringing together a number of interrelated multimodal transportation enhancements within the Project area. The purpose of these enhancements was to help facilitate interregional travel between Auckland and Northland by allowing the full benefits of the WRR to be realised by upgrading the SH18/1 connection.

The following paragraphs summarise the various strategic documents and decisions that have informed and driven the development of transport solutions within and beyond the Project area over the last decade that have resulted in the inception of the Project in its current form.

2.3.2 State Highway Strategy 2007

The NZ Transport Agency's State Highway Strategy of 2007 (SHS) identified SH18 as being part of the four-lane standard network at north Auckland. It further identified that any upgrade to motorway design standard was a matter to be determined at a later date. This document further emphasised that any such improvements in Auckland would be developed cooperatively to ensure integration with the local network and to include the provision of public transport and active mode alternatives.

A key concept included in the SHS was the completion of the 'ladder' for Auckland, a concept which was a precursor to what became the WRR, and which included the upgrading of SH18 and its connectivity to SH1.



2.3.3 Roads of National Significance (2009)

The Government announced its first seven RoNS in March 2009, one of which was the Auckland WRR-encompassing SH20/16/18.

Perhaps the most publicly visible part of the WRR is the Waterview Connection which is currently under construction and which is due to come into operation in 2017.

The WRR is New Zealand's largest ever transport project and encompasses a number of projects including this Project, which has been advanced through the Accelerated Auckland Transport Projects Package, as discussed further below, and completes the WRR to motorway standard, all the way from its northern and southern connections with SH1. The WRR is one of the country's most essential routes and a most urgent project within our largest population centres.

2.3.4 Accelerated Auckland Transport Projects Package 2013

On 28 June 2013, the Prime Minister made an announcement regarding the Government's transport package for Auckland. The Government indicated an intention to accelerate three State highway projects in the Auckland region to address congestion and capitalise on the benefits of the WRR, and improve access to the airport. The 2014 Budget provided new capital funding to the NZ Transport Agency to accelerate these Auckland projects by way of a Crown loan to be repaid by funding currently allocated to these projects in the National Land Transport Fund up to 2026/27. The Project is one of these accelerated projects.

2.3.5 New Zealand Infrastructure Plan 2015

The initial NIP, released in 2010, was a guiding document indicating how, amongst other matters, Government investment would be targeted at key infrastructure priorities. RoNS were a particular focus of how Government intended to make increased investment in roading, primarily State highways, to facilitate the efficient transport of goods and people and to remove inefficiencies. As described above, the WRR was identified as one of these RoNS.

The third iteration of this strategy is the New Zealand Infrastructure Plan 2015. It is the first Infrastructure Plan to detail a comprehensive suite of actions that will be undertaken to deliver on the new approach. Included within the Transport sector of the Action Plan is the delivery of the Accelerated Auckland Transport Package announced in 2013, which, as discussed above, includes this Project.

2.3.6 Government Policy Statement on Land Transport Funding 2015/16 – 2024/25

The GPSLT 2015 sets out the priorities, objectives and funding levels for land transport, establishing funding ranges for land transport activity classes and identifying the results expected from this investment.

The GPSLT 2015 continues the overall strategic direction of GPSLT 2012, prioritising:

- Economic growth and productivity;
- Road safety; and
- Value-for-money.

The objectives underpinning these priorities are listed as a land transport system that:

- Addresses current and future demand for access to economic and social opportunities;
- Provides appropriate transport choices;
- Is resilient;
- Is a safe system, increasingly free of death and serious injury;



- Mitigates the effects of land transport on the environment; and
- Delivers the right infrastructure and services to the right level and best cost.

Of note is the GPSLT 2015 emphasis on the need for additional investment in safe cycle networks in the main urban areas with the extension or improvement of dedicated cycle networks and routes where this can be achieved at reasonable cost.

The Project with its comprehensive modal mix of components embodies the priorities and objectives of the GPSLT 2015, by providing for greater connectivity, capacity, safety and resilience of the road network whilst also providing for dedicated shared-use pedestrian/cycle ways and similarly dedicated public transport facilities.

The Project is consistent with the results sought in Table 3 of the GPSLT 2015, which sets out the range of activity classes for transport investment and particular results sought for each activity class. The Project is consistent with the results sought in terms of State highway improvements, public transport improvements and walking and cycling improvements. The Project is also one of the projects which forms part of the Auckland Transport Package, specifically referred to in Table 3. The Auckland Land Transport Package is funded through loan funding that allows for the bringing forward of projects in the NLTP earlier than otherwise forecast.

2.3.7 National Land Transport Programme 2015-18

The NLTP sets out the transport investment over the identified three-year period, reflecting the strategic direction set out in the GPSLT 2015. For the Auckland region, it identifies the components of the Project as key routes and investments that address both travel time reliability and transport choice.

2.3.8 Draft State Highway Plan 2016/17

The State Highway Plan sets out how the Highways and Network Operations arm of the NZ Transport Agency will deliver the outcomes sought by government, as stated in the GPSLT 2015. Its key purpose is to communicate the NZ Transport Agency's annual work programme. In practical terms, the 2016/17 State Highway Plan identifies the project development for the Auckland Accelerated Programme (which includes the Project) and specifically identifies funding for the pre-implementation design phase of the Project for 2016/17.

2.3.9 The Auckland Plan

The Auckland Plan, which was adopted by AC in March 2012, was prepared in accordance with the Local Government (Auckland Council) Act 2009 requirement to produce a spatial plan. Its purpose is to contribute to Auckland's social, economic, environmental, and cultural well-being through a comprehensive and effective long-term (20 to 30 year) strategy for Auckland's growth and development.

The Auckland Plan:

- Sets a strategic direction for Auckland and its communities that integrates social, economic, environmental, and cultural objectives;
- Outlines a high-level development strategy that will achieve that direction and those objectives;
- Enables coherent and co-ordinated decision making by AC (as the spatial planning agency) and other parties to determine the future location and timing of critical infrastructure, services, and investment within Auckland in accordance with the strategy; and
- Provides a basis for aligning the implementation plans, regulatory plans, and funding programmes of AC.

Chapter 12 of the Auckland Plan identifies the existing and future location and mix of critical infrastructure, services and investment including transport.



Specific principles relating to land use and transport identified in the Auckland Plan that are relevant to the Project include:

- Ensure 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 this Plan; and
- Optimise existing and proposed transport investment.

Chapter 13 of the Auckland Plan identifies four strategic transport priorities that are relevant to the Project:

- Manage Auckland's transport as a single system;
- Integrate transport planning and investment with land-use development;
- Prioritise and optimise investment across transport modes; and
- Implement new transport funding mechanisms.

The completion of the SH18 link and connection to SH1 to motorway standard component of the Project is identified on Map 13.2 - Auckland's Priority Transport Projects, as one of the selected State highway improvements. It supports the level of population growth and development in the north of Auckland, which is identified in the Auckland Plan. As a component of the WRR, the Project will contribute to optimising the overall benefits provided by the WRR and will provide overall improved access and connectivity to both the north and south.

The current level of bus prioritisation measures between Constellation Bus Station and Albany Bus Station are identified in the Auckland Plan as constituting part of the RTN at Map 13.2. However, the Project will improve travel times and reliability through provision of a dedicated busway and direct connectivity to Albany Bus Station. The busway improvements are consistent with the RTN as identified at Map 13.1 of the Auckland Plan and similarly consistent with the draft RTN 2016-2026 Plan as promulgated by AT on its web site.

The proposed shared-use pedestrian/cycle way will contribute to improving the Regional Cycle Network shown on Map 13.3 (see extract provided at **Figure 6**). The Project will complete sections along both SH18 between Albany Highway and Constellation Bus Station and adjacent to SH1 between Constellation Bus Station and Oteha Valley Road. It will also provide a number of intermediate linkages to the existing and proposed network, at the following locations:

- Lavender Garden Lane;
- McClymonts Road;
- Greville Road;
- Rosedale Road;
- Arrenway Drive; and
- Constellation Drive.

The State highway upgrade component of the Project is specifically identified in the Auckland Plan as one of the priority state highway improvements. The Project is considered to be consistent with both the principles and priorities of the Auckland Plan.

2.3.10 Safer Journeys

The Government has indicated its intention to take a safe systems approach to improving transport system safety, which it sets out in Safer Journeys, its strategy to guide improvements in road safety over the period 2010-2020. The long-term goal of Safer Journeys is 'a safe road system increasingly free of death and serious injury'.



Safer Journeys states that road improvements have contributed to a reduction of 15.8% in urban road deaths between 1997 and 2005. The Project will adhere to the safe systems approach and should similarly contribute to the long-term safety goal of reducing the likelihood of crashes and minimising the consequences of those crashes that do occur. It will do this by providing safer roads and roadsides and the incorporation of current best practice safety standards.

The Project will include the following safety improvements:

- Replacement and upgrade of all median and edge safety barriers on SH1 and SH18 (within the Project area);
- Improvement in sight distance to State highway off-ramps, particularly at Albany Highway;
- Additional lanes between Greville Road and Constellation Drive to provide increased capacity for weaving manoeuvres; and
- Maintaining a slow vehicle lane on SH1 in the northbound direction between Greville Road and Oteha Valley Road.

The Project also includes safety enhancements through the provision of multi-modal improvements, being:

- Passenger platforms and access facilities at Constellation Bus Station;
- Dedicated busway and direct and separate access to Albany Bus Station;
- Provision of shared use paths adjacent to SH1 and SH18 (within the Project area) to provide cyclists and pedestrians an alternative to the local road network;
- Dedicated shared use pedestrian and cycle paths; and
- Pedestrian and cycle path connectivity through intersections.

Overall, the Project encompasses the Safer Journeys approach through its incorporation of the design components identified above.

2.3.11 New Zealand Transport Agency Statement of Intent 2015-2019 (SOI)

The NZ Transport Agency's current SOI identifies the overarching purpose of the NZ Transport Agency for the 2015-2019 period as creating transport solutions that are:

- Effective: move people and freight where they need to go in a timely manner;
- Efficient: deliver the right infrastructure and services to the right level at the best cost;
- Safe and responsible: reduce the harm from transport; and
- Resilient: meet future needs and endure shocks.

Key objectives that are relevant to the Project include:

- Objective 2: integrate national and local transport networks to support strategic connections and travel choices;
- Objective 5: incentivise and shape efficient travel choices using a customer-focused approach;
- Objective 7: greater resilience of the State highway network; and
- Objective 9: the provision of significant transport infrastructure (the Project is specifically identified as one of the Accelerated Auckland Transport Programme projects).

The priorities set out in the SOI include:

- Priority 2: Predictable journeys for urban customers; and
- Priority 6: Make urban cycling a safer and more attractive transport choice.

The Project will achieve these objectives and is consistent with the priorities because:

- Has a multi-modal focus (supporting travel choice);



- Integrates State highway network improvements with public transport and walking and cycling improvements; and
- Will improve journey reliability and resilience across modes.

2.3.12 Summary

At a nationally strategic level:

- The SHS in 2007 identified a need for network improvements and the need to consider an integrated solution giving consideration to local network integration and public transport and active modes;
- The WRR was identified by Government as a RoNS in 2009, with the Project being the final section of the WRR that will bring it up to motorway standard (see **Figure 7** above); and
- The importance of the WRR has been reinforced through the development of national infrastructure planning and its identification within the current iteration of such strategy, being the New Zealand Infrastructure Plan 2015.

At a regional level, the Auckland Plan has emphasised the importance of three key aspects of the Project:

- The identification of the Constellation Bus Station to Albany Bus Station section of the Northern Busway as a component of the RTN;
- The proposed SUP is identified as part of the proposed Regional Cycle Network; and
- The upgrade of SH18 is a strategic State highway network improvement.

The Project also aligns with the purpose, objectives and priorities of various NZ Transport Agency planning documents.

Additionally, the Accelerated Auckland Transport Projects Package (see **Section 2.3.4** above) identifies the mechanism through which the strategic need for the Project has been able to be addressed with immediacy.

2.4 Benefits of the Project

The Project will have a broad range of benefits which are discussed in the subsections below.

2.4.1 Network resilience and connectivity

Completion of the Project will provide a greater level of resilience to the inter-regional State highway network through providing an alternative north-south route (the WRR), through Auckland, to Motorway standard. This will additionally provide greater intra-regional travel flexibility and access to the Auckland International Airport from across the region and from Northland.

The resilience of an alternative route provides additional flexibility to journey planning for freight and general vehicle movements.

The Project will also provide resilience by improving options for alternative modes (providing choices if the function of SH1 within the Project area is compromised).

2.4.2 Improved journey efficiency

Substantial improved journey times along and between the SH1 and SH18 corridors are forecast as a result of the Project. With the Project being the final link in the completion of the WRR to motorway standard, the benefits to the motorist of the completion of the Project when combined with the travel time savings achieved by other WRR projects, will be even higher.

Similarly, the implementation of the dedicated Northern Busway extension to Albany Bus Station, will improve reliability of journey times for public transport users who complete or initiate their journey at Albany Bus Station.



Improved connectivity of the walking and cycling network will provide for greater accessibility and choice for pedestrians and cyclists that will allow them to plan more efficient journeys.

2.4.3 Improved connectivity and local access

The provision of improved connectivity and efficient access for local traffic will provide improved journey times on the local network and the State highway network with the separation of such journeys.

The Project similarly provides for greater connectivity for pedestrians and cyclists through the provision of walking and cycling facilities along SH1 and SH18, together with connections to Albany and Constellation Bus Stations and to the existing local walking and cycling network.

2.4.4 Greater local travel choice

The provision of the extensive SUP will provide greater travel choice for local trips with a forecast increase in the levels of active modes (walking and cycling). The separation of these active modes from general traffic has associated safety benefits.

2.4.5 Improved efficiency and reliability of public transport

The provision of a dedicated Busway from Constellation Bus Station with direct access to Albany Bus Station will reduce average bus journey times and improve reliability of journey times, due to the separation from general traffic.

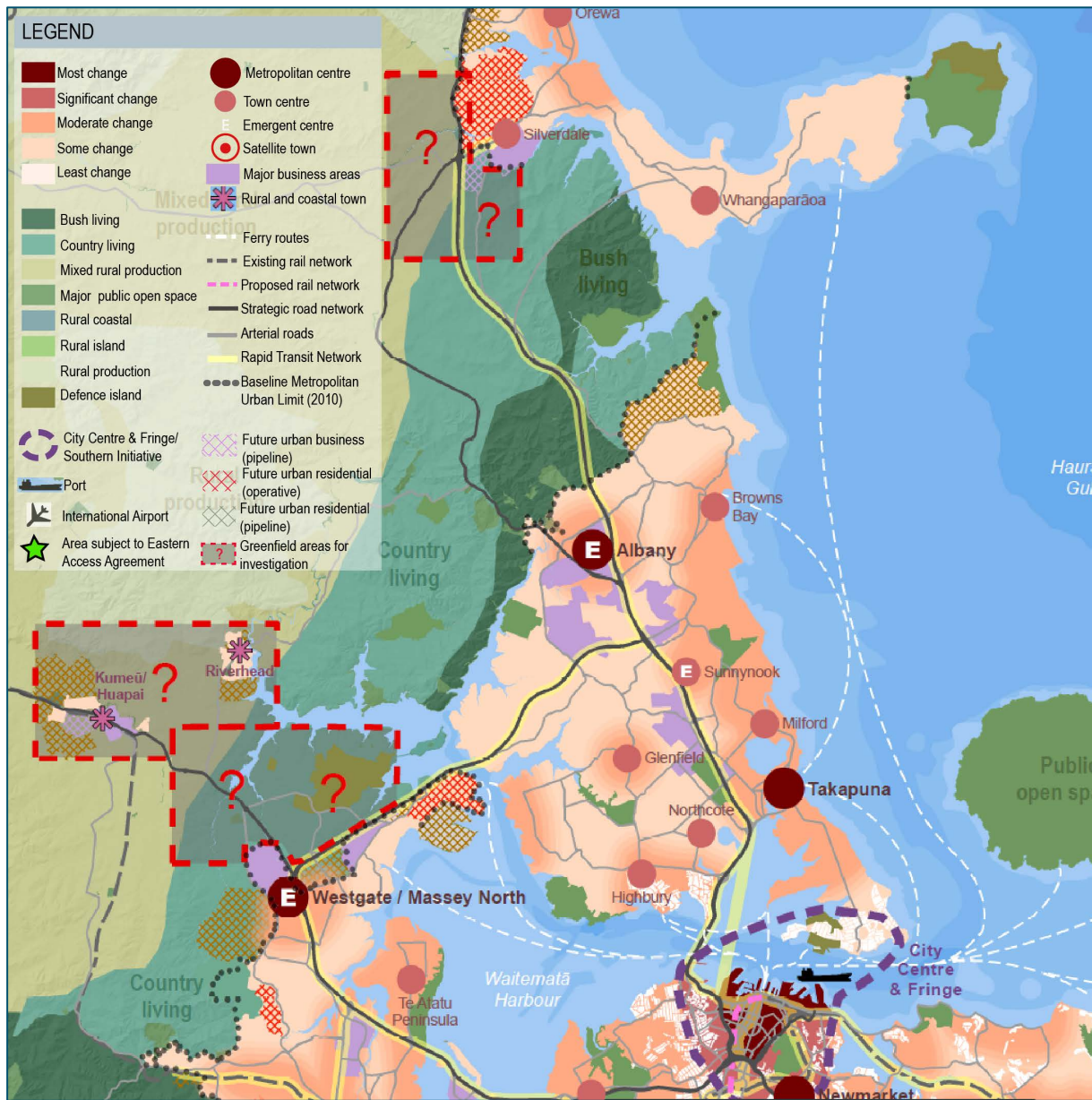
2.4.6 Population growth

The Project will support anticipated development in the northern and north-western growth areas of Auckland. These are identified within the Auckland Plan (**Figure 8**) and are concentrated in Albany, the Eastern Bays, Orewa, Silverdale, Whangaparaoa, Hobsonville Point, Westgate/Massey North, Kumeu and Huapai.

In addition, the Auckland Plan anticipates approximately 27,000 dwellings will be built in the Silverdale, Wainui and Dairy Flat area over the next 30 years. The Upper Harbour area has also been earmarked within the Auckland Plan for significant development over the next three decades, much of which is to consist of high and medium density housing and the growth of commercial and industrial areas.



Figure 8 Development Strategy of Auckland's Urban Core



Source: The Auckland Plan (Auckland Council)

Special Housing Areas feature strongly in these areas as the short term response to the immediate housing demand and supply challenge in Auckland, which will see the completion of new residential subdivisions and developments within the near future.

The 2016 Auckland Council Pre-Election Report states that Auckland is projected to grow by 736,000 people over the next 30 years. Based on highest growth forecasts for Auckland from the 2016 Population Projections, growth of one million people may arise. AC has interpreted this to mean up to 400,000 new dwellings and 277,000 additional jobs could be needed. As such, growth in North Auckland is likely to exceed that envisaged by the Auckland Plan due to demand.



3 Statutory and Policy Context

3.1 Introduction

This Section introduces the relevant legislative, statutory and non-statutory framework against which the Project will be assessed. It focuses particularly on those provisions of the RMA that are relevant to the NoRs and resource consents for the Project, including:

- Part 2 which establishes the purpose and principles of the RMA;
- Consideration of proposals of national significance (Part 6AA);
- NoRs for designations (Part 8); and
- Applications for resource consent (Part 6).

The relevant statutory matters are set out in this Section. An assessment of the Project in relation to these matters is provided in **Sections 11 and 12**. This Section also contains summary details of the NoRs for designations and the applications for resource consent, sought for the Project.

3.2 Purpose and Principles of the RMA

A territorial authority must, when considering a NoR against the matters set out in section 171, do so subject to Part 2 of the RMA. In addition, a consent authority's consideration of applications for resource consents under section 104 of the RMA must also be subject to Part 2 of the RMA.

3.2.1 Section 5 Purpose

Section 5 states the purpose of the RMA:

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while-*
 - (a) *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - (c) *avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

3.2.2 Section 6 Matters of National Importance

Matters of national importance are set out in section 6 of the RMA:

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) *the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development;*



- (b) *the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development;*
- (c) *the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;*
- (d) *the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers;*
- (e) *the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga;*
- (f) *the protection of historic heritage from inappropriate subdivision, use, and development;*
- (g) *the protection of protected customary rights.*

3.2.3 Section 7 Other Matters

'Other matters' are set out in section 7:

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to-

- (a) *kaitiakitanga;*
- (aa) *the ethic of stewardship;*
- (b) *the efficient use and development of natural and physical resources;*
- (ba) *the efficiency of the end use of energy;*
- (c) *the maintenance and enhancement of amenity values;*
- (d) *intrinsic values of ecosystems;*
- (e) *[Repealed]*
- (f) *maintenance and enhancement of the quality of the environment;*
- (g) *any finite characteristics of natural and physical resources*
- (h) *the protection of the habitat of trout and salmon;*
- (i) *the effects of climate change;*
- (j) *the benefits derived from the use and development of renewable energy.*

3.2.4 Section 8 Treaty of Waitangi

Section 8 directs that:

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

3.3 Proposals of National Significance

Part 6AA of the RMA provides for the consideration of matters which, singularly or collectively, constitute a proposal of national significance. Section 145 allows certain matters to be lodged directly with the Environmental Protection Authority (EPA). These include:

- A notice of requirement for a designation or to alter a designation (section 145(3)); and
- An application for a resource consent (section 145(1)(a)).



The NZ Transport Agency considers that the Project fulfils the criteria for a proposal of national significance, with consideration to the matters discussed at **Section 2** and the public interest as discussed at **Section 8**. In accordance with section 145, the NZ Transport Agency has lodged its applications for the NoRs and resource consent for the Project directly with the EPA. These applications for resource consent and the NoRs have also been served on AC, being the relevant local authority, in accordance with section 145(10) of the RMA.

3.4 Notices of Requirement

A designation is a planning mechanism that enables existing or future infrastructure to be efficiently managed and land requirements associated with future infrastructure to be signalled in district plans. Where a designation is provided in a district plan, any provisions that might normally apply, including zoning and land use controls, do not apply to public works or projects or works undertaken by the requiring authority (in this case the NZ Transport Agency).

The NZ Transport Agency is a network utility operator approved as a requiring authority under section 167 of the RMA. The Gazette Notice references approving the NZ Transport Agency as a requiring authority are:

- 1992/348; 7 December 1992 - The Resource Management (Approval of Transit New Zealand as Requiring Authority) Order 1992.
- 20/978; 3 March 1994 - The Resource Management (Approval of Transit New Zealand as a Requiring Authority) Notice 1994.
- 2015-go6742; 19 November 2015 - The Resource Management (Approval of NZ Transport Agency as a Requiring Authority) Notice 2015.

Pursuant to section 145 and 181 of the RMA, the NZ Transport Agency is lodging four notices of requirement to alter existing designations. In addition, the NZ Transport Agency is lodging two notices of requirement for new designations under sections 145 and 168 of the RMA. The notices of requirement are set out in **Table 1** below.

Table 1 Notices of Requirement being lodged with the EPA

Notice	Ref No.	Purpose and Authority	Location of Work
NoR1 Alteration to Designation	6750	Auckland-Waiwera Motorway (State Highway 1), including planning, design, supervision, construction and maintenance.	State Highway 1 from Greville Road interchange, Albany to Sunset Road overbridge.
NoR2 Alteration to Designation	6751	Proposed Motorway (Auckland/Waiwera Motorway State Highway 1), including planning, design, supervision, construction and maintenance.	State Highway 1 from Greville Road interchange, Albany to Oteha Valley Road, Albany.
NoR3 Alteration to Designation	6756	State Highway 18 - the control, management and improvement of the State Highway.	State Highway 18 from Albany Highway to State highway 1.
NoR4 Designation	New Designation	Northern Busway from Constellation Bus Station to Albany Bus Station.	Adjacent State Highway 1 from Constellation Bus Station to Albany Bus Station.
NoR5 Designation	New Designation	Shared Use Path.	Adjacent State Highway 1 from Constellation Bus Station to Oteha Valley Road.
NoR6 Alteration to Designation	6758	Upgrade of Station.	Constellation Bus Station.



The sites to which NoR1 – 6 apply, are identified and legally described in the NoR Plans and are associated NoR Property Information Table provided in **Volume 1**. NoR6 seeks to alter only the conditions imposed on designation 6758 (Constellation Bus Station); it does not seek to change the designated land area.

The EPA has standard NoR forms and has asked for these to be supported by an AEE. The matters that should be included in an AEE are set out in Schedule 4 of the RMA. The AEE (as documented in this report) has been undertaken in accordance with Schedule 4 and also fulfils the requirements of the AEE required in support of the resource consents sought for the Project.

As the NoRs will be lodged with the EPA under section 145(3) of the RMA, section 145(7) directs that where a notice is lodged with the EPA, section 168 applies, except that every reference in that section to a territorial authority must be read as a reference to the EPA. If the Minister directs the NoR to a Board of Inquiry (BoI), the BoI, rather than the NZ Transport Agency as the requiring authority, will make the final decision on the NoRs.

If the matters are directed to a BoI, all of the NoRs will be considered under section 149P. Section 149P(4) directs that a board:

- (a) *must have regard to the matters set out in section 171(1) and comply with section 171(1A) as if it were a territorial authority; and*
- (b) *may-*
 - (i) *cancel the requirement; or*
 - (ii) *confirm the requirement; or*
 - (iii) *confirm the requirement, but modify it or impose conditions on it as the board thinks fit; and*
- (c) *may waive the requirement for an outline plan to be submitted under section 176A.*

In making a decision on a NoR under section 171, the BoI will be required to consider the effects on the environment of allowing the requirement, having particular regard to policy statements and plans, whether adequate consideration has been given to alternative sites, routes and methods, whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority and any other matter considered reasonably necessary in order to make a decision. The decision is also subject to an overall assessment under Part 2 of the RMA as to whether the proposal represents sustainable management. **Section 7** provides an assessment of the alternatives considered with an assessment of the effects on the environment of allowing the requirement is provided in **Section 9** of this document. An analysis of the Project in relation to the relevant policy framework and Part 2 of the RMA is provided in **Sections 11 and 12** respectively of this AEE.

3.5 Outline Plan of Works

Section 176A sets out the circumstances when an OPW must be submitted to a territorial authority before commencing construction of a project or work under a designation. In accordance with section 176A(3):

“An outline plan must show-

- (a) *the height, shape, and bulk of the public work, project, or work; and*
- (b) *the location on the site of the public work, project, or work; and*
- (c) *the likely finished contour of the site; and*
- (d) *the vehicular access, circulation, and the provision for parking; and*



(e) the landscaping proposed; and

(f) any other matters to avoid, remedy, or mitigate any adverse effects on the environment.

Upon receiving an outline plan, a territorial authority has 20 working days to request any changes to the OPW. The requiring authority may accept or reject the requested changes. The NZ Transport Agency intends to submit outline plan/s for the Project prior to the commencement of work.

3.6 Land subject to existing NoR and Designations

Set out in **Table 2** below is an overview of the existing NoRs being progressed and designations held by other Requiring Authorities within the Project area.

Table 2 Existing Designations held by other Requiring Authorities

Ref No.	Purpose and Authority	Location	Proposed overlay
1421	Albany Bus Station. Auckland Transport	250 Oteha Valley Road and 125 McClymonts Road, Albany.	NoR2 and NoR4 will be extended over this designation.
417	Rosedale Closed Landfill. AC	62 Greville Road, Albany	NoR1, NoR4 and NoR5 will be extended over this designation.
8842	The installation, maintenance, repair, replacement, inspection and operation of one 110kV underground electricity transmission line. Vector Ltd	410 Albany Highway to State Highway 1 (Constellation Drive), Rosedale and along Currys Lane, Wairau Valley.	NoR3 will be extended over this designation.
9310	Wastewater purposes-wastewater treatment plant odour buffer control. Watercare	Rosedale Park, and reserves, roads and motorway in the vicinity of the RWWTP.	Extends over the existing primary NZ Transport Agency designation 6750 NoR1, NoR3, NoR4 and NoR5 will extend over this designation.
9311	Wastewater purposes – wastewater treatment plant and underground route to outfall to Mairangi Bay. Watercare	Rosedale Road and UHH, Albany, then via various properties and roads to Mairangi Bay.	NoR1, NoR3, NoR4 and NoR5 will extend over this designation.
No reference	Local Roding Network within the district as circumscribed by ACDP:NS. Auckland Transport	Local roading network connections within the Project area.	AT did not seek that this designation be included in the AUP, when this first combined plan for AC was developed.
Notice of Requirement by AT for Designation of the Road Asset 14 June 2012)	NoR over the Road Asset (including the AC owned and AT managed roads in the Auckland Region as identified in the ACDP:NS. Auckland Transport	Local roading network connections within the Project area.	AT gave a NoR to AC for the road asset within the Auckland District on 14 June 2012 in accord with section 168(2) of the RMA. There has been no further progress toward a decision on this NoR pursuant to part 8 of the RMA.
NoR2 North Harbour Watermain (Watercare reference)	NoR by Watercare over SH18 (North Harbour 2 Watermain).	Watermain	Designation 6756 is the primary (first in time) designation.



Ref No.	Purpose and Authority	Location	Proposed overlay
	Watercare		However, the alteration to Designation 6756 will extend over this NoR.

The necessary consents for the Project works required under section 177(1)(a) and section 178(2) will be sought by the NZ Transport Agency prior to works. The interface of the Project with these NoRs and designations is confirmed on the Designation Plans provided in **Volume 1**.

3.6.1 Local roading network connections within the Project extent

Advice received from AT indicates no definitive status relative to the designation or notice of requirement referred to in **Table 2**. AT has further advised the NZ Transport Agency that it considers the prudent approach would be for the NZ Transport Agency, if seeking to undertake any work within the extent of the designation or notice of requirement, that the NZ Transport Agency should seek the written consent of AT prior to undertaking any work in accordance with any designation that might be confirmed by a decision of the Bol.

Such written consent should be sought in accord with both sections 177(1)(a) and 178(2), with regard to the designation and notice of requirement, respectively.

3.6.2 Section 178 Interim effect of requirements for designation

Section 178(b) applies to the situation where a requiring authority gives notice of a requirement for a designation to a territorial authority under section 168. Section 178 provides:

- (2) *In the period that starts as described in subsection (3) and ends as described in subsection (4), no person may do anything that would prevent or hinder a public work, project, or work to which the designation relates unless the person has the prior written consent of the requiring authority*
- (3) *The period starts-*
 - (b) *For the purposes of subsection (1)(b), on the day on which the requiring authority gives notice of the requirement under section 168*
- (4) *The period ends on the earliest of the following days:*
 - (a) *The day on which the requirement is withdrawn*
 - (b) *The day on which the requirement is cancelled*
 - (c) *The day on which the designation is included in the district plan*
- (6) *This section does not prevent an authority responsible for an earlier designation or heritage order from doing anything that is in accordance with the earlier designation or order.*

As identified in **Table 2**, above, Watercare Services Limited (Watercare) has given a Notice of Requirement to AC for the North Harbour 2 Watermain (NH2). The NoR was lodged on 10 May 2016 and at the time of lodgement the NoR has interim effect under section 178. This NoR runs along the northern part of the primary (earlier) SH18 Designation (6756) from Albany Highway to William Pickering Drive. However, there are two locations where this NoR extends northward beyond the SH18 Designation, at the north-eastern corner of Albany Highway and SH18 and the north western corner of SH18 and William Pickering Drive. These locations are identified on the Designation Plans in **Volume 1 - Sheet 9**.



The NZ Transport Agency is aware of the existence of this requirement and as it relates to the two locations identified above. The necessary written consents under section 178(2) will be sought from Watercare at the same time as outline plans are submitted to AC, once the detailed design phase of the Project has been completed, provided the NH2 NoR continues to have interim effect at that time.

3.7 Project Designations to be reviewed after Construction

Once the Project has been constructed and is operational, the area of land required for the on-going operation and maintenance of the Project is likely to reduce (i.e. some of the designated land will be surplus to requirements as it will only be required during the construction stage of the Project).

It is intended that once construction has been completed, the NZ Transport Agency will review the designations and give notice to remove any part(s) of the designation(s) that are no longer required. Review of the Project designations is included as a proposed condition of the designations.

3.8 Applications for Resource Consent

Applications by the NZ Transport Agency for resource consents are being lodged under section 145(1)(a) and in accordance with section 88 (section 145(5)).

Section 88(2) requires that

An application must –

- (a) be made in the prescribed form and manner; and*
- (b) include the information relating to the activity, including an assessment of the activity's effects on the environment, as required by Schedule 4.*

Table 3 below identifies the relevant sections of this AEE which are intended to address the requirements of Schedule 4.

Table 3 Summary of Schedule 4 Matters

Schedule 4 Item – Matters to be included in an AEE	Relevant sections that address the requirements of Schedule 4.
A description of the activities / proposal.	The Project description is outlined in Section 5 of this document and includes a description of the land requirements, stormwater management, construction phasing and land disturbance proposed.
A description of the sites at which the activities / proposal is to occur.	As above.
The full name and address of each owner and occupier of the sites.	A list of the landowners and occupiers is included in Volume 1 – Forms .
A description of any other activities that are part of the proposal to which the application relates	Section 5 provides a description of the Project to which the application relates.
An assessment of the activities / proposal against the matters set out in Part 2	Section 11 contains an Assessment of Planning documents and Section 12 contains a Statutory Assessment of the proposal including an assessment against Part 2.
An assessment of the activities / proposal against any relevant provisions of a document referred to in section 140(1)(b). ¹	Section 11 contains an Assessment of Planning documents and Section 12 contains a Statutory Assessment of the proposal including an assessment against the documents referred to in section 140(1)(b).

¹ In accordance with clause 2(2) of Schedule 4, this assessment must include an assessment of the activity against (a) any relevant objectives, policies, or rules in a document; and (b) any relevant requirements, conditions, or permissions in any rules in a document; and (c) any other relevant requirements in a document (for example, a national environmental standard, or other regulation).



Schedule 4 Item – Matters to be included in an AEE	Relevant sections that address the requirements of Schedule 4.
<p>A description of permitted activities that form part of the proposal to which the application relates.</p> <p>Where reclamation is proposed, information regarding the location and boundaries of reclamation.</p>	<p>Section 6 identifies and describes those activities that are assessed to be permitted against the AUP.</p> <p>Section 6 provides a description of where reclamation is proposed.</p>
<p>If it is likely that an activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity.</p>	<p>A range of alternatives have been assessed over the course of the Project's design with the aim of keeping adverse effects to a minimum. An assessment of alternatives is provided in Section 7.</p>
<p>An assessment of the actual or potential effect on the environment of the proposed activity.</p>	<p>The specialist Technical Assessments undertaken to support the AEE are provided in Volume 3 and assess in detail actual and potential effects of the activities that will be undertaken for the Project. These are summarised in Section 9 and include an assessment of effects on the roading network, the natural environment, community, landscape and visual amenity and the historic and cultural environment.</p>
<p>If the activity includes the discharge of any contaminant, a description of –</p> <ul style="list-style-type: none"> I. The nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects; and II. Any possible alternative methods of discharge into any other receiving environment. 	<p>An assessment of the discharge of contaminants, the sensitivity of the proposed receiving environment to adverse effects and the alternative methods to discharge into any other receiving environment is included in Sections 9 and 10.</p>
<p>A description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect.</p>	<p>Proposed mitigation measures are discussed in Section 9 and listed in Section 10 which includes the provision of a Construction Environmental Management Plan (CEMP).</p>
<p>Identification of the persons affected by the proposal, the consultation undertaken, if any, and any response to the views of any person consulted.</p>	<p>Details of consultation undertaken in relation to this Project are outlined in Section 8. This Section identifies those persons considered to be affected by the Project.</p>
<p>If the scale or significance of the activity's effect are such that monitoring is required, a description of how, once the proposal is approved, effects will be monitored and by whom.</p>	<p>Proposed monitoring measures are discussed in Section 9 and listed in Section 10.</p>
<p>Any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects.</p>	<p>The assessment of potential and actual effects in Section 9 and the Assessment of Social Effects contained in Volume 3.</p>
<p>Any physical effect on the locality, including any landscape and visual effects.</p>	<p>The visual and landscape effects of the Project are contained in the Assessment of Landscape and Visual Effects provided in Volume 3.</p>
<p>Any effect on ecosystems, includes effects on plants and animals and any physical disturbance of habitats in the vicinity.</p>	<p>The assessment of effects on ecosystems are included in the freshwater ecology, terrestrial ecology (including arboricultural) Technical Assessments contained in Volume 3.</p>
<p>Any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations.</p>	<p>Technical Assessments relevant to the effects of the Project on recreational, historic and cultural values are contained in Volume 3.</p>
<p>Any discharge of contaminants into the environment, including any unreasonable</p>	<p>Technical Assessments specific to construction and operational noise and vibration, stormwater, surface</p>



Schedule 4 Item – Matters to be included in an AEE	Relevant sections that address the requirements of Schedule 4.
emission of noise, and options for the treatment and disposal of contaminants.	water, construction water, contaminated land and works within the Rosedale Closed Landfill are contained in Volume 3 .
Any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.	Details of the potential risks and mitigation measures associated with working within the Rosedale Closed Landfill are outlined in Volume 3 .

The assessment of environmental effects process (as documented in this report) has been undertaken in accordance with Schedule 4. It also fulfils the requirements of the assessment of effects on the environment required in support of the NoRs².

3.9 Consideration of Applications for Resource Consent

If the Project is directed to a BoI, the BoI will consider the applications under section 149P(1) and (2). Section 149P(2) provides that a BoI considering an application for resource consent must apply sections 104 to 112 and 138A as if it were a consenting authority.

As set out above, the activities for which the resource consents are sought fall into a variety of differing activity classes, ranging from controlled activities to non-complying activities. Applying the principle of bundling, the whole Project is to be assessed as having non-complying activity status. All applications must be considered under section 104 of the RMA, but there are also additional considerations specific to certain classes of activity).

The relevant parts of section 104 of the RMA require:

- (1) *When considering an application for resource consent, and any submissions received, the consent authority must, subject to Part 2, to have regard to-*
 - (a) *any actual and potential effects on the environment of allowing the activity; and*
 - (b) *any relevant provisions of—*
 - (i) *a national environmental standard:*
 - (ii) *other regulations:*
 - (iii) *a national policy statement:*
 - (iv) *a New Zealand coastal policy statement:*
 - (v) *a regional policy statement or proposed regional policy statement:*
 - (vi) *a plan or proposed plan; and*
 - (c) *any other matter the consent authority considers relevant and reasonably necessary to determine the application.*
- (2) *When forming an opinion for the purpose of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.*

² An NoR must include details of the effects that the project will have on the environment and the ways in which any adverse effects will be mitigated (Form 18 of the Resource Management (Forms, Fees, and Procedure) Regulations 2003). The effects are then assessed by the Board under section 171(1) of the RMA.



Section 9 assesses the effects on the environment of the elements of the Project that require resource consent.

Section 11 assesses the effects of allowing the Project in terms of relevant provisions of the National Policy Statement for Freshwater Management 2011 (NPS_{FM}), National Policy Statement for Electricity Transmission (NPS_{ET}), the NES_{Soil}, the AUP and legacy plans. Overall, it is concluded that the Project is not contrary to the relevant provisions of these instruments.

In addition to consideration under section 104, there are further considerations for particular classes of activities:

- Non-complying activities under section 104B and 104D; and
- Discharge permits, under section 105 and section 107.

3.9.1 Section 104B – Non-Complying activities

Under section 104B:

After considering an application for a resource consent for a discretionary activity or non-complying activity, a consent authority—

- (a) *may grant or refuse the application; and*
- (b) *if it grants the application, may impose conditions under section 108.*

The activities to be undertaken as part of the Project that require resource consent are set out in **Section 6**.

3.9.2 Section 104D – Particular restrictions for non-complying activities

Under section 104D:

- (1) *Despite any decision made for the purpose of section 95A(2)(a) in relation to adverse effects, a consent authority may grant a resource consent for a non-complying activity only if it is satisfied that either—*
 - (a) *the adverse effects of the activity on the environment (other than any effect to which section 104(3)(a)(ii) applies) will be minor; or*
 - (b) *the application is for an activity that will not be contrary to the objectives and policies of—*
 - (i) *the relevant plan, if there is a plan but no proposed plan in respect of the activity; or*
 - (ii) *the relevant proposed plan, if there is a proposed plan but no relevant plan in respect of the activity; or*
 - (iii) *both the relevant plan and the relevant proposed plan, if there is both a plan and a proposed plan in respect of the activity.*
- (2) *To avoid doubt, section 104(2) applies to the determination of an application for a non-complying activity.*

An assessment of the Project against section 104D is provided in **Section 12.3**.

3.9.3 Discharge permits

Section 105 requires that regard be had to matters in relation to discharge permits as follows:

- (1) *If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—*



- (a) *the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- (b) *the applicant's reasons for the proposed choice; and*
- (c) *any possible alternative methods of discharge, including discharge into any other receiving environment.*

In addition, section 107 provides:

- (1) *Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing—*
 - (a) *the discharge of a contaminant or water into water; or*
 - (b) *a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
 - (ba) *the dumping in the coastal marine area from any ship, aircraft, or offshore installation of any waste or other matter that is a contaminant,—*
if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:
 - (c) *the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;*
 - (d) *any conspicuous change in the colour or visual clarity;*
 - (e) *any emission of objectionable odour;*
 - (f) *the rendering of fresh water unsuitable for consumption by farm animals;*
 - (g) *any significant adverse effects on aquatic life.*
- (2) *A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied—*
 - (a) *that exceptional circumstances justify the granting of the permit; or*
 - (b) *that the discharge is of a temporary nature; or*
 - (c) *that the discharge is associated with necessary maintenance work—*
and that it is consistent with the purpose of this Act to do so.
- (3) *In addition to any other conditions imposed under this Act, a discharge permit or coastal permit may include conditions requiring the holder of the permit to undertake such works in such stages throughout the term of the permit as will ensure that upon the expiry of the permit the holder can meet the requirements of subsection (1) and of any relevant regional rules.*

Discharges to land include sediment and stormwater, with discharges to air being required for works within the Rosedale Closed Landfill and from construction works. **Section 9** considers the effects of the discharges and **Section 10** addresses mitigation of effects of the discharges.

3.10 Other Statutory Considerations

When considering the NoRs (under section 171) and the applications for resource consent (under section 104), the Bol must have regard to various matters.



Section 171 requires consideration of any relevant provisions of:

- A national policy statement;
- A New Zealand coastal statement;
- A regional policy statement or proposed regional policy statement;
- A plan or proposed plan; and
- Any other relevant matters that the BoI considers reasonably necessary in order to make a decision on the NoR.

Section 104 requires the consideration of all of the same matters, as well as any relevant provisions of:

- National environmental standards; and
- Other regulations.

3.11 Statutory Planning Documents

Statutory planning documents are considered to be documents required to be produced under legislation. Relevant to this Project are national policy statements (NPS), national environmental standards (NES), regional policy statement, regional plan and district plan.

The purpose of a NPS (other than the New Zealand Coastal Policy Statement) is to state objectives and policies for matters of national significance that are relevant to achieving the purpose of the RMA (section 45(1)). There are two relevant operative NPS with respect to the Project:

- NPS_{FM}; and
- NPS_{ET}.

A NES is a regulation issued under section 43 of the RMA. They generally apply nationally. The relationship between the provisions of the NES and the regional and district plan rules is outlined in section 43B of the RMA.

There are two NES which are considered relevant to the Project:

- The National Environmental Standards for Air Quality 2004 (NES_{AQ}); and
- NES_{Soil}.

3.11.1 National Policy Statement for Freshwater Management 2011

The NPS_{FM} came into effect on 1 August 2014.

It contains eight groups of objectives and policies:

- Water quality (A);
- Water quantity (B);
- Integrated management (C);
- National objectives framework (CA);
- Monitoring plans (CB);
- Accounting for freshwater takes and contaminants (CC);
- Tangata whenua roles and interests (D); and
- Progressive implementation programme (E).

An assessment of the Project in relation to NPS_{FM} is provided in **Section 11**.



3.11.2 National Policy Statement on Electricity Transmission

The NPS_{ET} came into effect on 10 April 2008.

The objective of the NPS_{ET} is:

[t]o recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:

- *managing the adverse environmental effects of the network; and*
- *managing the adverse effects of other activities on the network.*

The effects of the Project on the electricity transmission network will need to be considered and managed.

An assessment of the Project in relation to the NPS_{ET} is provided in **Section 11**.

3.11.3 National Environmental Standard for Air Quality

The NES_{AQ} is intended to protect public health and the environment of New Zealand by, among other things, setting concentration limits for criteria air pollutants. Different parts of the NES_{AQ} came into effect between 2004 and 2006.

There are five ambient air quality standards relevant to the Project. Schedule 1 of the NES_{AQ} sets out the ambient air quality concentration limits for the following:

- Carbon monoxide;
- Nitrogen dioxide;
- Ozone;
- Fine particulate matter (PM₁₀); and
- Sulphur dioxide.

The construction of the Project will not trigger the requirement for resource consent under the NES_{AQ}.

3.11.4 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The NES_{Soil} establishes a nationally consistent set of planning controls and soil contaminant values.

The NES_{Soil} contains a national set of soil contaminant standards for 12 priority contaminants for five standard land use scenarios (rural residential, residential, high density residential, recreational and commercial/industrial).

An assessment of the Project in relation to the NES_{Soil} is provided for in **Section 11**. All necessary consents required under the NES_{Soil} for land disturbances will be obtained prior to the commencement of any construction works for the Project.

3.11.5 Auckland Unitary Plan Operative in Part (15 November 2016)

The Proposed Auckland Unitary Plan (PAUP) was notified on 30 September 2013, with AC's Decision Version issued on 19 August 2016, and the appeal period has closed.

On 15 November 2016, AC gave public notice that it had resolved to make parts of the PAUP 'operative in part'. At the same time, AC issued an annotated version of the AUP that identifies those provisions that are operative, and those that are subject to appeal to the High Court or the Environment Court. All rules relevant to the Project (regional plan and district plan) are confirmed as



operative in the AUP. The relevant objectives and policies are discussed in greater detail in **Section 11** of the AEE while those subject to appeal are summarised in **Section 3.11.7** below.

3.11.5.1 AUP: Regional Policy Statement

Relevant resource management issues addressed in the RPS section of the AUP are:

- Urban growth and form (Chapter B2);
- Infrastructure, transport and energy (Chapter B3);
- Mana Whenua (Chapter B6);
- Natural resources (Chapter B7); and
- Environmental risk (Chapter B10).

An assessment of the Project in relation to the RPS in the AUP is provided in **Section 11**.

3.11.5.2 AUP: Regional Plan Provisions

Activities covered by the Regional Plan section of the AUP which are relevant to the Project are:

- Works within Significant Ecological Areas (SEA);
- Earthworks;
- Vegetation removal;
- Works on existing and new structures and associated bed disturbance or depositing of any substance diversion of water and temporary damming of water;
- Groundwater diversion;
- Groundwater take;
- Stormwater discharge and diversion;
- Discharges from high use roads (HUR);
- Stormwater management area – Flow 1 and Flow 2;
- Air quality; and
- Contaminated land.

3.11.5.3 AUP: District Plan

Objectives and policies relating to the following activities covered by the District Plan section of the AUP are relevant to the Project:

- Land disturbance;
- Trees in roads;
- Lighting;
- Flooding; and
- Noise and vibration.

District Plan rules are not relevant because the district aspects of the Project will be authorised by designations.

3.11.5.4 AUP Appeals

The relevant policies of the AUP that are subject to appeal relate to:

- Chapter B2 - Urban Growth and Form (Regional Policy Statement); and
- Chapters E15 – Vegetation Management and Biodiversity and D9 – Significant Ecological Areas Overlay (Regional Plan and District Plan).



While the policies within Chapter E36 - Natural Hazards and Flooding are subject to appeal, the appeals relate to coastal hazards and are not relevant to the Project

3.11.6 Auckland Council Regional Policy Statement

As a result of the appeals relating to Chapter B2 of the AUP, the urban growth objectives and policies from the Auckland Council Regional Policy Statement (ACRPS) are relevant and are considered in **Section 11**.

3.11.7 Auckland Council Regional Plan: Air, Land and Water Plan

As outlined above, Chapters E15 – Vegetation Management and Biodiversity and D9 – Significant Ecological Areas Overlay are subject to appeal and accordingly, the corresponding objectives in the (Auckland Council Regional Plan: Air, Land and Water Plan) ACRP:ALW have been considered as set out in **Section 11**.

3.12 Non-Statutory Strategic Documents

For the resource consent applications, the Bol must have regard to “any other matter the consent authority considers relevant and reasonably necessary to determine the application” (section 104(1)(c)).

For the NoRs, a Bol must also have regard to any other matter it considers reasonably necessary in order to make its decision (section 171(1)(d)).

The RMA does not define what matters are to be considered under these sections, however, it is accepted that these can include matters outside the RMA, including non-statutory processes. Those matters considered relevant have already been identified and discussed in **Section 2.3** and therefore are not repeated here.

3.13 Other Relevant Statutes

In addition to the RMA, there are a number of other statutes which are considered relevant to the Project and these are outlined in the following sections.

3.13.1 Land Transport Management Act

The LTMA provides the statutory framework for New Zealand’s land transport system. It is also the statute under which the NZ Transport Agency operations (in conjunction with the GRPA).

The LTMA was enacted in November 2003 and amended in 2008. The purpose of this Act is set out in section 3 as follows:

The purpose of this Act is to contribute to an effective, efficient, and safe land transport system in the public interest.

Section 94 sets out the corresponding objective of the NZ Transport Agency:

The objective of the Agency is to undertake its functions in a way that contributes to an effective, efficient, and safe land transport system in the public interest.

The NZ Transport Agency’s functions are set out in section 95 of the LTMA. Of specific relevance to the Project is:

(1) *The Agency has the following functions:*

(a) *to contribute to an effective, efficient, and safe land transport system in the public interest;*

[...]



(c) to manage the State highway system, including planning, funding, design, supervision, construction, and maintenance and operations, in accordance with this Act and the Government Roding Powers Act 1989; [...]

The principles under which the NZ Transport Agency must operate are set out in section 96. Of specific relevance to the Project are those in subsection (1):

(1) In meeting its objective and undertaking its functions, the Agency must-

(a) exhibit a sense of social and environmental responsibility; and [...]

3.13.2 Government Roding Powers Act 1989

The GRPA grants the NZ Transport Agency certain powers in relation to the construction, operation and maintenance of State highways (including motorways).

3.13.2.1 State highways

Under section 61 of the GRPA, the NZ Transport Agency has the sole power of control for all purposes, including construction and maintenance, of all State highways. Section 103(1)(a) of the LTMA provides that the NZ Transport Agency may, with the consent of the Secretary (being the Chief Executive of the Ministry of Transport), by notice in the Gazette, declare a 'road' to be a State highway. It is proposed that all of the new areas of carriageway for SH1 and SH18 (including the new ramps) as well as the Northern Busway from Constellation Bus Station to Albany Bus Station will be declared State highway.

3.13.2.2 Power to exclude general traffic from the Busway

Section 61(3) of the GRPA provides that the NZ Transport Agency may, from time to time, by notice in the Gazette make bylaws with respect to any State highway in relation to certain matters. This power enables the NZ Transport Agency to make a bylaw to restrict the types of vehicles using the Northern Busway.

3.13.2.3 Motorways

Under section 71 of the GRPA the NZ Transport Agency may request that the Governor-General declare that a road, or land where a road will be constructed, to be a motorway. Motorway status provides particular restrictions on the use of and access to a road. For example, pedestrians are not permitted to walk on motorways, and horses cannot be ridden on motorways (sections 82 to 84 of the GRPA). It is proposed that the land added by the Project to SH1 and SH18 (NoRs1-3) will be declared motorway under section 71 of the GRPA.

3.13.3 Public Works Act 1981

The Public Works Act 1981 (PWA) enables land to be acquired, either by agreement or by the processes set out in the Act, for public works, including roads. It contains provisions for compensation for owners of land required for public works and for the disposal of land no longer required for a public work.

A notice of requirement for the designation of land (taking effect from the date the notice of requirement for the designation is lodged) and a designation of land also allows the owners of the land that is subject to the notice of requirement or designation to apply to the Environment Court for an order obliging the requiring authority to acquire all or part of the land, in particular circumstances (section 185 of the RMA).

As of 30 November 2016, the Crown has acquired approximately 1% of the land required for the Project (in addition to land already held by the Crown within the Project area).



3.13.4 Reserves Act 1977

The Reserves Act 1977 (RA) provides for the acquisition, preservation and management of areas for their conservation values or public recreational and education values.

Section 3(1) of the RA states that the purpose of the Act is:

- “(a) *providing, for the preservation and management for the benefit and enjoyment of the public, areas of New Zealand possessing-*
- (i) recreational use or potential, whether active or passive; or*
 - (ii) wildlife; or*
 - (iii) indigenous flora or fauna; or*
 - (iv) environmental and landscape amenity or interest; or*
 - (v) natural, scenic, historic, cultural, archaeological, biological, geological, scientific, educational, community, or other special features or values: [...]”*

The Project impacts on nine recreation reserves and one esplanade reserve as indicated in **Table 4**.

Under section 17(1) of the RA, the purpose of a recreational reserve is to provide areas for:

the recreation and sporting activities and the physical welfare and enjoyment of the public, and for the protection of the natural environment and beauty of the countryside, with emphasis on the retention of open spaces and on outdoor recreational activities, including recreational tracks in the countryside.

The impact of the Project on Rosedale South Reserve will alter its use to one that is inconsistent with its current recreation reserve classification under the RA. AC does not hold the power to change the purpose of the reserve, and therefore a process under section 24 of the RA must be followed. AC is required to notify the Commissioner (an officer designated by the Director-General for the purposes of the RA) in writing, stating the reasons why the classification or purpose of the whole or part of the reserve should be changed to another classification or purpose, or that the reservation of the whole or part of the land as a reserve should be revoked. The revocation of a reserve is required to be publicly notified unless exempt under sections 24(6) or 24(7), and disposal may only occur once the reserve status has been revoked in accordance with the Land Act 1948.

The Reserve Management Plan for Rosedale Park South is a live document, reflecting the changing needs of the park over time. A change to this plan, in accordance with the requirements of the RA, will be necessary once the reserve status is removed from the Rosedale South Reserve portion of the park.

Table 4 outlines the parks and reserve land where both temporary and permanent construction works will be carried out as part of the Project.

Table 4 Parks and Reserve Land affected for the Project

Reserve Name	Location	Legal Description	Owner	Legal Status
Tawa Reserve	Land west of the Greville Road interchange	Lot 153 DP 139731 Lot 151 DP 139732 Lot 152 DP 139732	AC	Recreation Reserve subject to the Reserves Act 1977
Arrenway Reserve	Between SH1 and Arrenway Drive	Lot 57 DP 177699, Lot 62 DP 181967	AC	Recreation Reserve subject to the Reserves Act 1977



Centorian Reserve	Adjacent to Holder Place	Lot 7 DP 191947	AC	Recreation Reserve subject to the Reserves Act 1977
Meadowood Reserve	South of SH18	Lot 360 DP 132246	AC	Recreation Reserve
Rosedale South Reserve	North of Upper Harbour Highway	Pt Lot 1 DP 98275	AC	Recreation Reserve
Constellation Park	North of Upper Harbour Highway	Pt Lot 1 DP 98275	AC	Recreation Reserve
Omega Reserve	Between SH18 and Paul Matthews Road	Lot 103 DP 183219	AC	Recreation Reserve (adjacent lots are Local Purpose Esplanade and Recreation Reserve) subject to the Reserves Act 1977
Alexandra Stream	South of SH18	Lot 302 DP 152320	AC	Esplanade Reserve
Rook Reserve	South of SH18	Lot 300 DP 152320,	AC	Recreation Reserve
Bluebird Reserve	Between SH18 and Bluebird Crescent	Lot 214 DP 197052 Lot 214 DP 212142	AC	Recreation Reserve subject to the Reserves Act 1977

3.13.5 Wildlife Act 1953

The Wildlife Act 1953 (WA) addresses the protection and control of wild animals and birds, and the management of game. Permits are necessary under the WA to deal with certain wildlife. The WA also provides protection to a small number of terrestrial invertebrates and marine species.

Part 1 of the WA addresses the protection of wildlife. It provides varying levels of protection to different species. Most native birds, reptiles, bats and frogs are protected under the Act. Some native and some introduced bird species have limited protection.

The potential effects of the Project on protected species are discussed in **Section 9** of this AEE. If required, an application will be made under the WA for an authority to relocate any protected species prior to the commencement of construction of the Project.

3.13.6 Fisheries Act 1983

The Freshwater Fisheries Regulations 1983 (FFR) are regulations made under the Fisheries Act 1983 (FA). Part 6 of the FFR relates to fish passage and applies to “every dam or diversion structure in any natural river, stream, or water”.

Under regulation 42(1):

no person shall construct any culvert or ford in any natural river, stream, or water in such a way that the passage of fish would be impeded, without the written approval of the Director-General incorporating such conditions as the Director-General thinks appropriate.

These regulations require that the approval of the Director-General of Conservation be obtained for culverts where the passage of fish will be impeded. The Director-General can either:

- Issue a dispensation from the requirement to provide fish passage; or
- Specify that fish passage be provided and maintained.



All culverts required for the Project, have been designed to ensure adequate fish passage is provided where it is necessary.

Approval from the Director-General under the FFR will be sought as required.

3.14 Statutory Acknowledgements

A statutory acknowledgement is a formal recognition by the Crown of a particular cultural, spiritual, historic and traditional associations that an Iwi has with a statutory area. The statutory acknowledgements provided under Treaty Settlement legislation for areas within Auckland are confirmed in the AUP at Appendix 21. While statutory acknowledgements within Auckland under the Ngāti Manuhiri Claims Settlement Act 2012 exist, none relate to the Project area. No other statutory acknowledgements relate to the Project area.



4 Existing Environment

4.1 Overview

This Section provides a description of the existing human, physical and natural aspects of the existing environment within which the Project will be constructed and operated. It draws on more detailed information that can be found in the Technical Assessments contained within **Volume 3**. The potential effects of the Project on this environment and any mitigation measures are detailed in **Sections 9 and 10** of this AEE.

4.2 Human Environment

Land use and settlement patterns, consented activities as well as resource use have been considered to provide an overview of the human environment in the wider Project area.

4.2.1 Land Use

The existing built environment within and surrounding the Project area is predominantly characterised by the existing transport corridor, adjacent business/commercial/industrial land uses and established residential neighbourhoods concentrated at Unsworth Heights to the immediate south of SH18 as well as the Pinehill and Fairview Heights areas adjacent SH1 undergoing residential development. This land use profile is evident in the aerial photograph provided in **Figure 9** below.

The Project area is reflective of the historic development of the North Shore in general. Agricultural development commenced in the late 19th century converting the bush covered landscape to paddocks with dispersed residential properties. The area continued to be rural in nature until relatively recently, with little development apart from the construction of the wastewater treatment facilities at Rosedale in the late 1950s and more recently motorway construction in the late 1990s. Since construction of the motorway, residential development and associated infrastructure has developed significantly adjacent to the corridor.

To the north, on the western side of SH1 is the Albany industrial estate which is still under development. It forms part of a wider mixed use development area containing the Albany Mega Shopping Centre and a Westfield. The area contains big box retail warehousing, and multi-storey buildings set in lots with car parking and landscaping.

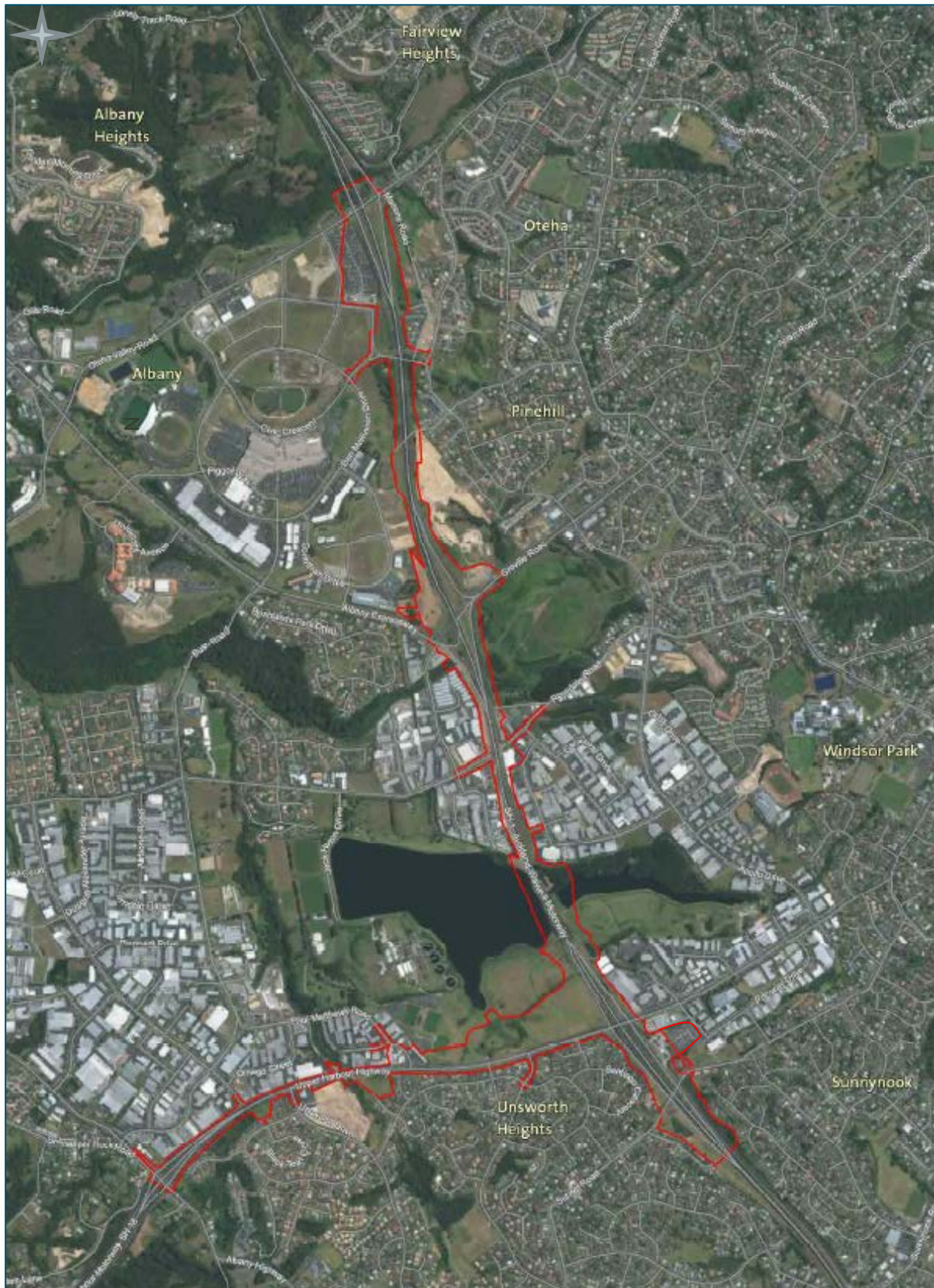
Of note is the proportion of commercial / industrial land use within the Project area. The North Harbour Business Park is located to the north of the UHH between Paul Matthews Road and the Albany Highway (North Harbour East). Another cluster is located along Constellation Drive/Apollo Way/Rosedale Road with a third block straddling Rosedale Road to the west of its intersection with SH1. These collectively are known as the North Harbour East area.

A network of open space is interspersed throughout the Project area with a number of key sporting facilities also present which are discussed further at **Section 4.2.5** below.

Notable land uses within the Project area include the Rosedale Closed Landfill located to the east of SH1 at Rosedale Road and the Rosedale Wastewater Treatment Plant (RWWTP) which straddles either side of SH1 above the UHH Interchange. These facilities are described in more detail at **Sections 4.2.10 and 4.2.11** below.



Figure 9 Built Environment within the Project Area



Source: Auckland Council GIS Viewer



A number of residential suburbs exist within the Project area including Albany Heights, Fairview Heights, Oteha Valley (Northcross), Pinehill, Fairview, Burnside and Fernhill (North Harbour East), Windsor Park, Unsworth Heights and Sunnynook. The residential areas within the southern section of the Study area are considered to be well-established suburban residential typically characterised by detached dwellings at low to medium densities. The newer residential areas to the north, are generally medium to low densities. The housing typology is mixed with a number of town house developments present. The majority of the residential land use is set back from the Project area along SH1 but the recent subdivision occurring at the western edge of the Pinehill/Fairview area will result in the uses abutting. Residential development at Unsworth Heights follows the UHH alignment.

The Census Area Units (CAUs) through which the Project traverses have a combined residential population as per the 2013 Census of 39,895 individuals. The Project area correlates to the Upper Harbour area which contains a significant business community. The number of businesses within this area has consistently grown by 5.2% in 2014 to 9,242 and grown by 58.0% in the past 10 years³.

4.2.2 Zoning and District Plan Features

The zoning adjacent the Project area is varied.

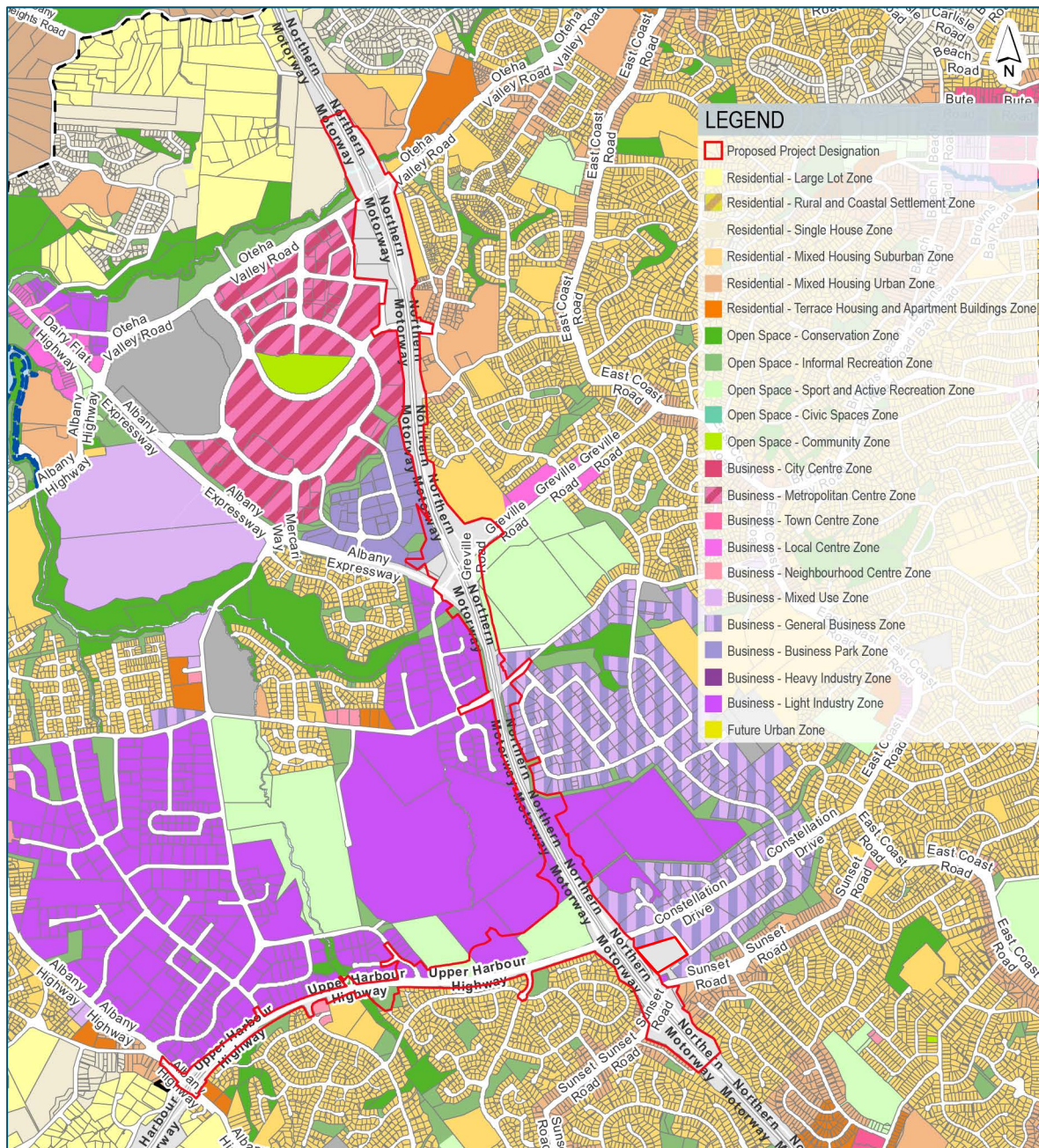
The majority of the land within the Project area is zoned for some form of business purposes under the AUP as illustrated in **Figure 10**. The bulk of the properties adjacent to the northern section of SH1 north of the UHH Interchange and SH18 have a light industrial zoning. The Albany Retail Precinct is zoned as a mixed use metropolitan centre.

Residential zoning is located to the south of the UHH Interchange and SH18 as well as to the east of the northern section of the Project area. The residential areas noted at **Section 4.2.1** are the subject of a variety of residential zones, which includes Special Housing Areas. Interspersed through these zones are areas of open space, the largest of which extends over the Rosedale Closed Landfill area situated between Greville Road and Rosedale Road.

³ Statistics on the economy in the Upper Harbour Local Board Area 2015, Auckland Council



Figure 10 Auckland Council Unitary Plan Zoning



Source: Auckland Unitary Plan (Operative in Part, 15 November 2016)

The Project area does not contain any items listed in the following sections of the AUP:

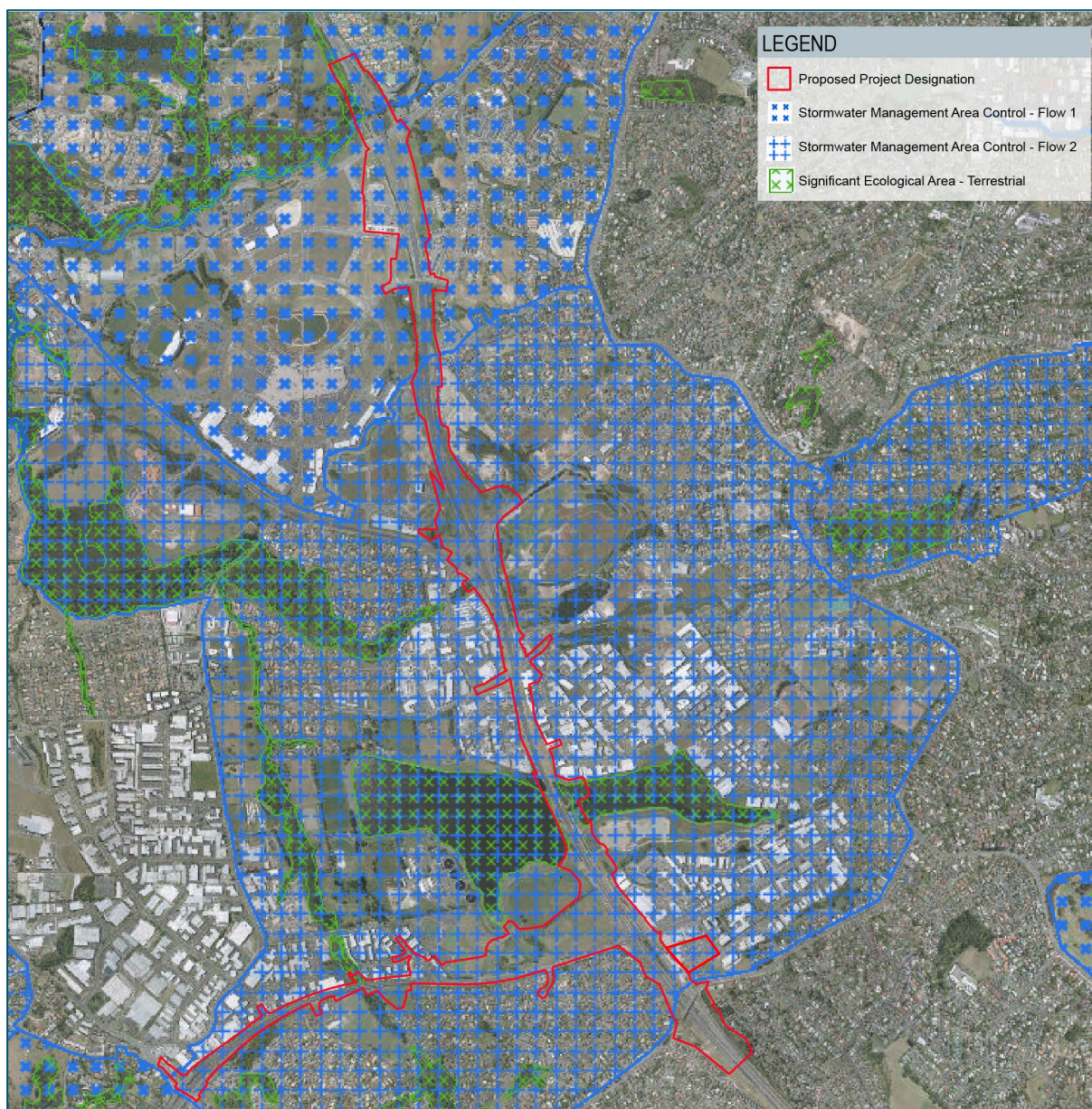
- Schedule 10 Notable Trees;
- Schedule 12 Sites and Places of Significance to Mana Whenua; and
- Schedule 14 Historic Heritage Schedule.

The entire Project area lies within a Stormwater Management Area control (SMAF) under the AUP and there are SEA overlays⁴ at Lucas Creek, to the east of Tawa Drive, to the north of Alexandra Stream and extending over both ponds at RWWTP (Figure 11).

⁴ Subject to appeals, see section 3.11 of this Report.



Figure 11 Auckland Council Unitary Plan Features and Overlays



Source: Auckland Unitary Plan (Operative in Part, 15 November 2016)

4.2.3 Consented Activities

Table 5 outlines the resource consents within the Project area that are currently unimplemented or pending a decision from AC at sites which lie in the immediate vicinity of the Project area. To the east of SH1 along Spencer Road, there is a consented subdivision which is in the process of development. The Metlifecare Greenwich Village facility located off of Barbados Drive is currently progressing the staged construction of the site.



Table 5 Consented Activities adjoining the Project Area

Address	Activity	Status
22 Colliston Rise, Pinehill	Proposed new dwelling	Unimplemented
2 Coxton Lane, Pinehill	Proposed new dwelling	Unimplemented
40 Masons Road, Oteha	Establish and operate a motor home park facility	Decision: 16/05/2014 Unimplemented
59 Corinthian Drive, Albany	Construction of a commercial building with office, warehouse and showroom components	Decision: 03/03/2015 Unimplemented
63 Corinthian Drive, Albany	Proposed construction of new warehouse/distribution buildings	Unimplemented

4.2.4 Community Services and Facilities

The Project area services not only the local community (including the residential suburbs of Sunnynook, Rosedale, Mairangi Bay, Murrays Bay, Rothesay Bay, Pinehill, Albany and Browns Bay) but also the wider Auckland region, particularly north and north-west Auckland (Helensville, Dairy Flat and Kaukapakapa).

There are a number of community services and other facilities within the vicinity of the Project area which act as attractions to the area, including:

- Albany Metropolitan Centre shopping and retail precinct;
- North Harbour (QBE) Stadium;
- Massey University's Albany Campus;
- Employment and economic activity in commercial and light industrial areas (North Harbour Industrial Area) between the Greville Road Interchange and the UHH Interchange;
- Constellation Drive retail area;
- NHHS; and
- Access to the East Coast Beach areas such as Mairangi Bay and Browns Bay.

There are a number of schools located within the vicinity of the Project area, many of which have catchment areas that straddle the boundary of the Project area, however none directly abut the alignment. There are many early childhood facilities within the vicinity of the Project area and within the Project area itself (but not within the proposed designation footprint).

4.2.5 Parks and Recreation

There are several parks and reserves adjacent to the main alignment of the Project, namely:

- Tawa Reserve (to the west of the Greville Road interchange), a grassed area with no facilities or formal access;
- Arrenway Reserve (between SH1 and Arrenway Reserve) a grassed area with no facilities or formal access;
- Centorian Reserve (adjacent to Holder Place) a grassed area with no facilities or formal access;
- Rosedale South Reserve (west of UHH interchange) a grassed area with no facilities or formal access;
- Constellation Reserve which accommodates the NHHS complex;
- Meadowood Reserve (south of SH18) which contains a play area, crèche and community centre;



- Alexandra Stream Reserve (south of SH18), an esplanade reserve with a pedestrian/cycle way;
- Omega Reserve (between SH18 and Paul Matthews Road), an esplanade reserve with a pedestrian/cycle way;
- Rook Reserve (south of SH18), a recreation reserve with grassed area, fitness equipment and pedestrian/cycle way; and
- Bluebird Reserve (between SH18 and Bluebird Crescent), contains a pocket park at its north-eastern extent which contains a play area and grassed area while the remainder is bush.

The NHHS facility is situated to the west of Constellation Reserve as part of Rosedale Park, to the north of the UHH. The facility consists of three hockey turfs, a clubhouse and ancillary buildings, car parking and football field.

Rosedale Park South is at the eastern end of Constellation Reserve. This land is not used for recreation purposes due to the unsuitable topography and access restrictions. It provides stock grazing and acts as a buffer between the Unsworth Heights residential area and the RWWTP. AC has long-term aspirations that the site be used for a future sports field development.

Rosedale Park North is home to the North Harbour Softball Association, the Albany United Football Club, a BMX facility, Rosedale Pony Club and a number of other recreational sports fields. This park also provides for informal recreation including walking and cycling.

From Rosedale Park North there is a corridor of reserves migrating south through the area each with different functions: Omega Reserve is a riparian esplanade reserve adjacent to Alexandra Stream, Rook Reserve is a pocket park providing passive recreation; and Unsworth Reserve consists of mainly native bush (conservation) in a gully-like setting which provides amenity and passive recreational value to the Unsworth Heights community. At the southern end of the Unsworth Reserve are sports fields.

There are many other parks and reserves scattered through the wider area. These are predominantly small neighbourhood parks with some larger parks and reserves located further west in Albany.

All reserves directly affected by the Project are Recreation Reserves under the RA. **Table 4** in **Section 3** provides further detail around these reserves, including their legal status.

4.2.6 Cultural Environment

The Iwi identified as having mana whenua over the Project area are Ngai Tai ki Tamaki, Ngāti Manuhiri, Ngāti Maru, Ngāti Paoa, Ngāti Te Ata Waiohua, Ngāti Whatua and Te Ākitai Waiohua. All have declared an interest in the Project, attending a site visit in May 2016 as well as a series of Project Hui (see **Section 8**). Ngāti Tamaoho and Te Kawerau a Maki have advised that the Project Area was outside their rohe. Ngai Tai Ki Tamaki, Ngāti Manuhiri and Te Ākitai Waiohua have provided Cultural Value Assessments (CVAs) which are attached as **Appendix F**.

The cultural values pertaining to the wider Project area and environment have been identified by mana whenua in these CVAs. Key concepts relating to cultural values are summarised as:

- Mauri** – All elements of the natural environment, including people, possess mauri (life force) and all forms of life are related. The interconnectedness of all things means that the wellbeing of any part of the environment will directly impact on the wellbeing of the people. The primary objective of Māori environmental management is to maintain the integrity of mauri and the interconnectedness of all forms of life.



Kaitiakitanga – Māori therefore, have an obligation to protect and enhance the mauri of all natural resources, for the benefit of themselves, other people living in their homeland and for future generations.

Ki uta, ki tai – The mauri of the waterways is also viewed holistically and includes from the source of the waterway (mountains, springs and wetlands) to the sea. This reinforces the view that activities upstream also impact on the well-being of the river downstream and aligns with the integrated management of catchments.

A longstanding relationship with the entire north east of Tamaki Makaurau and eastern Kaipara and its environs especially between Te Oneroa Kahu (Long Bay) and Ōteha (Albany) is identified. The wider Ōteha area was central along a major overland pathway between the east and west coast / Upper Waitemata. The western end of a portage route was Okahukura (Lucas Creek), the immediate receiving environment for the streams in the Ōteha catchment that discharges into the Upper Waitemata. As such, there is a cultural and spiritual association with the area.

4.2.7 Heritage Environment

There are no recorded or listed historic buildings or items within or immediately abutting the Project alignment. Additionally, there are no archaeological sites recorded in the Project area.

The closest recorded archaeological sites are two midden sites (R10/804 - CHI 11158 and R10/891-CHI 11242) found in Hooton Reserve and adjacent Lucas Creek. Neither of these sites are affected by the Project.

With regard to built heritage sites, there are three identified on AC’s Cultural Heritage Inventory (CHI) all of which are located at 40 Masons Road, Albany, being the premises of the North Shore Branch of the Vintage Car Club of New Zealand. The buildings are the former Takapuna Police Station (CHI 20118); the former Takapuna Jailhouse (CHI 20119) and historic villa (CHI 20120). These buildings were relocated to the site during the late 1990s and are not affected by the Project.

Further historic research and a field survey of the Project corridor by Clough & Associates has not identified any previously unrecorded archaeological remains, with the Project corridor generally found to have been significantly modified by previous urban development. The Assessment of Archaeological Effects (see **Technical Assessment 2**) provides a detailed description of the historical context and archaeological profile of the Project area.

4.2.8 Noise Environment

To confirm the existing noise environment both short and long duration surveys were undertaken in April and May 2016 in the vicinity of the Project area, including along local roads crossing SH1 and SH18. Measured and derived noise levels ranged from 60 to 68 dB L_{Aeq(24h)} (**Table 6**). These levels show the impact of the proximity of major roads in the area (SH1 and SH18) and their contribution to the existing noisy urban environment.

Table 6 Noise Level Survey Results

Item	Measured noise level	Derived noise level
Long duration measurements	dB L_{Aeq(24h)}	dB L_{Aeq(24h)}
14 Wren Place	61	n/a
49 Barbados Drive	61	n/a
21 Cabello Place	61	n/a
16 Lavender Garden Lane	60	n/a



Item	Measured noise level	Derived noise level
18/71 Spencer Road	60	n/a
Short duration measurements	dB L_{Aeq}(15min)	dB L_{Aeq}(24h)
112 Unsworth Drive (Medical Centre)	70	68
82 Bluebird Crescent	64	62
16 Saturn Place (Childcare Centre)	67	65
29 Arrenway Drive (businesses)	70	68
17 Tawa Drive (SH17)	65	63
80 Paul Matthews Road (Hockey)	68	66
Rook Place - Reserve	65	63

The majority of the dwellings between Oteha Valley and Greville Road are reasonably new and have been developed under the High Noise Route requirements of the legacy Auckland Council District Plan: North Shore Section (ACDP: NS), with some bunding and fencing installed between the residential development and the State highway. There is a new subdivision between Spencer Road and Greville Road which currently has no buildings on the lots. Building consent documentation for proposed dwellings has been lodged and has demonstrated that the dwellings will be built in accordance with the legacy ACDP: NS with mechanical ventilation included for habitable rooms facing the State highway.

4.2.9 Utilities

The following network utilities and service infrastructure are located in the Project area, some of which will need to be protected and/or relocated for the Project:

- Watercare (provider of regional water and wastewater services):
 - Existing Wairau Sewer (TS5) and East Coast Bays Branch Sewer (TS7) which are major lines leading to the Rosedale Wastewater Treatment Plant;
 - A section of 250dia. watermain on Rosedale Road; and
 - A 100dia watermain on Paul Matthews Road.
- Vector (distributor of electricity and gas);
 - Existing 11KV, 33KV and 110KV lines in multiple locations.
- Transpower (owner and operator of the National Grid);
 - Existing 220KV power lines (Constellation Drive to UHH and then through NHHS and RWWTP).
- Chorus NZ Ltd (telecommunications infrastructure provider); and
- Existing underground infrastructure in multiple locations.

The Project area also contains a number of other utilities such as local telecommunications and electrical supply infrastructure providing smaller connections. These utilities will be managed to maintain supply during Project construction.

4.2.10 Rosedale Closed Landfill

A land use of significance is the Rosedale Closed Landfill located on the eastern side of SH1 between Greville Road to the north, Hugh Green Drive to the east, and Rosedale Road to the south. Approximately 23ha of the 34.5ha site was used for refuse disposal. The top of the Rosedale Closed



Landfill is approximately 45m above SH1 and has a maximum depth of 28m. There is currently no public access to the site.

Prior to the establishment of the Rosedale Closed Landfill, the land was pasture with the Oteha Stream and several small tributaries flowing through the northern area of site. The stream and its tributaries were diverted when the Rosedale Closed Landfill was extended towards Greville Road.

The Rosedale Closed Landfill began accepting general refuse in the 1950s. It ceased operation in 2002 and is currently in its aftercare programme. Approximately 3.3 million tonnes of waste has been deposited into the Rosedale Closed Landfill. The capped surface is mainly grassed with some areas of established vegetation. Stormwater ponds are present at the eastern and western boundary of the site.

4.2.11 Rosedale Wastewater Treatment Plant

The RWWTP is operated by Watercare and the facility consists of the treatment plant buildings, treatment tanks and treatment ponds contained within a grassed buffer area. This is a significant land holding extending from Jack Hinton Drive in the west to Apollo Road in the east with the facility bisected by the SH1 causeway across the treatment ponds. The two ponds are connected by a weir and pipe system, with an additional bypass link. A vehicle link is also provided under SH1 linking both parts of the site. There is no public access to the facility.

The embankment over which SH1 travels was created at the same time as the treatment ponds in the early 1960s. The embankment partly acts as a large dam as it holds back water and failure could result in an uncontrolled release of water downstream. The western embankment of Pond 1 also acts as a dam.

Major upgrades to Pond 1 and the spillway system were undertaken between 1994 and 2000 with dam management systems improved. The RWWTP (including the Pond 1 dam) was re-consented in 2000 and 2001 (Project Rosedale). Several upgrades have continued from this project including stormwater management and storage improvements, UV treatment and a new outfall tunnel.

Stormwater from the surrounding catchments is prevented from entering the ponds by a series of open channels that run along the southern side of each pond and which discharge downstream of Pond 1.

4.3 Transport Environment

An overview of the existing transport environment including the State highway corridor, interchanges, bridges, the local road network, public transport, and walking and cycling infrastructure within the vicinity of the Project area is provided in the following sub section.

4.3.1 Existing State Highway Corridors

SH1 forms the key interregional link that traverses north-south through the Auckland region and throughout the Project area. SH1 is a six-lane motorway with three lanes in both directions north of the Oteha Valley Road Interchange. This reduces to two lanes north and south bound through the Interchange before returning to three lanes. SH1 then decreases to two lanes in either direction south of the Greville Road Interchange until the UHH Interchange, approximately 3.8 km south of the Oteha Valley Road Interchange. SH1 traverses through the RWWTP over a causeway with two lanes in either direction. Just to the north of the Sunset Road overbridge the north bound carriageway increases to three lanes.

To the west of the UHH Interchange, SH18 commences which is predominantly a four-lane (two west bound/ two east bound lanes) expressway for approximately 2 km through to the Albany Highway Interchange, where it becomes a motorway. There are two at-grade intersections with local roads, these being; Caribbean Drive and Paul Matthews Road. There is an at-grade west bound only slip



onto Unsworth Drive. SH18 reduces to a single lane in the westbound direction between Paul Matthews Road and Unsworth Drive. This link serves as a key intra-regional link from SH1 to West Auckland and the wider North Shore area whilst serving suburbs in between such as Greenhithe and Hobsonville Point.

4.3.2 Interchanges

The Oteha Valley Road Interchange is the northernmost interchange within the Project corridor. It serves the residential suburbs of Fairview Heights, Oteha, Northcross and Torbay to the east of the interchange in addition to the Albany metropolitan centre to the west. SH1 crosses Oteha Valley Road on an overbridge structure with both north and south bound on/off ramps provided.

Greville Road is the second major interchange and serves the residential communities of Browns Bay, Pinehill, Rothesay Bay and Murrays Bay to the east, and the Albany metropolitan centre to the west via the Albany Expressway. Again, SH1 traverses the local road on an overbridge structure. On/off ramps are provided for southbound traffic but only an off-ramp is in place for those travelling north.

The UHH Interchange is the intersection between SH1 and SH18. It includes both north-facing and south-facing ramps with signalised intersections at both the UHH and Constellation Drive ramps. It serves as the primary access to the Constellation Bus Station (including the park and ride) and the residential suburbs further east. To the west, it serves the residential suburb of Unsworth Heights and the North Harbour industrial area. Both north and south bound on/off ramps are provided to enter/ exit SH1 which crosses the UHH and Constellation Drive on an overbridge.

4.3.3 Bridges

There are in total six existing bridge structures within the Project area. These consist of local road over bridges and underpasses spanning SH1 and SH18.

Set out in **Table 7** below is a summary of the existing bridge structures as described from north to south.

Table 7 Bridge Structures in the Project corridor

Bridge Name	Bridge Detail
Oteha Valley Road Underpass	Oteha Valley Road passes beneath SH1 to provide access between the Albany metropolitan centre and the Oteha and Fairview communities. Footpaths are located in both directions under the bridge.
McClymonts Road Bridge	Two-lane road providing a connection over SH1 between the Albany metropolitan centre and the Pinehill and Oteha residential communities. There is a formalised footpath on the northern side of the bridge and an incomplete footpath along the southern side. Two span pre-stressed precast Double Hollow Core (DHC) bridge, supported on in-situ columns and piles at all supports, with Mechanically Stabilized Earth (MSE) small block infill abutment walls.
Greville Road Underpass	The arterial four-lane connection between Greville Road and the Albany Expressway crosses beneath SH1 interchange with a footpath located along the northern length of the underpass. Three span bridge consisting of pre-stressed U-shape precast girders with a 180-200mm thick deck, supported on in-situ piers and piled spill through abutments.
Rosedale Road Underpass	The underpass is a two-lane local road connecting the Rosedale business area to the North Harbour industrial area to the west. Footpaths and cycle lanes are provided in both directions. Single span pre-stressed precast DHC bridge with MSE block abutment walls and a shallow pad abutment foundation.



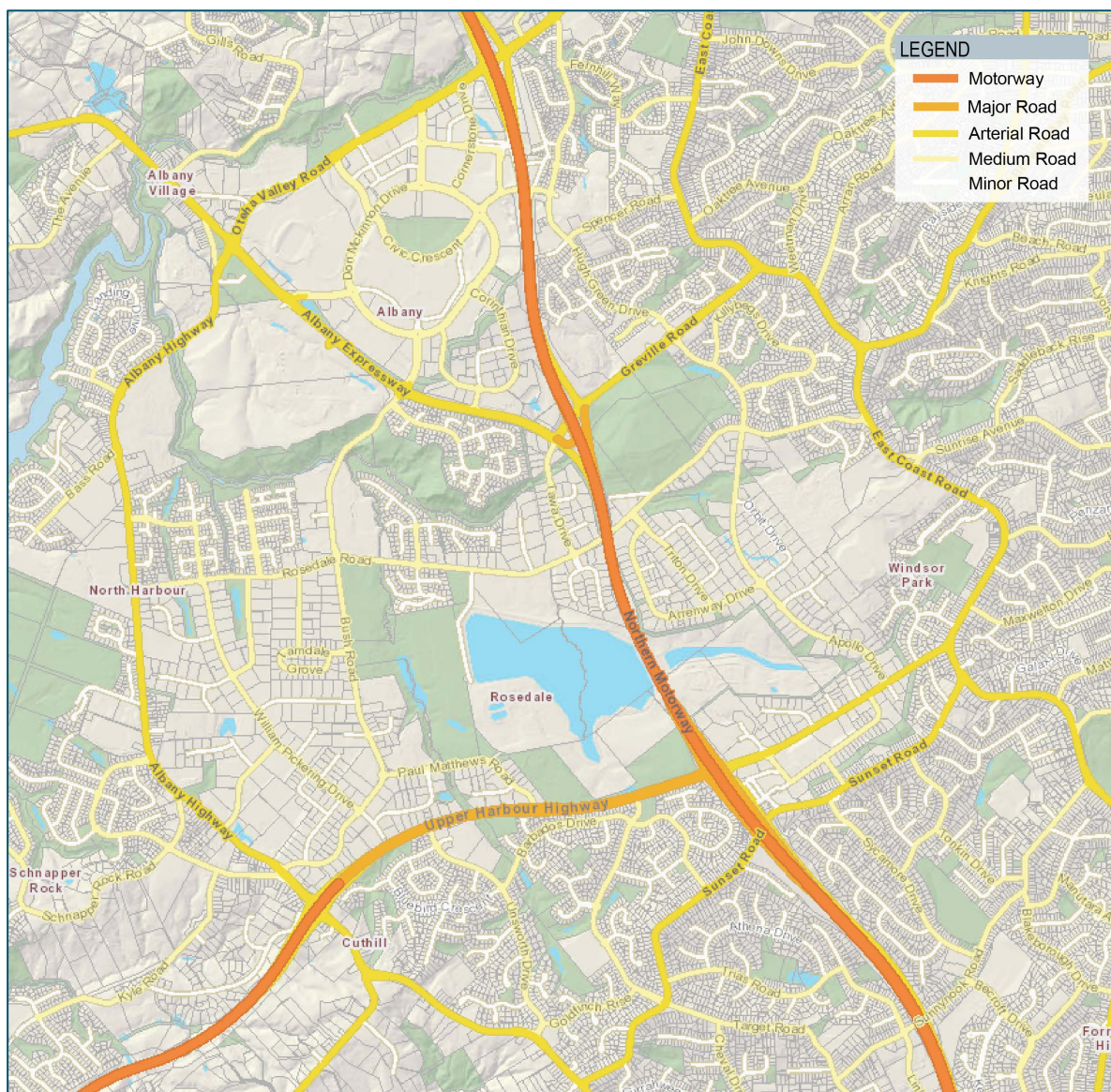
<p>Constellation Drive bridge (SH1 over)</p>	<p>SH1 crosses over above the intersection of Constellation Drive and SH18. Traffic signals and a pedestrian link are located beneath the bridge.</p> <p>Two span pre-stressed precast DHC bridge with in-situ piers and soldier pile and panel abutment walls.</p>
<p>Alexandra Stream Pedestrian Underpass</p>	<p>A pedestrian / cycleway underpass providing north/south connectivity from Unsworth Heights.</p> <p>Armco corrugated circular steel culvert with an infill concrete floor slab for pedestrians. Culvert has been previously repaired by means of an inner steel culvert with reinforced concrete between the outer and inner culvert “skins”</p>

4.3.4 Local Road Network

AT administers the local roads within the Project area. All local roads connect with SH1 via an interchange. There are several local road bridges, underpasses and intersections that continue the local road network (predominantly arterial) across SH1 and SH18 within the Project area (see **Figure 12** below and as described in detail in the Assessment of Transport Effects provided at **Technical Assessment 12**).



Figure 12 Road network within the Project Area



Source: Auckland Council GIS Viewer, 2016

The key arterial roads as shown on **Figure 12** form a loop around the Project area with connections via secondary arterials. The key primary arterial roads near the Project include Greville Road, Albany Highway, East Coast Road and Sunset Road. Secondary arterial routes include Oteha Valley Road, Albany Expressway and Constellation Drive.

4.3.5 Public Transport Network

The Northern Busway currently begins at the Auckland Harbour Bridge and terminates just south of the Constellation Bus Station. The Busway is situated along the eastern length of SH1 (Northern Motorway) and includes five existing stations. Albany Bus Station is not currently serviced by the Busway, however there is a high demand for the park and ride facility located adjacent to the Albany metropolitan centre to the west of SH1. Bus services are required to re-enter the general traffic on SH1 in order to travel between the Constellation Bus Station and Albany Bus Station. In addition, bus services travel east-west along Constellation Drive and SH18 to Paul Matthews Road.



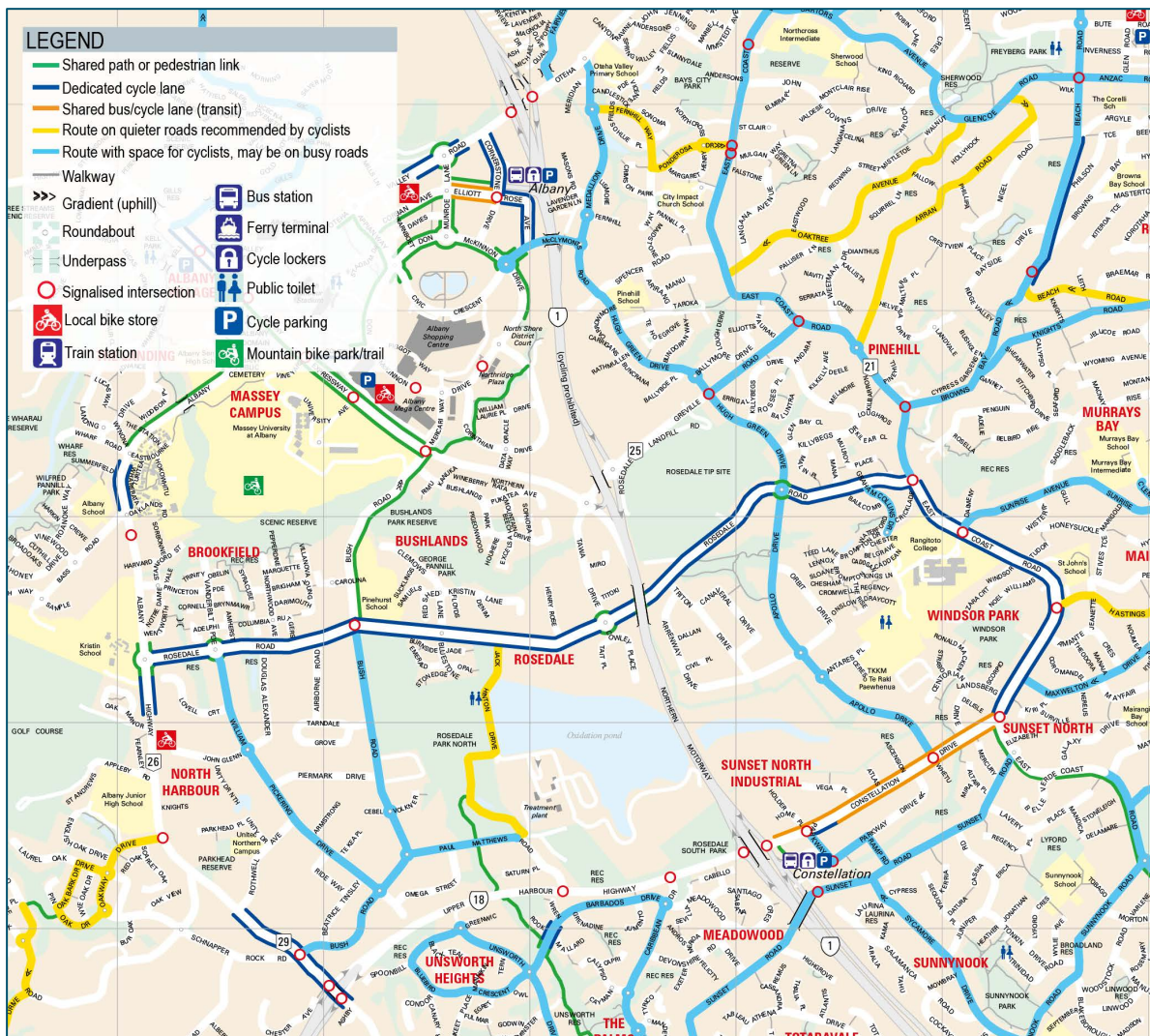
4.3.6 Walking and Cycling Accessibility

The majority of local road connections (as described above) that cross the State highway corridor provide for pedestrian access, however, very few of these are continuous in both directions without the interruption of traffic signals or with appropriate measures to prioritise pedestrians.

The existing cycleways present significant gaps that prevent cyclists from having a well-connected and continuous route. Cyclists often have no safe facilities in the most challenging locations such as intersections and interchanges along the State highway corridor.

Both the UHH and Greville Road interchanges form part of the existing or proposed Regional Cycle Network (**Figure 13**). There are currently no dedicated facilities at the UHH Interchange for cyclists which has resulted in the creation of a dangerous environment which discourages active transport modes. A footpath connects from Constellation Drive through the UHH Interchange to Caribbean Drive however, the facilities are not continued further west along SH18, nor is there a pedestrian or cyclist connection between the Constellation Bus Station and the North Harbour Business Park or the NHHS.

Figure 13 North Auckland Cycle Network



Source: Auckland Transport Northern Cycle Map



4.4 Physical Environment

The existing physical environment is described by reference to the topography, landscape, geology and hydrogeology of the Project area and the surrounding vicinity.

4.4.1 Topography and landscape

The Project area is generally characterised as being contained within two valleys, the Oteha Valley and the Albany Valley. Oteha Valley is located between the Oteha escarpment to the north of the Project area and the Albany Ridge traced by Spencer Road. The Albany Valley is located between Spencer Road and the Sunset Road ridge to the south of the UHH Interchange. East Coast Road, to the east of the Project area, occupies a prominent ridgeline which runs north to south.

The landscape within and surrounding the Project area is predominantly built up with several notable landscape characteristics in the surrounding context. These include; the vegetation along the Oteha Escarpment to the north of the Project area, the large trees within the Albany Scenic Reserve, the Rosedale Closed Landfill, the RWWTP ponds and an associated stand of large pine trees adjacent to Constellation Drive.

There is a variety of vegetation within and surrounding the Project area which occupies parks, reserves, road reserves and private properties. The most notable vegetation includes the grassed areas at the Rosedale South Park, the Rosedale Closed Landfill, the indigenous forest at Pigeonwood Reserve, the Burnside Escarpment, the Days Bridge Esplanade Reserve and the Manuka/Kanuka forest along the northern slopes of Oteha Valley.

4.4.2 Geology

The Project area is located within the Albany Basin with an overall gently undulating terrain, surrounded by a series of ridges and spurs. Residually weathered soils of the Waitemata Group are found across the project area as silty clays, sandy silts and clayey silts. As well major depressions and watercourse valleys contain alluvial deposits, the most recent of which consist of organic silty clay with gravel occurring at the bases of streams and watercourses. Engineered fills are also present throughout the project area, mainly in embankments, although they may also occur in other landscaping features.

The main soil types are impeded allophanic (characterised by generally stable topsoils) at the very northern part of the project area with ultic soils (characterized by clayey subsoils with low permeability) dominating through the central part of the alignment and along the UHH.

4.4.3 Hydrogeology

4.4.3.1 Groundwater

There are no known aquifers located within the Project area. Groundwater is deepest below topographically higher standing ridges such as Sunset Road in the southern end of the Project area, with shallower groundwater levels in low lying areas. The groundwater levels in the Waitemata Group soils near the ponds at the RWWTP are influenced by the standing water levels within the treatment ponds.

4.4.3.2 Catchments

The Project area falls within the Oteha Valley Stream and Lucas Creek catchments. The catchment area of the Oteha Valley catchment is approximately 1,310ha to the confluence of Lucas Creek (approximately 4km downstream of SH1). The catchment (**Figure 14**) includes the RWWTP, Massey University campus, Rosedale Closed Landfill, as well as residential and commercial land uses.

The Lucas Creek catchment (**Figure 14**) is approximately 625ha to the confluence with Oteha Valley Stream (some 2.5km downstream of SH1). The upstream catchment land uses are mostly residential,



and downstream of the SH1 crossing, the catchment is a mix of rural and residential uses, and also contains the Massey University campus and Albany Bus Station.

Figure 14 Oteha Valley and Lucas Creek Catchment Plan



There are several locations within the Project area that have been identified as having existing flood risk. The locations are identified in **Figure 15** and detailed in **Table 8**.



Figure 15 Existing flood prone locations within Project Area

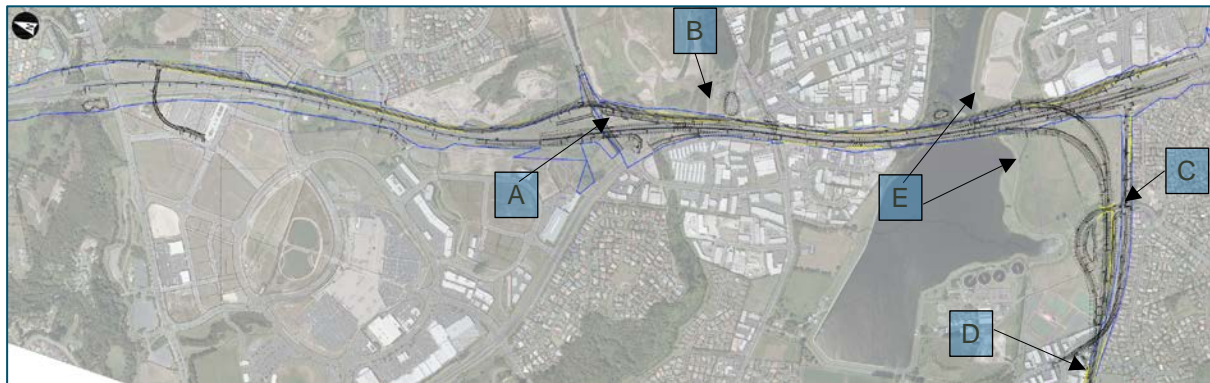


Table 8 Details of flood risk areas within Project Area

Figure Label	Flood risk area
A	SH1 Greville Road Interchange – flooding on local Road under motorway
B	SH1 Rosedale Road - flood plain adjacent to motorway
C	SH18 – Caribbean Drive Intersection
D	SH18 – major overland flow path parallel to eastbound carriageway
E	Overflow to RWWTP

A detailed description of the existing stormwater infrastructure and level of treatment currently applied to SH1 and SH18 is set out in the Assessment of Stormwater Management provided in **Technical Assessment 11**.

4.5 Natural Environment

The terrestrial and freshwater environment has been assessed in order to understand the existing environmental baseline for the natural environment within the Project area. There are no areas identified within the Project area as having an Outstanding Natural Landscape or Outstanding Natural Feature overlay within the AUP. There are four SEA identified by the AUP within the Project area. These are located at Lucas Creek, the RWWTP ponds and Alexandra Stream. Overall, the botanical and aquatic ecological values of the environments within the Project area are considered to be of a low value, with moderate value environments being those unmodified by the existing State highway corridor and adjacent developments.

Bioresearches Limited has carried out both freshwater and terrestrial assessments of the Project area and a more detailed description of the existing freshwater and terrestrial environment of the Project area is contained within the Assessment of Freshwater Ecology Effects and the Assessment of Terrestrial Ecological Effects (see **Technical Assessments 5** and **13** respectively).

4.5.1 Freshwater environment

The freshwater habitats within the Project area comprise Lucas Creek, Alexandra Stream, Oteha Stream, the tributaries of Lucas Creek, Oteha Stream and Alexander Stream, and existing AC and NZ Transport Agency stormwater ponds. All watercourses flow north and west to Lucas Creek to discharge to the Upper Waitemata Harbour near Albany Village.



4.5.1.1 Lucas Creek and tributaries

Lucas Creek flows beneath and traverses SH1 immediately north of Oteha Valley Road. The creek at this location is in a highly shaded, natural channel with steeply incised, near vertical banks. It averages 3.5m wide (maximum 8.3m) and 0.3m deep (maximum 0.81m).

Survey results of this part of Lucas Creek indicate that the macroinvertebrates present are dominated by the freshwater snail (*Potamopyrgus antipodarum*) and the sandfly larvae (*Austrosimulium*). Crans bully (*Gobiomorphus breviceps*) and shortfin eel (*Anguilla australis*) were the only native fish recorded. Freshwater crayfish (*Paranephrops planifrons*; *koura*) and exotic mosquito fish (*Gambusia affinis*) were also present.

A search of the New Zealand freshwater fish database for Lucas Creek returned fish records for four additional native fish, longfin eel (*Anguilla dieffenbachii*), banded kokopu (*Galaxias fasciatus*), common bully (*Gobiomorphus cotidianus*), redfin bully (*Gobiomorphus huttoni*); and for the freshwater mussel (*Hyridella menziesi*).

Site visits revealed that the quality of native galaxiidae spawning habitat was poor. Although shading was high, the banks were near vertical and there were no flatter stream banks with low growing vegetation necessary for spawning. The riparian vegetation further east is sparse and fragmented.

A small tributary to Lucas Creek drains the catchment north and west of the Oteha Valley Road northern on-ramp to SH1 to an adjacent stormwater pond. The watercourse follows a narrow run with shallow pools and averaged 0.5m wide (maximum 1.1m) and 0.08m deep. The stream has moderate freshwater ecological values due to its largely natural state and the presence of a variety of substrates for macroinvertebrates, good shading and regenerating bush.

4.5.1.2 Oteha Stream and tributaries

The northern tributary of Oteha Stream within the Project area flows from north to south for approximately 90m from an upstream culvert to a second culvert before running under the Albany Expressway and discharging to Oteha Stream. It forms a natural channel with steeply incised, near vertical banks with no connection with the floodplain. A very low number of macroinvertebrates were found and these were dominated by midges (*Chironomids*) along with some freshwater snails and springtails (*Collembola*). The overall habitat had a low Macroinvertebrate Community Index (MCI) score and a poor Semi-Quantitative MCI (SQMCI) ranking. Shortfin eel was the only native fish recorded and the quality of native galaxiidae spawning habitat is poor.

A short reach of the upper most open section of Oteha Stream is located within Tawa Reserve. The banks have been stabilised with large rocks and were covered in a mix of weed species. The stormwater ponds at the Greville Road intersection and upper Greville Road catchment drain to the Oteha Stream via a large (3000mm diameter) stormwater culvert. The water discharges to the stream over a culvert apron to bedrock. The stream bed is exposed bedrock without macrophytes, and has little cover for fish or substrate suitable for macroinvertebrates. The aquatic ecological values of the part of Oteha Stream located within the Project area are low.

4.5.1.3 Alexandra Stream and tributaries

Alexandra Stream drains south to north to a culvert under the UHH.

The southern arm averages 2m wide and 0.3m deep and forms a well shaded, natural channel with sloping banks. There are a variety of favourable aquatic habitats present including woody debris, riffles, undercut banks, root mats and other stable habitats. Macroinvertebrates identified from the stream survey are dominated by the freshwater snail (*Potamopyrgus antipodarum*) and dragonfly larvae (*Xanthocnemis zelandica*). However, the overall habitat has a low MCI score. Crans bully and shortfin eel were the only native fish recorded. No koura or other larger invertebrates were found in the creek, but the exotic mosquito fish was present. A search of the New Zealand freshwater fish



database for Alexandra Stream returned fish records for four additional native fish; longfin eel, banded kokopu, common bully, and redfin bully. The quality of native galaxiidae spawning habitat is low.

The northern arm of the Alexandra Stream drains south to north from the SH18 culvert to a culvert under Paul Matthews Drive. It averages 1.9m wide and 0.3m deep and forms a well shaded, natural channel with sloping banks. Macroinvertebrates identified from the stream survey are dominated by the freshwater snail and dragonfly larvae. Longfin eel, shortfin eel and crans bully were recorded from this northern reach with slightly elevated levels of longfin eel in comparison to other Auckland streams.

A section of tributary to the Alexandra Stream flows through Bluebird Reserve from west to east and forms a boggy watercourse at the base of a series of culverts adjacent SH18. Although recent riparian planting has been carried out the stream area has been highly modified with straightening of the watercourse, a series of gabion basket weirs, and culverts with concrete energy dissipation zones. The overall value of the aquatic habitat within the Alexandra Stream tributary is low.

4.5.1.4 Rosedale Wastewater Treatment Plant

There are a number of drains and watercourses within the RWWTP site that form part of its stormwater system.

South of Arrenway Reserve lies an open section of drain and a stormwater system collects water from the south and drains north to a large culvert that discharges west (under SH1) and north to Oteha Stream. The stormwater drain is lined with concrete and is 0.9m wide. Shortfin eel were noted in the drain during the survey.

The stormwater system is a narrow, open concrete lined channel draining generally east to west adjacent to the southern banks of Pond 2, then draining via culverts and open drains north and west to Oteha Stream. There is no effective shading on the drain and no quality habitat for aquatic fauna.

A stormwater pond approximately 73m by 25m is located adjacent to the UHH off ramp south, near Centurion Reserve. It discharges via a culvert under SH18 to drain overland via a wetland-like area to a stormwater drain on the southern edge of Pond 1. Survey results confirm the presence of shortfin eel and mosquito fish only.

Immediately north of the UHH in line with Caribbean Drive (and south of Pond 1), are a series of watercourse and stormwater drains. Despite its highly modified condition, the watercourse to the west of the Caribbean Drive intersection is considered to be an 'intermittent stream' under the AUP and is potentially permanent in some places. The watercourses in this area are highly modified and are confined to a concrete lined open drain, 1m wide with 0.4m concrete block sides. Survey results confirm the presence of shortfin eel and mosquito fish only.

Pond 1 and Pond 2 form part of the RWWTP treatment system, with Pond 1 being the main settlement pond. Their aquatic ecological values are low.

Overall the freshwater aquatic values of this area are low to very low.

4.5.1.5 Stormwater Ponds

Two stormwater ponds (SWP1 - east) and (SWP2 - west) are located north of Oteha Valley Road with both divided into two by a central bund. SWP 1 covers an area approximately 43m by 13m and SWP 2 is approximately 75m by 12m. Survey work confirms the presence of Shortfin eel in these ponds. The aquatic ecological values of these ponds are considered to be low.

A stormwater pond approximately 30m by 18m is located adjacent to the SH1 southbound below Masons Road and Lavender Garden Lane. It discharges over a weir to a small wetland that drains via a culvert under SH1 towards Lucas Creek. Survey work indicates the presence of shortfin eel and adult banded kokopu.



The stormwater pond adjacent 35 Corinthian Drive of dimensions 72m by 29m, is noted to contain shortfin eel and late stage tadpoles.

A large stormwater pond approximately 86m by 30m is located in the Rosedale Closed Landfill adjacent to Greville Road and the Greville Road on-ramp southbound. It discharges to a culvert under SH18 that drains to Oteha Stream. Survey of this pond confirmed the presence of introduced green and golden bell frogs (*Litoria aurea*) only.

A stormwater pond is located within the round-a-bout formed by the Greville Road on-ramp north and a second stormwater pond is located immediately south of the on-ramp north. Both ponds drain to the Oteha Stream via a 3000mm diameter culvert. No fish or frogs were noted in either pond.

The stormwater pond in Omega Reserve, adjacent to Alexandra Stream is approximately 56m by 27m and its survey confirmed the presence of shortfin eel.

Overall, the aquatic ecological values of these stormwater ponds are low.

4.5.2 Terrestrial environment

4.5.2.1 Vegetation and Flora

Vegetation within the Project area contains a mixture of exotic and native species typical of residential areas and transport environments. As the existing environment is characterised by an urban setting, ecological values are generally low.

The areas affected by the Project that are identified within the SEA overlay in the AUP are shown in **Figure 16**.

A SEA occupies the steep south-facing scarp above Lucas Creek and part of this SEA extends along the western side of the northbound on-ramp at the Oteha Valley Road (SEA_T_8297). There is a considerable amount of native vegetation⁵ surrounding SH1 in this area, including regenerating podocarp broadleaved forest. In general the riparian vegetation along Lucas Creek is of good quality with moderate to high botanical values while the SEA vegetation further up the slope is weedier with a significant component of exotic trees and moderate to low botanical values.

There is little vegetation of note on the southern side of Oteha Valley Road at either side of SH1, and that present is predominantly located on the western side of the motorway comprising isolated strip planting shrubs and trees such as cabbage trees (*Cordyline australis*), kanuka, karo (*Pittosporum crassifolium*), flax, lacebark, karamu, kohuhu, oioi and carex species. The botanical values are considered to be very low.

Between McClymonts Road and Rosedale Road, there is little vegetation of note. Wattles, gorse (*Ulex europaeus*), and macrocarpa (*Cupressus macrocarpa*) are located on the corner of McClymonts Road and the southbound SH1 on-ramp. There is also standard motorway revegetation on both sides of the on-ramp as well as a group of eucalypts (*Eucalyptus sp.*).

The Greville Road Interchange area contains mixed exotic and native vegetation with restoration planting surrounding the existing stormwater pond. The eastern end of Tawa Reserve adjacent the Greville Road Interchange consists of young revegetation planting (kanuka, cabbage trees, kohuhu, flax and karamu) and is weedy in character.

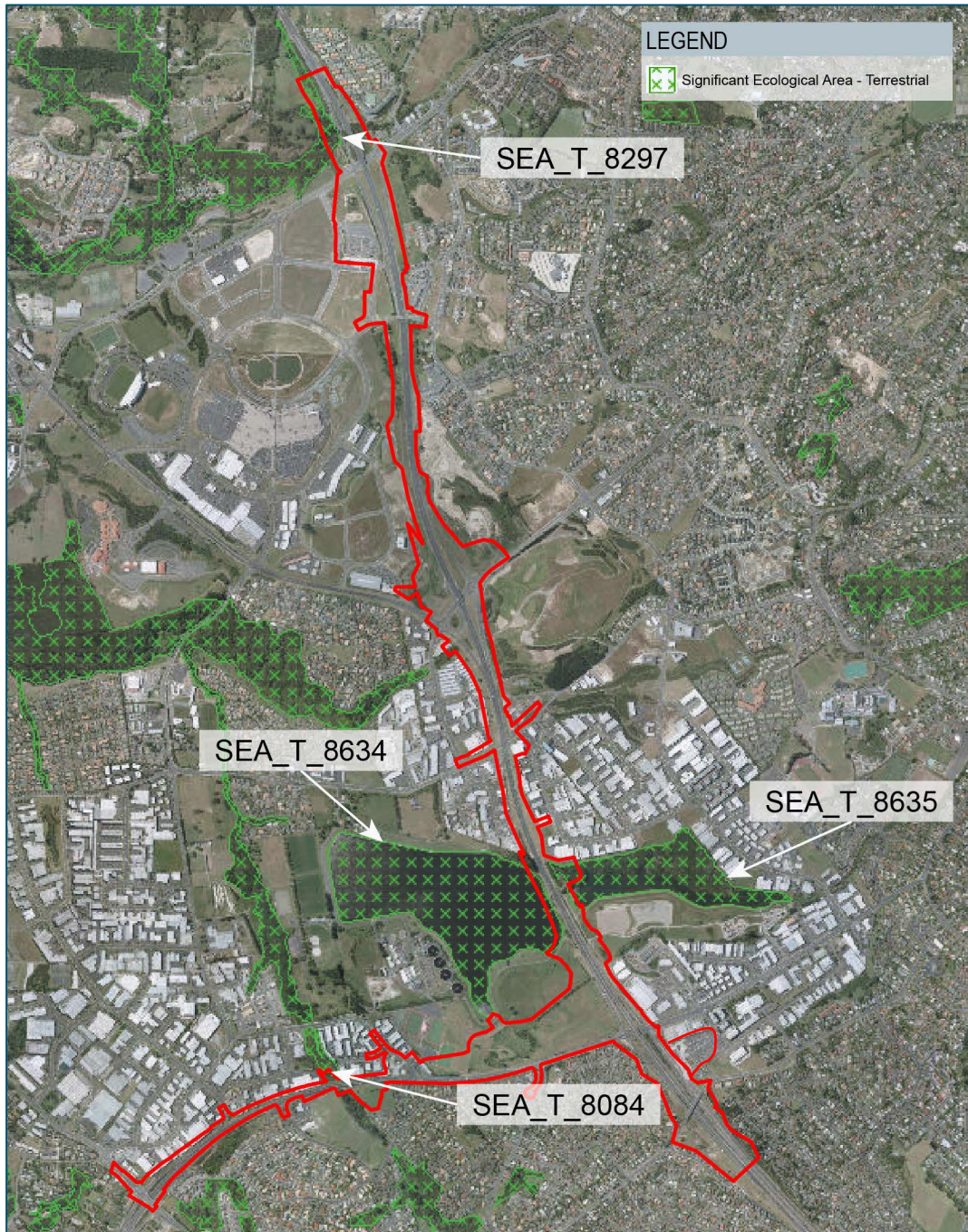
Vegetation within the extent of the Rosedale Closed Landfill within the Project area consists of some small eucalypts, various wattle species, karamu, cabbage trees, flax, manuka, ngaio (*Myoporum*

⁵ E.g: tall kanuka (*Kunzea robusta*), tanekaha (*Phyllocladus trichomanoides*), rewarewa (*Knightia excelsa*) and kahikatea (*Dacrycarpus dacrydioides*) over an understorey of silver tree fern (*Cyathea dealbata*), pate (*Schefflera digitata*), mapou (*Myrsine australis*), mahoe (*Meliclytus ramiflorus*) and karamu (*Coprosma robusta*)



laetum) and Tasmanian black wood with some pohutukawa also present. The Gas Plant has privet and bamboo at the western near SH1 and a stand of mature, mainly exotic trees to the east opposite the refuse transfer station. All of these areas have low to very low botanical values.

Figure 16 SEA overlay across the Project Area



Source: Auckland Unitary Plan (Operative in part 15 November 2016)



With respect to the Project area between Rosedale Road and Constellation Drive, there is minimal vegetation (grass and isolated exotics) on the eastern side of SH1. The botanical value of vegetation adjacent the Project within the RWWTP is low and consists of the following:

- North-east of Pond 2- radiata pines and open grassland with young revegetation planting consisting mainly of kanuka abutting SH1;
- South-east of Pond 2 - mainly open grassland with sparsely planted native trees (kahikatea, puriri, kowhai, titoki and kanuka) including flax and cabbage trees in wetter areas. A hedge/ shelterbelt of tall ngaio (c. 10m), pohutukawa and puriri runs east north east to SH1; and
- North-west of Pond 1 - a stand of pines, eucalypts and other exotic trees opposite to the Arrenway Reserve and an area of eucalypts and pines sweet gum with an understorey of karamu, lacebark, karo, houpara and young puriri to the north of the commercial area in Holder Place.

A number of reserves straddle SH18 (Omega Reserve, Rook Reserve and Bluebird Reserve) and are typical of urban reserves that have received native restoration planting. Omega Reserve is an SEA (SEA_T_8084). All have some botanical values, however these are generally low.

4.5.2.2 Fauna

A desktop analysis indicated the presence of nine sites within and immediately adjacent the Project area that could support potential lizard habitat. SEA_T_8297 is the most valuable with historic reporting indicating the presence of copper skink, ornate skink, forest gecko, green gecko and pacific gecko. Bluebird Reserve off SH18 supports an area of dense tree ferns which provide retreat sites for ground dwelling skinks and geckos with the overall habitat quality of this area assessed as low. The remaining areas (Albany Expressway Scrub, Tawa Reserve, RWWTP Ponds 1 and 2, Rook Reserve and Omega Reserve) typically have sparse understorey vegetation and areas of bare ground and are of marginal habitat quality. No native lizards were recorded from either habitat searches or funnel traps.

The RWWTP has habitat suitable to support a bat population (threatened long-tailed bat - *Chalinolobus tuberculatus*), being the tall pine trees on the northern bank to Pond 2. A bat survey was conducted with no bats recorded over the survey period nor was there evidence of previous occupation in the area. It is unlikely that bats use any of the environment within the Project area, even on an intermittent basis.

The vegetated and undeveloped areas along the Project area have the potential to support avifauna. The RWWTP ponds provide habitat for a wide range of species including New Zealand dabchick- *Poliocephalus rufopectus*; weweia (an 'At Risk' and 'Threatened' species) black swan, mallard/grey duck hybrids, paradise shelduck, Canada goose and pied stilt and are utilized for breeding. A relatively large population of birds is typically present, especially when numbers of Canada goose are high. The population has acclimatised to industrial activities at the RWWTP, farming activities and motorway works and operation, together with overflights of helicopters using the adjacent Helitrans heliport.

While New Zealand dotterel (*Charadrius obscurus*) generally roost and nest in open coastal areas (sandy beaches and shell banks), they are known to breed inland on open, short grass areas. The vacant land around the Albany commercial block is one such area.

Results of the avifauna survey carried out in the Project area, identified a total of 22 species, comprising 13 native species. With the exception of the New Zealand dabchick, none of the species recorded are classed as 'At Risk' or 'Threatened'. The areas of SEA_T_8297, Rook Reserve, Omega Reserve and Bluebird Reserve host both an introduced and native bird population including fantail (*Rhipidura fuliginosa placabilis*; *piwakawaka*), Silvereve (*Zosterops lateralis lateralis*) and Tui (*Prosthemadera novaeseelandiae*). Kereru (*Hemiphaga novaeseelandiae*) were noted at SEA_T_8297.



5 Project Description

5.1 Project Description Overview

The Project is intended to increase the capacity and enhance the safety and efficiency of the section of SH1 between Oteha Valley Road and Constellation Drive. SH18 will be upgraded to full motorway standard from the Albany Highway interchange to SH1, with a motorway to motorway connection to SH1 (north facing SH1 – SH18 ramps only).

The proposed changes to SH1 can be generally described as the widening of the mainline carriageway to include extra general traffic lanes in each direction, the provision of a new dual direction busway adjacent to the southbound carriageway shoulder of the Motorway, and the provision of a new off-road shared-use pedestrian/cycle way adjacent to the southbound carriageway of the Northern busway extension (see General Arrangements Plans 0201-0206 in **Volume 5**).

With respect to SH18, the proposal can be generally described as a separation of the motorway from the local roads with the reconfiguration of the section between the Albany Highway interchange and SH1 to provide two lanes in either direction; dedicated ramp connections to/from SH1 to the north (i.e. from SH1 southbound to SH18 westbound, and SH18 eastbound to SH1 northbound), direct connection of Paul Matthews Road to UHH, local road intersection improvements and the provision of a new off-road shared-use pedestrian/cycle way initially tracking from Albany Highway along SH18 and up the length of SH1 to Oteha Valley Road. Connections to the shared path from local roads will be provided throughout the Project alignment (see General Arrangement Plans 0206 – 0210 in **Volume 5**).

The Design and Constructability Report providing a more detailed explanation of the Project components is attached at **Technical Assessment 15**.

The Project has been designed to a level of detail which enables assessment of its effects. However, detailed design will not take place until a contractor is appointed, and outline plans of works will be submitted prior to construction. Therefore, many aspects of the Project are described at a broad scale or 'worst case'. Feasible and realistic construction methods and programmes have been developed in order to assess effects, but these are indicative only and the appointed contractor may develop an alternative methodology (provided this complies with relevant designation and resource consent conditions).

To accommodate the Project works it is necessary to alter existing designations and also provide for new designations as described at **Section 3.4** above. The designation footprints will be altered to reflect the works shown on the General Arrangements Plans 0201-0210 in **Volume 5**. These works include:

- An increase in the overall width of the existing SH1 designations (6750 and 6751) to accommodate interchange improvements, local road connections, stormwater management, retaining structures and construction areas;
- An increase in the overall width of the SH18 designation (6756) to accommodate the Paul Matthews Road Interchange, SUP, stormwater management, retaining structures and construction areas;
- An extension to the SH18 designation (6756) to meet the western extent of the SH1 designation (6750) and accommodate the new ramps linking SH18 to SH1, associated stormwater management, retaining structures and construction areas;



- Provision of a new designation of approximately 3.5km for the Northern Busway extension from the current northern terminus at Constellation Drive (Designation 6757) north to Albany Bus Station (AT Designation 1421);
- Provision of a new designation for a shared use path along SH1 of approximately 3.9km; and
- Alteration the Constellation Bus Station designation (6758) to provide for an upgraded station design.

5.2 Improvements to existing SH1 Motorway

A large extent of the proposed improvements will be located within the existing SH1 designation, however the designation also requires alterations to accommodate the full extent of these changes (see **Section 5.10**). These improvements are described below and illustrated in the schematic diagram provided at **Figure 2** above.

5.2.1 SH1 Alignment

5.2.1.1 Northbound

A northbound climbing lane is proposed between the Greville Road interchange and the Oteha Valley Road off-ramp. This climbing lane is necessary because of the potential low merge speeds of heavy commercial vehicles (HCVs) from the Greville Road northbound on-ramp as a result of the steep uphill gradient of SH1 in this section of the Project. The extended length of the additional lane to Oteha Valley will be provided between CH12450 and CH13750.

To facilitate the functionality of the climbing lane, a further additional lane is proposed between the Greville Road interchange and the Oteha Valley Road off-ramp along with the modification of the loop on-ramp. SH1 currently drops from three lanes to two prior to the Greville Road interchange. It is proposed that the third lane be continued northbound past the interchange. This will provide for four lanes of traffic between Greville Road and Oteha Valley Road.

It is also necessary to upgrade the causeway between the two treatment ponds at the RWWTP. This upgrade is necessary to:

- Accommodate the widening of SH1 northbound between Constellation Drive and Greville Road from 3 lanes to 5 lanes;
- Extend the Busway between Constellation Bus Station and Albany Bus Station;
- Include the shared use path between Constellation Bus Station and Oteha Valley Road; and
- Provide for the motorway to motorway ramp from SH1 southbound to SH18 northbound, and the motorway to motorway ramp from SH18 eastbound to SH1 northbound.

The maximum extent of the widening on either side of the existing causeway is as follows:

- On the western side (northbound) – widening of the crest by approximately 10m; and
- On the eastern side (southbound) – widening of the crest by approximately 10m.

The proposed interchange on-ramp from SH18 is a two-lane connection that will result in a fourth and fifth northbound lanes on SH1 between SH18 and the Greville Road off-ramp. These extra lanes will address the weaving and merging flows that are likely to result within this section of the motorway as a result of the upgraded SH18 ramps. Weaving occurs where a stream of traffic on a motorway must change lanes to the right, while a second stream of traffic must change across the same lanes to the left, within a short section of motorway. Depending on the volume of traffic and the length of the weaving manoeuvres, there can be resultant conflict and safety issues. The additional lanes address this issue.

The existing lane drop (from three to two lanes) south of the Constellation Drive overbridge was identified as an existing capacity constraint and safety issue. As such it is proposed that a third lane



will be extended across the Constellation Drive overbridge and through to the Constellation Drive northbound on-ramp, where the existing three lane section begins. This on-ramp, which will be used by less traffic than at present, will merge into the third lane rather than the existing lane gain.

5.2.1.2 Southbound

North of Greville Road overbridge, the existing lane drop from three to two lanes will be removed by continuing the third lane through to the Greville Road on-ramp, in order to address capacity and safety issues.

The Greville Road on-ramp will add a fourth southbound lane, which will continue until the proposed new SH18 off-ramp. This again is as a result of safety audit recommendations and addresses forecast weaving and merging flows within this section of the motorway.

After the SH18 off-ramp, three lanes will continue to the south of the Constellation Drive off-ramp, after which a lane drop will reduce the southbound carriageway to two lanes in the vicinity of the Constellation Drive overbridge.

5.2.1.3 Motorway design

The key motorway design parameters have been developed using the NZ Transport Agency State Highway Geometric Design Manual and Austroads and are detailed in **Table 9** below.

Table 9 Motorway Design Requirements

Parameters	SH 1 and SH 18 Mainlines	Motorway to Motorway Links	On/Off Ramps
Design Speed	110km/h	90km/h (des) 80km/h (min)	Off-ramps – 90km/h at nose reducing to 60km/h. On-ramps – 80km/h at ramp meter and 90km/h at nose.
Lane Width	3.5 m	3.5 m (4m for single lane)	3.5m
Min Shoulder Width (1 lane)	N/A	3m (left) and 1m (right)	2m (left) and 1m (right)
Min Shoulder Width (2 lanes)	3m (left) and 2m(right)	3m (left) and 2m (right)	1m (left) and 1m (right)
Min Shoulder Width (3 lanes)	3m (left) and 3m (right)	N/A	N/A
Maximum Shoulder Width	4m	4m	4m
Horizontal curve radius	725m (min)	380m (des) 235m (min)	Speed dependent

5.2.2 SH1 Bridge Structures

Modifications to three existing bridge structures within the Project area are required in order to accommodate the works. These include:

- Widening the Greville Road overbridge in both directions (north/south bound);
- Widening of the Rosedale Road overbridge in both directions (north/south bound); and
- Widening of the Constellation SH1 overbridge in both directions (north/south bound).

It is proposed to replace the existing McClymonts Overbridge with a new overbridge to the south of the existing alignment to facilitate the additional busway and SUP (see **Volume 5** - Civil Structures



Drawing 1315 for details). This new bridge will also contain improved pedestrian footpaths and cycle provision. The new bridge will be contained within the proposed designation boundary. The existing overbridge will be demolished upon completion and opening of the new bridge.

5.2.3 Upgrade of the causeway at the Rosedale Wastewater Treatment Ponds

In order to accommodate the Project works, structures and earthworks will be required within both RWWTP Pond 1 and Pond 2 to widen the existing causeway (introduced at **Section 4.3.1**). The extent of these works include the widening of the SH1 northbound lane between Constellation Drive and Greville Road from three lanes to five lanes, the extension of the Northern Busway from Constellation Bus Station to Albany Bus Station, the provision of the shared use path between Constellation Drive and Oteha Valley Road, and the motorway to motorway ramps between SH1 and SH18. The upgrade works proposed are not expected to encroach beyond the extents of the existing manmade structure, with new material likely to be confined to being deposited on top of existing fill material.

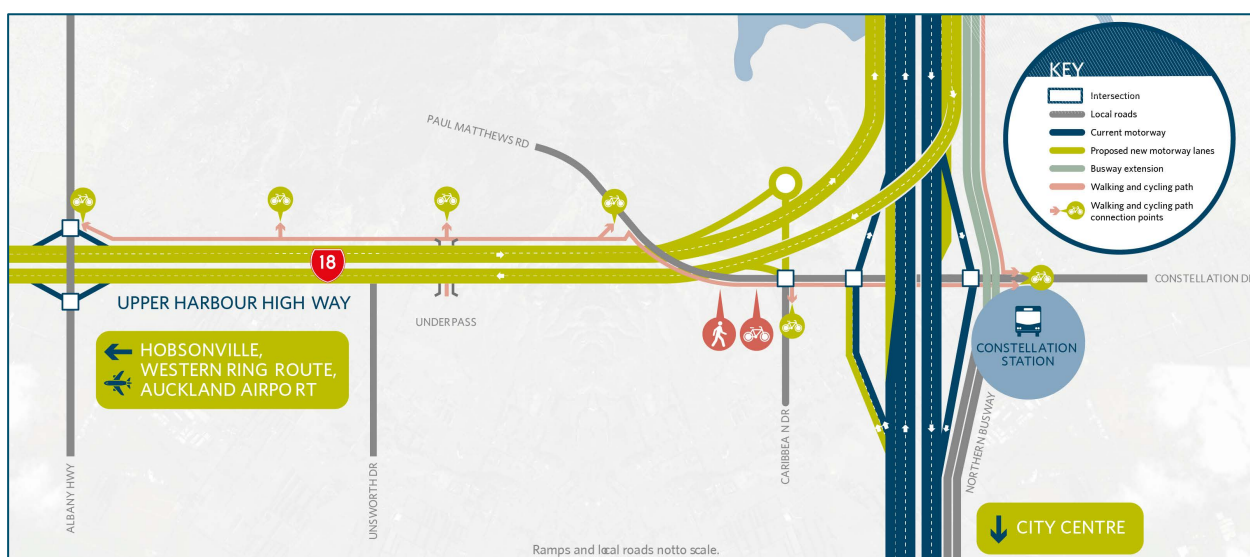
Construction works will require the temporary installation of rock revetment and/or sheet piles and groynes to be located within the bed of the ponds past the permanent structure. These works are required to temporarily allow de-watering of the construction area. It is expected that these works will not extend more than 10m beyond the existing structure in Ponds 1 and 2. A bunded area beside the existing carriageway will be required to temporarily stockpile contaminated excavated material from the wastewater pond for removal off site.

The Project will affect the existing pond link between the RWWTP treatment ponds. A new link will be constructed concurrently with the widening of the State highway between the ponds.

5.3 Improvements to existing SH18 Motorway

SH18 will be upgraded to full motorway standard from the Albany Highway Interchange to SH1, with a new SH18 eastbound to SH1 northbound ramp. The Interchange will involve a two lane ramp with ramp meter and bypass transit lane and will require the permanent closure of the Unsworth Drive exit. The works to be carried out in relation to SH18 are described below and illustrated in the schematic in **Figure 17**.

Figure 17 Schematic of the Proposed Improvements to SH18



Source: NZ Transport Agency

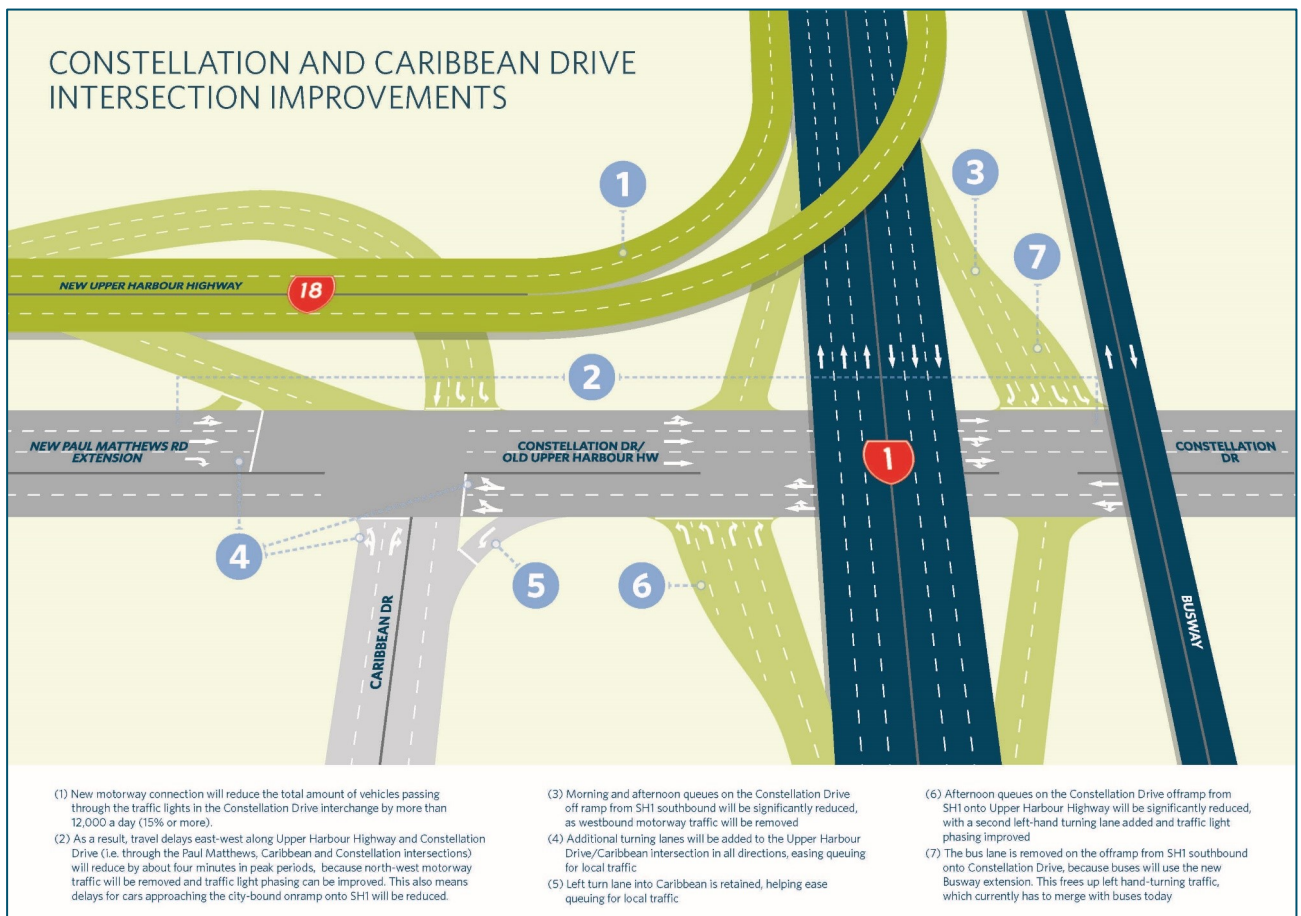


Paul Matthews Road will be realigned to connect with Constellation Drive at Caribbean Drive Intersection and an eastbound off-ramp will be provided from SH18 to connect with the local road network in the same location.

The motorway to motorway connection will be achieved by the provision of two, two lane ramp connections between SH18 and SH1 north. The southbound traffic ramp from SH1 to SH18 will utilise an overbridge to cross SH1.

The existing off ramp to Unsworth Drive will be closed, with traffic able to gain access to Unsworth Drive via the Albany Highway off-ramp or Caribbean Drive. See **Figure 18** below.

Figure 18 Schematic of the Constellation Drive and Caribbean Drive Intersection Improvements



Source: NZ Transport Agency

5.4 Northern Busway Extension

5.4.1 Busway

It is proposed to extend the route of the Northern Busway from its current terminus at Constellation Bus Station north to Albany Bus Station.

The Busway will be separated from the main carriageway and treated as a separate road. The Busway provides for a single lane travelling in each direction, and is intended for dedicated public transportation, maintenance and emergency service vehicles. The horizontal and vertical cross section elements of the Busway extension are set out in **Table 10** below and confirmed on the Typical Cross Section Drawings provided at **Volume 5**.



Table 10 Busway Design Requirements

Parameters	Requirement
Number of lanes	2 lanes (1 southbound & 1 northbound)
Lane width	3.50 m
Minimum shoulder width (on or under bridges)	0.6 m
Minimum shoulder width (all other locations)	1.0 m
Drainage channel width (in addition to shoulder width)	0.6 m
Minimum vertical clearance	6.0 m
Carriageway curve widening	Required for all curved sections of the main busway where the horizontal radius is less than 330 m
Constrained areas, minimum side clearance (eg to signs, columns barriers)	600 mm
Busway corridor width	10.2 m

The busway geometry, including the horizontal and vertical alignments, is designed to allow an operating speed of 80 km/h on the main busway and 50 km/h for station areas.

The proposed alignment for the Busway (in conjunction with the proposed SUP as discussed below at **Section 5.5**) will encroach into land currently occupied by the Rosedale Closed Landfill. The vertical alignment of the Busway will require a maximum cut depth of approximately 5m in the landfill area. This may require the excavation of some existing refuse layers which is expected at that depth. The cap of the Rosedale Closed Landfill is to be reinstated with new gas and leachate collection and disposal systems required behind the proposed retaining wall alongside the SUP. The retaining wall proposed along the eastern edge will result in a maximum fill wall height of 14m.

5.4.2 Albany Bus Station Busway Bridge

As the Busway route follows an alignment on the eastern side of SH1, a two-lane busway link across SH1 is required to provide access to Albany Bus Station.

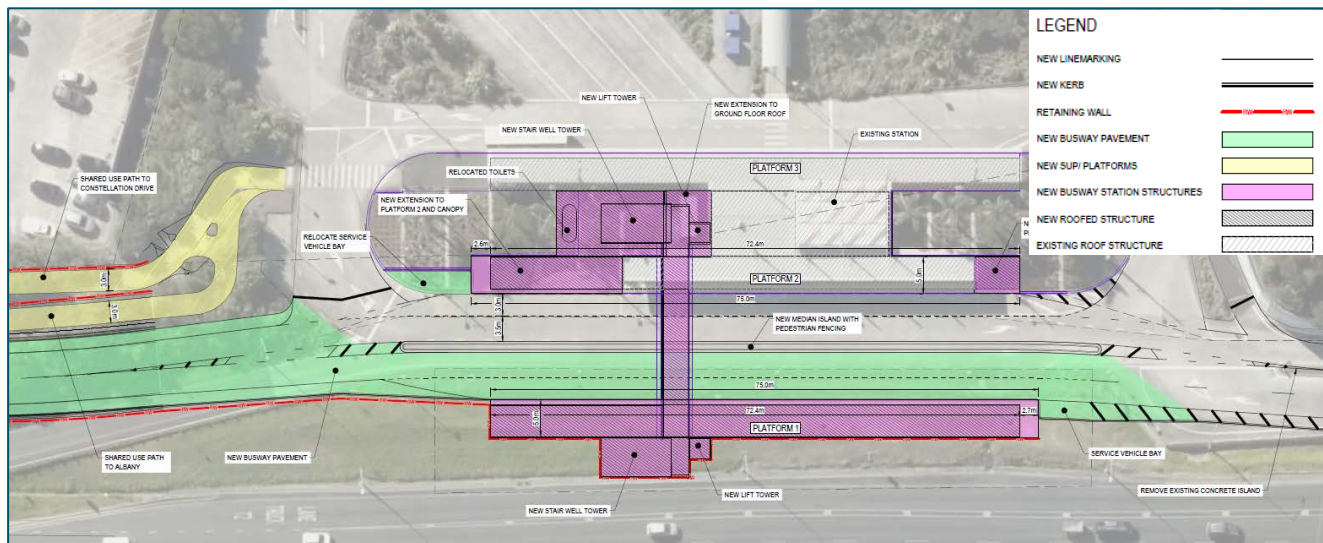
The overbridge is proposed to be a two-lane east/west bound extension of the Busway which terminates at the existing Albany Bus Station. The bridge is to run above the bus station parking area in order to connect with the existing terminal. The minimum bridge clearance over the motorway will be 6m (see Civil Structure Drawing 1310 in **Volume 5** for details).

5.4.3 Improvements to Constellation Bus Station

The proposed extension to the Busway from Constellation Bus Station to Albany Bus Station will necessitate additional station infrastructure at Constellation Bus Station in order to convert it to a dual direction station as opposed to a terminus station. The proposed arrangement is indicated in **Figure 19** below and detailed on the Constellation Bus Station General Arrangement Drawing 3001 **Volume 5**.



Figure 19 Constellation Bus Station Upgrade



The main components of the proposed upgrade include:

- Provision of a new platform for northbound movements.
- Extension of Platform 2 for southbound movements.
- New station building adjacent to the northbound platform.
- New pedestrian overpass linking northbound and southbound platforms.

The proposed reconfiguration of the Constellation Bus Station will allow for four lanes through the station with platforms to the east and west of the Busway. The new platform is proposed to be in the order of 75m in length with shelter coverage for 12 bays. The extension of the existing Platform 2 will also see the platform increase to 75m in length with shelter provided. Changes are to be made to the existing concourse enclosure of the station to better align with the back of the platforms. Earthworks and a retaining wall up to 2m in height are required to create the new northbound platform.

The architectural approach for the new structures at Constellation Bus Station will reflect the design philosophy established in existing northern busway stations. The height of the new stairwell towers and pedestrian overpass link between Platforms 1 and Platforms 2 and 3 (being the tallest of the structures required as part of the upgrade) will be no higher than 13m above ground level.

5.5 Pedestrian / Cycleway Connectivity Improvements

5.5.1 Shared Use Pathway along SH1

A new off-road 3m wide shared use pedestrian/cycle way adjacent to the busway shoulder (on the eastern side) is proposed to extend alongside the SH1 carriageway from Oteha Valley Road (CH160) to Constellation Drive (CH4170) for approximately 4km. It is envisaged that connections from the path to the local roading network will be provided at the following locations:

- Lavender Garden Lane;
- McClymonts Road;
- Greville Road;
- Rosedale Road;
- Arrenway Drive; and



- Constellation Drive.

The design of the SUP adjacent to the closed Rosedale Closed Landfill does not prevent future connections to that area should it be developed for recreational purposes although earthworks would likely be required to achieve tie-ins or the construction of additional ramps.

All paths are to be designed in accordance with Austroads Part 6A: Pedestrian and Cyclist Paths. The current proposed design of the path is based on a 3.0m clear width with 1.0m wide shoulder where possible, reducing to 0.5m in constrained locations. In constrained locations the SUP width will reduce to 2.5m clear width. It is currently designed so that the SUP is segregated from the Busway by a TL4 concrete barrier immediately adjacent to which would be a 1.8m security fence. Where the SUP is not contained by a retaining wall on the eastern boundary, a 1.4m fence will be provided. These design details are confirmed on the Typical Cross Sections provided in **Volume 5**.

The connection between the SH1 shared use path and the SH18 shared use path will be provided beneath the Constellation Drive overbridge, as shown on General Arrangement Plan 0206 provided in **Volume 5**. This will include at-grade 4m wide pedestrian/cycle⁶ crossings controlled by lights with a central refuge across both the Constellation Drive southbound on-ramp and northbound off-ramp.

5.5.2 Shared Use Pathway SH18

In addition, another 3m wide SUP will be provided adjacent to SH18 for a distance of approximately 2.3km. This path will commence on the southern side of the Constellation Drive Interchange before transferring to the northern side of the motorway via the proposed Paul Matthews Road overbridge. The path will descend from the overbridge via a ramp before continuing to run parallel to the eastbound motorway shoulder. It will terminate at the Albany Highway, which it will connect to by way of a ramp adjacent the westbound on-ramp to SH18 from the Albany Highway (see General Arrangement Plan 0210 in **Volume 5**). Access points to the path from the local road network are proposed at the following locations (see General Arrangement Plans 0208, 0209, 0210 in **Volume 5**):

- Caribbean Drive;
- Paul Matthews Road; and
- William Pickering Drive.

In addition, a link is to be provided from the shared path to the existing pedestrian/cycle way network which lies adjacent to Alexandra Stream.

The current proposed design of the SUP is based on a 3.0m clear width with 1.0m wide shoulders where possible, reducing to 0.5m in constrained locations. In constrained locations the SUP width will reduce to 2.5m clear width. As currently designed, the SUP is segregated from the carriage way of the SH18 UHH and Paul Matthews Road Link by a TL4 concrete barrier immediately adjacent to which would be a 1.8m security fence. Where the SUP is not contained by a retaining wall on the outer boundary, a 1.4m fence will be provided. These design details are confirmed on the Typical Cross Sections provided in **Volume 5**.

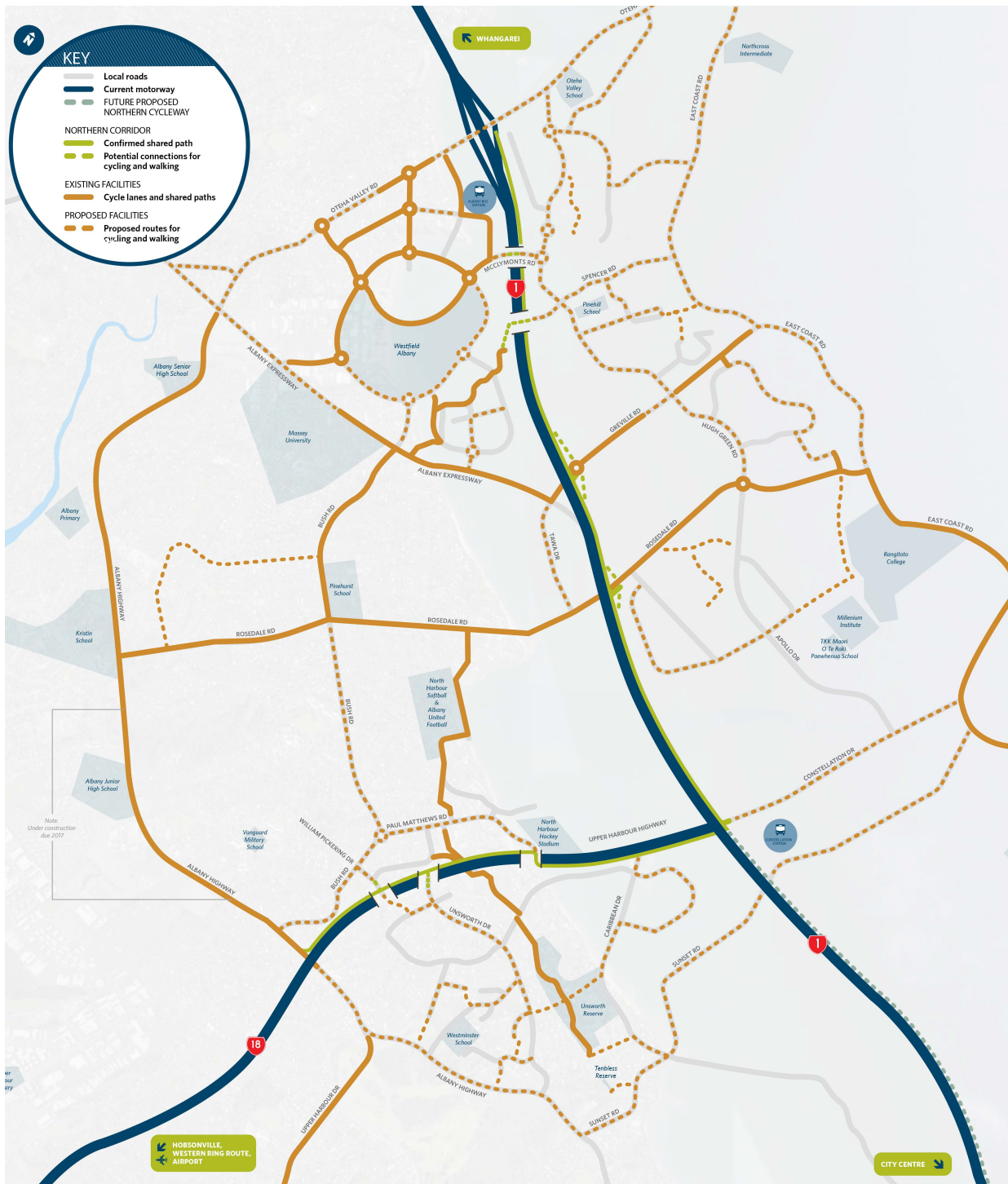
5.5.3 Indicative Shared Use Pathway connectivity within Project Area

Figure 20 below, illustrates the walking and cycling improvements described above that are proposed as part of the Project. **Figure 20** shows the current existing AT North Auckland Cycle Network and the proposed improvements provide for linkages and expansion to this network that generally accord with the Regional Cycle Network Plan from the Auckland Plan (which is included in **Figure 5**). **Figure 20**, additionally shows linkage and cross-motorway connectivity at Spencer Road, the subject of a separate NZ Transport Agency project that has the potential to link to the SH1 SUP.

⁶ A Toucan crossing



Figure 20 Proposed Walking and Cycling Connections



Source: NZ Transport Agency Northern Corridor Walking and Cycling Proposal Map, August 2015

5.6 Other Design Elements

5.6.1 Noise Attenuation

Noise attenuation barriers are currently proposed in the following areas as recommended in the Assessment of Operational Noise and Vibration (**Technical Assessment 12**):

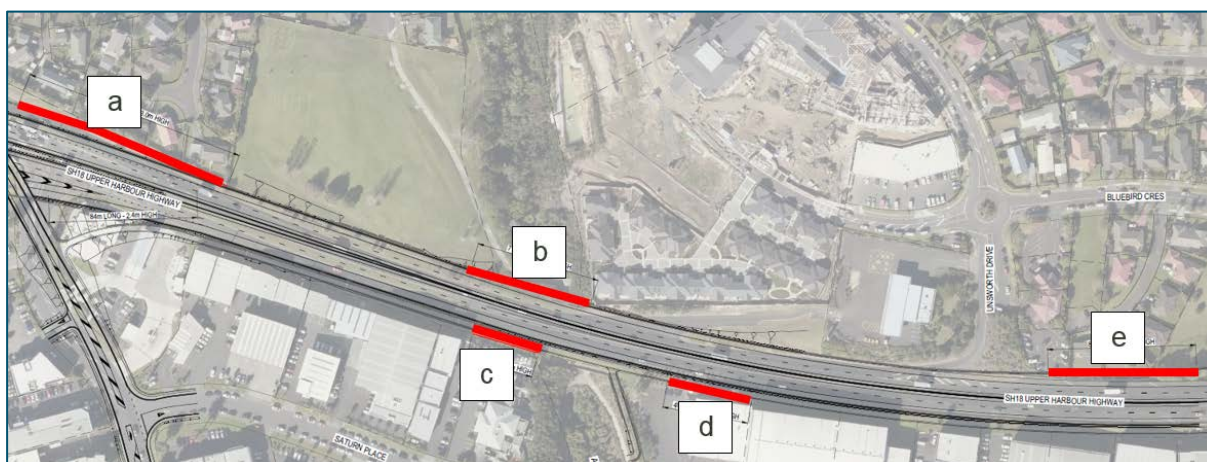
- a. Between SH18 and Barbados Drive (3m high and approximately 127m in length);



- b. Between SH18 and the Greenwich Gardens Metlifecare facility (2m high and approximately 71m in length);
- c. Between SH18 and the childcare facility at Saturn Place (2.4m high and approximately 39m in length);
- d. Between SH18 and the childcare facility at Omega Street (2.4m high and approximately 49m in length); and
- e. Between SH18 and Bluebird Crescent (2.4m high and approximately 84m in length).

Figure 21 below confirms the location of these noise attenuation structures, the detailed design of which will be informed by the design principles contained within the indicative Urban Design and Landscape Framework (UDLF) (see **Volume 4**) in consultation with the adjacent property owners.

Figure 21 Noise Attenuation Barrier Locations



Source: Base image from Auckland Council GIS Viewer

5.6.2 Cut and Fill Slopes

The topography of the area means that areas of cut and fill will be required along the alignment, with the form and treatment of these being an important aspect of the Project. Throughout the Project, the following general parameters will be adhered to:

- All cut/fill slopes will be stabilised to prevent any fretting or erosion after construction. Spill-through abutment slopes shall be surfaced with paving stone blocks to eliminate the potential for weed growth and erosion;
- An overall Project cut/fill balance will be maintained as far as practicable; and
- Earthworks cut slopes and fill embankments have been designed with gradients of 1V:3H (vertical: horizontal) where possible. However, in some constrained areas fill slopes have been increased in gradient to 1V:2.5H.

5.6.3 Retaining Walls

The topography of the area requires the construction of retaining walls at certain locations along the Project alignment, as indicated on the General Arrangement Plans provided in **Volume 5**. These will all be contained within the Project designations.

Approximately 7,105m of retaining walls are required for the Project. They are to be made up of the following wall types:

- MSE (mechanically stabilised earth) block walls;
- Bored pile walls;
- Anchored bored pile walls;



- L-shaped gravity walls; and
- Steel UC (universal column) walls.

The retaining walls will vary in height with a maximum height of 13.3m between CH14200 and CH14430 and a minimum height of 1.8m. The locations of all retaining walls will be within the area of designation sought under the NoRs and the individual heights, lengths and wall type are noted on the General Arrangement Plans provided in **Volume 5**. The typical appearance and bulk characteristic of these walls are illustrated on the Typical Cross Section drawings provided at **Volume 5** and within the typical cross sections within the UDLF.

5.6.4 Traffic Services

Traffic services along the carriageway will include features such as:

- Permanent road signs (including variable message signs);
- Road lighting;
- Road markings;
- Barrier protection;
- Closed-circuit Television (CCTV);
- Speed enforcement;
- Maintenance bays;
- Emergency phones; and
- Emergency laybys.

The traffic services that will be in place when the motorway opens to traffic will be confirmed during the detailed design phase and will be designed in accordance with the relevant standards at the time the Project is constructed.

Throughout the life of the motorway, it is anticipated that traffic services will be renewed and upgraded as required, to ensure the continued safe and efficient operation of the State highway.

5.6.5 Pavements and Surfacing

Final design of the pavement will be undertaken during the detailed design phase of the Project. The design will be based on the Austroads Pavement Design Manual, the NZ Transport Agency Supplement to Austroads Guide, the Austroads Guide to Pavement Technology and the AT Code of Practice Chapter 16 Road Pavements and Surfacing in respect of local roads.

In general terms, the SH1 and SH18 corridors pavement design (including shoulders) will be full depth asphalt with Open Graded Porous Asphalt (OGPA) surfacing as OGPA has benefits over chip seal in terms of drainage and noise attenuation.

For the interchanges along the main alignment, high stresses are likely to occur from braking, accelerating and turning, as such a stone mastic asphalt (SMA) is currently proposed.

5.6.6 Lighting

Project lighting has been considered at a conceptual level for the purpose of assessing the potential for any adverse effects. It is confirmed that the lighting for the Project will accord with the relevant provisions of the AUP, in particular as this relates to sensitive neighbouring activities such as residential sites.

Lighting columns will be located within the protective central median concrete barrier with infill lighting positioned on the shoulders where ramps are located for on/off ramps. Wider sections with five lane



arrangements will require infill lighting from the shoulder from a dual opposite arrangement to improve the uniformity and compressed centres to meet the design levels.

The optimum elevation of the lighting columns for the main carriageway will be a nominal height of 12-14m above finished ground level (AFGL) with an outreach arm of 1.2m - 3m with provision to extend to a maximum of 4.2m if necessary. Lighting to ramps will have the same column height but with a shorter outreach arm of a minimum of 1.2m - 2.4m pending on the offset from the kerbline or low-level protection.

The main carriageway and sealed shoulder lighting design will comply with Road Lighting Category V3 to meet Standards AS/NZS1158, or the equivalent standard applicable at the time the Project is constructed. Lighting within interchanges and the adjoining local network will be designed to and comply with Category V2. Category V3 of AS/NZS 1158 (or equivalent) which will require a luminance no less than 0.75 candela per square meter, with an overall uniformity (minimum-to-average) to be above 0.33; a longitudinal uniformity to be above 0.3. At intersections, the illuminance will meet AS/NZS1158 (being above 10 lux, with a max-to-min uniformity to be less than 8), or the appropriate equivalent at time of construction.

Lighting is intended to be located within the outer barrier with a double outreach lighting over the shared use path.

5.6.7 Landscaping

Landscaping will be undertaken as part of the Project and will serve a number of purposes, including those listed below:

- Integration of the Project into the existing landscape;
- Mitigation of the visual and landscape effects of the Project; and
- Stabilisation of batter slopes.

Detailed landscape plans will be provided as part of future OPWs for the Project, in accordance with the recommendations of the Assessment of Landscape and Visual Effects (**Technical Assessment 8**).

As shown in the indicative landscape planting plan, the landscape design will draw from the existing species mix within the existing landscape, in particular having regard to a native typology to ensure appropriate aesthetic and environmental outcomes.

5.7 Operational Drainage and Stormwater Management

A description of the drainage and stormwater management proposed for the on-going operation of the Project (as opposed to the initial construction) is set out below. More specific detail on the proposed management approach is provided in the Assessment of Stormwater Management provided in **Technical Assessment 11**.

The operational drainage and stormwater treatment design for the Project has been driven by two key requirements:

- Ensuring that stormwater does not inhibit the safe and effective operation of the road; and
- Ensuring that the potential adverse environmental effects associated with the disposal of stormwater are appropriately managed, both in terms of effects on freshwater ecological habitats and flooding effects in relation to properties.

A general layout of the various drainage components as further described and detailed in this section is provided in **Figure 22** below. This figure also indicates the location of the following drainage and stormwater management components of the Project:

- Wetlands;

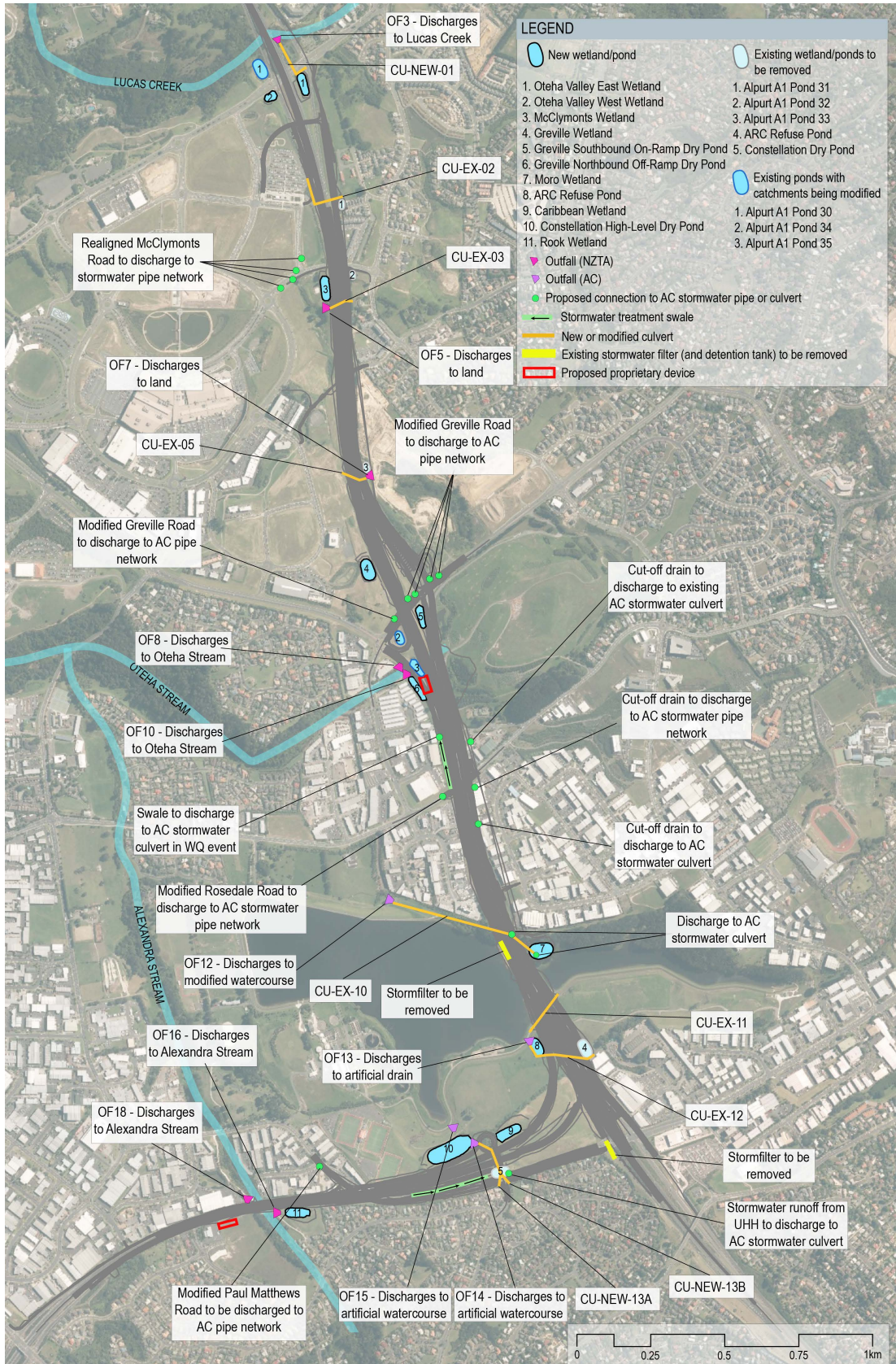


- Culverts;
- Outfalls; and
- Treatment swales.

These various drainage and stormwater treatment components are identified and described in **Tables 11-13**.



Figure 22 Proposed Drainage and Stormwater Treatment Design



Source: Aerial photography sourced from the LINZ Data Service and licensed by LINZ for re-use under the Creative Commons Attribution 3.0 New Zealand licence.



5.7.1 Drainage

Surface water runoff from pervious areas such as grassed or vegetated areas will generally be discharged untreated to the existing stormwater reticulation system. Where possible, this surface water is to be kept separate from the stormwater network conveying flows from the motorway surface.

Stormwater runoff from impervious surfaces will be collected via cross drainage throughout the Project Area, and discharged to stormwater treatment and management devices as discussed below.

5.7.1.1 Cross drainage

The majority of existing culverts (16 in total) within the Project area will remain in place. Only three new culverts are proposed, and these are set out in **Table 11** below. Several existing culverts are proposed to be extended, these are shown on **Figure 22** and detailed in the Assessment of Stormwater Management (**Technical Assessment 11**).

Table 11 Proposed Cross Drainage

Crossing Name	Existing / New	Location	Size	Total Length – Including Existing and Extensions (m)	Parallel to Stream flow (Y/N)	Crossing Type	Proposed works
CU-NEW-01	New	Oteha Valley Road	1500mm Ø	171	N	Grated manhole to headwall	New culvert
CU-NEW-13A	New	SH 18 – Caribbean Drive	1800mm Ø	210	Y (concrete channel)	Pipe network to headwall	New culvert
CU-NEW-13B	New	SH18 – Caribbean Drive	1350 mm Ø	47	Y (concrete channel)	Grated manhole to pipe network	New culvert

5.7.1.2 Outfalls

Existing outfalls for the Project are to be generally retained without modification. Runoff from new impervious areas is proposed to be treated and/or attenuated within wetlands prior to discharge to the receiving environment.

Overall, there are 18 outfalls included as part of the Project, of which five of are new (**Table 12**). Changes to the existing outfall structures are only proposed where there are changes to the existing peak flow rates.

Table 12 Proposed Outfalls

Outfall ID	AC Asset ID in Network Discharge Consent	Location	New / Existing	Public (AC) / Private (NZ Transport Agency)	Rip-Rap Outfall Protection Size	Comment
OF3	N/A - New Outfall	CU-NEW-01 outlet	New	NZ Transport Agency	Proposed Apron – 4.5m (L) x 5.7m (W)	New combined outfall for Oteha Valley Wetlands and cut-off drain



Outfall ID	AC Asset ID in Network Discharge Consent	Location	New / Existing	Public (AC) / Private (NZ Transport Agency)	Rip-Rap Outfall Protection Size	Comment
OF8	N/A - New Outfall	Greville Wetland outlet	New	NZ Transport Agency	Proposed Apron – 6.3m (L) x 7.4m (W)	New outfall for proposed wetland
OF10	N/A - New Outfall	Greville NB Basin outlet	New	NZ Transport Agency	Proposed Apron – 4.2m (L) x 6.0m (W)	New outfall for proposed basin
OF16	N/A - New Outfall	Alexandra Wetland outlet	New	NZ Transport Agency	Proposed Apron – 6.8m (L) x 8.6m (W)	New outfall for proposed wetland and cut-off drain
OF18	N/A - New Outfall	Near CU-EX-14 outlet	New	NZ Transport Agency	Proposed Apron – 7.5m (L) x 9.5m (W)	New combined outfall for proposed cut-off drains

5.7.2 Stormwater Treatment Devices

The proposed stormwater treatment for the Project seeks to ensure that adverse effects on waterbodies are avoided. The treatment design has been guided by:

- AC Technical Report TR2013/035 (2013); and
- AC's Stormwater Treatment Devices: Design Guidelines Manual (TP10).

Stormwater runoff from the motorways will be discharged to wetlands or treatment swales located along the alignment, treated, and, where necessary, extended detention will be provided to mitigate effects associated with erosion of the downstream environment.

5.7.2.1 Wetlands and dry basins

Constructed wetlands and basins provide effective treatment systems capable of high levels of attenuation. **Table 13** summarises the proposed wetlands and basins to be constructed as part of the Project.

Table 13 Proposed Wetlands Summary

Wetland / Device	Location	Sub-catchment	HUR Area Treated to 75% TSS Removal (ha)	WQV with 50% discount (m ³)	Live volume (m ³)	Note for replacement of existing ponds
Oteha Valley East Wetland	SH1-CH12030-SB	OV2M	0.75	480	1345	Includes WQV of 412m ³ and live volume of 548m ³ from existing Alpur A1 Pond 31
Oteha Valley West Wetland	SH1-CH12030-NB	OV2M	1c.07	150	495	No ponds replaced by this wetland.



Wetland / Device	Location	Sub-catchment	HUR Area Treated to 75% TSS Removal (ha)	WQV with 50% discount (m ³)	Live volume (m ³)	Note for replacement of existing ponds
McClymonts Wetland	SH1-CH12720-NB	M2S	1.41	405	1225	Includes WQV of 329m ³ and live volume of 483m ³ from existing Alpur A1 Pond 32
Greville Wetland	SH1-CH13670-NB	S2R	2.12	525	4420	Includes WQV of 116m ³ and live volume of 327m ³ from existing Alpur A1 Pond 33
Greville SB On-Ramp Dry Basin	SH1-CH13900-SB	S2R	0.00	0	320	No ponds replaced by this wetland.
Greville NB Off-Ramp Dry Basin	SH1-CH14110-NB	S2R	0.00	0	420	No ponds replaced by this wetland.
Alpur A1 Pond 34 (existing to be modified)	SH1-CH13930-NB	S2R	2.21	785	2520	Outlet modified for additional live volume. Refer to flow management section.
Alpur A1 Pond 35 (existing to be modified)	SH1-CH14050-NB	S2R	0.00 (2.96 ha to 60% TSS removal)	315	2800	Outlet modified for additional live volume. Refer to flow management section.
Moro Wetland	SH18-CH720-EB	R2C	6.23	1195	4095	No ponds replaced by this wetland.
Caribbean Wetland	SH18-CH1500-WB	C2PM	3.07	470	2400	No ponds replaced by this wetland.
Alexandra Wetland	SH18-CH720-EB	PM2AH	2.78	345	2005	No ponds replaced by this wetland.

Note: OV2M (Oteha Valley to McClymonts Road), M2S (McClymonts Road to Spencer Road), S2R (Spencer Road to Rosedale Road), R2C (Rosedale Road to Constellation Drive), C2PM (Constellation Drive to Paul Matthews Road), PM2AH (Paul Matthews Road to Albany Highway).

The preferred location identified for the wetland in the PM2AH catchment during the preliminary design phase was a grassed location adjacent to the UHH within Rook Reserve, to the north of Rook Place. However, following discussions with AC Parks and Reserves Division (AC Parks), two alternative sites within Bluebird Reserve were also considered. The outcome of a multi-criteria analysis process for the three sites indicated Rook Reserve as the preferred option.

However, at the time of writing, a decision had not been made by the Local Board (as manager of the reserves) as to its preferred location for the stormwater pond, largely due to the timing of the local body elections and the new meeting schedule for the Local Board. The NoRs and consent applications, therefore, include both the preferred Rook Reserve option and a Bluebird Reserve option. The alternative design drawings for Bluebird Reserve are provided in Appendix R of the



Assessment of Stormwater Management (**Technical Assessment 11**) along with an assessment of the effects of locating the stormwater pond in this location. Once the position of the Local Board is finalised, the designation line can be drawn back from the discarded option.

5.7.2.2 Swales

Swales will be used where practical to provide pre-treatment of runoff from existing and new impervious areas prior to discharge to dedicated treatment devices. They have been designed in accordance with TP10 to provide a 9-minute residence time to achieve 75% Total Suspended Solids (TSS) removal.

The current design proposes as a minimum the swale sections and lengths as identified in **Table 14** below and illustrated on **Figure 22**. The swales are detailed on Stormwater Layout Plans 1404 and 1408 in **Volume 5**. Both treatment swales have been designed with a trapezoid profile with 1m base width and 1V:3H side slopes.

Table 14 Proposed Treatment Swales Summary

Swale ID	Sub-Catchment	Impervious Area Treated (ha)	Swale Length (m)	Residence Time (min)	TSS Removal (%)
SW-S2R-1	S2R	1.02	160	11.0	75%
SW-C2PM-1	C2PM	0.28	230	14.4	75%

The hydraulic performance of swales will be designed in accordance with NZ Transport Agency and AC stormwater treatment requirements and will comply with the Auckland Motorway Alliance (AMA) and Austroads requirements for maintenance and access, and road user safety.

5.7.2.3 New proprietary devices

Stormwater treatment within the S2R catchment is provided by a stormwater proprietary device (StormFilter or similar). The proposed proprietary device has been designed to provide treatment to meet 75% TSS removal for all existing and new HUR pavement areas discharging to the existing Alport A1 Pond 35. This pond is currently undersized and provides sub-standard treatment (approx. 55% TSS removal), but is proposed to be retained for stormwater quantity management for the Project.

A proprietary device is also proposed for treatment of the PM2AH catchment. This device will ensure 75% TSS removal for all existing and new HUR pavement within this catchment.

5.7.2.4 Constellation Bus Station

The Constellation Bus Station stormwater reticulation system is proposed to be modified to discharge stormwater runoff from the new impervious surfaces resulting from the bus station alterations. This modification allows new impervious areas from the bus station to be treated and managed by the proposed Moro Wetland. The existing stormwater management devices within the bus station will be retained to manage stormwater runoff from the parts of the station that do not form part of the Project.

5.7.2.5 Auckland Council stormwater ponds

There are three existing AC ponds stormwater ponds within the Project area that are to be removed to accommodate the Project. These ponds are:

- Moro Pond;
- ARC Refuse Pond; and
- Constellation Pond.



The hydraulic performance of these ponds is to be replicated through two replacement stormwater devices. These are:

- An 8,500m³ offline high-level dry pond (Location 9); and
- An 850m³ online quality wetland for treatment (Location 6).

This pond and wetland are located as shown at **Figure 22**. The high-level dry pond is located to the north of the SH18 alignment and the wetland is located to the north of the RWWTP treatment ponds.

The existing stormwater ponds discharge to AC's stormwater network and the replacement ponds will also discharge to AC's network.

5.8 Utilities

Existing network utilities will be affected by the construction of the Project, to which the required works for their diversion, relocation or replacement are included within the Project scope. The notable utilities are detailed in the Design and Constructability Report (**Technical Assessment 15**) and in particular includes the following.

5.8.1 Watercare Services Limited.

The proposed SH18 alignment impacts on the existing Wairau Valley Branch Sewer (TS5), and East Coast Bays Branch Sewer (TS7) which are major lines leading to the RWWTP. Both trunk sewers are proposed to be diverted and a revised TS5 and TS7 alignment, as well as diversion of the local connections to the TS7 main, are proposed.

5.8.2 Vector Gas

No major relocation of Vector Gas assets has been identified as necessary, however a 50mm MP4 gasmain on Paul Matthews Drive may require a localised relocation which will be within the boundary of the Project area.

5.8.3 Vector Power

The proposed alignment conflicts with existing Vector 11KV, 33KV and 110KV overhead and underground lines in multiple locations. The relocation and replacement works have been discussed with Vector and agreed in principle which are summarised in **Table 15** below.

Table 15 Vector Relocation Works

Item	Description
McClymonts Road Bridge	Relocate existing 11kV and 33kV to proposed new McClymonts Road Bridge crossing
North of Greville Road to North of Rosedale Road	Underground existing overhead 33kV lines to accommodate busway
North of Rosedale Road	Replace existing 33kV lines under motorway due to widening. Diversion shall follow the motorway alignment south and then pass beneath the Rosedale Road overbridge.
Rosedale Road Lowering	Lower 11kV lines to allow for road lowering
Western side of SH1 north of Rosedale Road	Underground existing 33kV adjacent to SH1 to accommodate northbound widening
Eastern side of SH1 north of Constellation Drive	Underground existing 11kV adjacent to Constellation Drive Off Ramp to accommodate the busway
SH18/Upper Harbour Highway	Replace existing poles to raise height of existing 110KV and 33KV lines over proposed SH18 alignment.
SH18/Upper Harbour Highway	Relocate (underground) existing 33kV and overhead lines to accommodate Paul Matthews Road Off Ramp



Paul Matthews Road Corner	Relocate existing 33kV underground line to accommodate Paul Matthews Road realignment and bridge.
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5.8.4 Transpower

There are existing Transpower 220KV power cables and an associated designation that follows the length of the Busway before traversing beneath the State highway at the UHH interchange and continuing through the RWWTP and NHHS. The proposed alignment will intersect with this cable in two locations. After discussions with Transpower, the relocation of the existing cables is to be avoided due to significant costs and procurement lead times. It is proposed that the road is bridged over the Transpower cables using culverts.

5.8.5 Fibre Backbone

The existing fibre backbone running adjacent to SH1 will be impacted by the proposed works and will require relocation. The backbone includes Vodafone and Vector communications and NZ Transport Agency Intelligent Transport System/Advanced Traffic Management System (ITS/ATMS) infrastructure. It is proposed that the full length of the backbone from Oteha Valley Road southbound on-ramp to Constellation Drive be replaced and relocated beneath the proposed shared use path.

Consultation with affected network utility owners has been undertaken throughout the development of the design and will be ongoing throughout detailed design and construction.

5.9 Construction of the Project

The Design and Constructability Report providing a more detailed explanation of the Project's construction components is attached at **Technical Assessment 15**. Its purpose is to provide a basis for the assessment of the environmental effects undertaken at **Section 9** and within the Technical Assessments contained in **Volume 3**. This section summarises the proposed construction of the Project.

The commencement of works for the Project is not scheduled until 2018, and many specific details about the construction process have yet to be determined. OPWs will be lodged with AC prior to commencement of construction.

Construction of the Project will be influenced by a number of factors, including:

- Detailed design for the Project, which is undertaken by the appointed contractors, during the implementation phase of the Project. This will occur subsequent to the outcome of the Bol;
- Construction duration, and target completion date;
- Procurement method adopted;
- Specific requirements of the appointed contractor; and
- Any technological advances.

The information provided below should be treated as indicative only, being intended to provide sufficient detail on the proposed construction activities to assess their potential environmental effects and to identify any appropriate measures to avoid, remedy or mitigate those effects.

Once the contract for the Project has been awarded and a contractor is in place, the construction methodology will be further refined and developed. This will be undertaken within the scope of the conditions which will be in place to manage the environmental effects of the construction activities.

5.9.1 Construction Programme and Staging

A preliminary construction programme has been developed to inform the assessment of the environmental effects. Construction is expected to take approximately 3.5 years and be progressed in



a staged manner (see **Table 16** below). While there are some dependencies between these proposed construction stages, the specific staging and phasing of the work will be influenced by the factors noted in the previous section with construction likely to be undertaken on a number of fronts, such that many elements in multiple zones will be undertaken at the same time.

Table 16 Potential construction staging

Stage	Period	Description
Stage 0	December 2017 – May 2018	Project establishment Detailed design
Stage 1a	June 2018 – August 2018	Commence and complete early works for Paul Matthews diversion and north/southbound ramp tie-ins Commence Busway construction Commence Rosedale Road lowering
Stage 1b	September 2018 – October 2019	Continue Busway construction Commence north-facing ramps construction Commence and complete SH1 southbound widening Complete Rosedale Road lowering Commence and complete McClymonts Bridge Extension
Stage 1c	November 2019 – June 2020	Continue Busway construction Continue north-facing ramps construction Commence SH1 northbound widening
Stage 1d	July 2020 – December 2020	Continue Busway construction Complete north-facing ramps construction Complete SH1 northbound widening Commence and complete Constellation Drive Lowering Part 1 and connection to northbound ramps
Stage 2a	January 2021 – March 2021	Complete Busway construction Commence and complete Constellation Drive Lowering Part 2 as well as connection to southbound ramp Commence and complete Paul Matthews connection
Stage 2b	April 2021 – September 2021	Complete Busway construction Commence and complete Constellation Drive Lowering Part 3 and Part 4 final arrangement Commence and complete SH1 median works

5.9.2 Construction Zones

The Project has been currently divided into eight distinct construction zones. The construction zones are locations in which the proposed works will be constructed. Construction Support Areas (CSAs) (see **Section 5.9.3**) will be required for provision of welfare, storage and other support functions for these zones. The zones are listed below and illustrated on **Figure 23** below.

- Zone 1 – SH18/SH1 Interchange;
- Zone 2 – SH18 UHH - SH1 to Albany Highway;
- Zone 3 – SH1 Northbound;



- Zone 4 – SH1 Southbound;
- Zone 5 – SH1 Median;
- Zone 6 – Albany Bus Station & Busway Bridge;
- Zone 7 – Busway - Albany to Greville Road; and
- Zone 8 – Busway - Greville Road to Constellation Bus Station.

Figure 23 Construction Zones



Source: Aerial photography sourced from Auckland Council GIS Viewer

5.9.3 Construction Support Areas

Six CSAs are required to support the construction of the Project (**Figure 24**), and may be used for the following general activities:

- Site offices and construction personnel amenities, including car parking;
- Construction vehicle and machinery parking and maintenance;
- Loading and unloading of construction materials;
- Storage of construction materials;
- Fabrication, reinforcement cutting and bending;
- Storage of plant and equipment, and building materials;
- Storage of ground improvement plant and materials;
- Storage of hazardous construction materials (if any);
- Construction vehicle wheel washing areas (where necessary);
- Stormwater and groundwater treatment facilities where required;
- Waste storage and collection;
- Spoil handling and storage;
- Storage of supplanted trees / shrubs; and
- Aggregate crushing.



All CSAs will be fully fenced and made secure. It is likely that all CSAs will be provided with utilities (water, telecommunications, power, and sewer) with connections removed after the completion of the Project. All CSAs are likely to be established on compacted hardfill and will be used for the stockpiling of earthworks, including contaminated soils. Some earthworks may be required in the CSAs prior to mobilisation to allow for the re-levelling of surfaces for construction equipment access and placement. Upon the completion of works, the construction support areas are to be disestablished and the areas reinstated. It is likely that areas which are not required for the long term operation of the State highways will be subject to a designation draw back with the land disposed of.

Figure 24 Location of Proposed CSAs



Source: Aerial photography sourced from the LINZ Data Service and licensed by LINZ for re-use under the Creative Commons Attribution 3.0 New Zealand licence.

CSA 1 combined with CSA 2 will be the primary or largest CSA. This combined CSA is located within Construction Zone 1 providing good accessibility to the SH1/SH18 tie-in works area as well as to the haul road to the RWWTP Pond 1 works area.

In addition to the main CSA, four other site locations have been identified at:

- CSA 3: Greville Road West;
- CSA 4: McClymonts Road;
- CSA 5: Rosedale Road; and
- CSA 6: Greville Road East.

5.9.4 Earthworks

Table 17 identifies the proposed locations of cut and fill along the Project corridor.

Table 17 Project Earthworks Areas

Construction Zone	Cut Area (m ²)	Fill Area (m ²)	Total	Cut Volume (m ³)	Fill Volume (m ³)	Balance
Zone 1: SH18 Ramps	58,000	54,000	112,000	149,000	212,000	63,000
Zone 2: SH18 & UHH	105,000	37,000	142,000	71,000	3,000	-67,000
Zone 3: SH1 Northbound	86,000	52,000	138,000	49,000	45,000	-4,000



Construction Zone	Cut Area (m ²)	Fill Area (m ²)	Total	Cut Volume (m ³)	Fill Volume (m ³)	Balance
Zone 4: SH1 Southbound	84,000	36,000	121,000	48,000	39,000	-9,000
Zone 5: Median Barriers	-	-	-	-	-	-
Zone 6: Busway Link Bridge to Albany Bus Station	0	1,000	1,000	0	2,000	2,000
Zone 7: Busway Greville North	22,000	21,000	44,000	48,000	56,000	7,000
Zone 8: Busway Greville South	24,000	31,000	55,000	49,000	119,000	70,000
Total	379,000	232,000	613,000	414,000	476,000	62,000

5.9.5 Erosion and Sediment Control

Traditional erosion and sediment control methods, such as temporary silt fences, dirty water diversion bunds and clean water diversion bunds, as well as progressive stabilisation of batter will be used for the Project. These methods and the general layout are shown on the Construction Water Management Plans Drawings in **Volume 5**. The overall methodology for sediment control and the associated design philosophy is set out in the Assessment of Construction Water Management (**Technical Assessment 4**).

The methodology for sediment control will be by way of a management plan based approach.

The contractor will be responsible for implementing sediment control measures in accordance with AC's Technical Publication 90: Erosion and Sediment Control Guidelines for Land Disturbing Activities (TP90) and the NZ Transport Agency's Erosion and Sediment Control Guidelines for State Highways. The contractor will also have responsibility for environmental protection during the proposed works. Such measures will be implemented prior to any land disturbance taking place.

The main erosion and control measures include those matters listed below, which will be a requirement of the construction contract:

- Clean water diversions, established between the edge of the existing motorway alignment and works area, to be directed to discharge at points beyond the works location;
- Dirty water diversion bunds to intercept stormwater from earthworked areas and divert it to designated settlement areas or decanting earth bunds before discharge;
- Use of check dams incorporating filter socks (these measures are utilised on slopes to slow flow rates and assist in sediment deposition);
- Silt fences, hay bales and detention ponds to limit erosion and collect water-borne soil in a way that manages adverse downstream effects; and
- The use of super silt fence installed around culvert headwalls/outlets.

5.9.6 Construction Works to the Causeway at the RWWTP

Construction works will require the temporary installation of rock revetment and/or sheet piles and groynes to be located within the bed of the ponds past the permanent structure. These works are required to temporarily allow de-watering of the construction area and will not extend more than 10m



beyond the existing structure in Ponds 1 and 2. A bunded area beside the existing carriageway will be required to temporarily stockpile contaminated excavated material from the wastewater pond for removal off site.

5.9.7 Construction Works at the Watercourses to the South of Pond 1 at the RWWTP

The works will require the piping of several watercourses that lie between Pond 1 at the RWWTP and the UHH. Approximately 180m of the central watercourse is to be piped and filled over to accommodate for the realignment of Paul Matthews Road and the new SH1/SH18 ramps. Several adjacent watercourses (a combination of intermittent and ephemeral streams) are also to be piped and filled over. All of which are highly modified and have very low aquatic ecological values. The length of the watercourses proposed to be piped in this location is approximately 602m.

5.10 Land Requirements

Given the nature of the proposed improvements and scale of the construction to be undertaken, additional land beyond the existing designations is required at certain locations along the SH1 and SH18 corridors. Some of the land required is already owned by the Crown for roading purposes as well as AT local roads.

The land requirements for the Project, including that required for construction purposes, are shown on the NoR Plans contained in **Volume 1** and listed on the property schedules provided with these plans. The Project has been designed to avoid the amount of third party land required where at all possible.

When existing NZ Transport Agency land holdings and local road parcels are excluded, the alterations and new designations will affect 67 property parcels as set out below. The NZ Transport Agency has acquired some of these properties already as noted below.

5.10.1.1 Properties Required in Full

The following properties are required in full:

- 123 Rosedale Road;
- 78-80 Paul Matthews Road (Units 1, 1A, 2, 2A, 3, 3A, 4, 4A, 5, 5A, 6, 6A⁷, 7, 7A, 8, 8A, 9, 9A, 10, 10A, 11, 11A, 12, 12A, 13, 13A, 14, 14A, 15 and 15A); and
- 73-77 Paul Matthews Road.

5.10.1.2 Properties Required in Part

The following properties are to be required in part:

- | | |
|---|------------------------|
| ■ 98 McClymonts Road | ■ 1 Saturn Place |
| ■ 60 Masons Road | ■ 5 Greenwich Way |
| ■ 38 Colliston Rise | ■ 13 Omega Street |
| ■ 40 Colliston Rise | ■ 15 -17 Omega Street |
| ■ 42 Colliston Rise | ■ 19 Omega Street |
| ■ 44 Colliston Rise | ■ 21-23 Omega Street |
| ■ 117 Rosedale Road | ■ 25-27 Omega Street |
| ■ 121 Rosedale Road (Units G,H,I,J,K,L) | ■ 29-31 Omega Street |
| ■ 9 Arrenway Drive | ■ 90 Bluebird Crescent |

⁷ Already acquired from the owner by the NZ Transport Agency



- 11 Arrenway Drive
- 13 Arrenway Drive
- 15 Arrenway Drive
- 17 Arrenway Drive
- 19 Arrenway Drive
- 35 Arrenway Drive
- 6 Cowley Place
- 8 Cowley Place
- 10 Cowley Place
- 12 Holder Place
- 92 Bluebird Crescent
- 94 Bluebird Crescent⁷
- 96 Bluebird Crescent⁷
- 14 Wren Place;
- 2A William Pickering Drive; and
- 229 Bush Road
- 233 Bush Road
- 235 Bush Road
- 237 Bush Road
- 239 Bush Road

5.10.1.3 Auckland Council, Auckland Transport and Watercare affected land

Parts of the following AC, AT and Watercare properties will be affected by designations for the Project:

- McClymonts Road (AT)
- 62 Greville Road
- R62 Greville Road (reserve)
- R Tawa Drive (reserve)
- R15 Tawa Drive
- 171 Rosedale Road
- Rosedale Road (AT)
- R27 Arrenway Drive (reserve)
- RA2 Jack Hinton Drive (Watercare, reserve)
- R2 Centorian Drive (reserve)
- R1 Upper Harbour Highway (Constellation Park, reserve)
- Meadowood Reserve
- Omega Reserve
- Rook Reserve
- Bluebird Reserve

Not all of the above land will need to be acquired by the Crown. The NZ Transport Agency will discuss with each landowner whether land acquisition is necessary.

Where the land requirements relate to parks, discussions with AC Parks and Reserves continue to be progressed with regard to refinement of design details and the associated land requirements. It is considered probable that as a result of such refinements and discussions that there will be areas of parks from which the NZ Transport Agency will seek the removal of its designation at the completion of the Project.

The altered and new designations also include some areas of land that is required to enable the construction of the Project to be undertaken. Similar to the parks situation, upon completion of the Project it is probable that there will be areas for which the NZ Transport Agency will seek the removal of its designation(s).



The identification of any such areas will be determined as part of the completion of the Project, and if and when such areas are identified the appropriate applications for removal of the designation will be undertaken at that time.

5.11 Works excluded from Project

Works proposed for the following are excluded from this application package and are to be applied for by the NZ Transport Agency or other network utility operator separately where necessary.

5.11.1 Watercare Services Limited

The following works required to assets owned by Watercare are excluded from the Project scope.

5.11.1.1 East Coast Bays Link

A proposed network upgrade for a pumped rising main across SH1 will be affected by the Project. It is proposed that the link be constructed in conjunction with the Project to ensure integration between the road corridor and sewer network.

5.11.1.2 North Harbour 2 Watermain

The NH2 is being consented by Watercare as is proposed to be installed adjacent to the SH18 corridor between William Pickering Drive and Albany Highway. A suitable corridor for these works is allowed for as part of the Project's design.

5.11.2 North Harbour Hockey Stadium

The proposed alignment along SH18 will require some land currently occupied by North Harbour Hockey which is committed to hosting the 2016/17 Women's FIH World League final in November 2017 including the use of the stadium's facilities and four pitches. The proposed alignment of the SH18/SH1 interchange will encroach onto the existing pitch (Turf 3) and the adjacent grassed pitch located in the southwestern corner of the NHHS. As this will significantly compromise the complex, it is proposed that the hockey facilities are relocated to an alternative location within Rosedale Park North. The NZ Transport Agency has been working closely with Harbour Hockey Charitable Trust (Hockey), AC and other stakeholders to relocate the facilities, including gaining the necessary resource consents and approvals for the facilities to be constructed and operational by November 2017. Any resource consents required for the facility are being applied for separately from the Project.

5.11.3 Rosedale Closed Landfill

The Project will impact on the on-going operation of the Rosedale Closed Landfill, both during and post construction which will impact on the long term discharge consents held by AC for the Rosedale Closed Landfill site. The Project will require the relocation of monitoring apparatus which is currently located at the perimeter of the Rosedale Closed Landfill site. Consequently, variations to the following management plans are envisaged, as part of the detailed design phase of work:

- Rosedale Landfill Aftercare Management Plan, March 2010, prepared by EnviroWaste Services Limited (referred to as the Site Management Plan); and
- Rosedale Closed Landfill Air Quality Management Plan, July 2015, prepared by URS New Zealand Ltd.

A variation to the trade waste agreement may also be required. A Consenting Strategy is being developed in conjunction with the AC's Closed Landfill team in respect of these variations.



6 Reasons for Consent

6.1 Activities requiring Resource Consent

The activities which require resource consents under AUP and NES_{Soil} are set out below. No resource consents are required under the legacy district or regional plans, because all relevant rules of the AUP became operative on 15 November 2016.

All resource consents for the Project are being sought as part of this application. If, after detailed design is complete, further or different resource consents are required, these will be sought at that time. Resource consents for works which are related to the Project (but do not form part of it) will be sought separately. These related works include consents to relocate the NHHS and consents for a possible new Busway station.

Relevant activities that are restricted under the RMA are as follows:

6.1.1 Land use consents

Section 9 imposes restrictions of the use of land. Under section 9(2):

“No person may use land in a manner that contravenes a regional rule unless the use-

(a) is expressly allowed by a resource consent; or

(b) is an activity allowed by section 20A.”

Section 9(1) restricts the use of land that contravenes a national environmental standard; this is discussed in **Section 6.1.4** below. Further, section 9(3) restricts the use of land in contravention of a district rule; these uses will be authorised by designation.

The activities requiring resource consent under section 9(2) are set out in **Table 18** below:

Table 18 Consents pursuant to s9 of the RMA for Construction Activities

Rule Reference	Rule	Activity Status	Comment
Rule E26:A78 Infrastructure	Vegetation alteration or removal in riparian margins not otherwise provided for in relation to the operation, maintenance, renewal, repair, construction and removal of network utilities and electricity generation facilities and minor infrastructure upgrading.	Discretionary	Vegetation removal will be required within the riparian margins of Lucas Creek to accommodate a culvert outfall (CU-NEW-01) on the eastern side of the Oteha Valley interchange. Minor vegetation removal may also be required at Alexandra Stream and Oteha Stream to accommodate proposed new stormwater outfalls and rip-rap aprons and resource consent is being applied for out of caution. Tree removal in these areas will not encroach into any SEA. The removal will occur outside of the proposed road formation and is therefore is not covered by Rule E26:A76 or Rule E26:A77.
Rule E26:A78 Infrastructure	Vegetation alteration or removal within a SEA not otherwise provided for in relation to the operation,	Discretionary	Vegetation removal will be required within SEA_T_8365 for the construction of the SUP and Busway along the eastern length of the corridor and to construct the proposed Moro Wetland at the existing Moro Pond site



Rule Reference	Rule	Activity Status	Comment
	maintenance, renewal, repair, construction and removal of network utilities and electricity generation facilities and minor infrastructure upgrading.		(adjacent to the RWWTP). The vegetation is located around the Moro Pond and the northern side of Pond 2 near the State highway. Some of the removal will occur outside of the proposed road formation and is therefore is not covered by Rule E26:A76 or Rule E26:A77.
Rule E26:A103 Infrastructure	Earthworks greater than 50,000m ² where land has a slope less than 10 degrees outside the Sediment Control Protection Area other than for the maintenance, repair, renewal or minor infrastructure upgrading in all zones.	Restricted Discretionary	Earthworks will be required for the mainline works including works within the Rosedale Closed Landfill. These will extend from Oteha Valley Road, south along SH1 to Sunset Road, and along SH18 to Albany Highway. The area of earthworks outside of the Sediment Control Protection Area (SCPA) where the slope is less than 10 degrees will exceed 50,000m ² . Approximately 27.4ha (284,600m ³) of cut and 15.36ha (311,400m ³) of fill is expected where the existing slope is less than 10 degrees. The majority of these areas will be outside of the SCPA.
Rule E26:A106 Infrastructure	Earthworks greater than 2,500m ² where the land has a slope equal to or greater than 10 degrees other than for the maintenance, repair, renewal or minor infrastructure upgrading in all zones.	Restricted Discretionary	Approximately 5.39ha of cut (112,400m ³) and 5.92ha (165,000m ³) of fill is to be undertaken on areas where the slope is greater than 10 degrees. These areas are generally along the margins of watercourses, the Rosedale Closed Landfill, RWWTP ponds, along the lengths of SH1, and some areas along SH18 (mainly in Rosedale Park South).
Rule E26:A107 Infrastructure	Earthworks greater than 2,500m ² within the Sediment Control Protection Area other than for the maintenance, repair, renewal or minor infrastructure upgrading.	Restricted Discretionary	SCPAs are defined in the AUP as “50 metres landward of the edge of a watercourse, or wetland of 1000m ² or more”. Earthworks will be required within 50m of water for the construction of the Project near the RWWTP ponds, Alexandra Stream, Lucas Creek and various existing stormwater ponds and wetlands throughout the Project area. The volume of earthworks required will exceed 2,500m ² . The anticipated area of earthworks within the SCPA is 72,320m ² of cut and 82,760m ² of fill.
Rule E26:A117 Infrastructure	Earthworks from 10m ² to 2,500m ² and from 5m ³ to 2500m ³ within a Significant Ecological Area.	Restricted Discretionary	Earthworks will be required within SEA_T_8364 for the extension of the causeway within RWWTP Pond 1. This extension into the SEA is necessary for the inclusion of additional lanes along SH1. The



Rule Reference	Rule	Activity Status	Comment
			works within SEA_T_8364 will allow for an additional northbound lane and connection to the proposed new ramps between SH1 and SH18. The anticipated earthworks area and volume will be 600m ² /770m ³ of fill.
Rule E26:A118 Infrastructure	Earthworks for infrastructure greater than 2500m ² or 2500m ³ within a Significant Ecological Area.	Discretionary	Earthworks will be required within SEA_T_8365 for the extension of the causeway within RWWTP Pond 2. This extension into the SEA is necessary for the inclusion of an additional southbound lane, Busway extension, SUP, and the construction of the Moro Wetland to the east of SH1. The volume of earthworks required will exceed 2,500m ³ . It is anticipated that there will be 14,190m ² /4.600m ³ of cut and 4,040m ² /2,160m ³ of fill.

Section 13 imposes restrictions on certain uses of beds or lakes and rivers. Under section 13(1):

No person may, in relation to the bed or any lake or river-

- (a) *use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed; or*
- (b) *excavate, drill, tunnel, or otherwise disturb the bed; or*
- (c) *introduce or plant any plant or any part of any plant (whether exotic or indigenous) in, on, or under the bed; or*
- (d) *deposit any substance in, on, or under the bed; or*
- (e) *reclaim or drain the bed-*

unless expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.

Activities requiring resource consent (land use consent) in relation to the use of bed of rivers are set out in **Table 19** below.

Table 19 Consents pursuant to s13 of the RMA for Construction Activities

Rule Reference	Rule	Activity Status	Comment
Rule E3:A23 Lakes, rivers, streams and wetlands	Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water.	Restricted Discretionary	SEA_T_8364: The causeway works within Pond 1 at the RWWTP are partly within the SEA. These works include changes to the batter slopes and rip-rap within the existing footprint of the causeway structure. SEA_T_8365: The causeway works within Pond 2 at the RWWTP are partly within the



Rule Reference	Rule	Activity Status	Comment
	Replacement, upgrading or extension of existing structures complying with the standards in E3.6.1.12 in a Significant Ecological Area.		SEA. These works include changes to the batter slopes and rip-rap within the existing footprint, and the inclusion of additional lanes for the proposed Busway extension and SUP. Compliance will be achieved with the standards in E3.6.1.10 and E3.6.1.2. The causeway works will occur within the footprint of the existing causeway structure. Temporary damming will be required during the construction period to isolate the area within the ponds for the extension of the causeway. Any bed disturbance during construction will not exceed 10m beyond the existing/proposed structure in accordance with the standards listed in E3.6.1.10 and E3.6.1.12.
E3:A26 Lakes, rivers, streams and wetlands	Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water. Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.10 – E3.6.1.13.	Discretionary	Culverts are defined in the AUP as “a structure with an inlet from and an outlet to a lake, river, stream or the coastal marine area, designed to enable access across a river, such as a road or crossing”. Extensions are proposed to the following existing culverts over natural and concrete channels and streams which will increase their length to more than 30m in total: CU-EX-02 (190m + 39m extension), CU-EX-03 (77m + 11m extension), CU-EX-05 (62m + 6m extension), CU-EX-09 (60m + 15m extension), CU-EX-10 (473m + 59m extension), CU-EX-11 (132m + 10m extension), and CU-EX-12 (121m + 124m extension).
Rule E3:A39 Lakes, rivers, streams and wetlands	New structures and the associated bed disturbance or depositing any substance, reclamation, diversion of water and incidental temporary damming of water Stormwater or wastewater outfall complying with the standards in E3.6.1.14 in a Significant Ecological Area	Discretionary	A replacement pond link connection between Pond 1 and Pond 2 at the RWWTP is proposed due to the existing being affected by the Project. The outfall will discharge water from Pond 1 into Pond 2 and is located to the south of the pond.
Rule E3:A41 Lakes, rivers, streams and wetlands	New structures and the associated bed disturbance or depositing any substance, reclamation, diversion of water and incidental temporary damming of water Surface water intake structure in a Significant Ecological Area	Discretionary	A replacement pond link is proposed between Pond 1 and Pond 2 at the RWWTP is proposed due to the existing being affected by the Project. This structure will intake surface water from the south of Pond 1 with the outfall being located within Pond 2.
Rule E3:A49	Reclamation and drainage and associated structures, bed	Non-complying	A series of watercourses lie to the south of Pond 1 at the RWWTP with their headwaters



Rule Reference	Rule	Activity Status	Comment
Lakes, rivers, streams and wetlands	disturbance or depositing any substance, diversion of water, incidental temporary damming of water, and discharges arising from the piping of a reclaimed waterbody associated with: New reclamation or drainage, including over a piped stream.		being near Caribbean Drive on the Unsworth Heights side of SH18. These watercourses are considered to be naturally occurring intermittent or permanent streams, despite being highly modified and predominantly located within a combination of concrete lined channels and grassed areas. The proposed works will see the existing watercourses largely reclaimed and the diversion and piping of the watercourses from Caribbean Drive to a new course. The existing watercourse is to be filled (reclaimed) to accommodate the new Paul Matthews Road connection and the proposed wetlands within the Rosedale South Reserve.

6.1.2 Water permits

Section 14 imposes restrictions in relation to water. Under section 14(2):

No person may take, use, dam, or divert any of the following, unless the taking, using, damming, or diverting is allowed by subsection (3):

(a) water other than open coastal water; or [...]

Under subsection (3):

A person is not prohibited by subsection (2) from taking, using, damming, or diverting any water, heat, or energy if –

(a) the taking, using, damming, or diverting is expressly allowed by a national environmental standard, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent; or [...]

Consents required under section 14 of the RMA for operational activities are set out in **Table 20** below.



Table 20 Consents pursuant to s14 of the RMA for Operation Activities

Rule Reference	Rule	Activity Status	Comment
Rule E7:A13 Diverting surface water and associated discharge of water	Diverting surface water not meeting the permitted activity standards or not otherwise listed.	Discretionary	<p>Chapter E7 only provides for surface water diversion to artificial watercourses as a permitted activity and therefore resource consent is required for diversions to other watercourses and waterbodies.</p> <p>Surface water is to be diverted during the operation of the Project to discharge into the proposed stormwater wetlands and freshwater bodies via conveyance and treatment swales.</p>

The resource consents required under section 14 of the RMA for the construction of the Project are set out in **Table 21** below:

Table 21 Consents pursuant to s14 of the RMA for Construction Activities

Rule Reference	Rule	Activity Status	Comment
Rule E7:A13 Diverting surface water and associated discharge of water	Diverting surface water not meeting the permitted activity standards or not otherwise listed.	Discretionary	<p>Surface water from proposed sediment retention pond devices are proposed to flow to grass environments which will then discharge to freshwater systems.</p> <p>Water within the ponds at the RWWTP will require temporary diversion during the construction period whilst construction is occurring at the causeway.</p> <p>Chapter E7 only provides for surface water diversion to artificial watercourses as a permitted activity and therefore resource consent is required for diversions to other watercourses and waterbodies.</p>
Rule E7:A20 Groundwater take	Dewatering or groundwater level control associated with a groundwater diversion authorised as a restricted discretionary activity under the Unitary Plan, not meeting permitted activity standards or is not otherwise listed.	Restricted Discretionary	<p>Dewatering will be required for the construction of the Project for groundwater encountered during the construction period as well as for groundwater encountered during construction works within the Rosedale Closed Landfill.</p> <p>The proposed dewatering will be unable to meet the permitted activity standards (E7.6.1.3, E7.6.1.4, E7.6.1.5, E7.6.1.6 and E7.6.1.10).</p> <p>Groundwater take across the Project will exceed 5m³ per day even averaged over any consecutive 20 day period, and will be unable to comply with the time periods for groundwater diversion and dewatering in standard E6.6.1.6. Diversion will be caused by excavation and trenching and will be unable to meet the permitted time period of 10 days at a time.</p>



Rule Reference	Rule	Activity Status	
			The Project will comply with the restricted discretionary activity standard E7.6.3.3 as the groundwater is not geothermal nor is it for municipal water supply.
Rule E7:A28 Diversion of groundwater	The diversion of groundwater caused by any excavation, (including trench) or tunnel that does not meet the permitted activity controls or is not otherwise provided for in all zones	Restricted Discretionary	<p>Groundwater diversion associated with the Project will be unable to meet the permitted activity standards (E7.6.1.10) as the excavations that will extend below ground level will exceed 1ha in total (approximately 1.3ha).</p> <p>Standard E7.6.1.10 does not provide for diversions in open parts of trenches for more than 10 days.</p> <p>The proposed excavations that extend below ground level will not be within 50m of a Wetland Management Overlay, 10m from a scheduled Historic Heritage Overlay, or 10m from a lawful groundwater take.</p>

6.1.3 Discharge permits

Section 15 places restrictions on the discharge of contaminants. The term ‘contaminants’ is defined in section 2 as:

includes any substance (including any gases, odorous compounds, liquids, solids, micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat-

- (a) *when discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or*
- (b) *when discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged.*

Under section 15(1):

No person may discharge any-

- (a) *contaminant or water into water; or*
- (b) *contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
- (c) *contaminant from any industrial or trade premises into air; or*
- (d) *contaminant from any industrial or trade premises onto or into land-*

unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.

Under section 15(2):

No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a national environmental standard unless the discharge-



- (a) is expressly allowed by other regulations; or
- (b) is expressly allowed by a resource consent; or [...]

Under section 15(2A):

No person may discharge a contaminant into the air, or into or onto land, from a place or any other source, whether moveable or not, in a manner that contravenes a regional rule unless the discharge-

- (a) is expressly allowed by a national environmental standard or other regulations; or
- (b) is expressly allowed by a resource consent; or [...]

Activities requiring resource consent (discharge permit) in relation to the discharge of contaminants include:

- Discharge of stormwater (as associated diversion – as grouped together by the AUP);
- Development of new or redevelopment of existing impervious areas within a stormwater management flow area;
- Discharge of contaminants to water;
- Discharge of contaminants into air; and
- Discharges from closed landfills.

Consents required under section 15 of the RMA for operational activities are set out in **Table 22** below.

Table 22 Consents pursuant to s15 of the RMA for Operational Activities

Rule Reference	Rule	Activity Status	Comment
Rule E8:A10 Stormwater discharge and diversion	All other diversion and discharge of stormwater runoff from impervious areas not otherwise provided for.	Discretionary	<p>The proposed stormwater discharges from the Project will be unable to meet E8.6.1(3)(a) and E8.6.1(3)(b) as flooding will be increased at several properties as listed in Table 40 and is therefore unable to comply with the permitted activity standards for Rule E8:A5.</p> <p>The proposed impervious areas will exceed the controlled activity threshold of 5,000m² and therefore cannot comply with the controlled activity Rule E8:A9.</p> <p>Discharges will occur at the following new or relocated NZ Transport Agency outfalls: OF3, OF7, OF8, OF10, OF16 and OF18 (refer to Figure 22).</p>
Rule E9:A9 Stormwater quality- high use roads	Development of a new or redevelopment of an existing high use road that does not comply with the relevant permitted or controlled activity standards.	Restricted Discretionary	<p>The Project involves areas of new and the redevelopment of existing high use road which is defined as having traffic volumes in exceedance of 5,000 vehicles per day.</p> <p>The Project is unable to comply with the controlled activity standards outlined in E9.6.2.2 for E9:A7 as not all runoff from the</p>



Rule Reference	Rule	Activity Status	Comment
			new impervious areas will be treated to TP10 standards, rather an area equivalent across all high use road areas within the Project area (new and existing) will be treated to this standard.
Rule E10:A3 Stormwater management area- Flow 1 and 2	Development of new or redevelopment of existing impervious areas greater than 50m ² within Stormwater management area control – Flow 1 or Stormwater management area control – Flow 2 complying with Standard E10.6.1 and Standard E10.6.4.1	Restricted Discretionary	SMAF 1 and 2 controls cover the entire Project area and therefore this rule will be triggered for the reconfiguration of Constellation Bus Station which will see the construction of a new platform (75m in length) and the extension of one of the existing platforms. In addition, the 6.3km SUP is proposed. The total impervious surface coverage for these areas will exceed 50m ² and is therefore unable to comply with the permitted activity rule, E10:A2. The proposed works will be able to comply with Standards E10.6.1 and E10.6.4.1 as the appropriate hydrology mitigation has been provided.
Rule E10:A7 Stormwater management area- Flow 1 and 2	Development of new or redevelopment of existing impervious areas greater than 5,000m ² for a road, motorway or state highway operated by a road controlling authority or rail corridor within Stormwater management area control – Flow 1 or Stormwater management area control – Flow 2 that complies with Standard E10.6.1 and Standard E10.6.4.2	Restricted Discretionary	SMAF 1 and 2 controls cover the entire Project area. The new and redeveloped impervious surfaces that form part of the Project will meet the standards outlined in E10.6.1 and E10.6.4.2 as detention has been provided in accordance with the hydrology mitigation requirements for SMAF areas. Retention is not required due to insufficient infiltration rates and there being no opportunity to reuse on site in accordance with E10.6.3.1.1(2).

Table 23 below the consents required for the construction activities related to the Project:

Table 23 Consents pursuant to s15 of the RMA for Construction Activities

Rule Reference	Rule	Activity Status	Comment
Rule E4:A11 Discharges of contaminants	Discharge of water and/or contaminants (including washwater) onto or into land and/or into water from any of the following: (a) cleaning, maintenance and preparation of surfaces of buildings, and associated structures;	Controlled	The discharge of water (some of which may contain contaminants) will be required for the upgrading works as part of the Project as the activity involves the construction and upgrading of network utility infrastructure and the construction, repair and upgrading of the stormwater and wastewater network. The construction works associated with the Project will be unable to comply with the permitted activity standards for several activities included in Rule E4:A1 as part of



Rule Reference	Rule	Activity Status	Comment
	<p>(b) construction, repair, maintenance, upgrade or removal of network utility infrastructure; or</p> <p>(c) construction, repair, maintenance, upgrade or removal of any component of the stormwater or wastewater network</p>		<p>the infrastructure borders and extends over a waterbody.</p> <p>Sediment and erosion control measures are proposed to ensure that after reasonable mixing the discharge will be able to comply with the standards set out within E4.6.1. Any water generated that is not able to meet this standard will not be discharged to land or water but treated and disposed of off-site.</p>
<p>Rule E14:A82</p> <p>Air quality</p>	<p>Earthworks and the construction, maintenance and repair of public roads and railways not meeting the general permitted activity standards.</p>	<p>Restricted Discretionary</p>	<p>Dust will be generated as a result of the earthworks and construction activities.</p> <p>Permitted activity standard E14.6.1.1(1) requires that the discharge must not contain contaminants that cause, or are likely to cause, adverse effects on human health, property or the environment beyond the boundary of the premises that the activity takes place. Any discharges to air as a result of the construction of the road (such as dust and odour) are likely to traverse beyond the boundary of some parts of the Project area and will therefore be unable to meet the permitted activity standards.</p>
<p>Rule E14: A158</p> <p>Air quality</p>	<p>Discharges of contaminants to air from waste processes</p> <p>Landfills that ceased receiving waste materials (closed landfill) after 1 October 1991, and contained at least 200,000 tonnes of waste materials at the time of closure</p>	<p>Restricted Discretionary</p>	<p>The Rosedale Closed Landfill ceased operation in 2002 and it contained at least 200,000 tonnes of waste material at the time of closure as it received over 3.3 million tonnes during its operation.</p> <p>The earthworks within the landfill will perforate the cap of the landfill resulting in the discharge of landfill gases, dust and contaminants to air during the construction of the Busway and SUP within the landfill.</p>
<p>Rule E30:A7</p> <p>Contaminated land</p>	<p>Discharges of contaminants into air, or into water, or onto or into land not meeting controlled activity Standard E30.6.2.1</p>	<p>Discretionary</p>	<p>Discharges to air from contaminated land is required for the Project, including discharges from the Rosedale Closed Landfill including landfill gas.</p> <p>A Preliminary Site Investigation has been undertaken to determine potential sites with land contamination and expected contaminants. A Draft Contaminated Site Management Plan has been prepared.</p> <p>Compliance with the permitted or controlled activity standards will not be achieved with the standards in E30.6.2.1 as a Detailed Site Investigation has not been produced.</p>



6.1.4 Other resource consents required

6.1.4.1 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

Several sites within the Project area have been identified as containing activities on the Hazardous Activities and Industries List (HAIL) or as a potential HAIL site. A Preliminary Site Investigation (PSI) for the Project has been undertaken in accordance with the NES_{Soil} and is included in **Technical Assessment 6**. It is proposed that a Detailed Site Investigation (DSI) is undertaken to establish contaminant concentrations where works are proposed on a HAIL or potential HAIL site.

The Project will comply with Regulation 8(2) of the NES_{Soil} for any sampling undertaken of any contaminated or potentially contaminated sites.

However, as a DSI has not yet been completed, the Project will be unable to comply with the controlled and restricted discretionary regulation standards and therefore resource consent for a discretionary activity is sought under the NES_{Soil} for the disturbance of soil and the change in land use (Regulation 8(3)).

6.2 Activities considered to be permitted

The following tables summarise those aspects of the Project that are permitted by the regional rules in the AUP, and where compliance with the relevant development controls will be achieved.

6.2.1 Land use activities

The activities considered to be permitted under section 9(2) of the RMA are set out in **Table 24** below:

Table 24 Permitted Activities pursuant to s9(2) of the RMA

Rule Reference	Rule	Activity Status	Comment
E26:A9 Infrastructure	Pipes and cables for the conveyance of water, wastewater, stormwater, electricity, gas and telecommunications	Permitted	Some network utility infrastructure is required to be relocated or replaced to accommodate for the main Project works. The extent of these relocation and replacement works are outlined in Section 5.8 . This rule has been included for completeness as it appears to be a matter under section 9(3) of the RMA (but the AUP is not clear).
E26:A49 Infrastructure	Underground pipelines and ancillary structures for the conveyance of water, wastewater and stormwater (including above ground ancillary structures associated with underground pipelines)	Permitted	Stormwater pipes, including culverts that do not meet the definition of a culvert under the AUP, are proposed throughout the Project area. This rule has been included for completeness as it appears to be a matter under section 9(3) of the RMA (but the AUP is not clear).
Rule E26:A109/ Rule E11:A14 Infrastructure/ Land disturbance - regional	Activities ancillary to erosion and sediment control. The temporary diversion and damming of surface water and the discharge of treated sediment laden water from any land disturbance allowed by a	Permitted	Rule E26:A109 refers to Table E11.4.2 (Activity table for all zones and roads- diversion, damming and discharge of treated sediment laden water) where activities ancillary to erosion and sediment control are permitted activities (including temporary diversion and damming of surface water).



Rule Reference	Rule	Activity Status	Comment
	land use consent in the above tables.		Erosion and sediment control activities such as sediment ponds, bunds, and temporary diversion of sediment laden water will be required to treat discharges of water generated as a result of earthworks.

The land use activities considered to be permitted under section 14 of the RMA are described in **Table 25**:

Table 25 Permitted Activities pursuant to s14 of the RMA

Rule Reference	Rule	Activity Status	Comment
Rule E3:A22 Lakes, rivers, streams and wetlands	Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water. Minor upgrades to existing infrastructure related structures complying with the standards in E3.6.1.12 not within an overlay.	Permitted	Minor upgrades and repairs are proposed to existing culverts and outfall structures within the Project area to accommodate the proposed increases in stormwater discharges. These upgrades comply with the permitted activity standards in E3.6.1.12 as there will be small amounts of bed disturbance and only small increases in the size of the structures.
E3:A23 Lakes, rivers, streams and wetlands	Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water. Replacement, upgrading or extension of existing structures complying with the standards in E3.6.1.12 not within an overlay.	Permitted	For upgrading of the causeway structure between the two RWWTP ponds outside of the SEA overlay. The causeway was constructed in the 1960s and is lawfully established. The upgrading works outside the SEA overlay are permitted as the upgrade will occur within the existing footprint of the causeway structure and will be able to comply with the standards in E3.6.1.12.
E3:A34 Lakes, rivers, streams and wetlands	Erosion control structures less than 30m in length when measured parallel to the direction of water flow complying with the standards in E3.6.1.14.	Permitted	Several rip-rap aprons are proposed at outfalls within the Project area. Rip-rap aprons and other small erosion protection mechanisms will not exceed 30m in length nor will disturbance of the bed exceed 10m either side of the outfall structure. The installation will not increase flooding above the 1 per cent annual exceedance probability and will be able to comply with the permitted activity standards in E3.6.1.14.



Rule Reference	Rule	Activity Status	Comment
			New rip-rap aprons are proposed for the following outfalls in streams: OF3, OF8, OF10, and OF18 (Refer to Figure 22).
E3:A39 Lakes, rivers, streams and wetlands	Stormwater or wastewater outfalls complying with the standards in E3.6.1.14.	Permitted	Five stormwater outfalls are proposed to be constructed or modified as part of the Project and are within streams (OF1, OF8, OF10, OF16 and OF18). None of these are located within overlays. The construction of the outfalls will be able to comply with the permitted activity standards outlined in E3.6.1.14.
E3:A53 Lakes, rivers, streams and wetlands	Any activity that is undertaken in, on, over or within the bed of an ephemeral river and streams complying with the standards in E3.6.1.1.	Permitted	Ephemeral streams are defined in the AUP as streams with reaches above the water table at all time with water flowing during and shortly after rain events. No ephemeral streams have been identified within the Project area that are likely to be affected by the works. However if, after a rainfall event, an ephemeral stream were to become apparent, the Project will be able to comply with the permitted activity standards in E3.6.1.1.

6.2.2 Diversion of water

Set out in **Table 26** are the water diversion activities considered to be permitted under section 14 of the RMA:

Table 26 Permitted Activities pursuant to s14 of the RMA

Rule Reference	Rule	Activity Status	Comment
Rule E7:A11 Diverting surface water and associated discharge of water	Diversion into an artificial watercourse.	Permitted	Dirty water runoff diversion channels will be sized to cater for the 1% annual exceedance probability rainfall event to prevent uncontrolled runoff within the site boundaries. Diversions of surface water will not reduce the water quality of any downstream waterbody, including effects associated with the discharge of sediment.
Rule E8:A1 Stormwater – Discharge and diversion	Diversion of stormwater runoff from lawfully established impervious areas directed into an authorised stormwater network or a combined sewer network that complies with Standard E8.6.2.1.	Permitted	There are existing impervious areas within the Project area that were established prior to the date the AUP became operative in part. The diversion of stormwater into an authorised stormwater network is permitted as the NZ Transport Agency has asset owner approval in



			principle for diversion to the network as per the permitted activity standard in E8.6.2.1(1).
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6.2.3 Discharges

Set out in **Table 27** are the activities considered to be permitted under section 15 of the RMA:

Table 27 Permitted Activities pursuant to s15 of the RMA

Rule Reference	Rule	Activity Status	Comment
Rule E4:A1 Other discharges of contaminants	Discharge of water and/or contaminants (including washwater) onto or into land and/or into water from any of the following activities: concrete/asphalt laying or reworking, drilling, mobile cleaners, washing vehicles, plant or machinery, road construction activities and dust suppression.	Permitted	Various construction activities may result in the discharge of contaminants which are able to comply with the permitted activity standards in E4.6.1. Resource consent is sought for other activities listed in E4:A1 that are unable to meet the permitted activity standards under Rule E4:A11.
Rule E4:A5 Other discharges of contaminants	Discharge onto or into land and/or into water for the purpose of dewatering trenches or other excavations	Permitted	Any discharges from trenches will be able to comply with the permitted activity standards in E4.6.1 and E4.6.2.4. The origin of all discharges will be limited to surface water and/or groundwater. Appropriate sediment control measures will be implemented to ensure discharges are compliant with the standards in E4.6.2.4(2).

6.3 Resource Management Act 1991 Assessment

Overall, resource consent is sought as a non-complying activity. For avoidance of doubt, the NZ Transport Agency is seeking resource consents under the above rules and any other rules which may apply to the activity, even if not specifically noted. Therefore, all resource consents directly required for the Project are being sought at this time. However, after detailed design is complete, if further or different consents are required, these will be sought at that time

Resource consents for works which are related to the Project (but not part of it) will be sought separately. These related works include consents to relocate the NHHS, network utilities and any in respect of a possible further busway station.

6.4 Existing Resource Consents

A search of the NZ Transport Agency's and AC's records has identified a number of existing resource consents relating to the on-going operation of the State highway within the Project area. **Table 28** details the resource consents which relate to stormwater discharges from the existing network. Where the outfalls listed below are being retained and used for the Project, new discharge consents are being sought as part of these applications.



Table 28 Existing Resource Consents relevant to the Project

Consent reference	Project Name	Relevant Stormwater Conditions
29776	SH1 Albany Bus Station Ramps	<p>Oteha Valley Road Pond South – Alpur A1 Pond 30 – 27,590m² for TSS removal and 34.5mm detention</p> <p>McClymonts Road Pond South- Alpur A1 Pond 32 – 11,880m² for 75% TSS removal</p> <p>McClymonts Road Pond North – Alpur A1 Pond 31 – 10,019m² for TSS removal and 34.5mm detention</p>

The AC Network Discharge Consent 31819/33076 (NDC) covers the stormwater discharges from AC owned assets within the Project area and the surrounding catchments. Upgrades to two of AC’s outfalls are proposed as part of the Project. Some stormwater from the Project is proposed to discharge through AC assets (see Section 5 for detail). The discharges from the Project that utilise the AC stormwater outfalls will comply with the conditions set out in the NDC. Condition 9(c) of the NDC specifically requires that stormwater discharges from developments with more than 1,000m² of impervious areas are to incorporate mitigation including source control initiatives and a treatment level of 75% TSS removal on a long term average basis.



7 Assessment of Alternatives

7.1 Introduction

This section provides a summary of the alternatives assessment process undertaken in the development of the Project.

The development of the Project has been an iterative process over a two-year period, since its inception as one of Auckland's Accelerated Roding Projects in June 2014, although many elements of the Project were subject to earlier investigations and studies. Preliminary work commenced in July 2014 and has continued through to preliminary design during 2016, as part of the pre-implementation phase of the overall Project. At each stage, a process of identifying and evaluating alternatives was undertaken, commensurate with the level of detail at that stage, taking into account the existing natural and built environment, as well as social and cultural values.

The Project is essentially an integrated package of connection and linkage improvements for an existing transport network structure, to improve the functionality and capacity of that network and thereby provide the local, regional and interregional benefits being sought by the Project objectives. Therefore, the alternatives assessments that have been undertaken have focused on specific design options for the various connection improvements, including alignment and siting options, as well as determining appropriate arrangements of elements to ensure the greatest level of efficiency and safety.

The alternatives assessment process was informed by and responded to a series of staged stakeholder and community engagement as investigations and options were developed. The information derived from this process was fully considered and incorporated into the decision-making process during the development of the final Project scheme.

This Section summarises the decision-making process involved in the consideration of alternative routes (alignments), sites and methods, with reference to the relevant statutory requirements, and the key steps involved in the assessment process, which were as follows:

- Indicative Business Case (IBC) – an assessment of the key alternative concepts;
- Detailed Business Case (DBC) – an assessment of the alignment and interchange alternatives and development of concept design; and
- Preliminary design – design refinement.

7.2 Statutory Requirement to Consider Alternatives

To implement the Project, a number of authorisations under the RMA will be needed, including new designations, alterations to existing designations, and various resource consents.

The new designations and designation alterations will be obtained by lodging NoRs with the EPA, to be determined by a BoI established under Part 6AA of the RMA (Proposals of National Significance). Related resource consent applications will be lodged with the EPA at the same time.

Under the RMA, a consideration of alternative routes, sites and methods is relevant in certain respects:

- In relation to notices of requirement, where a requiring authority does not have an interest in the land sufficient for undertaking the work, or it is likely that work will have a significant adverse effect on the environment (s171(1)(b));
- In relation to resource consent applications, the information to be included in an AEE must include a description of possible alternative locations or methods for undertaking the activity where it is



likely that the activity will have a significant adverse effect on the environment (Schedule 4, Clause 6);

- In relation to applications for discharge permits, “any possible alternative methods of discharge, including discharge into any other receiving environment” (s105 and Schedule 4, Clause 6); and
- The “best practicable option” shall be adopted to ensure that the emission of noise from that land or water does not exceed a reasonable level, which implies consideration of options (s16).

7.2.1 Notices of Requirement – Sections 168 and 171(1)(b)

The RMA allows requiring authorities approved under section 167 of the RMA to notify requirements for land for a project or work. The NZ Transport Agency is approved as a requiring authority for:

...(a) all existing roads that are State highways as defined in section 2(1) of the Government Roading Powers Act 1989; and

(b) the maintenance and improvement of the safe and efficient operation of the existing State highways in New Zealand [and specified projects]⁸

...the construction and operation (including the maintenance, improvement, enhancement, expansion, realignment and alteration) of any State highway or motorway, pursuant to the [Transit New Zealand Act 1989]⁹ and

...the purpose of constructing or operating (or proposing to construct or operate) and maintaining cycleways and shared paths in New Zealand pursuant to the Government Roading Powers Act 1989 and the Land Transport Management Act 2003.¹⁰

When considering a NoR, Section 171(1)(b) of the RMA requires the consenting authority to have particular regard to whether adequate consideration has been given to alternative sites, routes and methods of undertaking the work in cases where either –

- The requiring authority does not have an interest in the land sufficient for undertaking the work, or
- It is likely the work will have a significant adverse effect on the environment.

Through section 181(2), the consideration of alternatives is also required when considering alterations to existing designations under the same circumstances.

Section 171(1)(b) requires the NZ Transport Agency as a requiring authority to demonstrate that its investigation of alternatives has not been carried out in an arbitrary or cursory way¹¹. This does not mean that it is required to consider the full suite of alternatives available, or to select the best option in assessing the relative merits of the alternatives identified¹². However, while section 171(1)(b) does not necessitate a requiring authority to fully evaluate every non-suppositious alternative with potentially reduced environmental effects (i.e. every possible feasible option), nevertheless the adequacy of the consideration of alternatives needs to be in proportion to the impact of the proposed designation: that is, greater scrutiny is required where the impacts are likely to be higher, both in terms of the impact on land not held by the requiring authority and in relation to the severity of the adverse effects of an option. If there is a non-suppositious option that would have reduced effects, then it should be evaluated in a transparent and replicable manner.

⁸ Resource Management (Approval of New Zealand Transport Agency as Requiring Authority) Order 1992.

⁹ Resource Management (Approval of Transit New Zealand as Requiring Authority) Notice 1994, notified in the Government Gazette on 3 March 1994. Under clause 29 of Schedule 2 of the Land Transport Management Amendment Act 2008, the NZ Transport Agency replaced Transit New Zealand as the requiring authority approved under this Gazette Notice. Under section 47(1)(c) of the Land Transport Management Amendment Act 2008, from 1 July 2008 the Transit New Zealand Act 1989 is to be called the Government Roading Powers Act 1989.

¹⁰ Resource Management (Approval of NZ Transport Agency as a Requiring Authority) Notice 2015, published in the Gazette on 19 November 2015, No 126, page 6742.

¹¹ Refer *Environmental Defence Society v Mangonui County Council* (HC Auckland, M101/81, 23 October 1981); *Waimairi District Council v Christchurch City Council* (Planning Tribunal, 030/82, 13 July 1982) and *Villages of NZ (Mt Wellington) Ltd v Auckland City Council* (Environment Court, A023/09, 20 March 2009).

¹² Refer *Beda Family Trust v Transit New Zealand* (Environment Court, A139/04, 10 November 2004).



Where there are options requiring land in which the requiring authority does not have sufficient interest to undertake the proposed work (such as by ownership or easement), then there is a requirement to establish an appropriate range of alternatives and adequately consider them. The measure of adequacy will depend on the extent of the land affected by the designation. The greater the impact on private land, the more careful the assessment of alternative sites not affecting private land will be¹³.

A similar approach must be adopted in relation to adverse effects on the environment: i.e., the greater the adverse effects, the more rigorous the assessment of alternatives that may have lesser effects¹⁴.

7.2.2 Resource Consent Applications – Schedule 4 & Section 105

Schedule 4 of the RMA requires an assessment of alternatives in specific instances, namely:

- Where it is likely that an activity will result in any significant adverse effect on the environment, alternative locations or methods for undertaking the activity must be described (Clause 6(1)(a)); and
- Where the activity includes the discharge of any contaminant, any possible alternative methods of discharge, including discharge into any other receiving environment must be described (Clause 6(1)(d)(ii)).

The latter consideration aligns with the requirement under section 105, under which the consent authority in considering an application for a discharge or coastal permit must, in addition to the matters in section 104(1), have regard to any possible alternative methods of discharge, including discharge into any other receiving environment.

For the resource consent applications (including discharge permit applications), the available choice of locations or methods is constrained by the Project for which the designations are sought. That is, locations or methods that will not enable the work for which the designations are sought are not 'possible' alternatives. In this sense, the alternatives to be considered in relation to both the designations and resource consents must align.

Detail on the proposed methods for discharges are contained in the relevant Section 5 and within the Assessment of Stormwater Management (**Technical Assessment 11**).

7.3 Overview of Project Design Process

7.3.1 Strategic History

Prior to mid-June 2014, a number of investigations and studies had been undertaken by the NZ Transport Agency (as well as AC and AT), on a number of the components that now form part of the Project. These include:

- **SH1/Greville Road Interchange Upgrade** – this component was outlined and assessed in the Albany Land Use and Transportation Study: Final Report, Beca, September 2010, which concluded that a direct grade separated connection between SH1 and the Albany Expressway at the Greville Road Interchange would best address capacity and congestion issues.
- **SH1/SH18 Interchange Upgrade** – the options for improving the intersection between SH1 and SH18 were assessed in the North Harbour Strategic Scoping Study (Opus October 2010), and State Highway 1 Upper Harbour to Greville Interchange Improvement Assessment – Traffic Assessment and Economic Evaluation (Flow March 2011).
- **State Highway 18 Intersection Optimisation Improvements** – this component involved looking at various interim options for improving congestion along the section of SH18 between Unsworth Drive and the SH1/Constellation interchange in response to the predicted increase in traffic brought about by the completion of the WRR. The preferred option involved a series of intersection upgrades, providing additional lanes and additional length to existing turn bays to mitigate impacts

13 Refer *Queenstown Airport Corporation Limited v Queenstown Lakes District Council* [2013] NZHC 2347, at [97].

14 Refer *NZ Transport Agency v Architectural Centre Inc* [2015] NZHC 1991, at [140].



from queuing. The assessment was reported on by Aurecon in May 2011, Preliminary Project Feasibility Report SH18 Paul Matthews Drive/ Caribbean Drive Investigation.

- **SH1/UHH to Greville Road Upgrade** – this component involved a new third lane of the northbound lanes of the SH1 motorway between Upper Harbour Highway and Greville Road: this was investigated and reported on in the SH1 Upper Harbour Highway to Greville Northbound Improvements Scheme Assessment Report. Construction of this widening commenced in 2012, and was completed earlier this year.
- **Northern Busway Extension to Albany** – A 2011 scoping report, Northern Busway Extension Constellation to Orewa Scoping Report was followed by a Scheme Assessment Report, Northern Busway Extension Constellation to Orewa Scheme Assessment Report (SAR), which was completed in February 2012. This report examined options to extend the current Northern Busway, which terminates at the Constellation Bus Station, to the Albany Bus Station. The report recommended that an Eastern alignment be progressed as this was the most effective and efficient option for any future Northern Busway Extension.

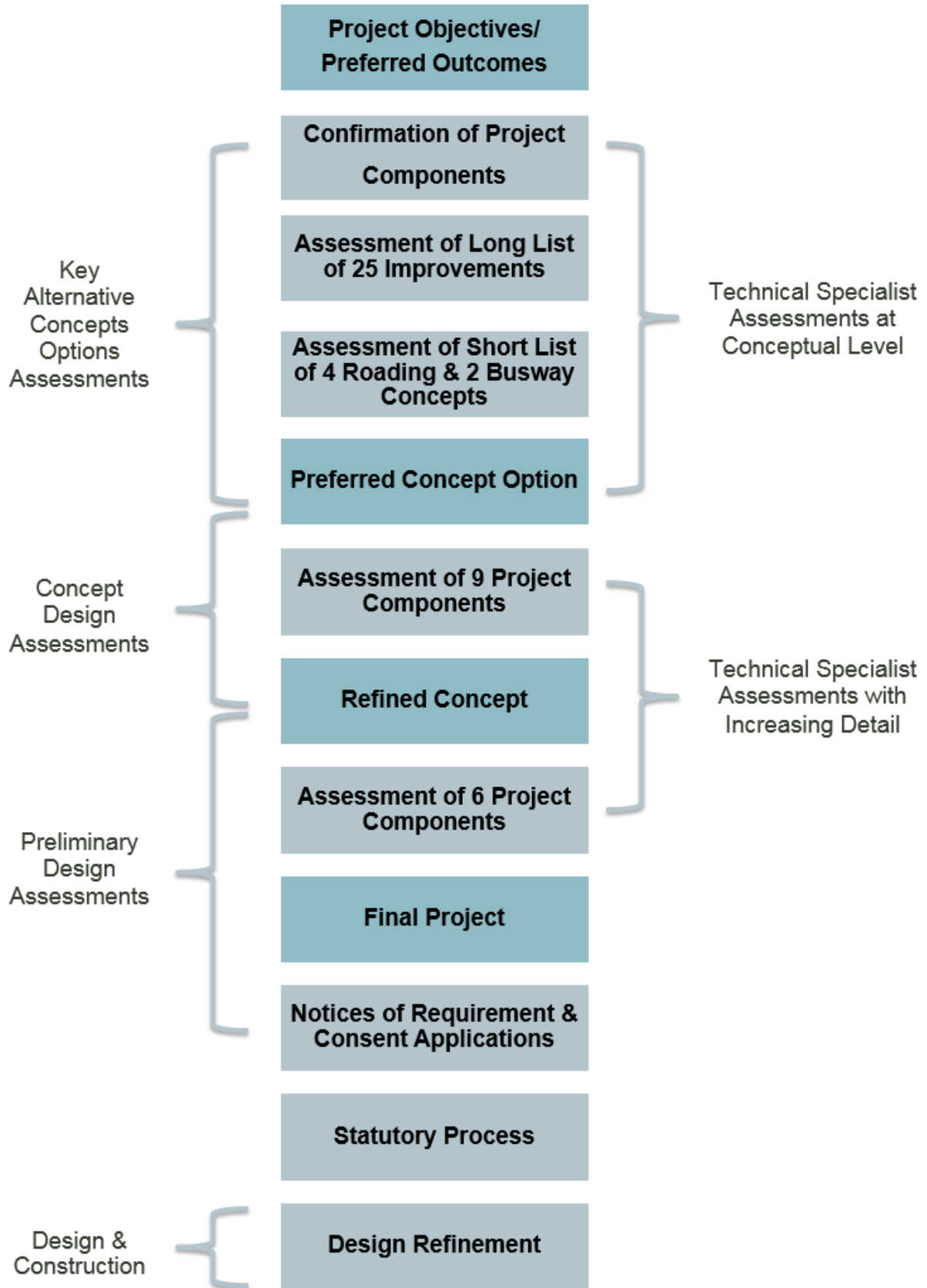
7.4 Northern Corridor Improvements Project 2014

The Project has evolved out of the various separate transport improvement investigations and schemes that have been undertaken or considered over the last decade in the Project area as indicated in **Figure 25**.

These components were all brought together to form the Project as one of the Government's Accelerated Regional Roding Projects in 2014 (but without the SH1/UHH to Greville Road Upgrade for which construction was already underway). In addition to the roading and Busway components, the Project also sought to address the constraints and opportunities for improving the walking and cycling connections in the Project area to provide a fully integrated multi-modal approach to the area's transportation functionality.



Figure 25 Summary Diagram of the Project Assessment Process





Unlike many transportation projects where investigations into new routes are a critical primary stage of the assessment of alternatives, there is no route selection component to the Project. Rather the Project is essentially an integrated package of connection improvements for an existing transport network structure to improve the functionality and capacity of that network, and thereby provide the local, regional and interregional benefits being sought by the Project objectives. Therefore, the alternatives assessment that has been undertaken has focused on specific design options for the various connection improvements, including alignment and siting options.

7.5 Assessment of Key Alternative Concepts 2014-15

Following the inception of the Project in mid-2014, Beca and Opus were engaged to develop an IBC for the Project, reviewing the overarching strategic case for the improvements and scoping the high level options for bringing about the strategic outcomes sought by the Project. The purpose of this phase was to:

- Provide a summary of the problems, benefits and measures and to assess them;
- Develop a long list of options to address the problems identified and deliver the benefits identified;
- Assess the transport performance of and social/environmental impacts of the long list of options and short list of options; and
- Identify a recommended option(s) to proceed to further analysis in the next stage.

To inform the process, stakeholder and public consultation was undertaken in June-July 2014, seeking feedback on the various connection improvement concepts being investigated for SH1 and SH18. These concepts are shown diagrammatically in **Figure 26** below.

Specifically, feedback was sought on:

- Urban design ideas, given the Northern Corridor runs through both residential and industrial areas, several natural features, and follows the North-West Wildlink corridor;
- A potential additional bus station on the new Busway extension, with Park and Ride options, in the Rosedale area to service a major employment area;
- Where the community would like improved walking and cycling links and access points built; and
- Whether a local road bridge at Unsworth Drive would improve connectivity for local residents.



Figure 26 Project Key Components



Source: NZ Transport Agency



The study confirmed the strategic case for the Project, which is summarised in **Section 2** above. In brief, it concluded that the Project has a 'High Strategic Fit' as it forms part of the WRR which has been developed through the RoNS programme, and has the potential for a nationally significant contribution to economic growth and productivity through significant improvements in:

- Journey time reliability;
- Easing of severe congestion in major urban areas;
- Relieving capacity constraints;
- More efficient freight supply chains; and
- By providing a secure and resilient transport network.

The problems, opportunities and constraints for improving network connections in the area were identified, including the land use, social, property, infrastructure and environmental constraints. The base case, or 'do-nothing option', was also identified, against which the performance of the options could be compared. The base case presumed a number of future network improvements outside the Project that would affect overall network performance, including elements of the Project.

The alternatives assessment process involved a two-staged approach:

1. A Multi Criteria Assessment (MCA) was undertaken on a **long list** of 26 options, comprising various alternatives for each of the Project's four components, drawing on previous technical investigations. The components of the Project were identified at a conceptual level only – for example, it assessed the option of having a northbound link from SH18 to SH1 but not options for the specific location and design of such a link. From this assessment, a number of project elements were discarded from further evaluation or as potential complimentary measures; and
2. A second MCA was undertaken of a **short list** of component options to develop an overall package of elements.

A summary of these two assessments is provided below.

7.5.1 Long List MCA

For the long list, a number of options were identified for each of the following four key components of the Project:

- SH18 UHH/Constellation Drive Interchange;
- SH1/Greville Road Interchange;
- Local Roads off SH18 and SH1; and
- Busway Extension.

A number of walking and cycling improvements that could be implemented regardless of the roading or busway options were also identified, being:

- A new north/south connection adjacent to the new Busway from Constellation Bus Station to Albany Bus Station;
- Improved access to the NHHS; and
- Connection of the walking and cycling facilities along SH18 to the existing underpass east of Unsworth Drive.

The 26 long-listed options were evaluated using a MCA, applying a wide range of criteria, under the following categories:

- Performance against Project Objectives
- Transport
- Safety
- Economic efficiency



- Consentability
- Urban Design
- Natural environment
- Culture and heritage
- Land requirement
- Constructability
- Social
- Public Health
- Construction disturbance

The suite of assessment criteria covered a range of matters relevant to meeting the sustainable management purpose of the RMA, including health and safety, social and economic wellbeing, heritage and cultural, and a range of environmental impacts. The MCA Framework was developed with consideration of the NZ Transport Agency's z19 Environment and Social Responsibility Standard (June 2014) and incorporated criteria that aligned to the Agency's Social and Environmental Screen. The options were evaluated by appropriate experts, who provided their assessment on each of the 26 options.

The findings of this MCA were then evaluated through a workshop to determine feasible options for combining into a single overall package of Project elements, screening out concepts that did not meet or support project objectives. As part of this evaluation, key land or environmental impacts were identified. While most of the options were either discarded or retained, the evaluation also identified opportunities for future proofing for other options or retaining as complimentary measures to the main options.

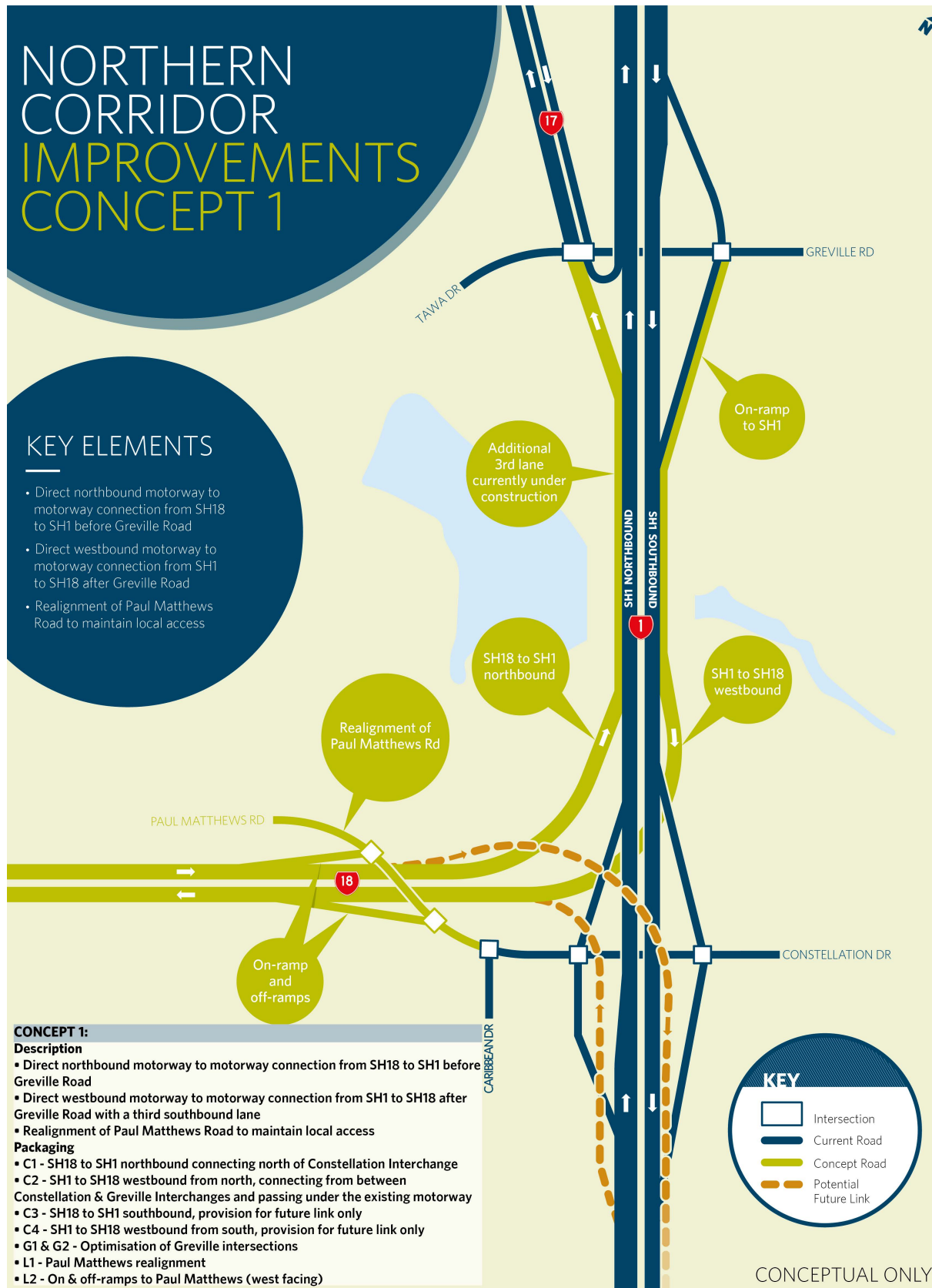
7.5.2 Short List MCA Evaluation Framework

From the long list evaluation, a number of short-listed concept options were developed by packaging together the discrete components identified from the long list assessment, and presented in simple diagrammatic illustrations. The outcome was a total of four motorway 'improvement' concepts and two busway concepts. The four motorway concepts were essentially a cumulative packaging of different design elements, with Concept 1 being the "base package" and hence the lowest cost option. All motorway concepts allowed for the busway to be extended northwards towards the Albany Bus Station.

A summary of each concept option with an illustrative diagram is provided below in **Figures 27 – 31**.



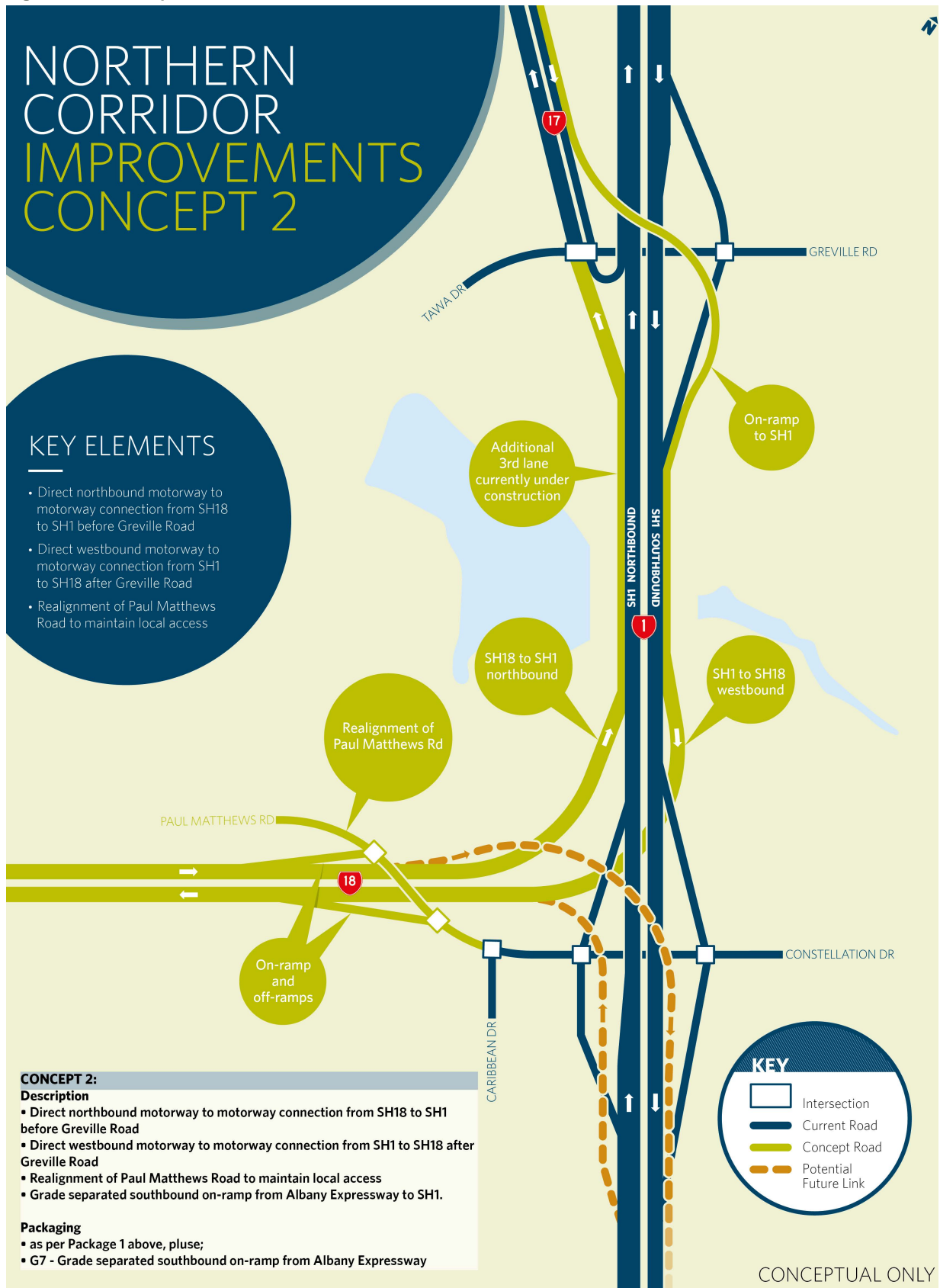
Figure 27 Concept 1



Source: NZ Transport Agency



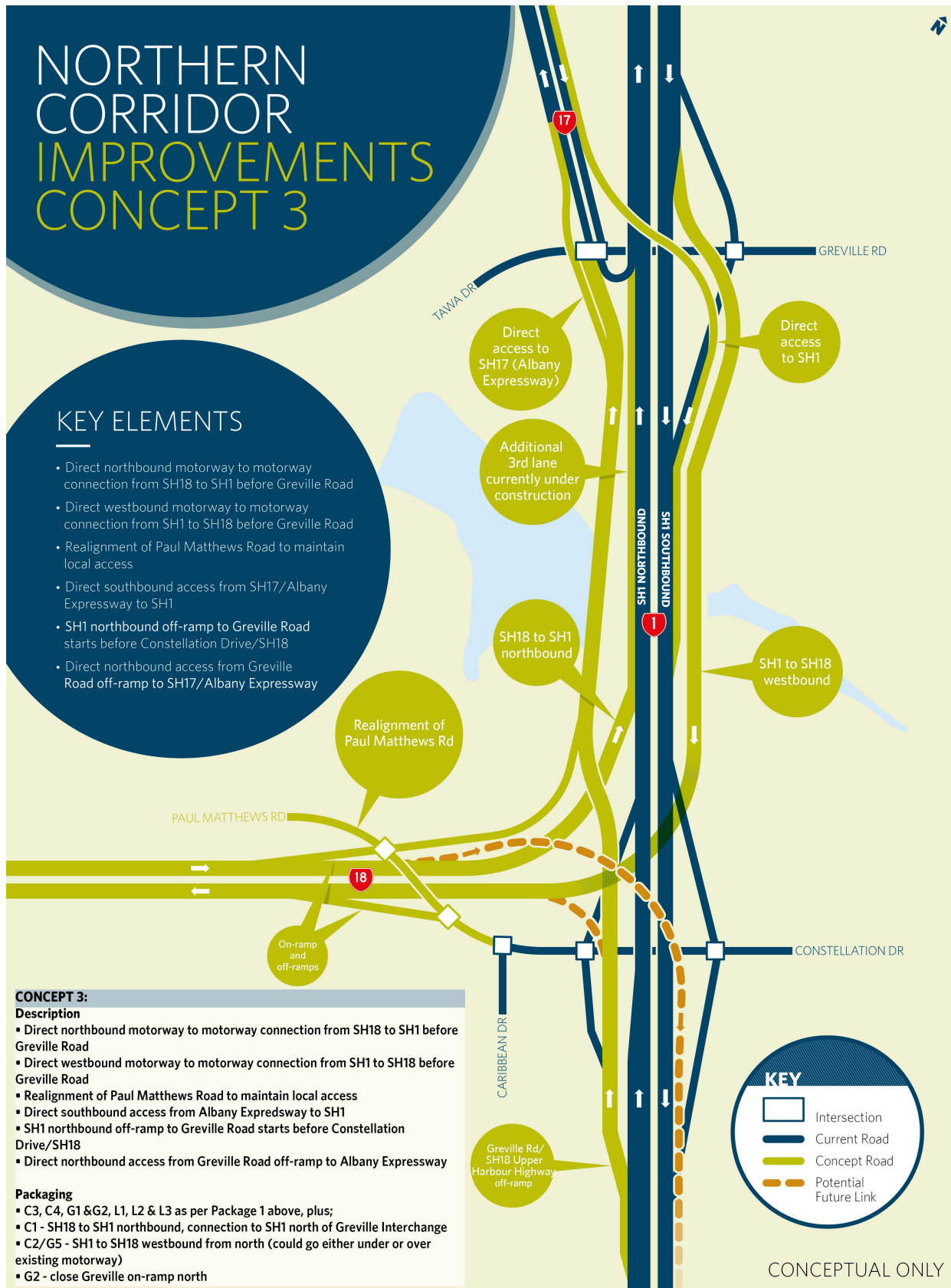
Figure 28 Concept 2



Source: NZ Transport Agency



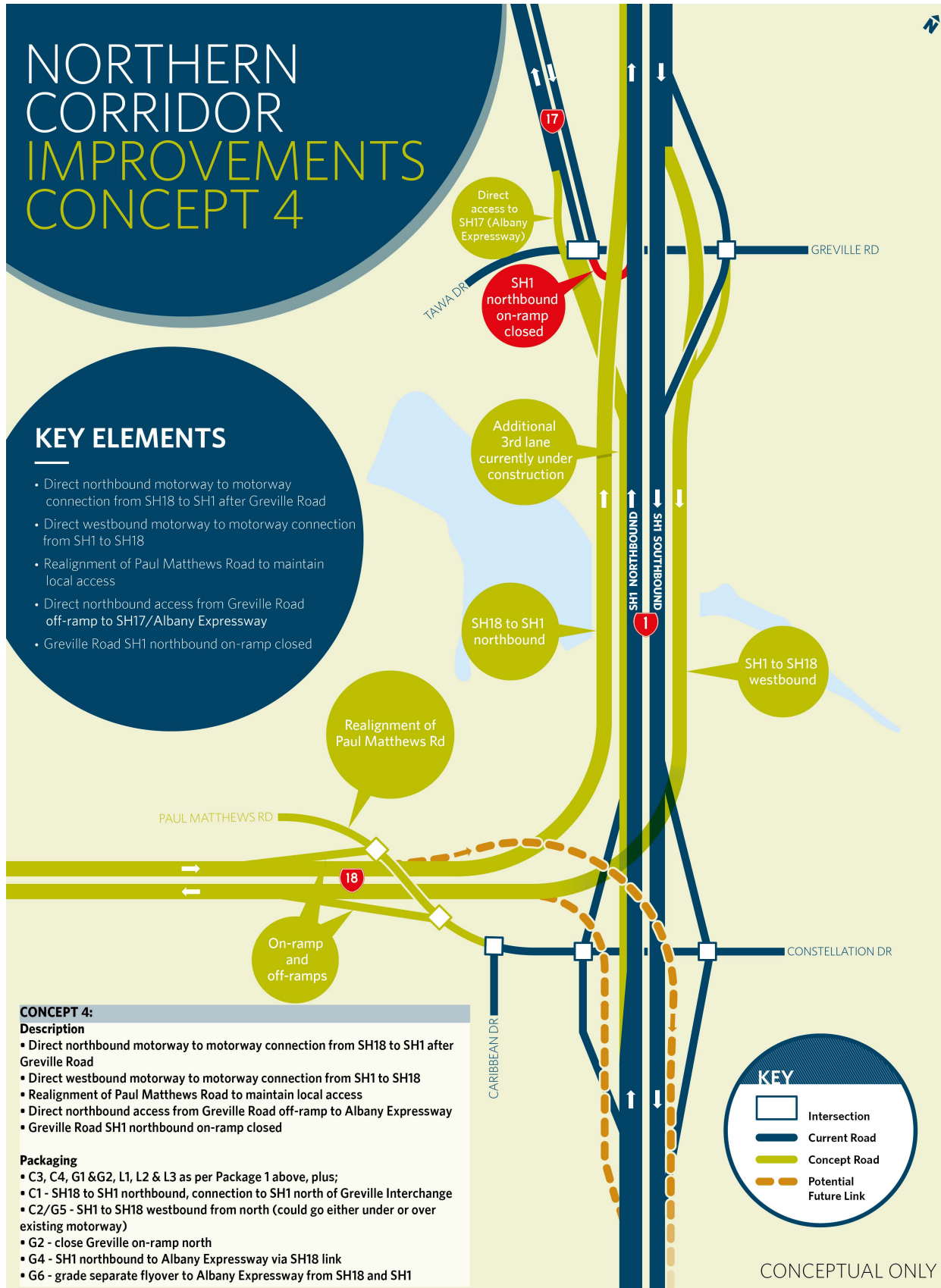
Figure 29 Concept 3



Source: NZ Transport Agency



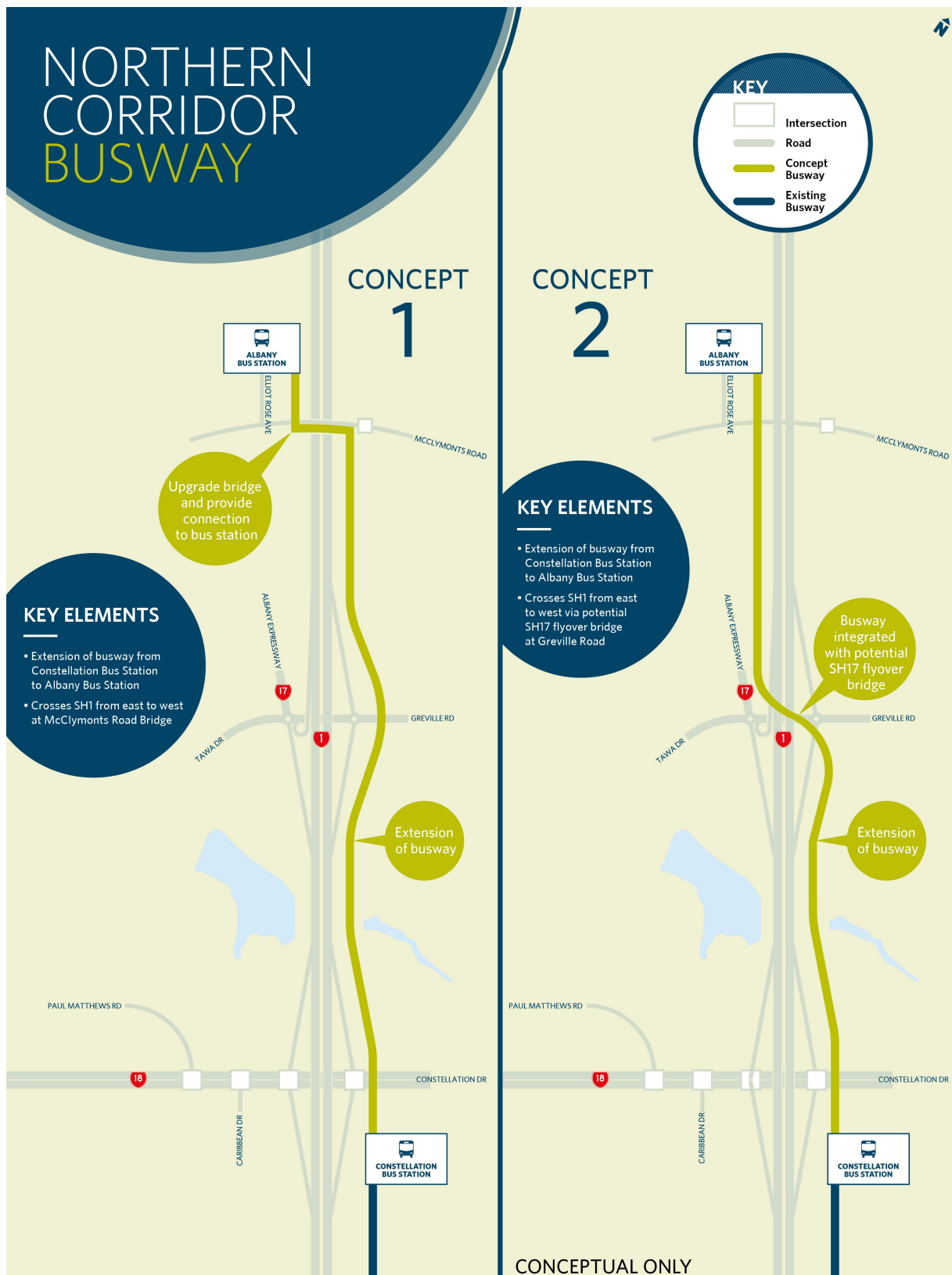
Figure 30 Concept 4



Source: NZ Transport Agency



Figure 31 Busway Concept 1 and 2



Source: NZ Transport Agency



Busway Concept 1	Busway Concept 2
<p>Description</p> <ul style="list-style-type: none"> ▶ Extension of busway from Constellation Bus Station to Albany Bus Station. ▶ Remains on the eastern side of the motorway from Constellation Bus Station to Albany. ▶ Bridge over Constellation Drive. ▶ Bridge over Greville Road. ▶ Direct bus connection to Albany Bus Station in the vicinity of McClymonts Road. ▶ Accommodate future extension of the busway on the eastern side further north to Silverdale. <p>Packaging</p> <ul style="list-style-type: none"> ▶ Can be provided with all. 	<p>Description</p> <ul style="list-style-type: none"> ▶ Extension of busway from Constellation Bus Station to Albany Bus Station. ▶ Remains on the eastern side of the motorway from Constellation Bus Station to Greville Road. ▶ Bridge over Constellation Drive. ▶ At Greville Road Interchange, the busway crosses to the western side of SH1. ▶ Busway passes beneath McClymonts Road to access Albany Bus Station. ▶ A new bridge structure will be required across SH1 north of McClymonts Road to accommodate future extension of the busway on the eastern side further north to Silverdale. <p>Packaging</p> <ul style="list-style-type: none"> ▶ This option was primarily identified in response to the opportunity to construct the bridge at Greville Road in conjunction with the new ramp to SH17 (Long List concept G7 above).

The concept design for each of the above shortlisted options was refined through further geometric investigations, as well as consideration of operational performance (from transport modelling, stormwater design), safety concerns, knowledge of existing utility services, land ownership and impacts on sensitive areas (environmentally and socially).

In November 2014, the initial range of concept options proposed for the Project were announced and discussed with stakeholders, Mana Whenua, local businesses and residents and the wider community at a series of public events. More than 500 submissions were made, and this feedback, along with further detailed analysis and geotechnical work, was used to help inform a second MCA evaluation in February 2015.

The short list options were assessed using the same MCA Framework in the long list assessment, with a number of refinements, including adding community and stakeholder feedback, and operations and maintenance.

A wider range of technical specialists were involved in the short list options assessment, whereby the Social and Environmental specialists' assessments were collated and challenged at a Short List Evaluation Workshop. The final assessment of the short list of options against the criteria is shown in detail in the Appendix 4 of the IBC.

The assessment was undertaken by technical specialists within the Project team, and was based on a five point scale, as shown in **Table 29** below:



Table 29 Scoring used in MCA evaluation of Short-listed Options

Score	Scale of Impact	Description
2	Significantly Contributes/Enhancing	Significantly contributes to the criteria/Significantly enhances qualities and characteristics of the existing environment
1	Contributes/Enhancing	Contributes to the criteria/Enhances qualities and characteristics of the existing environment
0	Neutral	Neutral to the criteria/Has no more than minor impacts on qualities and characteristics of the existing environment
-1	Detracts/Adverse	Detracts from the criteria/Adversely impacts on qualities and characteristics of the existing environment
-2	Significantly detracts/Significantly adverse	Significantly detracts from the criteria/Significantly adversely impacts on qualities and characteristics of the existing environment

The options were examined according to performance against objectives and problem statements, and against various transport, economic, environmental, social, cultural and other ‘topics’. There were a total of 15 MCA ‘topics’, which were broken down into a total of 56 assessment criteria, generating a complex evaluation matrix. Each criterion was scored by the appropriate expert, using the above spectrum, which was reviewed and challenged in the workshop. There was no ‘weighting’ applied to the assessment criteria – all criteria were considered equally.

The short-list options were also assessed for their strategic fit with the outcomes being sought by the Project, their economic performance, and for their transport performance in addressing the specified transport problem statements:

- Improved journey times along SH1/SH18 corridor;
- Improved connectivity and efficient access for local traffic;
- Greater travel choice for local trips; and
- Efficient and reliable public transport operations through the Project area.

The assessment of the shortlisted options included technical specialists’ input on the remaining MCA categories, including safety, social and community impacts, potential effects on the natural environment, consentability, constructability, construction disturbance.

Consultation feedback on the shortlisted options was summarised into key themes which informed the scoring of the ‘community and stakeholder engagement’ criterion, using the same five point scoring system. The key themes were:

- Overall acknowledgement that improvements to the SH1/SH18 section of the motorway network are necessary to relieve current congestion and provide for future growth and demand;
- Preference for Concept 1 as it is much cheaper and less complicated than the other options;
- Extend the third northbound lane on SH1 across Constellation Drive;
- Keep the northbound on-ramp at Greville Road open;
- Maintain local road connections as a minimum;
- Support for the Busway extension to Albany with many stating that this should be the priority ahead of the roading upgrades, and providing more parking at the bus stations;
- No clear preference for Busway options, but a clear desire for another station between Constellation and Albany Bus Stations;
- Support for providing walking and cycling especially from the Constellation Bus Station to Unsworth Heights and further afield to Albany business areas, Massey University and schools; and
- Concern about the effects on Paul Matthews Road and other businesses adjacent to SH1, on the NHHS complex, and on adjacent open space areas.



The IBC was prepared in several stages, with the first draft report completed in May 2015, with the preliminary findings and recommendations from the MCA process, and the final report completed in September 2015. This two-staged process allowed for public consultation to inform the final assessment and recommendations.

7.5.3 Short List MCA Motorway Evaluation

For the four motorway concept options, the scoring against each criterion was agglomerated under each of the 15 topics (shown in **Table 30** below):



Table 30 Summary of MCA assessment across Short-listed Motorway Options

MCA Topic	Concept 1 North	Concept 1 South	Concept 2 North	Concept 2 South	Concept 3 North	Concept 3 South	Concept 4 North	Concept 4 South	Comments
Performance against objectives	+1	+1	+1	+2	+2	+2	+2	+2	All four motorway concepts and two busway concepts meet the project objectives.
Performance against problem statements	+1	+1	+1	+1	+1	+1	+1	+1	All four motorway concepts and two busway concepts provide opportunity to address the transport problems identified.
Safety	0	0	0	-1	-1	0	0	+1	Concept 2 southbound and Concept 3 northbound are less safe than the existing situation/do minimum option.
Affordability	+1	+1	+1	+1	-2	-1	-1	-1	Concept 1 and 2 are able to be constructed within targeted budget.
Trade Offs									
Consentability	+1	+1	+1	+1	0	0	0	0	No complex consenting challenges for Concept 1 & 2. Opportunities to avoid, remedy or mitigate environmental effects for all concepts.
Constructability	-1	-1	-1	-1	-1	-2	-1	-1	Concept 3 southbound will require complex construction management for cut and cover trench under the SH1.
Urban Design	-1	-1	-1	-1	-2	-2	-2	-2	Concept 3 and 4 have larger footprint, impacts on pedestrian and cyclist environment, and North Harbour Hockey Stadium.
Social	0	0	0	0	-1	-1	-1	-1	Concept 3 and 4 impact on North Harbour Hockey Stadium, Council Parks and Watercare land more due to a larger footprint.
Natural Environment	0	0	0	-1	-1	-1	-1	-1	Concept 3 and 4 encroach further into the Rosedale Closed Landfill through the larger volume of cut required.
Public Health	+1	0	0	0	0	0	0	-1	Concept 1 northbound improves air quality for nearby educational facilities due to decreased traffic volume and has a low contamination risk.
Cultural and Heritage	0	0	0	0	0	0	0	0	There are no scheduled heritage sites or Maori sites of significance within the project footprint of all concepts.
Construction Disturbance	-1	-2	-1	-1	-2	-2	-1	-1	Concept 1 southbound and Concept 3 require complex construction management for cut and cover trench under the SH1.
Land requirement	-1	-1	-1	-1	-2	-2	-2	-2	Concept 3 and 4 require greater land take due to larger project footprint.
Community and Stakeholder engagement	0	0	0	0	0	-1	-1	-1	Concept 3 southbound and 4 impact on local business, Harbour hockey, Council parks and Watercare land. Also concerns expressed over cost and complexity of Concepts 3 and 4.

This information then fed into the final evaluation process, which focused on the concept options' performance against the principal transportation and economic outcomes (highlighting their MCA scores), with the other assessment criteria being used to highlight the main potential issues or impacts of each option, such as land take, impact on recreation and public assets, visual and social impacts.



The option with the highest MCA score was not necessarily preferred. Rather, the MCA scores allowed relative comparisons. An example of this evaluation is shown in **Table 31** below:

Table 31 Example of Summary evaluation of Short-listed Concept Options

CONCEPT 4 SOUTHBOUND		
MCA Category	Score (Average)	Comment
Performance against Project objectives	+2	Significantly enhances wbd motorway connectivity and delivers additional capacity. Benefit includes separation of UHH demands from strategic regional traffic. Provides additional sbd capacity, enhancing network resilience. Improves journey time and network speed. Provides benefit to freight movement although quantifiable benefits not as significant as Concept 3.
Performance against Problem Statements	+1	Forecast to reduce daily average travel times from SH1 to SH18 Wbd by 65% and travel times along SH1 Sbd by 30% compared to the do minimum in 2026. Concept 4 forecast to reduce total network travel time by 2.3 million pcu hours per annum. Improved walking and cycling facilities, thus mitigating existing severance issues and improving connectivity between surrounding commercial and residential land uses.
Safety	+1	Reduction of weaving on SH1. Best option for southbound departures. Best number of south/east bound conflict points, only 3 compared to the 12 existing.
Affordability	-1	\$256M - High cost impact, with additional land requirement. May be able to be constructed within budget available, although a significant level of cost efficiency will need to be identified.
Operations and Maintenance	-2	NPV for Whole of life costs (nbd and sbd) is \$20.6 million. A significant increase in pavement area, and a new structure provided sbd across the Rosedale treatment pond (east side). A wide area between the sbd ramp and the motorway will also need to be maintained.
Trade Offs		
<ul style="list-style-type: none"> ■ Consentability - Achieves objectives and outcomes. Overlapping designations, relying on approval from other requiring authorities. ■ Constructability – Traffic management for pier construction and night-time closure required for bridge over SH1. Significant encroachment into the landfill. ■ Urban Design – Greatest visual severance due to corridor width. Significant change in scale and high retaining wall cut into landfill impacts on sense of neighbourhood, concept creates illegible road environment and undermines clear visual/physical connection for sbd vehicles from SH17. Negative impacts on commercial areas. ■ Social – Improved connectivity for all modes. SH18/SH1 ramps and Paul Matthews Road realignment impact on Harbour Hockey Site and Watercare/Council Parks land. The large footprint and complexity also creates an adverse effect on amenity. ■ Natural Environment – Second biggest cut into landfill, with highest contaminant discharge risk, and issue with disposal of cut material. High visual effects associated with elevated ramps and retaining walls. Low – moderate mitigation potential for visual effects. ■ Public Health – Excavation in landfill is a significant risk to workers due to leachate and risk of explosion of landfill gas pockets. Risks to human health can be minimised via a Contaminated Soils Management Plan and Health and Safety procedures. ■ Cultural and Heritage – No sites of significance to mana whenua. No scheduled archaeological sites or heritage features. 		



- Construction Disturbance – Community impacted during construction of Greville Road bridges. Issue with construction traffic management near live lanes and relocation of major utilities. Opportunity to avoid some service relocations by bridging over SH1.
- Land Requirement - Second largest footprint. Significant land required of Council Parks and Watercare land, as well as localised businesses on both the western and eastern sides of SH1.
- Community and Stakeholder Engagement - Concern with the scale, cost and impact on Harbour Hockey, Watercare and Council Parks land. Impact on businesses on Paul Matthews Rd, near Rosedale and Greville Roads, and along SH1 (eastern and western side).

The summary evaluation of the four motorway concept options is shown in **Table 32** below:

Table 32 Summary of Assessment of Motorway Concept Options

Concept 1
<ul style="list-style-type: none"> ■ Represents the low cost option. Costs currently include a cut and cover tunnel beneath SH1 for the SH1 to18 westbound connection. This could be bridged, further reducing cost. ■ This option has the smallest footprint, minimising social and environmental impacts, and the impact on adjacent land. ■ Least impact on the contaminated landfill site
Concept 2
<ul style="list-style-type: none"> ■ Relatively low cost, with additional cost associated with SH17 to 1 southbound ramp. This ramp increases the benefits significantly, resulting in the highest incremental BCR (value for money). ■ As with Concept 1, the footprint and subsequent environmental impacts are low relative to Concepts 3 and 4.
Concept 3
<ul style="list-style-type: none"> ■ Highest cost option, although it also has the greatest benefits and therefore contributes best to the objective of improved efficiency of the corridor ■ If Concept 3 is selected for both north and southbound directions, a tunnel will be required beneath SH1, resulting in significant disruption to SH1 traffic during construction. ■ Options for realigning Paul Matthews Road become challenging due to the long northbound to Greville Road. ■ SH17 to SH1 in Concept 3 is worst performing as the provision of this connection will push traffic onto Bush Road, creating a congestion point in this area, even though it will relieve congestion from the interchange. ■ Largest footprint - greatest environmental and property impacts
Concept 4
<ul style="list-style-type: none"> ■ Concept 4 has the second best travel time and contributes to the objectives through improved transport corridor efficiency. ■ Concept 4 southbound is hard to achieve because of its proximity to the landfill, and gas pipeline. ■ Without the SH17-1 connection, an investment in local road improvements (e.g. Tawa Drive/Rosedale Road) could assist congestion at Greville Road. ■ Oteha Valley Road interchange improvements could be explored at DBC phase to ease Greville Rd/other local road congestion. ■ Concept 4 has large footprint with significant environmental and property impacts.

The two busway concepts were also evaluated, using the same assessment criteria, scoring system and technical experts. A summary of the MCA scores are provided in **Table 33** below:



Table 33 Summary of MCA Assessment across Short-listed Busway Options

MCA Topic	Busway 1	Busway 2
Performance against objectives	+2	+2
Performance against problem statement 4	+2	+2
Safety	-1	-1
Affordability	0	0
Operations and Maintenance	0	0
Consentability	0	+1
Constructability	0	-1
Urban Design	0	+1
Social	+1	+1
Natural Environment	0	-1
Public Health	-1	0
Cultural and Heritage	0	0
Construction Disturbance	-1	-1
Land requirement	-1	-1
Community and Stakeholder engagement	+1	+1

The alignment for Busway Concept 2 was developed based on the premise that it could be constructed as part of the bridge structure provided for the SH17 to SH1 southbound ramp connection (i.e., a new bridge for traffic from the Albany Expressway directly joining the southbound lanes on the SH1 Motorway at the Greville Road Interchange, under Long list motorway concept G7). However, subsequent design review identified that this opportunity could not be realised due to differing geometric requirements, and that a separate bridge structure would need to be provided, which significantly increased the cost of this option compared with Busway Concept 1.

A Scheme Assessment for the extension of the Northern Busway to Silverdale, undertaken separately to the Project concept option investigations, recommended that an Eastern alignment be progressed as a preferred option as this was most effective and efficient for any future Northern Busway Extension. This was primarily due to a site of ecological significance at the Lucas Creek West Bush (just north of the Oteha Valley Road Interchange to the west of SH1). Therefore, for Concept 2, the future extension of the Busway to Silverdale would need to cross back over SH1 north of the Greville Road Interchange but before Oteha Valley Road in order to connect with the Albany Bus Station and the future extension on the western side of the motorway to Silverdale. This would require an additional bridge structure with associated costs and environmental impacts. Therefore, any environment benefits associated with Concept 2 are negated by the need to provide this additional crossing.

Identification of an option to connect the Busway from the eastern side of SH1 to Albany Bus Station was developed as Concept 1. This option was identified as the preferred option for moving forward, with confirmation of an appropriate crossing (location and form) over SH1 to be part of the concept design investigations, working collaboratively with AC and AT.

7.5.4 Walking and Cycling Network Improvements

Working with AT, and informed by feedback from the initial consultation undertaken in mid-2014, investigations and the design process were undertaken separately to identify the opportunities for improving cycling and walking links and connections within the Project area.

Arising from this workstream, a draft Walking and Cycling Network Plan was developed. This recommended a new shared path between the bus stations following the Busway extension between



Constellation Drive and the Oteha Valley Interchange, with multiple options and crossings for paths along UHH that would link up to the new paths being built along Albany Highway. The Plan also looked at connecting with future paths in the area.

Walking and cycling connections were consistent between options and were recommended to be considered further in developing the subsequent concept design phase.

7.5.5 Draft Assessment Conclusions

In terms of the four motorway concept options, the draft assessment concluded that, while Concept 3 contributed the greatest degree of cumulative benefit of the four motorway improvement options identified, it also had significantly higher costs. The draft assessment also concluded that Concept 1 could still achieve significant benefits, reducing journey times by nearly 50%, improving the capacity of the northern corridor, enhancing network resilience and easing congestion for all modes of transport. It was also considered likely to have the least impact on landholdings and the environment of the four options. Based on these factors, the draft assessment therefore determined Concept 1 to be the recommended motorway improvement option.

However, some potentially significant benefits associated with improving connections with the Albany Expressway at the Greville Road Intersection under Concept 2 were also identified. Consequently, this option was also recommended as worth evaluating further during the DBC.

7.5.6 Consultation on Draft Findings and Recommendations

In August 2015, the short listed design concept drawn from the draft assessment was announced for further community consultation and feedback, with the submission period for feedback closing on 18 September 2015. A summary map of the recommended design concept is shown in **Figure 32** below.

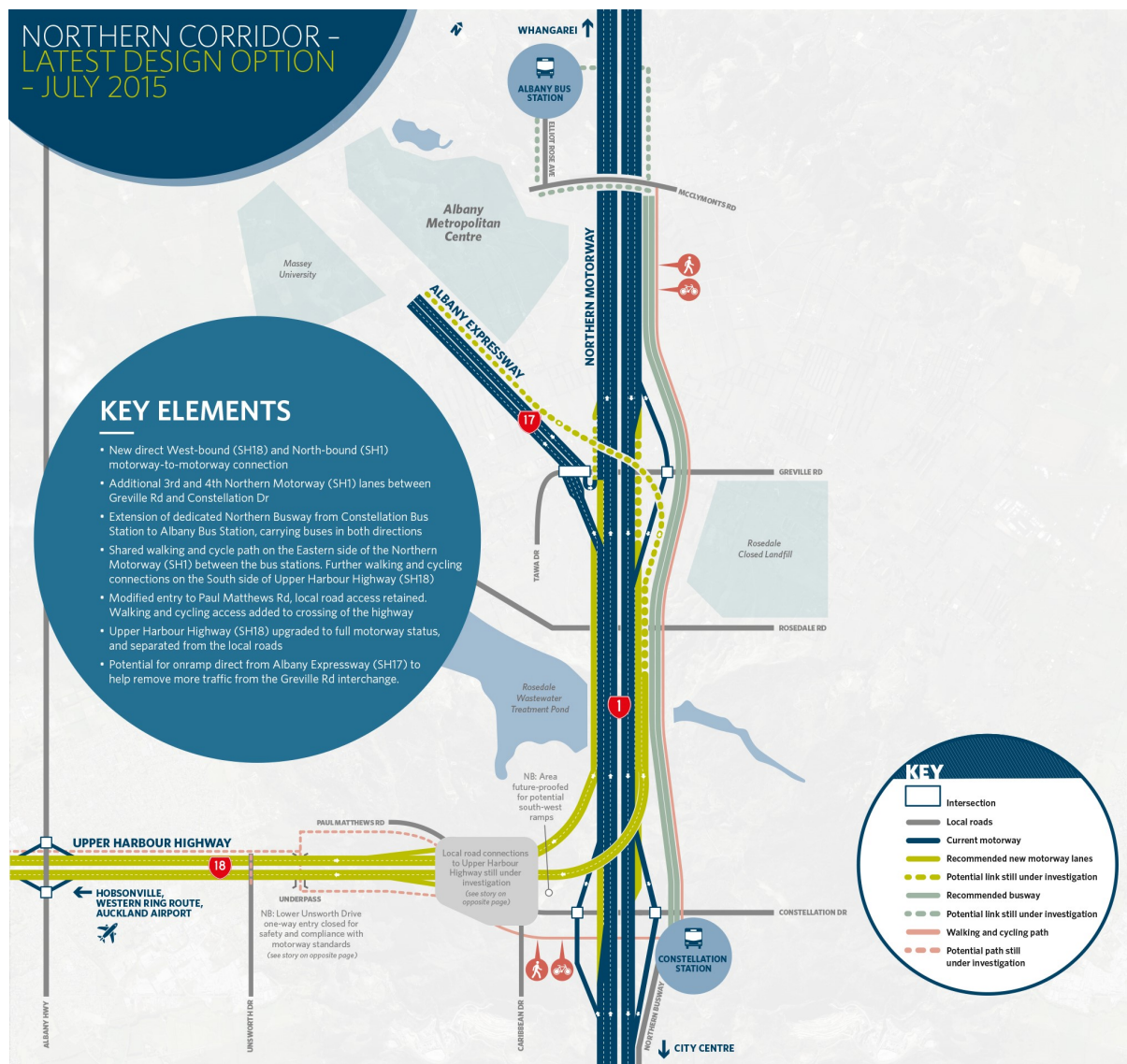
A brochure outlining the plans and asking for feedback on specific design aspects was mailed to households and businesses around the wider Project area, local stakeholder groups and property owners were invited to one-on-one meetings, six open day events were held in different locations, and an online form was made available for the public to send in. More than 1200 people had their say during this period, either visiting one of the six consultation events, or by either phoning, emailing or dropping into the Project Information office. In particular, this consultation focused on inviting feedback on several specific topics:

- The multiple options still being considered for several local road changes required when UHH is upgraded to full motorway status – this included options for new bridges and/or underpasses to ensure community connectivity;
- The design of the Busway extension, walking and cycling path access points, and possible new station options; and
- A proposal for over 5km of walking and cycling paths around the two motorways, and an additional 25km of connecting paths all around the area.

This consultation was held in partnership with AT to progress ideas and consult on all these aspects.



Figure 32 Summary Map of draft Project Design Concept at July 2015



Source: NZ Transport Agency

7.5.7 Other Project Component Assessments

The draft concept assessment recommended an alignment for the Busway extension along the eastern side of SH1 between Constellation Drive and McClymonts Road, but did not detail how it would be connected with the Albany Bus Station on the western side of the highway. A separate options assessment was produced in May 2015, recommending a new bus and walkway/ cycleway bridge over SH1 south of the existing McClymonts Road Bridge.

7.5.8 Final Concept Assessment

After evaluating the feedback from consultation, the assessment and findings were confirmed, including the recommended motorway connection and busway solution. The report, however, identified that further option assessment was required to finalise a number of detailed operational layout decisions. These elements of the Project did not impact on confirmation of the recommended overall Project Design Concept, as they could be considered in isolation from other design elements.



The recommended areas of further assessment were as follows:

- **Operational Layout for SH1 Motorway**

The recommended concept included a direct connection between SH18 to SH1. The lane configuration in the southbound direction would, however, impact on the operation and safety of this section of SH1, particularly in relation to the safety of the weave movement. Further modelling and investigations were recommended to determine the appropriate solution.

- **Paul Matthews Road Interchange**

The configuration of this interchange would impact on Watercare land and AC land. In particular, the NHHS will be impacted to some extent. A separate workstream was therefore recommended to assess the options for the interchange configuration, including a separate assessment being carried out by the wider AC organisation (including Watercare and AT). The future operation of the NHHS and the ability to host international tournaments was a key consideration in this analysis.

- **Direct Connections to Albany Expressway**

The assessment indicated that there was likely to be a significant benefit associated with the provision of direct ramps to Albany Expressway. However, these ramps would be technically challenging to accommodate, and would impact on the operation of the SH1 motorway. Therefore, further assessment of the feasibility and incremental benefit was recommended.

- **Northern Busway Connection to Albany Bus Station**

The recommended option included the extension of the busway along the eastern side of the motorway, with a direct connection to be provided to Albany Bus Station, although specific detail of the form and location for this was to be determined. It was recommended that, working with AT, a separate workstream should determine a suitable connection.

- **Local Road Improvements**

The operational modelling to be undertaken as part of the concept design assessment would identify the impacts on local roads, to enable any effects directly resulting from the Project to be identified, as well as supporting projects that could be programmed and constructed by AT. A Network Integration Plan was recommended to be developed as part of the concept design assessment to demonstrate how the Project will connect with the existing and future local road network.

7.6 Concept Design Assessments 2015-2016

After the IBC was approved in August 2015, Beca and Opus undertook a more detailed analysis of economic, financial and commercial aspects of the Project. This analysis confirmed the Strategic Case for the Project, as well as the constraints and benefits. It also outlined the stakeholder feedback on key concept outcomes and outlined how that feedback had influenced the design of the Project to date.

A number of separate assessments were also undertaken on design components of the Project.



7.6.1 Key Design Assessments

The various workstreams on the design components of the Project were also drawn together, the key outcomes being as follows:

- SH1 Northern Motorway Lane Configuration

This was an operational assessment which concluded that four northbound lanes were required on SH1 between Greville Road and SH18 to ensure that an adequate Level of Service could be provided to address safety issues with weaving, merging and diverging traffic, and to accommodate future traffic volumes, particularly during morning and evening peak traffic flows.

- SH1 to SH17 northbound ramp connection

The concept design proposed the possibility of a direct northbound off-ramp from the SH1 motorway onto the Albany Expressway, crossing over the Tawa Drive/Greville Road intersection via a flyover. After investigation, however, this possibility was discarded, as it would have required the exit point off the motorway to be shifted further south, onto a crest curve where adequate sightlines could not be provided. The additional exit point would also have increased safety concerns with weaving traffic from the SH18/SH1 interchange.

- SH17 to SH1 southbound ramp connection

The concept design originally included a new southbound on-ramp from the Albany Expressway onto the SH1 motorway, requiring the proposed busway extension to be offset approximately 10m further east to accommodate the on-ramp. This in turn would have increased the cut and retaining wall requirements on the edge of the Rosedale Closed Landfill. While this option would significantly reduce the volumes of traffic through the Greville Road interchange, it would also have increased traffic flows onto the motorway. This option was discarded because of the safety concerns where the ramp merges with SH1, only a short distance south of the merge of the Greville Road on-ramp onto the motorway southbound, creating significant weaving issues with westbound traffic leaving the motorway to connect with the SH18 motorway (WRR).

- Northern Busway Construction timing

This assessment examined the costs and benefits of constructing the busway extension as either part of the motorway improvements or as a separate project. The assessment concluded that there were a number of benefits of building the busway extension as part of an integrated package of improvements, compared with as a separate project. In particular, it would avoid requiring a separate period of construction with the consequent additional delays and disruption. Extending the busway as part of the Project would also bring forward the estimated \$39million of travel time benefits from the extension. It would also allow the combined walkway/cycleway to be constructed at the same time.



- Albany Bus Station Connection

Concept 1 in the first stage assessment of alternatives assumed connecting to Albany Bus Station via a widened McClymonts Road bridge, a signal controlled intersection at McClymonts Road / Elliot Rise Avenue and an on street connection to the Bus Station via Elliot Rose Avenue. During the detailed design assessment, a separate workstream was undertaken to determine the appropriate location and form of having the Busway extension cross the SH1 motorway and connect with the Albany Bus Station.

Five options were developed and evaluated within a workshop with AT Public Transport Network planning officers. As the options were all contained either within the SH1 Motorway (designated) corridor or AT land with no external effects, the MCA was limited to a technical assessment regarding performance against relevant Project Objectives (capacity and resilience; reliable bus journey times), as well as geometrics, affordability, safety and operations and maintenance.

The recommended option extends the Busway along the eastern side of SH1, beneath McClymonts Road and then across SH1 on an overbridge into Albany Bus Station. This option readily facilitates the future northern extension of the Busway with no redundancy.

- Busway Stations

AT identified and reviewed the site options for a new bus station, recommending a site off Rosedale Road, on the south-eastern side of SH1. At this stage of the design assessment, the site had not been confirmed, as approval for the station attributes had not been finalised. This process is now being pursued by the NZ Transport Agency separately to the Project.

- Paul Matthews Road Interchange

The concept assessment confirmed the need to provide west-facing ramp connections at Paul Matthews Road, which would serve the Paul Matthews Business area, the residential area of Unsworth Heights, and the areas to the east of the northern motorway. Five options were identified for this interchange, and assessed using a MCA. This is summarised in **Section 7.6.2** below.

- Local Road Improvements

Traffic modelling undertaken of the effects of the Project on surrounding local roads: this assessment identified that the intersection of Unsworth Drive with Albany Highway (south of the Project Area) would face increased pressure. The design assessment recommended the provision of a new road link across SH18 between Unsworth Drive and Omega Place, for which considerable community support was given during public consultation in September 2015. There was no time available to undertake a design options assessment at this stage of the design assessment, so this aspect was therefore recommended for further investigation.

- Walking and Cycling Improvements

An investigation of the surrounding walking and cycling facilities was undertaken jointly with AT to maximise the opportunities for walking and cycling presented by the Project. Arising from the concept assessment phase, it was recommended that a shared path facility be formed alongside the extension of the busway between Oteha Valley Road, Constellation Bus Station and Albany Highway. This facility would provide a 'spine' to future improvements and development of the walking and cycling network within the local area. At this stage, it was recommended that further design be undertaken to confirm its feasibility.



7.6.2 Paul Matthews Realignment and Connections – Assessment of Options

The extension of the SH18 motorway through to connect with the SH1 motorway required the bridging of Paul Matthews Road over the motorway to retain its connection with Constellation Drive and Caribbean Drive. As noted, the design concepts assessment had confirmed the need to provide west-facing ramp connections at Paul Matthews Road to serve the Paul Matthews Business area, the residential area of Unsworth Heights (via Caribbean Drive), and the areas to the east of the northern motorway.

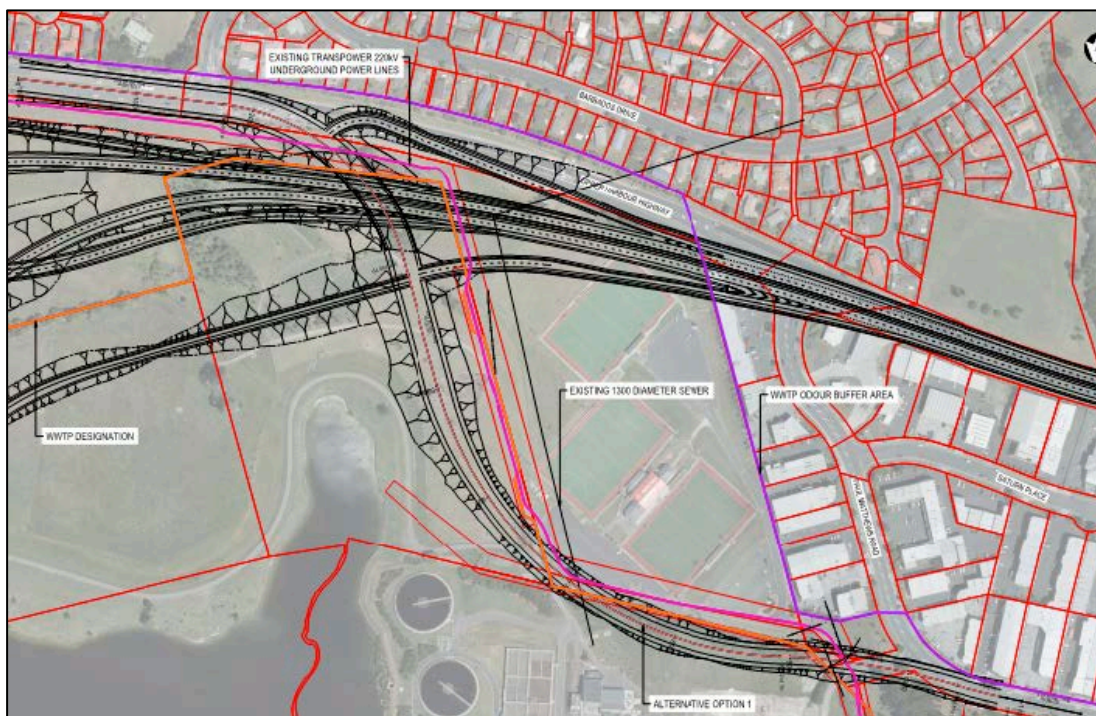
As part of the concept design assessment, further work on options for the Paul Matthews Road overbridge and interchange connections was undertaken. The assessment was separately reported on, but integrated into the overall concept design recommendations.

Land take and property impacts were a particular issue for this aspect of the Project, given its proximity to residential areas and the impact on the NHHS, Watercare's RWWTP and AC's Rosedale South Park.

Five options were identified and assessed, using the same assessment criteria as used for the design concepts' MCA, but some refinements to take into account the particular context of this Project component. The first two options represented the initial options for this component of the Project.

The five options were as follows (See Figures 33 – 37):

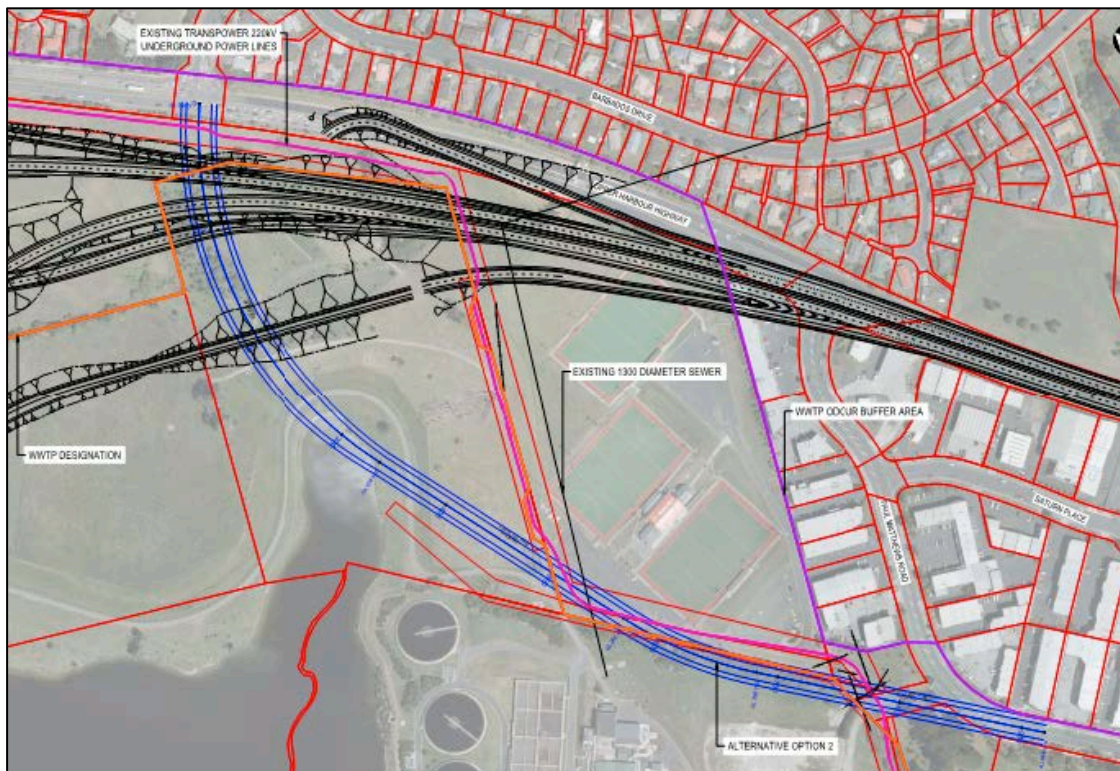
Figure 33 Option 1 – East of NHHS to UHH



Realignment of Paul Matthews Road to pass between the NHHS and Watercare RWWTP, then bridged over motorway before joining the existing UHH alignment at the intersection of Caribbean Drive. The existing intersection of Paul Matthews Road and UHH would be closed, with a cul-de-sac provided.

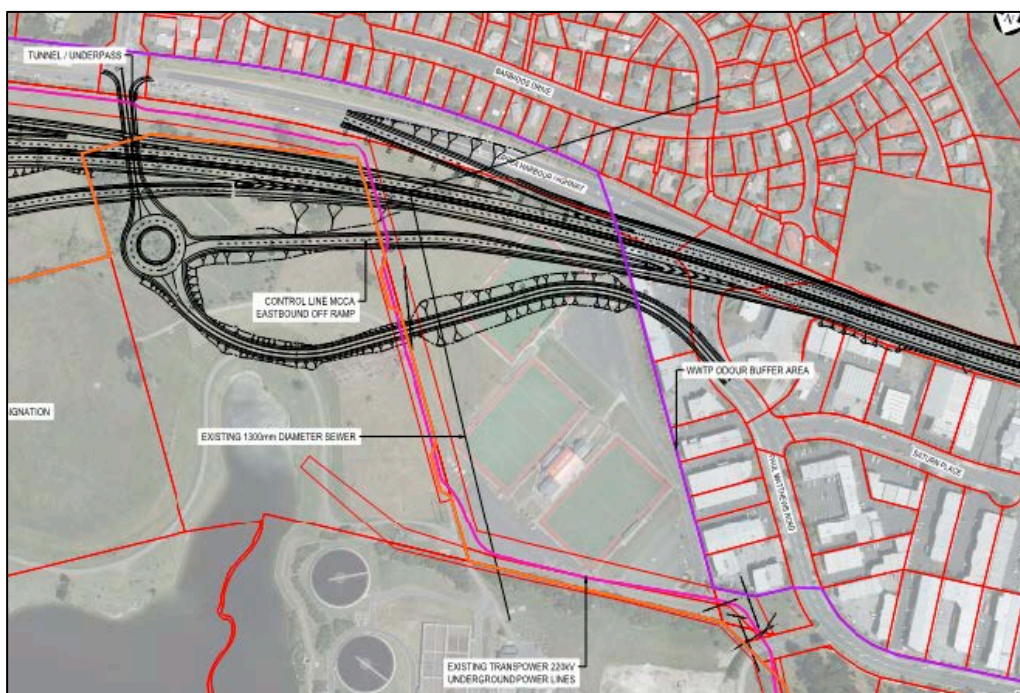


Figure 34 Option 2 – East of NHHS to Caribbean Drive Intersection



Realignment of Paul Matthews Road to pass between NHHS and Watercare RWWTP, then bridged over SH18 motorway before terminating at UHH at the existing intersection of Caribbean Drive. The existing intersection of Paul Matthews Road and UHH will be closed, with a cul-de-sac provided at termination of Paul Matthews Road.

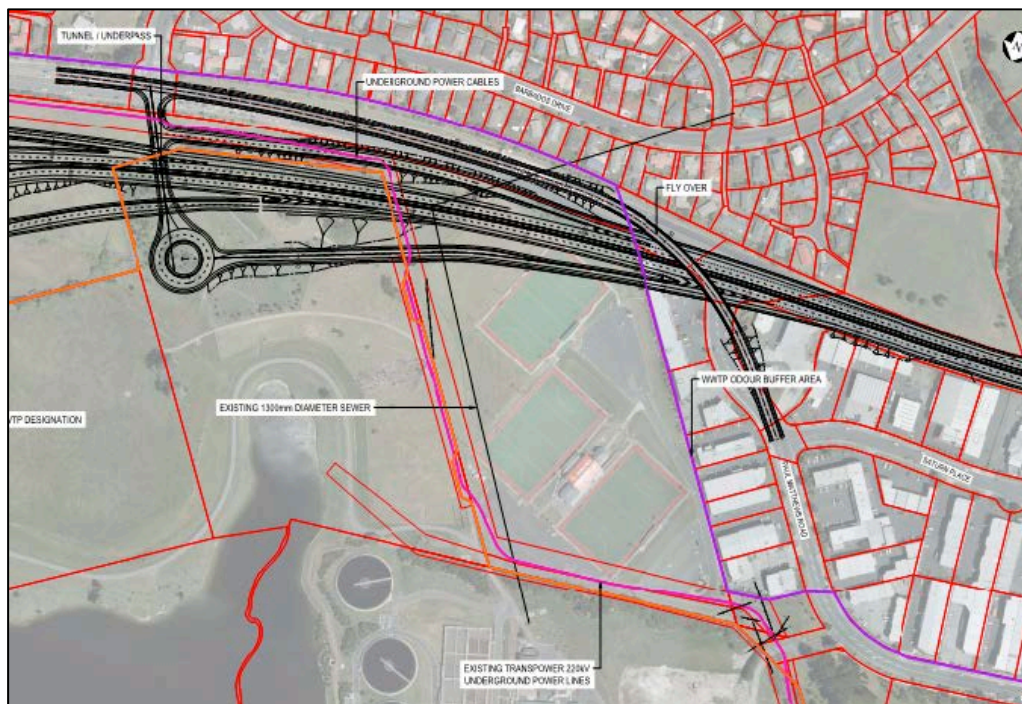
Figure 35 Option 3 – South of NHHS to Caribbean Drive Intersection via Tunnel





Extension of southern end of Paul Matthews Road through the southern part of NHHS, to run alongside the proposed motorway alignment. It then crosses Watercare land to a roundabout connecting to the proposed SH18 eastbound off-ramp. The road then passes beneath the new alignment of the SH18 motorway via underpass, before terminating at the existing UHH/Caribbean Drive intersection.

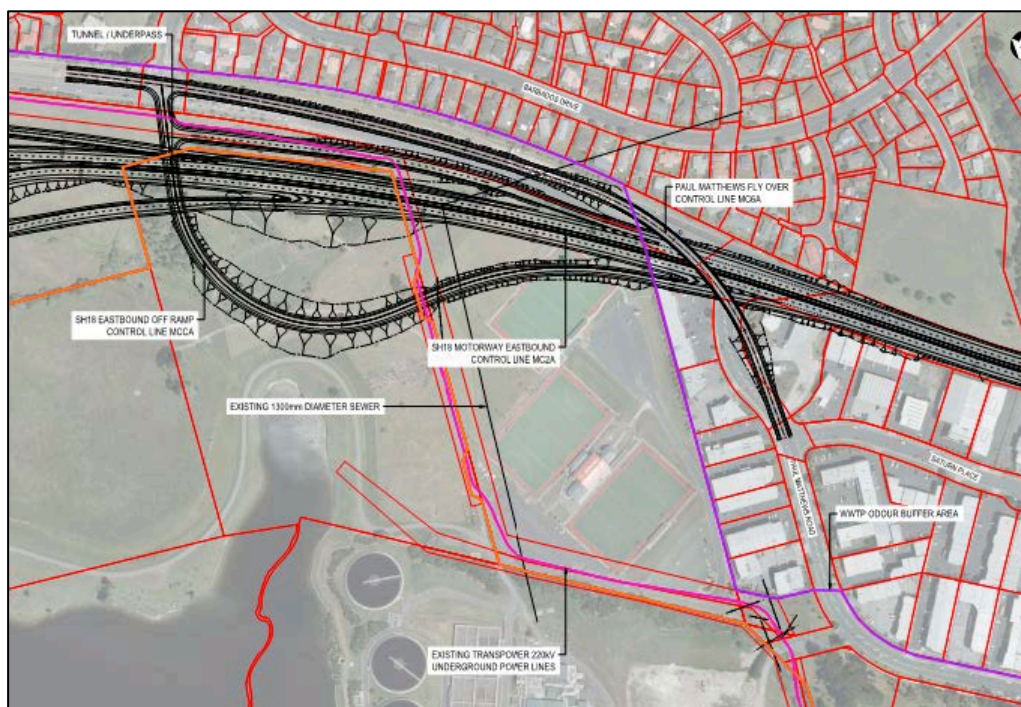
Figure 36 Option 4 – Paul Matthews Flyover, with Underpass for Eastbound Off-Ramp via Roundabout



Connect southern end of Paul Matthews Road to UHH via flyover, with the SH18 off-ramp connected to UHH at Caribbean Drive intersection via an underpass and a faux roundabout.



Figure 37 Option 5 – Paul Matthews Flyover, with Underpass for Eastbound Off-Ramp



Realignment of the southern end of Paul Matthews Road to a flyover to connect with UHH, including a direct connection from the SH18 eastbound off-ramp to the Caribbean Drive intersection.

A summary of the MCA scoring was provided in the DBC report, drawing on the more detailed evaluation matrix in the separate report – this is shown in **Table 33** below:



Table 34 Summary of MCA scoring for Paul Matthews Road Options

Option/Criteria	PM Option 1	PM Option 2	PM Option 3	PM Option 4	PM Option 5
Project Objectives					
Objective 1	1	1	1	1	1
Objective 2	1	2	2	2	2
Objective 3	1	2	2	1	2
Objective 4	2	2	2	1	1
Implementability Appraisal					
Technical	0	0	0	0	0
Consentability	-2	-2	-1	-1	-1
Operational/ Maintenance	-1	-1	-1	-1	-1
Safety and Design Consideration	1	1	1	1	1
Financial	0	0	0	0	0
Public/Stakeholders	-2	-2	-2	-1	-1
MCA					
Economy	1	2	2	2	2
Integration	1	1	1	1	1
Social	-2	-2	-1	-1	-1
Bio-Physical (average Score)	-0.1	-0.3	0	-0.6	-0.6
Contaminated Land - receiving environment	0	-1	0	-1	-1
Groundwater	0	0	-1	-1	-1
Ecological	-1	-1	0	0	0
Stormwater	-1	-1	-1	-1	-1
Landscape	0	0	0	0	0
Visual	0	0	0	-1	-1
Air Quality	0	0	0	0	0
Noise	1	1	2	0	0
Contaminated Land - human health	0	-1	0	-1	-1
Cultural	0	0	0	0	0
Property Impacts	-2	-2	-1	-1	-1
Other Infrastructure	-2	-2	-1	-1	-1
Total - Average (rounded 2 dec places)	-0.18	-0.02	0.24	0.14	0.20
MCA scores based on "scale of impact" only					

From this MCA, Option 5 was identified as the recommended option as it has the least impact on the Watercare Designation and Odour Designation, which would simplify the approvals process with Watercare. While the impacts on the Watercare land are greater than with Option 4, the configuration of the off-ramp of Option 4 is not considered feasible as set out above. This option also utilises the existing road corridor for UHH which would be redundant with the other options.

The MCA identified a number of environmental impacts from the selected options, although it was concluded that these potential effects can be managed or mitigated. These were as follows:

- Overlap of Watercare's designation for RWWTP and Outfall/Odour Buffer Area as well as Vector's designation for 110kV underground electricity transmission line. Approval from these requiring authorities under RMA s177 will need to be obtained before undertaking any work that may prevent or hinder these existing designations.
- The road bridge over the SH18 motorway extension to SH1 will have greater visual and noise effects on the residents to the south of the Project: these effects can be mitigated to some extent through screening and barriers.
- Business North Harbour (formerly North Harbour Business Association) expressed concern at the potential speed of vehicles coming down the bridge and the safety risk associated with the Saturn Place intersection: an appropriate design can be developed to reduce this risk.
- There is potential to impact the underground tanks and fuel lines for the service station and any potential contamination associated with it, with a higher potential for requiring soils disposal to landfill if contamination is found present: contamination risks to the environment would be able to be minimised through a contaminated soils management plan.



During the public and stakeholder consultation, feedback was received that the Project would result in less congestion, and in relation to the options there was general support for Options 4 and 5 (the flyover bridge options).

In extending the SH18 motorway to link with the SH1 motorway, the existing westbound off-ramp from SH18 to Unsworth Drive will have to be closed. In order to improve local accessibility and network resilience, a new bridge over the motorway linking Unsworth Drive and Omega Place was considered: support for such a bridge was expressed during consultation. However, initial investigations into this option indicated a number of potential issues with such a connection. Local topography and property constraints would create difficulties in achieving a bridge design to the appropriate standards, and a number of properties would be required or otherwise adversely affected by its construction. Traffic analysis also concluded that a bridge at this location would redirect significant traffic volumes from arterial roads to collector roads, effectively creating a “rat run” travelling between Glenfield and North Harbour. This would in turn create some capacity and safety issues at a number of intersections, as well as increasing traffic volumes through a primarily residential neighbourhood.

7.6.3 Concept Design Assessment Recommendations

Incorporating the findings of the concept design assessment, the key components of the recommended Project design were as follows:

- UHH upgraded to full motorway status and separated from the local roads;
- New direct westbound (SH1-SH18) and northbound (SH18-SH1) motorway-to-motorway connection;
- Additional third and fourth Northern Motorway (SH1) lanes between Greville Road and UHH;
- Extension of the Northern Busway from Constellation Bus Station to Albany Bus Station;
- Shared walking and cycle path on the eastern side of the Northern Motorway (SH1) between the bus stations. Further walking and cycling connections alongside the Upper Harbour Highway (SH18); and
- Modified connection to Paul Matthews Road, local road access retained and walking and cycling access added to crossing of the SH18 motorway.

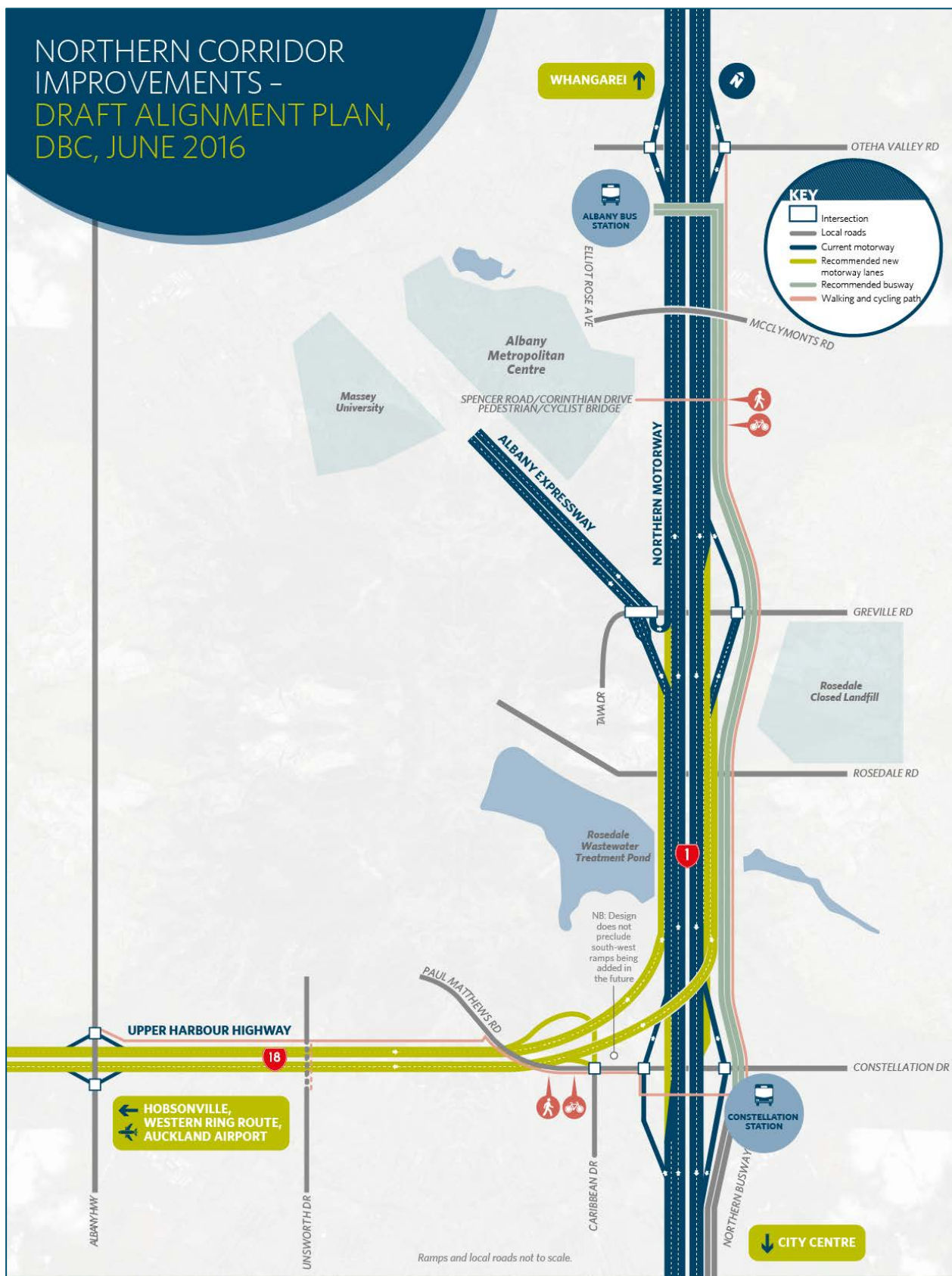
The assessment recommended that further investigations into the possibility of a new road link across SH18 between Unsworth Dive and Omega Place occur during final design.

In conjunction with the extension of the Northern Busway, AT reviewed the potential for additional stations between Constellation Bus Station and Albany Bus Station. Rosedale Road was identified as the preferred location and the Busway extension was accordingly designed to allow for the provision of a bus station at Rosedale.

A plan showing the recommended Project design at this stage of the design process is shown below in **Figure 38**:



Figure 38 Recommended Project Design at June 2016



Source: NZ Transport Agency



In addition to the recommendations regarding the final Project design, a number of property and environmental issues were identified as requiring further investigation, including:

- Options for addressing the impacts on the NHHS;
- Further design work regarding the widening of the SH1 motorway north of the proposed ramps to SH18 through the Watercare site, between Pond 1 and Pond 2; and
- Preparation of a cohesive and integrated urban and landscape design vision for the Northern Corridor, to strengthen both the linear identity of the highways and their connection to the places through which they pass.

The concept design assessment concluded that:

The MCA options assessment undertaken to date ensured that any significant adverse effects associated with each option were identified and consideration was given to whether mitigation was available for these adverse effects or not. The options assessment outcomes informed the selection of the recommended option. (Page 94)

7.7 Preliminary Design Assessments 2016

A number of design elements of the Project were left unresolved at the time the concept design assessment was completed. These elements were investigated and considered as part of the preliminary design process, including the consideration of alternative designs where there were potential property impacts or significant adverse environmental effects.

7.7.1 Unsworth Drive – Omega Street Connection Overbridge

An assessment into options for constructing a new link between Omega Street and Unsworth Drive via an overbridge crossing the extended SH18 Motorway (UHH) was conducted as part of the preliminary design process. This investigation confirmed the findings of the initial investigation, in that:

- A number of properties would be required or otherwise be adversely affected to create the new link;
- A re-analysis of the impacts on traffic flows on the roading network confirmed that a bridge at this location would redirect significant traffic volumes from arterial roads to local collector roads, effectively creating a “rat run” travelling between Glenfield and North Harbour through a residential neighbourhood; and
- This would in turn create some capacity and safety issues at a number of intersections, as well as increasing traffic volumes through a primarily residential neighbourhood.

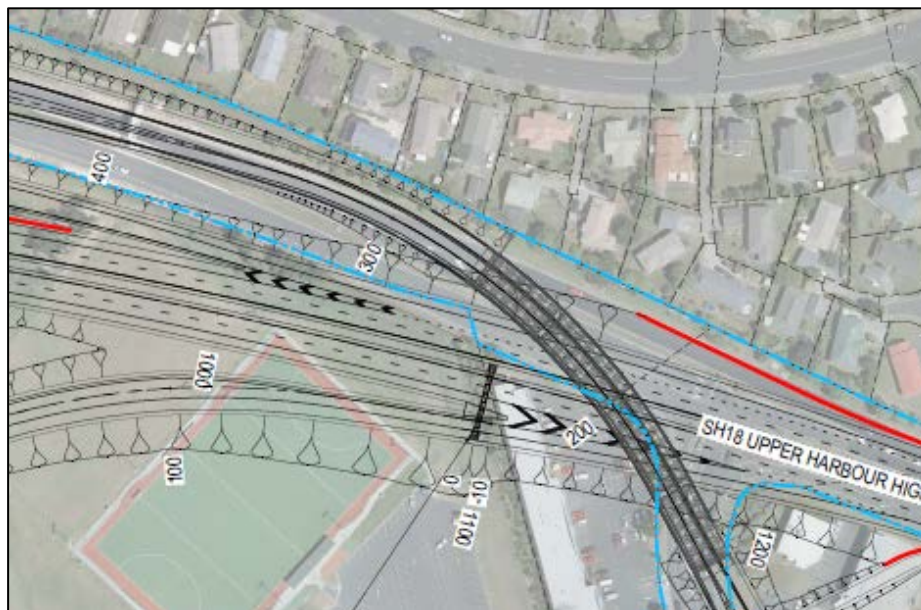
Accordingly, this connection is not proposed as part of this Project.

7.7.2 Paul Matthews Road/SH18 Configuration

As outlined above (**Section 7.6.2**), as part of the concept design assessments that occurred in 2015-2016, a range of options for the Paul Matthews Road realignment and interchange connections were identified and assessed. After undertaking a multi-criteria assessment, Option 5 was recommended as the preferred scheme design. This design involved realigning the southern end of Paul Matthews Road to a flyover to connect with UHH as well as a direct connection from the SH18 eastbound off-ramp to the Caribbean Drive intersection. This option had fewer property and environmental impacts compared with alternative schemes, as well as a lesser impact on the significant infrastructure located in this vicinity (RWWTP, a Transpower service easement, Vector powerlines, and AC’s reserve and recreation facilities). All options, however, would impact on the NHHS to varying degrees, with Option 5 having the eastbound off-ramp from SH18 cutting through Pitch 3 of the Stadium, as well as an area that could be developed for a future fourth pitch. The impact of that option on the NHHS is shown in **Figure 39** below.



Figure 39 Base Option showing Impact on NHHS



As part of the preliminary design process, to ensure that all options for minimising the potential land requirement from NHHS have been thoroughly and robustly investigated, a further assessment was undertaken of potential options for the configuration of the Paul Matthews Road realignment and connections. The Base option was the preferred design from the earlier assessment, Option 5. All of the options were variants of the initial options that were identified for the previous assessment.

Figure 40 Option 1 – Revised Base Option



Option 1 (**Figure 40**) is a revised version of the Base Option, with some geometric amendments to address a number of road safety matters, including ensuring the interchange is future-proofed for potential southbound and westbound ramps at the SH1/SH18 interchange (shown in pale yellow). This option does not alter the land requirements in relation to the NHHS.



Figure 41 Option 2 – Base Option Variant Incorporating SH18 Eastbound Off-Ramp with Roundabout



This option involves a slight realignment of the Paul Matthews Road flyover to connect with UHH, and a SH18 off-ramp to a roundabout as shown above on **Figure 41**. This option also addresses the same safety concerns as per Option 1. The potential future southbound and westbound ramps at the SH1/SH18 interchange are shown in pale blue. This option provides the opportunity for a new dedicated access to the NHHS via the roundabout. This option reduces but does not eliminate the land requirement in the south-east corner of the NHHS.

Figure 42 Option 3 – Realignment of PMR with SH18 Eastbound Off-Ramp to Signalised Intersection



This option (**Figure 42**) re-investigated the possibility of realigned Paul Matthews Road to pass between NHHS and RWWTP to allow direct connection to UHH and Caribbean Drive at a signalised intersection. Under this option, Pitch 3 can be avoided. However, the alignment of Paul Matthews Road has to be south of the Vector easement which provides a key constraint to the north of the NHHS site and consequently this option impacts on Hockey Pitch 2. This is a significant impact due to the interrelation of the clubrooms that are central to Pitches 1 and 2. In addition, this option would still impact on the area of a possible future fourth pitch because of the alignment of the SH18 off-ramp.



Figure 43 Option 4 - Realignment of PMR with SH18 Eastbound Loop Off-Ramp



As with Option 3, this alternative design (**Figure 43**) proposes the realignment of Paul Matthews Road to pass between NHHS and RWWTP to allow direct connection to UHH and Caribbean Drive at a signalised intersection. However, this option includes a SH18 eastbound loop off-ramp to Paul Matthews Road to further reduce the land requirement at the south end of the NHHS site.

The four options were assessed for their ability to reduce property and infrastructure impacts. In summary:

- There are no options available to ensure that the NHHS is not impacted, while also minimising impacts on other stakeholders in the area;
- Options that would avoid impacting on Hockey Pitch 3 (Options 3 and 4) would impact on Pitch 2, a more significant impact given that pitch's relationship with the Hockey clubroom and stadium;
- None of the options would avoid impacting on the site of a potential fourth hockey pitch;
- All options impact on Transpower's service easement, AC's site for future football pitches and on incoming sewer pipelines to the RWWTP;
- All options impact to some extent on the RWWTP site; however, Options 3 and 4 would require the greatest amount of land, and bring Paul Matthews Road within the RWWTP odour buffer area; and
- While all options would impact on commercial properties on Paul Matthews Road to some extent, Option 1 would require the greater extent of commercial property. However, Options 3 and 4 would turn the southern end of Paul Matthews Road into a cul-de-sac, with a consequential significant impact on the commercial activities along this part of the road, including a number relying on passing traffic (for example, a service station and fast food outlet).

For these reasons, the base option, Option 1, which provides the least impact on property and infrastructure, was incorporated into the Project, subject to minor refinements.

7.7.3 Northern Section of Busway and Shared Use Path

As part of the preliminary design work, the design of the northern section of the Busway extension and SUP between McClymonts Road Bridge and Oteha Valley Road was developed to comply with geometric, drainage and maintenance requirements. The design of this component of the Project had to accommodate both north and southbound bus lanes with shoulders and adequate separation from the SH1 motorway. It also had to provide for a 5m wide SUP with provision for separation between the Busway and SUP.

At the McClymonts Road Bridge, however, there is inadequate space between the eastern abutment and the SH1 motorway to accommodate the Busway and SUP. The original design concept sought to



retain the eastern abutment of the McClymonts Road Bridge, and construct a new eastern span, under which the Busway and SUP would be located. To accommodate this alignment, however, the preliminary design determined that one of the townhouse complexes at 60 Masons Road (Block E) would be required to be demolished: Block E comprises 10 residential units.

In response, a number of options were considered to reduce the property impact and significant disruption effects.

One option considered was to remove the SUP between McClymonts Road and the proposed connection at Lavender Garden Lane (therefore avoiding Block E at 60 Masons Road). Between these two points, cyclists and pedestrians would have to use either Medallion Drive (via McClymonts Road) or Masons Road. However, in discussion with AT, this option was discarded because:

- The intersection of McClymonts Road with Medallion Drive, a large roundabout, would be difficult for cyclists to navigate, resulting in potential safety concerns, and this option would create a longer, less direct route; and
- The southern end of Masons Road is a private right-of-way, and is therefore not available for a public SUP route.

An alternative design was developed to avoid the property impacts involved with constructing a new eastern span on the McClymonts Road Bridge to accommodate the busway/SUP. This alternative design involved reducing a number of the horizontal dimensions for accommodating the busway and SUP, and realigning the Busway/SUP to run alongside the southbound lanes of the motorway. To accommodate this realignment, the existing abutment of McClymonts Road Bridge would have to be demolished, and the existing span over the southbound lane of the motorway would have to be replaced with a new 37 long span to accommodate the existing southbound lanes.

The key benefit of this alternative design was the reduction in property impact. While additional land would be required along the western edge of the common ground of 60 Masons Road, the alternative design would avoid requiring the demolition of 60E Masons Road and significantly reduce the impact on the common ground at 60 Masons Road.

However, the rebuilding of the bridge would have required the full closure of McClymonts Road during construction for a significant period of time. This closure would significantly impact not only on local traffic but on the bus route that uses McClymonts Road and on maintaining bus operations from the Albany Bus Station onto SH1.

Accordingly, the option of constructing a new bridge off-line to the south of the existing alignment was considered. A new McClymonts Road Bridge would allow for improved provision for cyclists and pedestrians using McClymonts Road. Another benefit of realigning the McClymonts Road Bridge would be the potential to relocate the western abutment of the bridge further back from the northbound lanes, thereby improving the sightline for northbound SH1 traffic to the Oteha Valley off-ramp.

While the realignment of McClymonts Road Bridge would require additional land at the northern end of 98 McClymonts Road, a large vacant site bounded by McClymonts Road and Don McKinnon Drive, it still had the significant benefit of avoiding the demolition of 60E Masons Road and reducing the impact on the common ground at 60 Masons Road. The remaining land required for the realigned bridge would all be within the existing road corridors. This design would also avoid the significant disruption effects of reconstructing the bridge on the existing alignment.

For these reasons, it was determined to modify the Project design to reconstruct the McClymonts Road Bridge on a more southern alignment and to realign the Busway extension and SUP alongside the southbound lanes of the SH1 motorway.



7.7.4 Rosedale SH1 Widening

As part of the preliminary design work, another design element to be resolved was how to minimise the impact of the Project on the Rosedale Closed Landfill. The widening of the SH1 Motorway north of the interchange with SH18, combined with the extension of the busway and construction of a SUP will require the widening of the corridor into the former landfill site, with the potential need to excavate into part of the Rosedale Closed Landfill and the consequent environmental risks. Accordingly, a number of alternative designs were identified and assessed to seek to minimise such risks while considering the impact on other adjacent properties and other environmental effects.

During the previous design phase, the SUP and Busway extension north of Constellation Drive was proposed to slope downwards from the bridge over Rosedale Road towards the Rosedale Closed Landfill, requiring a cutting into the landfill of up to 10.1m, before descending down towards Greville Road. The width of the corridor is based on certain minimum dimensions, including for the Busway (a 3.5m wide bus lane plus two 1.6m shoulders) and SUP (5m width), plus a 1.1m wide barrier roll allowance between the Busway and SUP and a separation distance from SH1 motorway that provides for maintenance and police enforcement bays. In addition, there are certain requirements for ramp connections from the SUP to Rosedale Road.

The cut into the Rosedale Closed Landfill would require an anchored bored pile wall of approximately 180m in length. The wall anchors would go 15m into the Rosedale Closed Landfill site, although their position some 4.5m below the surface would avoid the refuse zone. However, the depth of the cut and retaining wall would encroach into the refuse layer of the Rosedale Closed Landfill and into the unknown material below the refuse. The alignment of the SUP and Busway at the detailed design stage would occupy part of 121 Rosedale Road, although the remainder would be useable for continued commercial purposes, behind a retaining wall of up to 7.8m high.

The alignment would also require the demolition of the building adjacent to the western boundary and the partial demolition of the property adjacent to the northern side. MSE block walls would be used along the fill beside other adjacent properties to minimise the impact on those properties.

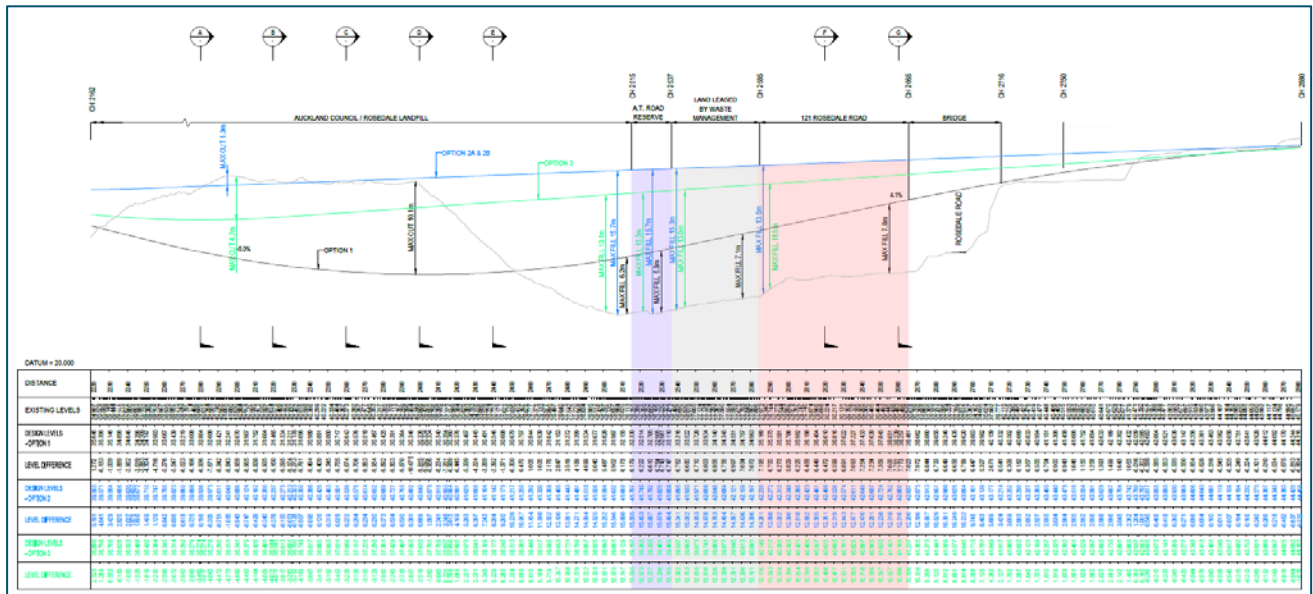
Due to the tight horizontal parameters, providing little scope to make the busway and SUP alignment any narrower to any meaningful degree, the only feasible options were vertical variations in design. Two alternative vertical alignments for the Busway/SUP were developed for north of Rosedale Road bridge, in addition to the original design described above (Option 1).

Option 2 would entail extending the Busway/SUP from the south of the Rosedale Road bridge up to the existing ground level at the Rosedale Closed Landfill, eliminating the need for cutting into the landfill. However, this would involve a significant increase in height of the Busway/SUP adjacent to the properties south of the Rosedale Closed Landfill, as well as a large fill wall between the Busway and the existing motorway. This element could be accommodated by either a viaduct bridge design (Option 2A) or a retaining wall (Option 2B). Because of the height of the retaining wall option (the highest point of the embankment required to carry the Busway/SUP up to the Rosedale Closed Landfill would be 15.7m above the existing ground level), an additional width of 3.2m would be required to accommodate the wall under Option 2B, which would also require 15m long anchors through the Busway embankment. The viaduct option (Option 2A) would not require any additional corridor width.

Option 3 would entail raising the Busway/SUP up from the Rosedale Road bridge to a point that would involve a cutting into the Rosedale Closed Landfill of only 4.5m in maximum height, allowing for a bored pile wall along the landfill edge that does not require anchors. The maximum fill height required to carry the Busway/SUP south of the Rosedale Closed Landfill would be 13.5m. The reduced height of the embankment would require a shorter length of an anchored bored pile wall between the Busway/SUP and motorway compared with Option 2 (70m compared with 200m). In brief, Option 3 represents the 'midway point' between Options 1 and 2 in terms of vertical alignment.



Figure 44 Comparative Long Sections



Options 1, 2A, 2B and 3 were assessed using a MCA Framework with the input of a wide range of technical specialists (Social and Environmental). The MCA Framework comprised six MCA 'categories', which were broken down into a total of 37 assessment criteria. MCA criteria covered matters such as safety, social impact and potential effects on the natural environment as well as construction risk. Each criterion was scored by the appropriate expert using the same five-point scale as used in MCA assessments for other Project components. The specialists' assessments were collated and challenged at an Evaluation Workshop, at which representatives of Mana Whenua also attended to provide cultural input.

For Options 1, 2A, 2B and 3, the scoring against each criterion was agglomerated under each of the six MCA categories. The MCA Evaluation process concluded that Option 1 was the least acceptable option while Options 2a, 2b and 3 were of equal merit, for the following reasons:

- Option 1 had comparatively greater potential air quality effects, including the excavation of relatively large amounts of material, potentially discharging dust and gases from the old landfill;
- Option 1 had significantly greater visual and landscape effects, involving the truncating of a prominent landform, a highly visible 10m wall running along the SUP, with limited opportunity to mitigate the effects;
- Option 1 posed the greatest risk of exposing hazardous material in the former landfill;
- Although it avoids the effects of cutting into the landfill, the height of Options 2A and 2B above the existing ground level in the Rosedale Road vicinity made these options the most prominent of the options; and
- While Option 3 would still entail cutting into the landfill landform, the cut would avoid exposing the refuse layer, and the stepped profile adjacent to the landfill would result in a reasonable fit, with the lower height walls able to be visually mitigated (for example, through planting).

In all other regards, there were no substantive differences between the options from environmental, cultural or transport perspectives.

From a property perspective, Option 2B (high embankment) had the greatest land requirement, while Option 2A (viaduct) had the least. However, the overall differences in land requirements was not great (a range of 765m²). To accommodate the connecting ramp between Rosedale Road and the SUP, Options 2A, 2B and 3 had the greater land requirement at 121 Rosedale Road; however, this property



would be impacted by all options and under all options the remainder of the site would be able to have a commercial use following completion of the Project.

While the costs of Option 1 were the lowest, the environmental effects were the greatest and therefore this Option was discarded. Option 3 was incorporated into the project as this design had the least cost of the other options, had only minor impact on the Rosedale Closed Landfill, with minor visual and landscape effects that could be readily mitigated.

7.7.5 Other Project Components

7.7.5.1 UHH Stormwater Management Wetlands

As part of the extension of the SH18 motorway to connect it with the SH1 motorway, a number of alternative locations were identified for a new stormwater management pond in the Unsworth Road vicinity to treat stormwater from the new section of motorway. An above ground constructed wetland is considered to be the Best Practicable Option (BPO) for the provision of necessary treatment, detention (stream erosion protection) and level of attenuation (flood mitigation from the additional stormwater run-off from new areas of impervious surface).

Due to the proximity of residential and commercial properties to the UHH, there are limited locations for a wetland of sufficient size capable of treating the estimated volumes of stormwater. The only feasible options are located in areas of open space to the south of and immediately adjoining SH18, which are reserves managed by the AC Parks division.

The location identified for the wetland during the preliminary design phase was a grassed location adjacent to the UHH within Rook Reserve, to the north of Rook Place. AC Parks division expressed concern about the potential loss of functionality that locating a wetland would have on this reserve. In response, two alternative sites were identified, both within the Bluebird Reserve: one site within the grassed open area north of the children's playground, and another in an area of bush within the same reserve.

All options would require the use of a proprietary device to filter the stormwater prior to discharge into the local streams. In all other aspects, the Bluebird Reserve options would provide a comparably suitable area to the Rook Reserve option for a stormwater management wetland that would also provide an amenity feature, accessible by the public.

An MCA process was undertaken in conjunction with AC Parks on all three sites, with the Rook Reserve site being selected as the preferred location for the following reasons:

- The Rook Reserve option performs better from a stormwater functionality perspective, with the least increase in downstream flood flows, the avoidance of the need to fill in a floodplain and the avoidance of the use of culverts to convey the stormwater to the filter before discharging;
- While all three locations would result in a reduction in the functionality of each reserve, the Rook Reserve is larger and therefore has greater opportunities to enhance the reserve's recreational value following the construction of the wetland, including opportunities to integrate the wetland as a community asset; and
- The Bluebird bush location would have relatively much greater adverse freshwater and terrestrial ecology and landscape and visual effects, with the loss of stream and aquatic habitat adversely impacting on Mana Whenua's relationship with water.

A decision from the Upper Harbour Local Board (as manager of the Reserves) was unable to be made prior to lodgement of the NoRs and resource consent applications with the EPA. The NoRs and consent applications, therefore, include both the Rook and Bluebird Reserve options. Once the position of the Local Board is known, the NZ Transport Agency will confirm which alternative it wishes to proceed with, and seek that the BoI assess the NoRs and consents accordingly.



7.7.5.2 SH18 Shared Use Path Connection

As part of the Concept Design Phase, it was proposed to construct a new Shared Use (cycling and walking) bridge over the Northern Motorway SH1 to connect the Constellation Bus Station with the pedestrian and cycling network to the west of the motorway. This bridge would be located between the northern end of the bus station and the embankment on the side of the northbound off-ramp, to the rear of 77 Santiago Crescent. This bridge was envisaged as an enclosed steel truss structure, with sufficient height to future-proof it for possible southbound ramps connecting SH18 with SH1, requiring it to be an estimated 18m above the level of the motorway. This design would require a 300m long ramp on the eastern side and a 420m long ramp on the western side, to connect with Constellation Drive and UHH respectively, to provide the necessary gradients. However, as there is insufficient capacity to provide ramps of these lengths, a lift would be required at either end of the bridge for pedestrians and cyclists: 25m high at the eastern end and 28m high at the western end.

This design, however, presents a number of significant issues, including:

- The relatively high cost of the bridge and lift structures;
- The CPTED safety issues of the use of the lifts, especially at night;
- Significant ongoing operation and maintenance costs for AT and the NZ Transport Agency;
- The visual effects of a high structure for residents, affecting a potentially wide audience;
- The line of desire between the SUP on UHH and the Constellation Bus Station would be to use the footpath under the SH1 motorway bridge, rather than use the ramps and lifts, presenting safety issues for pedestrians and cyclists; and
- The discharge and entry of pedestrians and cyclists at the Constellation Bus Station side would impact on the efficiency and safety of the bus station operation – pedestrians and cyclists accessing the existing the SH1 SUP would also have to go through the Constellation Bus Station.

For these reasons, as part of the preliminary design phase, an alternative design was developed to address these issues. This option involved compressing the width of the road lanes on Constellation Drive under the motorway bridge to accommodate a widened SUP on the southern side of the road. This would allow a 2.0m wide footpath on the northern side of the road, and a 2.9m wide SUP on the southern side of the road. This option has the following benefits over Option 1:

- It provides the shortest trip length from the proposed SUP on Upper Harbour Highway to the SUP on SH1 and the bus station – it is on the expected desire line of pedestrians and cyclists;
- It avoids the need for the bridge;
- It avoids the need for lifts, as a gradient compliant ramp can be provided on the eastside of SH1, utilising the space underneath the busway bridge over Constellation Drive;
- It allows pedestrians and cyclists wishing to join the SUP on SH1 to avoid entering the bus station, and; and
- It only requires modification of the carriageway markings and crossings and construction of a widened path, which will be significantly cheaper than Option 1.

Accordingly, the Project design has been modified to discard the bridge option, and incorporate the underbridge SUP design.

7.8 Conclusion

Since the commencement of the Project, there have been a number of alternatives assessments to progressively refine the options for improving the network connections in the Project area to confirm the preliminary design and hence the Project's land requirements and resource consents.



The assessments have been carried out by way of evaluation frameworks which have had regard to Part 2 of the RMA and the Project's overarching objectives. This process has been thorough and robust in terms of the requirements of sections 171(1) and 181(2) and Schedule 4 of the RMA.



8 Consultation and Communication

8.1 Overview

Consultation and engagement on the Project has been undertaken from 2014 to 2016. Engagement has been ongoing with key stakeholders including AC, AT and Mana Whenua, as well as affected land owners and the wider community.

Methods of engagement have included one-on-one meetings, hui, workshops, letters, newsletters and E-news distributions, Project Reference Group (PRG) meetings, community open days, online campaigns, and advertising. Feedback from this engagement has been essential in developing and influencing key aspects of the Project and stakeholders have been advised on how their feedback has been used by the Project team to date.

This Section provides an overview of the Project stakeholder and community engagement activity completed from June 2014 through to lodgement of the NoR and resource consent documentation in December 2016.

During this time, three rounds of consultation have taken place and all activity has been captured in two Stakeholder and Community Engagement Reports:

- Stakeholder and Community Engagement Report - September 2015;
 - Engagement from June – November 2014 for the preliminary design; and
 - Engagement from December 2014 – September 2015 for the scheme design.
- Stakeholder and Community Engagement Report - November 2016;
 - Engagement from January – November 2016 to progress the pre-implementation phase and prepare for lodgement of the NoRs and resource consent applications.

8.2 Consultation Objectives

Initial consultation objectives for the preliminary and scheme design phases of the Project (2014 – 2015) were to:

- Keep all those interested and affected by the Project informed;
- Receive feedback that may be used to inform decision making at all stages of the Project;
- Understand stakeholder issues and needs and input these into the optioneering and scheme design;
- Gain support from stakeholders for the Project by understanding stakeholder and community needs and managing their expectations;
- Work with affected landowners/operators to avoid or minimise impact;
- Build and enhance positive reputations for the NZ Transport Agency; and
- Minimise consenting risks for the future stages of the Project.

Specific engagement goals as set out in the Communications and Stakeholder Engagement Plan (2015) were to:

- Inform, involve or consult key stakeholders, property owners and the wider community in the process of narrowing down the Project's recommended option/s. The intention was to incorporate feedback on how the Project would work best for stakeholders and the community;



- Begin consultation with affected property owners, to raise awareness of the possibility of land purchases or effects in 2016-2021;
- Generate good will that this Project has benefits for the community, Auckland and the region, and show that NZ Transport Agency is committed to being a good neighbour; and
- Gather input that the consultation team can contribute to wider project decisions made for the next phase of the Project and the preferred final option that is taken to design and consenting in 2016.

The most recent consultation and engagement objectives set for the Project in early 2016 were developed to build on the strong relationships already established and to continue effective engagement practices with stakeholders and the community:

- To maintain and continue the two-way communication process and build on the strong relationships established during previous rounds of engagement;
- To inform the community on the preferred project alignment and footprint for the Project and advise how previous consultation feedback has influenced decision making so far;
- To consult with the community and provide multiple ways to provide meaningful and relevant feedback on key themes in preparation for lodging consents in late 2016;
- To capture feedback data and present it back to the NZ Transport Agency in a timely manner, to allow feedback to influence the design and decision making process; and
- To look after the reputation of the NZ Transport Agency and the Project during the engagement process.

8.3 Consultation Drivers

8.3.1 Resource Management Act 1991 (RMA)

Pre-application consultation with potentially affected parties and key stakeholders is considered best practice, especially for major projects. It is the NZ Transport Agency's policy to consult on such matters to exhibit a sense of social and environmental responsibility including taking into account the views of affected communities.

The NZ Transport Agency carries out consultation even though there is no statutory requirement for consultation under the RMA for either a NoR or an application for resource consent. However, consultation is consistent with Treaty of Waitangi obligations under section 8, and a statement of any consultation carried out in relation to a project is required by Form 18 of the Resource Management Regulations 2003 and Clause 1 of the Fourth Schedule to the RMA.

Within the framework of relevant statutory matters, consultation has been carried out in within the context of considering:

- The actual and potential environmental effects of the Project;
- Suitable approaches for avoiding, remedying or mitigating adverse effects on the environment;
- Alternative routes and alignments for delivering the NZ Transport Agency's objectives for the Project; and
- The effects of the Project on tangata whenua.

8.3.2 Land Transport Management Act 2003 (LTMA)

The NZ Transport Agency is required under section 96(1) of the LTMA to exhibit a sense of social and environmental responsibility while meeting its objectives and undertaking its functions. The NZ Transport Agency's consultation objectives for the Project are consistent with these principles.



8.3.3 NZ Transport Agency Public Engagement Policy 2008

The NZ Transport Agency's Public Engagement Policy identifies four key commitments to public engagement:

- Providing genuine opportunities for public contributions;
- Ensuring people are informed;
- Adopting an inclusive and representative approach to public engagement;
- Maintaining high professional public engagement standards; and

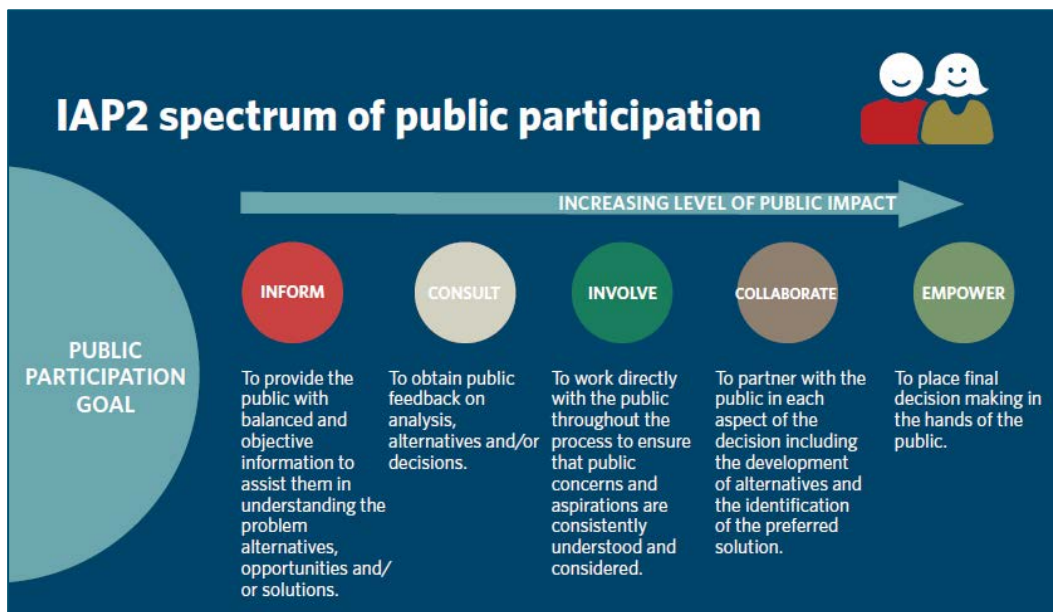
The Project consultation objectives align with the commitments within the Engagement Policy.

8.3.4 International Association for Public Participation (IAP2)

Engagement during each phase of the Project has been based on the principles and core values of the IAP2.

IAP2 provides internationally recognised consultation best practice principles. The community engagement spectrum of participation (see **Figure 45**) is based on the decisions to be made and the associated level of influence (if any) the community has on project decision making.

Figure 45 IAP2 Public Participation Spectrum



Source: NZ Transport Agency

8.4 Parties Consulted

8.4.1 Stakeholders

Key stakeholders have been identified as any individual, group or organisation representing an interest in the Project area, rather than the general public or community.

Table 35 provides a summary of those key stakeholders with whom the Project team have engaged from 2014 - 2016.



Table 35 Key Project Stakeholders

Stakeholder	Interest Area
AC – Parks, Strategy, Consenting, Policy, Landfill and stormwater teams	AC owns space in Project area. Consenting application, environmental factors.
Auckland Councillors	Overall Project, interest in local areas and amenities.
Auckland Transport – Walking and cycling, public transport, network outcomes, bus station planning teams and AT Travelwise team	Integrated approach to planning walking and cycling paths and connectivity to local network, Busway extension, local road improvements and connections with Project, effects on local schools and accesses.
Watercare Services Limited	Integrated approach to works affecting Watercare owned land.
Upper Harbour Local Board	Overall Project and benefit to local community in Upper Harbour electorate, consideration of NHHS.
Hibiscus and Bays Local Board	Overall Project and benefit to local community in Hibiscus and Bays electorate, consideration of NHHS.
Business North Harbour	Interest in local businesses and industrial/commercial areas.
Hokai Nuku (comprising five Iwi)	Overall Project, environmental and ecological issues, urban design, cultural heritage of the Project area.
Te Kawerau a Maki	Overall Project, environmental and ecological issues, urban design, cultural heritage of the Project area.
Ngai Tai Ki Tamaki	Overall Project, environmental and ecological issues, urban design, heritage of Project area.
Harbour Hockey (including representatives from Hockey NZ)	Relocation or reconfiguration of Hockey grounds.
Auckland Motorway Alliance	Progress updates on overall Project, traffic management, maintenance (road and environment), safety.
Ministry of Transport	Progress updates from NZ Transport Agency.
Minister of Transport/ National Government office	Progress updates from NZ Transport Agency.
Office of Local MPs	Overall Project, community and business considerations, local areas and amenities from a political overview.
Emergency services	Access in and around the Project area, effects on local community.
Business and residents' associations including Paul Matthews Business Forum and Greenwich Shops	Potential effects on, and benefits for, the local community and business groups.
Local schools and education facilities, including Westminster Christian School and Massey University	Effects on local community, interest in walking and cycling connections, Busway extension, new bridges.
Utilities, including Transpower, Vector, telecommunication services	Project design and constructability, integration with utility services.
Interest groups including Bike Auckland, Walk Auckland, and Probus	Project footprint, walking and cycling connectivity, Busway extension.
Sports clubs and facilities including North Harbour Sport and QBE Stadium	Access to/from sporting facilities, connections for local community, construction effects.



8.4.2 Neighbours and Wider Community

The Project neighbours and the wider community have been consulted since 2014 using a variety of methods including the distribution of Project newsletters (hard copy and E-newsletters), letters, advertising/ promotion, open day events at the Westfield Albany Mall, business breakfast drop-in sessions, events at Constellation and Albany Bus Stations, local community events in Unsworth Heights, community planting days and an event at Massey University.

The purpose of these events was to inform and consult with the community and community stakeholders during each phase of the Project. Feedback gathered from the community was recorded and used to influence certain areas of the Project's development.

An overview of the feedback and outcomes from each round of consultation can be found in the two Stakeholder and Community Engagement Reports - September 2015 and November 2016.

8.4.3 Directly affected property owners

The Project involves the requirement for full and partial use and occupation of third party owned properties in the Project area. Interaction with directly affected property owners commenced in 2014 and discussions have been progressing with more in-depth negotiations taking place from early - mid 2016, between the NZ Transport Agency property team, landowners and tenants.

Directly affected property owners include those properties which possibly or probably are likely to be physically impacted by the Project footprint/designation. A total of 160 properties were identified based on the General Arrangement plans that were prepared in 2014. Of these, the majority were considered "probably affected" (i.e. highly likely or certain to be physically impacted in the alignment plans) and a smaller number were considered "possibly affected" (i.e. further work still needed to be done on the alignment plans before a firmer conclusion could be reached).

For the 2016 engagement period, property owners who were identified as "probably affected" in the most recent versions of the General Arrangement plans have been engaged with and discussions are continuing.

The Project team has also been in contact with local real estate agents to raise the awareness of the Project in the area. A Project update was presented to Colliers, Barfoot & Thompson, Harbours and Bayleys in July 2016 to explain the timelines for the Project. Agents who have property owner clients or were advertising/leasing tenancies at properties potentially affected by the Project were asked to advise their clients to contact the Project team.

8.5 Consultation Overview

8.5.1 Project development and level of consultation

Community and stakeholder feedback influences key decisions during the development of a project. Key decisions are typically made at the start of the process where a number of options are under investigation. As the project progresses, the level at which key stakeholders and the community can influence the decision making process reduces. As a result, intensive consultation usually takes place at the beginning of a project's lifecycle.

Various options were investigated for this Project in 2014 and 2015. As a result of consultation and engagement undertaken during that period, stakeholders and the community were able to provide feedback and influence a number key decisions, such as the configuration of the Paul Matthews Road/ Caribbean Drive intersection and the need for a Paul Matthews bridge, the design of the Northern Busway Extension, and the shared walking and cycling path location and connections.

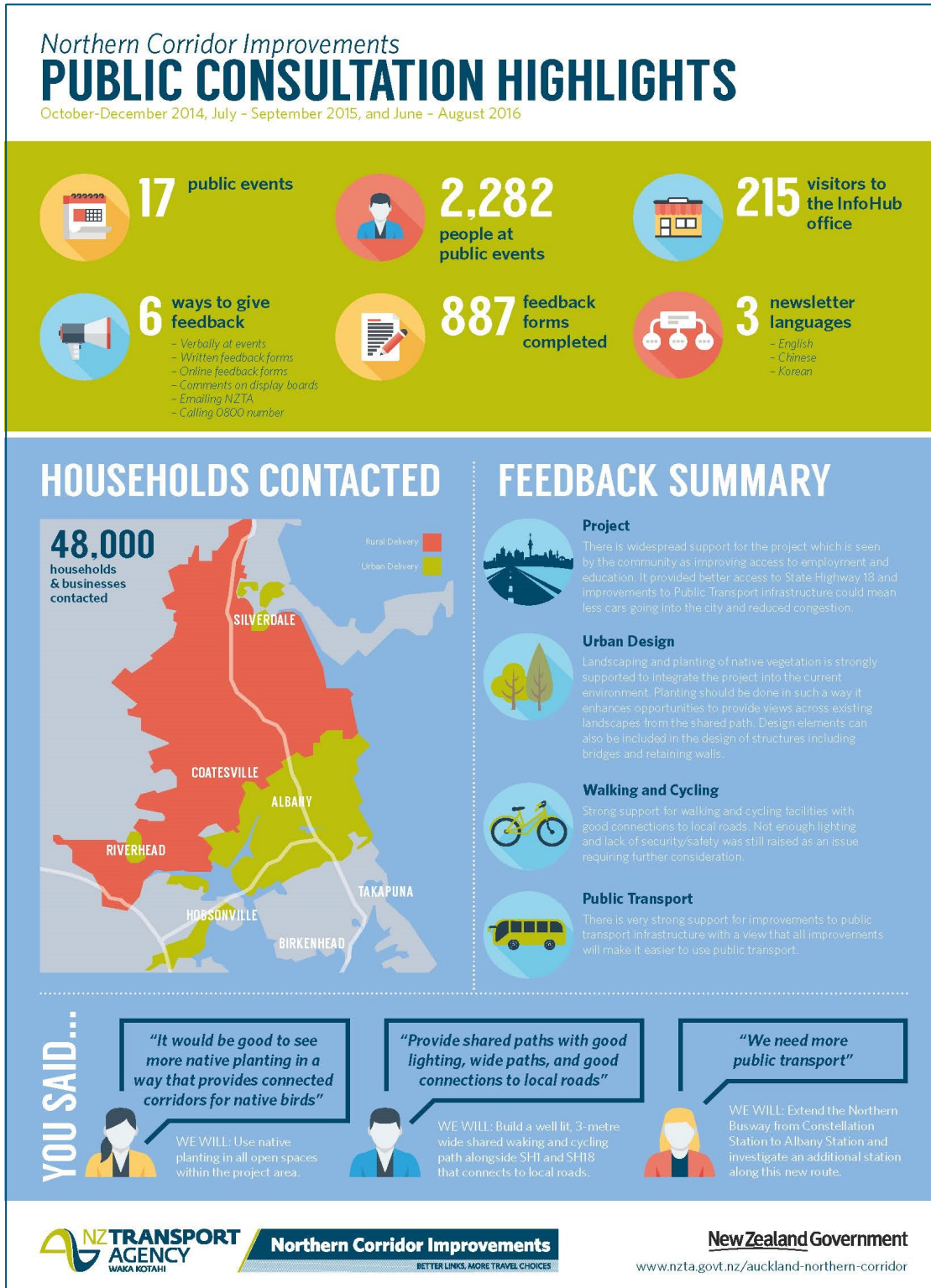
During the 2016 consultation period, engagement was more at the 'inform' level (IAP2 framework) with a lower level of influence from stakeholders and the community.



8.5.2 Consultation Highlights

The below diagram (Figure 46) provides an overview of public consultation for the Project, from 2014 – 2016.

Figure 46 Public Consultation Highlights



Source: NZ Transport Agency



8.6 Consultation Reporting

Consultation reporting has been split into two stages:

- Investigation (2014 – 2015) – covering the preliminary design and scheme phases; and
- Pre-implementation/ lodgement (2016) – including the concept design developed up to the lodgement of the application with the EPA.

An overview of each of these stages is provided below.

8.6.1 Consultation during Investigation Phase (2014 – 2015)

Consultation was undertaken during the preliminary and scheme design phases of the Project to understand stakeholder issues and needs, and to seek feedback to develop and shape the early stages of the Project. In addition, consultation at this stage allowed the NZ Transport Agency to build relationships with stakeholders, affected landowners and the wider community whilst minimising risks for the future stages of the Project.

The stakeholders identified and engaged with during the 2014 and 2015 engagement periods included AC and its Council Controlled Organisations (CCOs), NZ Transport Agency's internal stakeholders, Mana Whenua, local boards, business associations and community groups, and the wider community. Methods of engagement included, but were not limited to, individual and group meetings, workshops, presentations, newsletters, open days, and letter distribution. These were tailored to each stakeholder or stakeholder group.

A PRG was established in mid-2014 to act as a governance group for the Project and provide direction on decision-making. The PRG consists of key stakeholders including the NZ Transport Agency and its internal groups, AC and its subsidiaries, local boards, Mana Whenua and the former North Harbour Business Association (now known as Business North Harbour). This group met monthly throughout 2014 and 2015 to provide feedback on the progression of the Project.

Further engagement occurred with AT and AC through direct collaboration with the Project team. AT is a member of the PRG and had a representative seconded to the Project in 2014 and 2015 to participate in all meetings and ensure a collaborative approach when planning for impacts on the local road network, Northern Busway and local bus networks, and walking and cycling routes.

Engagement with Mana Whenua took place through representation on the PRG, regular meetings (hui) and correspondence.

8.6.2 Consultation during Pre-Implementation/Pre- Lodgement Phase (2016)

From January – November 2016, the Project team engaged mainly on a one-on-one basis with key stakeholders in meetings, workshops, and via phone and email. These included:

- Meetings with Upper Harbour and Hibiscus and Bays Local Board;
- Workshops with the Project Reference Group;
- Meetings with Business North Harbour;
- Meetings with the Central - Northern Iwi Integration Group (IIG);
- Meetings with other key stakeholders such as AT, AC, Watercare, Bike Auckland, utility companies;
- Ongoing meetings with North Harbour Hockey; and
- One-on-one sessions with potentially affected property owners and tenants.



The Minister officially announced the next stage of the Project on 20 June 2016 which provided more information on the draft alignment and marked the start of the public consultation period. The Project team utilised a range of methods, tools and techniques to further engage with stakeholders and the community. They included:

- Workshops and presentations to key stakeholders;
- Meetings with the IIG, as well as individual hui with interested groups;
- Individual and group meetings with other key stakeholders;
- Letters, online booking system and individual appointments with affected landowners;
- Letters to key stakeholders including Mana Whenua, affected owners and neighbours;
- Poster series with graphical images;
- Project website with posters, contact details;
- An information day at Westfield Albany and Club Day at Massey University;
- Static display at Massey University;
- Business breakfasts;
- Newsletters with feedback forms;
- Tailored newsletters and letters with feedback forms for the Unsworth Heights community;
- Translated newsletters in Korean and Chinese;
- Newsletter distribution at Albany and Constellation Bus Stations;
- Media release, advertising and articles in newspapers;
- Multimedia video;
- Social media feedback campaign;
- Project Hub office open for drop ins from the public;
- Project website with online survey;
- Project e-mail address; and
- Project 0800 phone number.

8.7 Consultation Feedback

This section provides an overview of consultation feedback from key stakeholders and the community. A more detailed summary of the consultation undertaken can be found in the two Stakeholder and Community Engagement Reports - September 2015 and November 2016 provided at **Appendix E**.



8.7.1 Project Reference Group

Feedback from the PRG during the preliminary phase centred on the objectives of the Project and the future-proofing of SH1 and the local road network, impact of landowners and local businesses, various concepts, engagement processes, and identifying stakeholders. Feedback during the scheme phase focused on the pros and cons of the various concept designs and the process for engagement and identification of other stakeholders who may have an interest in the Project.

8.7.2 Auckland Council

The Project team has worked closely with AC in 2016 to build on previous relationships and make important decisions on key aspects of the Project. Regular meetings have been held with representatives from the following technical teams:

- Stormwater and Healthy Waters Units;
- Closed Landfills and Contaminated Land Response Team; and
- Parks, Sports and Recreation Unit.

Key discussion points from these meetings included:

- Confirmation of catchment flood assessment criteria;
- Confirmation of hydrological modelling requirements;
- Details of known existing flooding issues over the Project;
- Confirmation of stormwater peak flow attenuation requirements;
- Culvert design and sizing;
- Guidance on the Project's stormwater management report detail required for consent;
- Understanding of existing stormwater drainage over the Project;
- Design considerations for interface with existing public AC drainage;
- The Project's stormwater management reporting requirements in relation to the existing Network Discharge Consent;
- Guidance on the AUP stormwater management requirements;
- The impact on the Rosedale Closed Landfill in terms of extent of encroachment in to the landfill area and reinstatement of landfill infrastructure; and
- The impact on AC reserves / open space (passive) land and design detail requirements for the proposed main alignment works.

8.7.2.1 AC Stormwater and Healthy Waters Units

The Project includes changes to AC owned stormwater pipes, discharge to AC's stormwater network and open channels/streams and the relocation of three existing stormwater ponds. Regular consultation with AC's Healthy Waters Unit resulted in agreed key objectives which included the following:

- Minimise flood risk for properties in the stormwater catchment, in particular properties adjacent to watercourses;
- Minimise flood risk on local roads;
- Maximise stream health by regulating erosion potential and runoff treatment requirements; and
- Maintain the space and ability to improve existing stormwater management assets.

The proposed stormwater management design for the Project addresses AC's concerns as follows:

- Attenuation requirements:



- Attenuation requirements have been assessed using AC's stormwater models. The post-development model run demonstrates peak flows up to 100-year ARI result in minimal upstream and downstream impacts.
- Stream erosion:
 - Detention is provided for discharges from all catchments.
- Replacement of existing ponds:
 - The hydraulic performance of the proposed ponds replacement has been confirmed with flood modelling of the post-development scenario, to be adequate to maintain pre-development peak flows and overflow volumes into RWWTP Ponds; and
 - Treatment functions of existing ARC Refuse Pond to be replaced by a new wet pond on the west side of SH1.
- Caribbean Drive flooding:
 - The existing culvert is proposed to be upsized to improve the existing flood situation.
- Greville Road flooding:
 - The proposed busway bridge abutments have been placed outside the existing floodplain, hence the Project does not adversely affect existing flood risk and no improvement work is proposed.
- Treatment above TP10 standards:
 - The proposed stormwater management design uses swales and wetlands, and proprietary devices that treat all new high use road runoff to 75% TSS removal in accordance with TP10. In addition, swales are proposed, where practicable, to provide informal pre-treatment before discharging to wetlands, which provide additional treatment above and beyond TP10 requirements. The Project will also treat a significant proportion of the existing high use road impervious area.
- External catchment management:
 - The Design team has consulted with AC regarding the replacement ponds adjacent to the RWWTP. These ponds serve stormwater run-off from external residential and commercial catchments. The existing capacity will be retained in the replacement ponds.
- Detention:
 - Detention has been provided in accordance with SMAF1 and in accordance with the AUP.
 - Attenuation of 10-year ARI and 100-year ARI peak flows has been provided where flood risks are present.
- Pre-treatment:
 - Swales have been provided where practicable (e.g. between the shared-use path and busway where space within designation allows) for informal pre-treatment prior to discharge to wetlands.
- Culverts:
 - The Project team has consulted with AC regarding culvert upgrades. It was noted that changing existing sizes could cause adverse flood effects to the upstream and downstream receiving environment. As such, any poor condition pipes are proposed to be replaced with pipes of the same size.



8.7.2.2 AC Closed Landfills and Contaminated Land Response Team

The AC Closed Landfill and Contaminated Land Response Team (CLCLR) initially raised concerns regarding the concept design for the Project and its interaction with the Rosedale Closed Landfill. Consequently, the Project team considered a range of alternatives to reduce the extent of the works within the Rosedale Closed Landfill with respect to the vertical and horizontal alignment and to develop a design for the reinstatement of landfill infrastructure displaced by the Project, as reported in **Section 7** above.

The CLCLR has been closely involved in the review of these designs, and is in principle in support of the Project which achieves their principal objectives. On-going liaison continues with CLCLR to develop a consenting strategy for any alterations necessary to the existing resource consents for the Rosedale Closed Landfill and the development of the detailed contents for inclusion in the Landfill Reinstatement Works Plan which is proposed in the conditions provided in **Appendix A**.

8.7.2.3 AC Parks and Reserves

AC manages parks and reserves which provide for passive recreation and local purpose activities in Auckland. Its key concern is ensuring that a healthy ratio of amenity open space servicing residential areas is maintained.

The Project has an impact on those reserves listed at **Section 4.2.5**.

Due to the location and nature of Tawa, Arrenway, Centorian, Alexandra Stream and Omega Reserves, AC Parks has raised no concerns with the proposed use of these reserves and in particular, support the activation of Arrenway Reserve with the provision of a link between the local road network and the SUP.

While the impact on Meadowood Reserve is primarily the removal of boundary vegetation and AC Parks is generally in support of the Project works, this reserve houses a Community House and Crèche. The Project team is actively engaging with AC Parks and its tenants in respect of the limitations and controls necessary during the construction phase so that onsite activities can function during the construction period.

A wetland is required to treat stormwater from the Oteha Stream catchment. As set out in **Section 7**, the Project team and AC Parks held workshops to consider the advantages and disadvantages of alternative locations for this stormwater pond. This MCA process has confirmed Rook Reserve as the preferred location. However, the Local Board has yet to meet and consider the matter. The Project team will continue its engagement with AC Parks and the Local Board to resolve this issue.

AC has advised that part of Constellation Park referred to as Rosedale Park South has been identified for potential future sports fields. This area is affected by the proposed SH1 to SH18 interchange. A working group has been formed that includes the NZ Transport Agency and AC representatives from the Parks and Property teams. Regular meetings have been held from 2014 to the time of preparing this report, and the NZ Transport Agency is committed to working with the Council to find compensatory land for future sports fields.

Constellation Park also contains the NHHS complex and at **Section 8.7.11** an overview of the consultation process concerning this facility is provided.

8.7.3 Auckland Council Local Boards

During the concept design stage of the Project, presentations were given to both the Upper Harbour Local Board and the Hibiscus and Bays Local Board. Both Local Boards provided similar feedback and acknowledged that the Project is necessary at a strategic level. Concerns were raised about the potential impact of the Project on the NHHS and how the potential impact of the Project on local businesses would be addressed as the Project progresses. The Upper Harbour Local Board also



raised concerns regarding the potential impact of the Project on the Unsworth Heights community, including the closure of the Unsworth Drive off-ramp.

The Project team has continued to meet regularly with the two Local Boards and the neighbouring Rodney Local Board to update them on the overall progress of the Project and to seek feedback on the draft alignment plan prior to undertaking public consultation.

At the workshops with the Local Boards, the Project team sought guidance from the Upper Harbour Local Board on how best to engage with the Unsworth Heights community and followed its advice. In particular, the Upper Harbour Local Board requested that the Project team investigate an Unsworth overbridge. Comprehensive consultation was undertaken at the same time as the Project team investigated the potential traffic impacts, impacts on private property and a safety assessment being undertaken. As a result of these investigations, the Project team determined that an Unsworth overbridge was not the preferred option. In particular, traffic modelling showed that a bridge at this location would redirect significant traffic volumes from arterial roads to local collector roads, effectively create a “rat run” travelling between Glenfield and North Harbour through the residential neighbourhood. This assessment is described in **Section 7** of this AEE.

Both Local Boards have expressed their appreciation for the extent and quality of the updates provided by the Project team. Neither Local Board raised any significant issues with the draft alignment plan for the Project. The Upper Harbour Local Board has publicly voiced its support for the Project, including positive feedback about the Project's investment in the Albany area in their newsletters, and attending one of the Project business consultation breakfasts.

The Local Boards have also provided feedback on the NHHS relocation strategy and have been integrally involved in the design of the works proposed in relation to various reserves. The Project team is also continuing to work with the Upper Harbour Local Board in relation to the location of a stormwater pond at either Bluebird or Rook Reserve. Due to the timing of the local elections, this could not be resolved prior to the lodgement of the NoRs and resource consent applications. Therefore, both options have been included within the Project design and the effects of both are considered in this AEE. However, the options will be discussed with the Upper Harbour Local Board at the earliest opportunity, and only one option will be constructed.

8.7.4 Watercare

The Project will have an impact on the RWWTP and significant pipe assets that feed into the treatment plant site as explained in **Section 5**. Regular fortnightly meetings have been held with Watercare during 2016 to discuss:

- The realignment of trunk sewer mains to mitigate the impact of the Project;
- Integration and coordination of proposed Watercare upgrade works with the works required as a result of the Project to agree a collaborative approach;
- Provision for a larger pond link connecting the wastewater treatment ponds;
- Classification of the causeway link as a dam and the construction of the motorway widening; and
- Provision for stormwater ponds within the Watercare site.

Watercare's key concerns with respect to the proposed stormwater design for the Project include:

- Minimising overflow into the Watercare ponds from existing artificial watercourses adjacent to the Watercare ponds (particularly overflows into Pond 1); and
- Maintaining the space and ability to expand the RWWTP. This includes not locating assets on the east side of SH1 south of Pond 2, which has significant development potential for this facility.

The design has taken into consideration Watercare's concerns during consultation by:

- Reducing stormwater overflow into the RWWTP treatment ponds:



- Pond 1 is currently used for wastewater treatment and while Pond 2 provides further polishing of flows, this is not required for wastewater treatment; and
- The proposed solution reduces overall stormwater overflow into the ponds, with a significant decrease of overflow into Pond 1, at the expense of a slight increase of overflow into Pond 2.
- Coordinating the relocation of ARC Refuse Pond with Watercare:
 - Watercare does not support any replacement ponds south of Pond 2 east of SH1. The replacement ARC Refuse Pond has been located on the west of SH1;
 - The location of the relocated ARC Refuse Pond avoids the footprint of Watercare's expansion plans for the Wastewater Treatment Plant; and
 - The location of the proposed Constellation Drive Pond that replaces existing AC Ponds also avoids the footprint of Watercare's planned expansion.

Discussions have also included the proposed new bridge at Spencer Road which does not form part of the Project but is located within the Project area. As part of a wider project to service growth in Auckland, Watercare requires a new watermain to cross SH1 and connect the Albany Reservoir with the Pinehill Reservoir. It was proposed that collaboration could benefit both parties by integrating the watermain crossing with a strategic walking and cycling bridge that would connect popular East Coast Bays cycle routes with the growing employment and retail area of Don McKinnon Drive/Corinthian Drive, near Westfield Albany. This joint project has been agreed in principle at the time of writing subject to further design development. The bridge will be delivered in advance of the Project.

8.7.5 Auckland Transport

The Project team has continued to work very closely with AT, with regular meetings to progress the Project footprint and agree components of the general arrangement drawings throughout the preliminary design development and assessment of environmental effects phases. Key discussion topics included:

- Local network impacts during construction;
- Local network impacts post construction;
- A potential Unsworth overbridge;
- Shared walking and cycling paths;
- Busway extension;
- Constellation and Albany Bus Stations; and
- A potential new bus station.

An overview of these workstream topics is provided below:

8.7.5.1 Local Network Impacts during Construction

During the pre-implementation phase, the Project team has engaged with AT to discuss the likely construction staging and the associated impacts on the local network as forecast from the traffic modelling. Likely local road closures and/or restrictions on McClymonts Road, Rosedale Road and Paul Matthews Road have been discussed. The key feedback received from AT was that it would like to see the Project team do whatever it can to keep the busway and associated bus services running without impediment/extreme time delays, and to ensure at least one direction of traffic on both Rosedale Road and Paul Matthews Road is kept open at all times. As a result, the Project team has agreed to maintain at least one direction of traffic on these local roads during construction due to the importance of these routes for private and commercial traffic, as well as buses.

A key decision has also been made in collaboration with AT to construct the McClymonts Road Bridge off-line. This decision means the new structure will be built first, next to the existing one and then



traffic will be moved onto the new structure. By constructing this bridge separately, cars, trucks and buses can continue to use the existing bridge and disruption on this important route will be minimised.

Detailed information on construction staging and associated traffic management will form part of the traffic management plans required by the conditions of consent.

8.7.5.2 Local Network Impacts Post Construction

Prior to the pre-implementation phase, traffic modelling was undertaken to determine the impacts of the Project on the local road network. AT provided comments and feedback on this traffic model. During the pre-implementation phase in 2016, the traffic model has been updated to take into account comments from AT, changes to the wider future network assumptions, and the further development of the design for the Project.

Key decisions that have been made to improve efficiencies on the local network as a result of ongoing consultation with AT include:

- The decision to improve Caribbean Drive intersection with additional lanes and a left-turning lane to relieve pressure;
- A change to the layout of Greville Road East from the existing roundabout to a signalised intersection to improve safety;
- Improvements to the Greville Road interchange layout and removing 'trap lanes' to reduce risk associated with lane weaving;
- Improvements to the vertical clearance on Rosedale Road for double decker buses; and
- Improvements to the Constellation Drive intersection.

8.7.5.3 Proposed Unsworth Overbridge

One of the final aspects of the Project to be confirmed was whether a new bridge would be provided across SH18 to Unsworth Heights. Community consultation in 2015 and 2016 showed great interest in a potential local road bridge being built over SH18, connecting Unsworth Drive with Omega Street/Paul Matthews Road/Bush Road.

The bridge was proposed to provide an alternative access route for residents in and out of Unsworth Drive, when the current one-way access from SH18 closes as part of the Project.

More in-depth consultation with the community took place in June/July 2016 to gather feedback on the proposed bridge.

Many people supported the proposal, citing the ease of access this could offer for residents to get to and from their homes, local schools and places of employment in Albany and North Harbour. Some people, however raised safety concerns and were concerned with the risk of people using Unsworth Heights as a through-road.

The Project team undertook an in-depth assessment of the need to provide the Unsworth overbridge, including traffic impact studies and safety assessments in consultation with AT to investigate the following:

- The minimum cross-section of the bridge;
- The alignment options with varying levels of impacts on property, safety and traffic operations; and
- Social impacts following consultation with neighbours, stakeholders and the local Unsworth Heights community.

The Project team and AT worked together to assess the findings of each of these aspects and undertook a workshop in late August 2016, which ultimately reached the conclusion that the Unsworth Drive link is not required as mitigation for the effects of the Project. This assessment process is described in **Section 7** of the AEE.



The traffic impact assessments were tabled at a meeting on 26 August 2016, which included representatives from AT and the NZ Transport Agency. The conclusion was reached that the negative outcomes of the Unsworth Drive link, such as an increased volume of traffic using Unsworth Drive when considered alongside safety issues, such as the steep alignment of the proposed bridge design, outweigh the positive social impacts and that therefore the link should not be included as part of the Project.

In October 2016, the Project team communicated these findings back to the community and informed it that the Unsworth overbridge will not be included as part of the Project. The Project team received mostly positive feedback on this decision.

8.7.5.4 Shared Walking and Cycling Paths

During the pre-implementation phase, the Project team has engaged with AT on various facets of the proposed shared walking and cycling paths during the weekly meetings including:

- The general design philosophy with respect to the provision of walking and cycling facilities and connections to the existing local network;
- Provision of a 5-metre corridor (path and shoulders) for the proposed shared path on SH1 and SH18 (except where impacts on property could result in locations where the path has to reduce to a 4-metre corridor (path and shoulders));
- Providing Austroads compliant connections to the existing local network (including safe road crossings where required) where there were no additional impacts to property;
- Options for providing a connection between the proposed shared walking and cycling path on SH1 and SH18 including an overbridge over SH1, underpass on SH1 and modifications to the cross-section of Constellation Drive to utilise a maximised footpath width as a connection; and
- The strategic need to continue the proposed shared path on SH1 north of McClymonts Roads and the impacts on property.

The Project team also worked with AT to further consult on walking and cycling shared paths in the 2016 consultation questions. This consultation aimed to help the Project team refine the connection points to the shared path, and indicated what features would make these paths attractive for use by the public. The purpose was to be able to provide AT's Walking and Cycling Team with information to assist with funding applications in the next 3-year plan for shared use paths to integrate into those provided by the Project.

Key decisions have been made as a result of consultation with AT on the shared walking and cycling paths, and include:

- Providing a 5m width (path and shoulders), reducing to a 4m width (path and shoulders) where there are space constraints;
- Integrating a wide shared path on Constellation Drive as a link from SH1 to SH18, rather than a dedicated walking and cycling bridge to Constellation Bus Station;
- Including a wide shared path on the new McClymonts Road Bridge;
- Ensuring connections to existing walking and cycling paths including at Oteha Valley Road, McClymonts Road, Medallion Drive, Greville Road, Rosedale Road, Constellation Drive, Paul Matthews Road, Omega Street and Albany Highway;
- Providing upgrades to existing walking and cycling facilities including upgrades to the Alexandra Underpass¹⁵; and
- Ensuring all routes are well lit so walkers and cyclists feel safe.

¹⁵ These do not form part of the Project but were a point of discussion with AT.



In addition, a new pedestrian and cyclist connection between Albany and Pinehill across SH1 at Spencer Road which links to existing local paths at either side is progressing as a separate project in advance of the Project.

8.7.5.5 Northern Busway Extension

During the pre-implementation phase, the Project team engaged with AT on various facets of the proposed Busway during weekly meetings, including:

- The design criteria used to develop the design for the operation of buses and future-proofing of light rail; and
- Geometric departures from the agreed design criteria to minimise the impact on property and/or environmental effects.

During this phase of design, the Project team and AT have agreed on key decisions including the provision of a direct Busway access to Albany Bus Station via a dedicated overbridge across SH1 (rather than via McClymonts Road Bridge).

8.7.5.6 Constellation and Albany Bus Stations

During the pre-implementation phase, the Project team has engaged with AT with regard to the necessary upgrades of the existing stations at Constellation and Albany as a result of the Busway Extension. Upgrades are required to the Constellation Bus Station to allow it to become a through station, with the Busway continuing further north to the Albany Bus Station. The Albany Bus Station will also require modification to allow buses to enter from the SH1 side of the station.

The Project team has been working closely with AT to discuss and agree on the following matters:

- The general design philosophy of converting Constellation Bus Station into a through station and the modification of the existing platform arrangements;
- Safety and design considerations for Constellation Bus Station;
- Minimisation of bus circulating movements within the Albany Bus Station through the identification of alternative service patterns and modifications to existing ones; and
- Beneficial upgrades to both stations to improve form/function and provide consistency across bus stations in the Auckland area.

8.7.5.7 Proposed New Bus Station

Throughout 2014-15, AT and the NZ Transport Agency undertook a high-level investigation of the potential for a new bus station between Constellation and Albany Bus Stations, including looking at alternative sites and potential design layouts.

While AT and the NZ Transport Agency are continuing to work together to investigate the feasibility of a new station in parallel to the Project, a new bus station does not form part of the Project. In the event, a decision is reached to progress a new bus station in the Project area, it will be subject to its own statutory approval process and stakeholder and community engagement.

8.7.6 Mana Whenua

Project specific consultation with Mana Whenua commenced with the IIG. The IIG comprises a forum of iwi who have expressed an interest in several NZ Transport Agency projects being undertaken within the Central and Northern Parts of Auckland. The IIG has been the primary forum for engagement with iwi having an interest in the project since August 2015. Membership of the IIG include Ngai Tai ki Tamaki, Ngāti Manuhiri, Ngāti Maru, Ngāti Paoa, Ngāti Tamaoho, Ngāti Te Ata Waiohua, Ngāti Whatua o Orakei, Te Ākitai Waiohua and Te Kawerau a Maki.

The first IIG hui for the pre-implementation (i.e. design and consenting) phase of the Project was held on 29 January 2016 and subsequent IIG hui have taken place on a monthly basis from that date.



These hui have been supplemented by Project specific hui (Project hui) from June 2016. Ngāti Tamaoho and Te Kawerau a Maki were invited to participate in these Project hui, however they advised that the Project Area was outside their rohe.

The first of these Project hui occurred on 3 June 2016 where an overview of the process leading to the Bol was presented to Mana Whenua representatives, together with an outline of key elements of the design including the stormwater management philosophy and the urban design principles to be used to guide the Project. Initial feedback from Mana Whenua at this Project hui centred on avoiding effects on natural areas and waterways such as the Oteha Valley. Other matters such as earthworks, stormwater treatment, vegetation removal, potential impacts on biodiversity, and the opportunity for Mana Whenua to input into the design were also discussed and identified as matters for discussion at future Project hui. Copies of the draft UDLF were provided to the Mana Whenua with an invitation for them to provide feedback and suggest appropriate cultural input into this document.

On 7 July 2016 members of the Project team undertaking environmental assessments presented the results of their baseline assessments to Mana Whenua and feedback was sought. Baseline assessments were presented on archaeology, stormwater, water quality, freshwater ecology, terrestrial ecology, land contamination, the Rosedale Closed Landfill, noise and landscape and visual effects as well as the social context of the Project area. Electronic copies of baseline assessment reports were distributed to each iwi subsequent to this Project hui.

The next Project hui on 4 August 2016 provided an update of design elements of the Project identified by Mana Whenua as being of particular interest. Accordingly, specific presentations were made to the hui by experts dealing with stormwater management, the management of works within the Rosedale Closed Landfill and the UDLF. Key matters of concern expressed by Mana Whenua at this Project hui included the following:

- Identification of Lucas Creek as a culturally significant location;
- Proposed methods of stormwater management and treatment;
- Opportunities to improve water quality within existing streams with the affected catchments;
- Potential effects of cutting into the Rosedale Closed Landfill and causing leachate and gas migration and possible effects of these;
- Proposed stormwater management detention and treatment methods; and
- The inclusion of a Cultural Values Framework and 'Cultural Responsiveness' into the planning, consenting and construction phases of the Project through the UDLF and contract documentation (the Southern Corridor Improvements and East-West Link projects were offered as examples of how this could be progressed).

Design options for the Rosedale Closed Landfill works and the management of leachate and gas emissions were also discussed with the Project's closed landfill expert.

Formal feedback was provided via Cultural Values Assessments prepared by Ngāti Te Akitai Waiohū and Ngai Tai Ki Tamaki and a Cultural Impact Assessment from Ngāti Manuhiri. These documents, along with engagement at Project hui, have been used to develop an understanding of matters of importance to Mana Whenua and to inform the development of the Project design to reflect these.

To this end, at the subsequent Project hui on 30 August 2016, the latest iteration of the General Arrangement plans were presented, along with an overview of key design developments that had occurred. The UDLF was discussed in detail and design opportunities for input from Mana Whenua were discussed and agreed. These included input into the design of retaining walls along the corridor and the proposed planting strategy.

At the next Project hui on 23 September 2016 design changes were presented, with the focus being on stormwater treatment design over the Project footprint and key treatment devices to be used,



including the design and location of proposed water quality ponds and wetlands. Landscape and visual mitigation measures were also discussed.

The 11 October 2016 hui focussed on the built elements of the Project. It was agreed that input on the detailed design of these structures would be provided by an iwi artist in accordance with principles expressed in the UDLF.

At the 28 October IIG, Mana Whenua were provided with electronic copies of all AEE material presented to the EPA for pre-lodgement completeness checks.

Project hui were held on both 4 and 18 November 2016. Discussions addressed the design of alternatives for water quality wetlands to be established in either the Rook or Bluebird Reserves (see the alternatives assessment in **Section 7**). Mana Whenua expressed a preference that stormwater treatment be maximised through the use of both reserves or, if this option was not considered viable, to use the Rook Reserve option as it resulted in a greater treatment footprint.

Draft conditions were also presented to Mana Whenua at these Project hui. The matters of particular interest included the following:

- Use of organic flocculants, where practicable;
- Input into management plans;
- Cultural inductions for contractors;
- Input of a Maori artist into the UDLF; and
- Reference to native planting and use of native grasses.

In addition to the above, Mana Whenua suggested the inclusion of additional conditions or amendment of conditions to address the following matters:

- Treatment of stormwater and construction water to higher standards than those provided for in TP10 and TP90;
- Identification of cultural indicators;
- Mana Whenua participation in native lizard and fish recovery;
- The identification of opportunities for cultural harvesting;
- Remediation of material from contaminated sites rather than disposal where practicable; and
- Mana Whenua input into the Project communications where Maori imagery is used.

At the time of lodgement these suggestions are being considered by the NZ Transport Agency.

8.7.7 Directly Affected Landowners

During the early stages of the Project, potentially affected land and business owners were identified and consulted through one on one meetings. At this stage of the Project, their concerns predominantly focused on the uncertainty of the potential impacts of the Project on their business and property interests.

As the design process has progressed, the certainty about the potential effects of the Project and the properties that are affected has increased. Based on the design at the beginning of 2016, a total of 160 properties were identified as being potentially affected by the Project. The number of directly affected properties subject to the Preliminary design which is the subject of the NoRs is 131. One on one meetings with affected landowners have continued throughout this year.

As a result, willing negotiations have commenced with a number of affected property owners and tenants. Engagement with affected property owners/occupiers is ongoing.



8.7.8 Wider Community

As outlined above, there has been a wide variety of consultation with the wider community about the Project including open days, newsletters and the Project website. In July 2016 an individually addressed letter was also sent to approximately 1,190 property owners within close proximity of the Project. The purpose of this letter was to explain the Project in more detail to those people living and working within the vicinity of the Project. A copy of the newsletter distributed within the Project area in June 2016 was also included with the letter to provide more information and encourage feedback on the Project.

Feedback from the community covered a number of key themes including:

- Busway extension – strong support for the extension;
- Urban design –planting and landscaping, artwork and noise wall designs;
- Walking and cycling facilities –connection points and facilities;
- Local road improvements –the possibility of an Unsworth overbridge;
- SH18/SH1 ramps – possibility of including South facing ramps; and
- Matters relating to the proposed SUP on the bridge proposed at Spencer Road, the location of a new bus station and ways to improve parking at existing bus stations – these matters are beyond the scope of the Project.

8.7.9 Walking and Cycling Groups

Feedback has been received from cycling and walking groups during various interactive workshops. Cycle Action Auckland (now Bike Auckland) has noted that for a cycle route to be effective, it must be continuous and of a high standard. Bike Auckland identified a number of routes that it considers should receive early focus and prioritisation. Overall Bike Auckland expressed support for the inclusion of dedicated walking and cycling facilities as part of the Project and has been working with the Project team to provide feedback on suitable path widths and links to the road network to assist with the design development.

Walk Auckland was also generally supportive of the proposed scheme design, particularly the increased connectivity along the motorway corridor.

8.7.10 Business North Harbour

The Project team has met regularly with Business North Harbour in order to explain the Project and obtain feedback on the development of the design. During 2016, the Project team has continued to meet regularly with both Business North Harbour's CEO and Transport Relationship Manager to explain next steps in the Project, and has responded to individual queries from businesses passed on by Business North Harbour.

In summary, the key feedback from Business North Harbour was supportive of the Project including:

- The decision to bridge Paul Matthews Road;
- The SUP on the proposed Spencer Road Bridge to help employees gain access to the Corinthian Drive area (although not part of this Project);
- Support for the completion of the WRR and the benefits it will bring; and
- Excitement about the general growth the Project would bring to the area.

Ongoing consultation with Business North Harbour is continuing to take place. In particular, the Project team is currently working together with Business North Harbour's Commercial Property/Leasing Subcommittee to identify and promote potential relocation sites within the business zones within the vicinity of the Project area for those property owners or business tenants who are required to relocate



as a result of the Project. Business North Harbour is keen to see that businesses do not relocate to other parts of Auckland as a result of the Project.

Overall, Business North Harbour has expressed satisfaction with the engagement approach the Project team has taken in relation to business owners.

8.7.11 Harbour Hockey Charitable Trust

Part of the existing NHHS located at 60 Paul Matthews Road, Rosedale is required for the construction of the Project. A collaborative approach has been undertaken with AC as landowner, lessee Hockey, tenant North Harbour Hockey (also the facility operator) and strategic partner Hockey New Zealand to find the optimal solution.

A working group has been formed that includes the Project team, Hockey and AC representatives from Watercare and the Parks and Property teams. Regular meetings have been held from 2014 to the time of preparing this report, and the NZ Transport Agency is committed to working with Hockey to maintain its ability to service the hockey community both during the construction works and into the future.

Hockey had intended to upgrade the NHHS in order to accommodate ongoing community growth, to host international events scheduled for 2017 and beyond, and to provide training facilities for the New Zealand men's and women's teams. The Project has meant the upgrade cannot proceed, but Hockey and the NZ Transport Agency have agreed to temporary upgrades of the existing NHHS, to ensure the training and international events can still occur. The construction timetable also allows Hockey to remain on the existing NHHS until after the events scheduled for November 2017 have concluded.

In addition, the working group has been investigating a number of options to either permanently reconfigure the existing site or relocate the facility to a different site, while ensuring minimum disruption to community games or major events.

After an in-depth options analysis, a site in the western corner of Rosedale Reserve has been identified as the preferred option for a relocation site. This option has the support of the joint working group including Hockey, AC and Watercare. It has also been supported by Upper Harbour Local Board, subject to details being worked through with the incumbent tenants located on the site that is the preferred option (Rosedale Pony Club and North Harbour BMX).

Any resource consents required for the permanent reconfiguration or relocation of the facility will be sought separately from those required for the Project.

8.7.12 Utilities

Vodafone, Vector, Chorus and Transpower all own assets within the Project area that are likely to be affected by the Project works. The Project team has been consulting with these network utility operators to confirm the impact of the Project on their assets, understand key constraints and agree what diversions will be required.

Transpower has completed an optioneering report, which recommends bridging over the existing 220kV cables by constructing a tunnel through the proposed SH18 motorway fill embankment using a cut and cover approach. This approach is to allow for protection of the existing Transpower assets, while allowing for a future proofed alignment for additional circuits. The Project design accommodates the solution.

Vector and the Project team have been working to agree a solution to the replacement of a Vector tower. This is needed in order to raising the 110Kv overhead line clear of the proposed interchange ramps. The parties are confident an acceptable solution will be found.

The impacts on the Vodafone, Vector and Chorus assets are typical for a Project of this nature. Solutions for the relocation of these assets will be determined during detailed design.



8.8 Ongoing and Future Consultation

Ongoing consultation is taking place with key stakeholders, landowners and the community as the Project team progresses the Project through the consenting phase.

The Project team will continue to inform and engage on a regular basis on key milestones during the consenting process. This engagement will include a range of methods such as E-news updates, open days and Project newsletter distributions.



9 Assessment of Actual and Potential Environmental Effects

9.1 Overview

The actual and potential environmental effects of the Project and suggested methods for avoiding, remedying or mitigating these effects are addressed in detail in the suite of Technical Assessments contained in **Volume 3**. These effects are summarised below along with methods for mitigating any identified adverse effects that cannot be avoided or remedied in accordance with sections 5, 171, 104 and Schedule 4 of the RMA.

The assessments carried out for the Project do not apply a permitted baseline in order to discount the severity of adverse effects. A permitted baseline can be difficult to apply for a project of the scale and complexity of the Project. The NZ Transport Agency is not asking the consent authority to disregard any effects in accordance with section 104(2). However, in many instances existing or authorised activities will provide context for understanding the nature and acceptability of effects and the expectations of the community. For example, many of the activities carried out for the Project could (or already do) occur within the existing designations in the Project area. Because of this, the community surrounding the Project area in many ways already accommodates the effects of the proposal.

9.2 Positive Effects

There are a number of positive effects associated with the implementation of the Project. These positive effects are canvassed throughout the body of the AEE, with such effects being implicit in the nature and detail of the Project as described earlier and with particular benefits of the Project being addressed in **Section 2.4**.

A high level overview of the range and extent of the positive effects of the Project is set out below. The main thematic areas of positive effects are transport, social, and those associated with the natural environment.

9.2.1 Transport

The scale and extent of positive effects of the Project for traffic and transport are identified in

Figure 47 below and discussed further in **Section 9.3**. Along with a wide range of travel-time savings for both private vehicles and public transport, congestion on the local network will be reduced and the Project will be built to a higher safety standard. The establishment of the SUP for the full extent of the Project will positively affect the modal choice available.



Figure 47 Summary of Transport Benefits of the Project



Source: NZ Transport Agency

9.2.2 Social

The Project provides positive social effects at both a regional and localised level. Improved journey efficiency, network resilience and connectivity will have both a positive local and regional effect, whilst the increased mobility choice provided by the SUP and the provision of acoustic attenuation within the Project extent will provide positive localised social effects. Social effects are discussed further in **Section 9.10**.

9.2.3 Natural Environment

The Project includes the implementation of a stormwater management system that will improve both the quality and quantity of stormwater management compared to the existing situation. The Project addresses flow attenuation to improve flooding effects across the greater extent of the Project relative to the current situation. It also implements a wetlands focussed approach which will significantly improve existing water quality. The improvement of water quality discharge will have a positive effect on the receiving surface water environment and the freshwater ecology as a consequence of this.

In addition to the mitigation planting proposed as part of the Project (to soften the impact of the Project from a visual perspective), amenity planting will be undertaken which will contribute positively to the local natural environment.

The treatment or removal of contaminated soil as a consequence of earthworks is a further positive effect on the natural environment.



Effects on the natural environment are discussed further in **Sections 9.13 to 9.20**.

9.3 Transport Effects

A transport assessment has been prepared by Flow Transportation Specialists to assess the potential effects on the transport environment from the construction and operation of the Project and is included as the Assessment of Transport Effects (**Technical Assessment 14**). The assessments and predictions in this section are taken from that Technical Assessment.

The Assessment of Transport Effects assesses the potential effects of the Project on private and commercial vehicles, public transport, pedestrians and cyclists during both construction and operation. Positive and adverse effects have been predicted through use of the following traffic and transport models:

- The Upper Harbour SATURN model to identify the predicted performance of the road network and the road user benefits of the Project;
- The Auckland Regional Transport (ART) model to assess the likely public transport benefits of the Busway Extension and to identify the anticipated changes in traffic flows which have been fed through to the following traffic models; and
- Auckland Cycle Model to predict the cyclist and pedestrian demands on the proposed new SUPs.

9.3.1 Effects

9.3.1.1 Effects during Construction

Potential effects on the transport network resulting from the Project's construction will likely arise from the proposed traffic management measures which include:

- Temporary speed limit reductions along SH1 and SH18 for the majority of the construction period;
- Lane narrowing along SH1 and SH18, with the number of through traffic lanes and the location and extent of bus shoulder lanes along SH1 and bus priorities at the interchanges to be retained, as far as reasonably practicable. These restrictions are likely to be in place for the majority of the construction period;
- Rosedale Road would be kept open for traffic and pedestrians throughout the construction period, however one way traffic and signalised controls may be implemented; and
- Access between SH18 and Paul Matthews Road to be kept open for traffic throughout the construction period, however right turn bans to and from Paul Matthews Road may be implemented to allow the works to progress along SH18.

McClymonts Road is proposed to be kept open for two way traffic throughout the construction period, as far as reasonably practicable, by the construction of an off line bridge. This will allow eastbound buses from Albany Bus Station to reach the southbound bus only on ramp at McClymonts Road and to allow pedestrians from the east to reach the Albany Bus Station.

Overall, the proposed traffic management measures during construction will potentially adversely affect vehicles using motorways and the wider road network, as well as users of public transport, pedestrians and cyclists. This is further discussed below.

Effects along SH1, SH18 and wider Road Network

Speed reductions put in place along SH1 and SH18 are predicted to result in temporary increased travel times along SH1 and SH18 (Table 29 of the Assessment of Transport Effects). Journey times on SH1 and SH18 respectively are predicted to increase by approximately 20 seconds with further increases in journey time congestion in the morning peak southbound on SH1 and then northbound on SH1 and westbound on SH18 in the evening peak.



Construction activity is also predicted to result in an increase of traffic flows on the wider road network (Table 31 of the Assessment of Transport Effects). This is primarily due to the temporary restrictions to be put in place at Rosedale Road and Paul Matthews Road.

Effects on Public Transport

During construction bus services will be impacted by an increase in congestion on the wider road network, the temporary closure of the Rosedale Road bridge and through the elimination of right turns into Paul Matthews Road. Impacts on the Northern Express services and other bus services on the SH1 main line may also occur temporarily.

Effects on Pedestrians and Cyclists

The closure of Rosedale Road at any stage of the works may result in a significant detour for pedestrians and cyclists, depending on their origin and destination. However, surveys of pedestrians and cyclists activity at Rosedale Road show relatively few users, as outlined at Section 8.2.3 of the Assessment of Transport Effects.

Effects on Albany Park and Ride Parking

Construction of the busway link over the Northern Motorway to Albany Bus Station is likely to temporarily affect the capacity of the Park and Ride facility at Albany. Opportunities to provide temporary alternative parking spaces to those impacted have been identified (refer to Section 8.2.4 of the Assessment of Transport Effects) and include utilising the AT owned vacant land at 125 McClymonts Road, adjacent to the Albany Bus Station and through provision of additional parking at Silverdale Station.

9.3.1.2 Effects during Operation

Operational effects associated with the Project have been considered in respect of the following matters:

- Effects for vehicles using SH1 and SH18;
- Area-wide transportation effects of Project;
- Effects on pedestrians and cyclists;
- Effects on public transport;
- Effects on Freight; and
- Safety effects of Project.

Effects along SH1 and SH18

As discussed at section 7.2 of the Assessment of Transport Effects, the Project is expected to increase daily flows on the Northern Motorway (SH1) by up to 28,600 vehicles per day (two way in 2031, between the Greville interchange and the SH18 direct connections (a 21% increase)). Daily flows along the UHH (SH18), east of the Albany Highway interchange are expected to increase by 22,500 vehicles/day (two way, in 2031 (a 49% increase)).

The effects of these increases will be significantly reduced by:

- the provision of additional capacity along SH1, between the SH18 direct connections and Oteha Valley Interchange;
- the provision of the SH18 direct connections between SH18 and SH1 (north); and
- The upgrade of SH18, between the Albany Highway and SH1 direct connections, to motorway standard.

As a result, travel times are predicted to improve, even with these increases in flows, relative to the future scenario without the Project. These improvements in travel times will vary by route, direction



and time of day, but travel times are predicted to include decreases of over 10 minutes during the weekday morning and evening peaks¹⁶.

Area-wide Transportation Effects of Project

While the Project is predicted to result in an increase in flows along both SH1 and SH18, Section 7.2 of the Assessment of Transport Effects identifies that decreases in flows are forecast on a number of parallel routes (based on 2031 traffic forecasts). These routes include:

- Albany Highway (reductions of up to 5,600 vehicles per day predicted, or 22%);
- Rosedale Road (reductions of up to 4,800 vehicles per day predicted, or 19%);
- Bush Road (reductions of approximately 4,500 vehicles per day predicted, or 14%);
- William Pickering Drive (reductions of approximately 4,000 vehicles per day predicted, or 24%);
- Paul Matthews Road (reductions of approximately 3,300 vehicles per day predicted, or 13%);
- Apollo Drive (reductions of approximately 3,000 vehicles per day predicted, or 11%);
- East Coast Road (reductions of up to 2,900 vehicles per day predicted, or 8%); and
- Sunset Road (reductions of approximately 2,900 vehicles per day predicted, or 17%).

Conversely, traffic flows are predicted to increase on several arterial routes, particularly those that feed the Greville and Oteha Valley Interchanges. Most notable among these is Albany Expressway, which is predicted to increase by up to 4,400 vehicles per day west of SH1 (an 11% increase).

In general, the Project is predicted to result in a decrease in forecast traffic flows on local streets and roads, except for those closest to and that connect directly to Greville and Oteha Valley Interchanges. This will have corresponding effects on local property accesses. Access will, for example, be improved on local roads that experience reductions in traffic volumes.

Effects on Pedestrians and Cyclists

The Project's effects on pedestrians and cyclists are assessed in Section 7.4 of Assessment of Transport Effects.

The Project proposes SUPs parallel to SH1 from Oteha Valley Road to Constellation Bus Station and parallel to SH18 from Albany Highway to Constellation Bus Station. In general, the SUPs proposed will provide connections where presently there are none.

Connectivity for pedestrians and cyclists will be significantly improved both north-south along the SH1 corridor and east-west parallel to SH18 through the provision of continuous and safe SUPs along these corridors, bridging a significant gap in the existing walking and cycling network. It is also considered that by reducing traffic on existing arterial routes, this will indirectly benefit both pedestrians and cyclists.

The Project will also contribute to remedying severance caused by the existing motorway corridors through the provision of new pedestrian and cyclist connections across these corridors.

In summary, the Project's effects on pedestrians and cyclists will be positive and the Project will result in significantly improved safety and connectivity outcomes for active modes.

Effects on Public Transport

Section 7.5 of the Assessment of Transport Effects identifies a number of benefits for public transport in terms of providing quicker and more reliable journeys by bus through the extension of the Busway to Albany Bus Station. In particular, northbound buses will no longer need to travel with general traffic at the Upper Harbour Interchange as they leave the Constellation Bus Station. It is predicted in 2031 that the Project will result in a reduction of travel time from Albany Bus Station to Constellation Bus

¹⁶ Between SH1 at Oteha Valley Interchange and SH18 Albany Interchange southbound



Station of over 10 minutes Northbound and 4 minutes Southbound during the evening peak period compared to if the Project was not constructed. This reduction of travel times for buses will provide greater reliability and make bus patronage more attractive.

Reductions in general traffic volumes on several roads in the areas surrounding the Project are expected with the implementation of the Project. These reductions will provide indirect benefits to public transport operators and users by reducing congestion on these routes and improving bus travel times where bus priorities are not already in place. This includes East Coast Road, Bush Road, Rosedale Road, Apollo Drive, Paul Matthews Road, William Pickering Drive and Sunset Road, each of which are expected to experience reduced traffic.

Overall, the Project will provide travel time and reliability benefits for public transport, which should lead to increased patronage.

Effects on Freight

An assessment of the effects of the Project on freight movements is provided at Section 5.6 of the Assessment of Transport Effects. The Project is predicted to provide direct benefits to through freight movements by reducing motorway travel times on both SH1 and SH18. In addition, provision of a ramp signal bypass lane for trucks at the SH18 to SH1 (north) will reduce travel times compared to general traffic.

Benefits will also be gained by freight movements on arterial roads that are predicted to experience reductions in traffic as a result of the Project. This includes Bush Road, Rosedale Road, Apollo Drive and William Pickering Drive.

Safety Effects of the Project

The Project is expected to result in increased traffic on the motorways and local arterials leading to the motorways, with corresponding reductions in traffic elsewhere on the local network. As discussed at Section 7.7 of the Assessment of Transport Effects, if all other factors are equal, the likelihood of a crash would be expected to increase where traffic volumes increase (as a result of increased exposure and speed), and decrease where traffic volumes reduce (as a result of reduced exposure).

However, the rate of crashes occurring on the motorway and its interchanges are expected to reduce, despite increases in traffic volumes and speed, as the Project will deliver a range of safety improvements, including:

- Removing motorway to motorway traffic from the local road network, especially with regards to freight;
- Removing right turn movements from SH18 at Paul Matthews Road and Caribbean Drive;
- Reducing congestion and queuing on SH1, thereby reducing the incidence of rear-end type crashes;
- Improving street lighting throughout the Project extent;
- Providing increased shoulder widths in some locations;
- Improving existing crash barriers;
- Provision of increased shoulder widths which will allow forward visibility to be improved in certain locations; and
- Providing safe, separated pedestrian and cyclist facilities.

Predictions of the crash rates for SH1 and SH18 in 2031 with and without the Project have been developed (refer to Table 25 of the Assessment of Transport Effects). Crash reductions are predicted through sections of motorway, particularly on SH18 east of Albany Highway. Increased crash rates are predicted on sections of motorway where increased traffic is expected but are not being improved by the Project, particularly on SH18 west of Albany Highway. It is acknowledged that an increase in



traffic flows and an increase in the number of lane change manoeuvres introduced by the Project along SH1 may lead to an adverse effect in terms of the number of crashes between the Greville and Upper Harbour Interchanges. In addition, the increase in forecast speeds in this area may lead to increases in the severity of crashes. In total however, a net reduction in annual injury crashes on the motorway network is expected, relative to 2031 predictions without the Project.

Therefore it is assessed that the Project will result in beneficial effects for the safety of traffic, pedestrians and cyclists within the Project area.

9.3.2 Mitigation

From an operations perspective the Project will improve the efficiency and effectiveness of travel along the strategically significant routes of SH1, SH18 and the Busway. These improvements will enhance the capacity and efficiency of movement for people and freight travelling within Auckland, and between Auckland and the north. As such, no mitigation of operational traffic effects is required as there is a net positive effect.

The temporary effects of construction will be mitigated through the implementation of the following (as far as practicable) as part of a Construction Traffic Management Plan (CTMP). These include:

- The retention of the existing number of through traffic lanes along SH1 and SH18;
- The retention of existing bus shoulder lanes along SH1 and bus priorities at interchanges;
- The retention of vehicle and pedestrian connectivity on McClymonts Road, over SH1; and
- The retention of at least one traffic lane on Rosedale Road, beneath SH1.

Construction effects could also be further mitigated through management of works to occur during periods of least traffic disruption such as outside of peak periods and providing information to travellers for their consideration of alternative transport arrangements.

9.3.3 Summary

The Project has been assessed to provide an overall net benefit by improving the efficiency and effectiveness of travel along the strategically significant routes of SH1, SH18 and the Busway. These improvements will enhance the capacity and efficiency of movement for people and freight travelling within Auckland, and between Auckland and the north. The Project will also provide improved connectivity and safety to pedestrians and cyclists.

Temporary adverse effects may arise to transportation modes during the construction programme. These effects are able to be appropriately mitigated through the implementation of a CTMP.

9.4 Construction Noise Effects

Marshall Day Acoustics has undertaken a risk assessment of the noise effects that may be generated during the construction phase of the Project and this assessment is contained in the Assessment of Construction Noise and Vibration Effects (**Technical Assessment 3**). The proximity of dwellings and businesses to the proposed works and the absence of existing attenuation means there is the potential for the adopted day-time and night-time noise criteria to be exceeded.

As discussed at Section 2 of the Assessment of Construction Noise and Vibration Effects, the appropriate standard for the construction noise assessment is NZS6803:1999 (Acoustics – Construction Noise). The Standard does not anticipate that full compliance with the applicable construction noise criteria will be achieved at all times and at all receivers, rather it focuses on the implementation of the BPO for construction noise management and mitigation.



The following activities have the potential to result in exceedances of the Project construction noise criteria:

- Piling, construction and demolition of bridges;
- The construction of retaining walls and noise barriers;
- Bulk earthworks; and,
- Construction of structures and pavements.

9.4.1 Effects

A detailed assessment of the Project's construction noise levels and effects is provided at Section 6 of the Assessment of Construction Noise and Vibration Effects. Two residential areas in close proximity to the proposed works, at Pinehill to the east of SH1 and Unsworth Heights to the south of SH18, are predicted to be adversely affected by the noise generated during construction. Some of the properties in these residential areas currently receive acoustic screening from cutting escarpments or noise barriers, however, there are some properties that will have a direct line of sight towards the proposed construction areas.

Areas with limited or no sensitivity are considered to be unaffected by noise levels above 75 dB L_{Aeq} regardless of the time. Other commercial or community activities such as the District Court, which is located off Don McKinnon Drive, may be affected to a greater extent when the noise levels exceed 70 dB L_{Aeq} due to the need for clear communication within these spaces during day-time hours. The primary effect at this location is likely to be the interference of communication as well as general annoyance when concentration is interrupted.

Specific commercial and residential properties likely to receive noise levels in excess of the Project noise criteria are detailed in Section 6.1 of the Assessment of Construction Noise and Vibration Effects and include the following locations:

- The townhouses to the west of McClymonts Road and Masons Road, where future dwellings are currently being constructed which are likely to be temporarily exposed to levels greater than 70 dB L_{Aeq} ;
- A significant number of dwellings around the McClymonts Road Bridge and Albany busway area / Oteha Valley Road bridge works may be temporarily exposed to night-time noise levels in excess of 45 dB L_{Aeq} ;
- Several of the commercial activities adjacent to the motorway are likely to be exposed to temporary noise levels in excess of 70 dB L_{Aeq} during the day-time;
- A residential area between Constellation Drive and Sunset Road where the works required will be modest in scale and the proposed noise standards will only be exceeded for the first row of dwellings facing the motorway. During night-works, the Project noise criteria may be exceeded at a number of dwellings in this area; and
- It is anticipated that many properties within Unsworth Heights, due to their proximity to the southern boundary of the Project area, are likely to be temporarily exposed to noise levels in excess of 70 dB L_{Aeq} during the day-time. There are no proposed night works for this area, however in the event these are required, a significant number of dwellings will be exposed to levels greater than 45 dB L_{Aeq} .

9.4.2 Mitigation

As stated at Section 8.1 of the Assessment of Construction Noise and Vibration Effects, the most appropriate and effective method of managing construction noise is through on-site management and communication between staff and managers. It is proposed that a Construction Noise and Vibration Management Plan (CNVMP) is prepared for each sector by the contractor in accordance with the guidelines produced by the NZ Transport Agency and recommendations within Section 8.2 of the Assessment of Construction Noise and Vibration Effects.



The CNVMP will require the following noise mitigation measures to be implemented throughout the duration of construction. General noise mitigation measures include:

- Training of personnel with regard to quiet operating procedures;
- Maintenance of equipment to ensure noise levels remain as low as possible;
- Noise barriers are to be erected where necessary. Where operational noise barriers are proposed, these are to be installed at the beginning of construction to reduce construction noise effects;
- Noisy stationary equipment should be enclosed if necessary and where practicable;
- Low noise plants should be selected wherever practical, and where not practical, noisy plants should have mitigation measures fitted (e.g. silencers or enclosures);
- Night-time construction works should only occur when Project criteria can be met or where alternative measures are implemented to reduce noise emissions such as limiting works prior to midnight or operating on non-consecutive days;
- Tonal reversing alarms should be deactivated or replaced with a suitable alternative for night-time works;
- Public liaison and communication to ensure potentially affected properties are reasonably informed; and
- Noise barrier screening and appropriate management of temporary construction yard compounds.

Where an exceedance of the Project construction noise criteria is identified to be likely due to a specific activity in a specific area and the general mitigation measures as discussed below are not sufficient to achieve full compliance with the Project criteria, further mitigation should be investigated and implemented where practicable, such as temporary resident relocation.

9.4.3 Summary

Actual and potential adverse effects from construction noise will be temporary and will be appropriately managed with noise mitigation measures implemented through the CNVMP. Noise associated with piling activities, while temporary, has the potential to be significant. Effective communication with stakeholders is critical in terms of this particular activity, along with the implementation of identified mitigation measures.

Overall, the noise assessment concludes the Project can be constructed in such a way that any adverse construction noise effects are either mitigated or specifically managed to reduce effects as far as practicable.

9.5 Operational Noise Effects

An operational noise assessment has been prepared by Marshall Day Acoustics to assess potential effects on noise from the operation of the Project (refer to the Assessment of Operational Noise and Vibration in **Technical Assessment 9**).

The operational noise assessment methodology is detailed at Section 3 of the Assessment of Operational Noise and Vibration. Ambient noise levels have been determined by undertaking both long and short distance noise surveys within the vicinity of the Project. Computer noise modelling of the measured data has enabled the prediction of operational noise effects across the assessment area being defined as 100m from the edges of the carriageway.

The assessment is based on NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads). The application of the BPO requires Category A criteria to be met (or bettered). If this is not achievable, Category B criteria are to be met. If Category B criteria are unable to be met with the BPO, then Category C criteria must be achieved. The standard also considers the potential subjective response of people to changes in noise level and the number of people likely to be highly annoyed by the traffic noise levels.



9.5.1 Effects

The Project area has been divided into eight assessment areas (refer to Section 5 and Appendix B of the Assessment of Operational Noise and Vibration) that have been defined by identifying protected premises and facilities in accordance (PPFs) with NZS 6806:2010 that are:

- Located on the same side of SH1 or UHH (i.e. either adjacent to northbound or southbound lanes only);
- In neighbourhood clusters; or
- Adjacent to a section of SH1 or SH18 with the same traffic volume (i.e. located between ramps and not crossing over ramps).

A detailed assessment of the noise effects from the Project to each of the described assessment areas is provided at Section 5 of Assessment of Operation Noise and Vibration, with a summary as follows:

9.5.1.1 Assessment Area 1 – SH1 north of McClymonts Road

Two dwellings along Masons Road are predicted to currently receive noise levels within Category C criteria. These dwellings are multi storey units and it is the upper floors that are mostly affected by traffic noise. With the Project in place, the number of PPFs in Category C may increase to 11.

The assessment indicates an increase of up to 4 decibels at some PPFs following the implementation of the Project due to the proximity of the Busway. Although the new Busway will take traffic closer to dwellings in this area, the assessment concludes that the number of people likely to be highly annoyed by traffic noise would increase slightly over time. The assessment states that the noise environment in this Assessment Area would be similar to that experienced without the Project with the noise character remaining unchanged.

Two noise barrier options were tested, however the proposed location of the Busway and stormwater management devices result in insufficient space to construct a barrier high enough to effectively mitigate noise levels. Consequently, building modification was selected as the preferred mitigation option for these Category C dwellings.

9.5.1.2 Assessment Area 2 - SH1 South of McClymonts Road

There are 24 PPFs located between the southbound lanes of SH1 and Spencer Road, which are generally three storey townhouses. These are all classified as Category A PPFs. The dwellings are reasonably new and would have been constructed under the requirements of the former ACDP:NS, which required residences near State highways to have high levels of noise insulation. Bunding and fencing are already installed and while these will be acoustically effective for lower floors, they would not provide shielding for upper floors.

As a result of the Project, four PPFs are predicted to receive noise levels within Category C and a further five PPFs receiving noise levels within Category B. Noise levels in this area are predicted to increase generally by 3 to 4 decibels due to the widening of SH1 and the introduction of the Busway. This change in noise level would be just noticeable, but given the character of the noise remains unchanged, it is unlikely that effects will be any more than slight.

Consideration of a 5 m high barrier was undertaken, however, structural mitigation is not considered to be the BPO solution for this area with only marginal noise attenuation benefits for dwellings achieved. Consequently, building modification was selected as the most practical mitigation option.

The number of people highly annoyed would increase slightly over time. The reason is that the busway and motorway widening will bring traffic closer to the PPFs. Even with the modelled 5m high barrier option, only a marginal reduction in the number of people highly annoyed is predicted.



9.5.1.3 Assessment Area 2A –SH1 Colliston Rise

There are currently no buildings in this assessment area, however applications for building consent have been lodged for some of the sites within the approved subdivision. Building consent documentation shows those dwellings are to be built in accordance with the High Noise Route provisions of the former ACDP:NS and will include mechanical ventilation for habitable rooms facing the State highway. It is anticipated that future dwellings can also be designed to mitigate the effects of the State highway noise.

9.5.1.4 Assessment Area 3 – SH1 south of SH18

There are 28 PPFs in this area, generally single and double storey dwellings, all but two of which are predicted to receive existing ambient noise levels within Category A, due to shielding provided by the surrounding terrain. The remaining two dwellings receive existing noise levels within Category B (59B and 63 Santiago Crescent) and are two storeys dwellings overlooking the partial bund shielding them from the State highway.

With the Project in place, those two Category B PPFs are predicted to change to noise levels within Category C, with the effects relating to the unshielded upper storeys. No other dwellings will experience a Category C noise level change. There are no changes to the State highway in the vicinity of these PPFs, however as they are within 100m of the Project assessment is required under NZS 6806. Noise levels, as a result of the Project, are expected to marginally change with a predicted increase of up to 2 decibels which is an unnoticeable audible change for most people.

Irrespective of this, a 3m barrier option was assessed but structural mitigation is not considered to be the BPO solution for this area with only marginal noise attenuation benefits for the predicted Category C dwellings achieved. Consequently, building modification was selected as the most practical mitigation option.

9.5.1.5 Assessment Area 4 – SH18 Cabello Place

There are 30 PPFs within this area which are generally single and double storey dwellings. All these dwellings, with the exception of 21 Cabello Place, are predicted to receive existing ambient noise levels within Category A. Existing noise levels for most dwellings are below 60 dB $L_{Aeq(24h)}$. This is likely to be partially attributed to the existing earth bund and residential fencing in place between SH18 and the PPFs. The dwelling at 21 Cabello Place is predicted to receive an existing ambient noise level within Category B.

Once the Project is implemented, noise levels are predicted to remain relatively unchanged, with the majority of PPFs predicted to experience noise level changes of no more than two decibels. It is noted that two properties may receive noise level increases of 3 decibels (12 Cabello Place and 53 Meadowood Drive). However, noise levels would not exceed the mid-50 decibel level, and the effect for most would be negligible and slight for the three sensitive properties. As a result of this assessment outcome, no attenuation is necessary.

9.5.1.6 Assessment Area 5 – SH18 Barbados Drive

With a total of 86 PPFs, this is the largest assessment area and is generally characterised by established single and double storey dwellings located between SH18/UHH and Barbados Drive.

With the exception of three dwellings, all are predicted to receive existing ambient noise levels within Category A. This is as a result of an existing earth bund located between UHH and Barbados Drive which provides shielding. For 1A Caribbean Drive, 9 and 11 Wren Place, ambient noise levels are just within Category B, at 65 dB $L_{Aeq(24h)}$.

Once the Project is implemented, four properties (9, 11, 13 and 14 Wren Place) are likely to receive noise levels within Category C due to their proximity to the new ramps and UHH connection.



The introduction of a 3m barrier was assessed which resulted in three of the four receiving noise levels within Category A and 14 Wren Place receiving Category B noise levels. Further barrier attenuation to 14 Wren Place was not deemed practicable.

The Project (with mitigation) is predicted to result in noise level changes of +/-5 decibels. However, the PPF with the highest noise level (14 Wren Place, at 65 dB $L_{Aeq(24h)}$) is predicted to receive a 1 decibel noise level increase, which is unnoticeable. Overall, for the majority of PPFs, the effects from the change in noise level are predicted to be slight.

9.5.1.7 Assessment Area 6 – SH18 Metlifecare

This Assessment Area relates to the new Metlifecare aged care facility and all dwellings are predicted to receive existing ambient noise levels within Category A. An existing acoustic barrier to the SH18 frontage provides noise attenuation to the adjacent villas. A change to noise levels within Category B is likely as a result of the Project due to the proximity of traffic lanes and associated volumes.

Two barrier options have been assessed and a provision of a 2m barrier on the frontage to the east of the site would achieve noise levels within Category A at all PPFs.

Noise level increases of up to 5 decibels for the majority of PPFs are likely with mitigation in place, which will be a noticeable change. The resultant noise levels will be up to 62 dB $L_{Aeq(24h)}$. The assessment states at section 5.7.2 that with the windows closed, this would equate to no more than 40 dB $L_{Aeq(24h)}$ inside the dwellings during daytime, and significantly less during night time. The assessment concludes that these noise levels are considered appropriate for residential use and provide good amenity.

9.5.1.8 Assessment Area 7 – SH18 Bluebird Crescent

Of the 13 PPFs in this assessment area which are generally one storey, eleven currently experience Category A noise levels while Category B noise levels are experienced by the two remaining dwellings. Most PPFs receive noise levels below 60 dB $L_{Aeq(24h)}$.

Traffic speed and volume, once the Project is implemented, are likely to result in two PPFs receiving noise levels within Category C, and one within Category B. A 2.4m high barrier was selected as the BPO for this location and eliminates Category C noise levels occurring.

The introduction of the Project, even with the above barrier in place, is predicted to result in an increase of up to 5 decibels for the majority of PPFs which is noticeable, however, the noise levels are predicted to remain below 65 dB $L_{Aeq(24h)}$ for all but two PPFs (94 and 102 Bluebird Crescent). The assessment confirms at section 5.8.2 that these two PPFs would receive less or the same noise level even without Project (do nothing scenario), and concludes that there will be no adverse noise effects at these properties.

9.5.1.9 Assessment Area 8 – SH18 Childcare Centres

Assessment Area 8 contains only two PPFs, being two storey childcare centres with play areas facing SH18 located at Saturn Place and Omega Street. Existing noise levels are predicted to be up to 60 dB $L_{Aeq(24h)}$ Category A noise level for the Saturn Place facility and 66 dB $L_{Aeq(24h)}$ Category B at the Omega Street centre.

Following implementation of the Project, noise levels up to 66 dB $L_{Aeq(24h)}$ are likely for the Saturn Place centre while at the Omega Street facility, a noise level within Category C (71 dB $L_{Aeq(24h)}$) is predicted.

A 2.4m barrier has been assessed which results in a noise level of 64 dB $L_{Aeq(24h)}$ Category A for the Saturn Place centre and 66 dB $L_{Aeq(24h)}$ Category B as likely for the Omega Street centre. The change in noise level at the Saturn Place centre is a slight change that may just be noticeable. However, the character of the noise will not change. At the Omega Street centre, a noise level reduction of 1



decibel is predicted with the preferred mitigation option in place compared to the do nothing scenario. This would be an unnoticeable noise level reduction and would maintain the current level of noise.

9.5.2 Mitigation

To mitigate noise effects, OGPA, a low noise generating road surface, will be used on the main alignment and a dense asphalt surface will be used on the ramps. In addition, where practicable, noise barriers of varying heights will be installed.

With mitigation in place as described in **Section 9.5.1** above, the noise level change due to the Project for dwellings will generally be small (less than 4 decibels). This resultant change is either unnoticeable or just perceptible. For most areas, noise levels would change by no more than 2 decibels. This change would be imperceptible, particularly as the noise source (i.e. traffic) does not change.

For some dwellings, noise levels are predicted to increase by more than 4 decibels. Generally, those dwellings will still receive noise levels within the most stringent noise criteria Category A, so resultant noise levels are considered to be appropriate for residential use. New dwellings, particularly those adjacent to SH1 and the new Metlifecare retirement village adjacent SH18, have been designed and constructed to take account of the existing high noise levels from the existing roads, and no further improvement will be required. Any houses where noise levels are predicted to remain within Category C will be assessed on a case by case basis to determine if building modification mitigation would be required to achieve internal noise levels of 40 dB $L_{Aeq(24h)}$.

9.5.3 Summary

With the implementation of the identified mitigation measures, noise levels are predicted to be generally within the same noise Category as would be the case without the Project (do-nothing scenario). For most areas, noise levels would change by no more than 2 decibels. This change would be imperceptible, particularly as the noise source (i.e. traffic) does not change. While noise level increases cannot be mitigated at all dwellings, the proposed mitigation will generally maintain noise levels within the same noise Category despite the increase in traffic volume and speed over time.

9.6 Construction Vibration Effects

A construction vibration assessment has been prepared by Marshall Day Acoustics to assess potential vibration effects during construction of the Project and this is included in the Assessment of Construction Noise and Vibration Effects (**Technical Assessment 3**).

Vibration generating construction activities along the Project alignment are likely to include vibrating roller compactors and vibropiling or impact piling rigs. Accordingly, the assessment of effects has focussed on these activities.

9.6.1 Effects

Section 7.3 of the Assessment of Construction Noise and Vibration Effects identifies that there is a medium to high level of risk that vibration guidelines will be exceeded for some residential and commercial buildings adjacent to the Project. This is due to buildings being located within 20m of the site works in some instances. Within such distances, vibration management will be required.

The main areas where dwellings are located adjacent to areas of works includes the northern end of the Project near McClymonts Road and along the length of SH18. At these locations, significant numbers of dwellings will be located within the high and medium risk zones as defined at Section 7.3 and at Appendix F of Assessment of Construction Noise and Vibration Effects.



Commercial buildings vary in their proximity to construction works, however, many are located close to retaining wall construction areas or near large cuts/fills. Several commercial buildings are located within the high risk zone.

9.6.2 Mitigation

As outlined at Section 8.3 of Assessment of Construction Noise and Vibration Effects, in order to manage and mitigate adverse effects of vibration on affected properties, detailed management and mitigation options for construction vibration will be contained in a CNVMP. Management will include:

- Liaison with affected parties;
- Monitoring of building condition prior to construction and in response to complaints;
- Monitoring of vibration levels received by buildings during the first use of high-vibration activities in their vicinity and in response to complaints;
- Using low-vibration techniques and managing the timing of activities where practicable to avoid disturbance; and
- Remedying any vibration-induced damage.

9.6.3 Summary

Overall, the construction vibration assessment concludes that the Project can be constructed in such a way that any potential adverse construction vibration effects are either mitigated or remedied (see Proposed Condition CNV 8).

9.7 Operational Vibration Effects

An operational vibration assessment has been prepared by Marshall Day Acoustics to assess the potential effects of vibration during the operation of the Project and this is included as the Assessment of Operational Noise and Vibration Effects (**Technical Assessment 9**).

The Project vibration risk has been assessed by reviewing data of heavy commercial vehicles travelling on existing roads and by applying a range of surfaces (scenarios). This data has been compared against suitable traffic vibration criteria (Class C of the Norwegian Standard NS 8176.E:2005) which indicates that compliance with the criteria can be achieved at 25 metres from the road edge (even for roads in a degraded state). For newly sealed OGPA, the risk contour may be as small as 2m from the road edge.

Complaints data for the Project area has also been requested from the AMA which is responsible for the maintenance of the Auckland State highway network. In response, it is understood that no complaints have been received in regards to traffic vibration, which indicates that the current level of traffic vibration is likely acceptable and is expected.

9.7.1 Effects

As no receivers are identified to be within 2m from the traffic lane edge, it is assessed that the operational vibration effects will be negligible.

9.7.2 Mitigation

No mitigation is proposed as it is not warranted.

9.7.3 Summary

As referred to above, it is assessed that the operation vibration effects will be negligible.



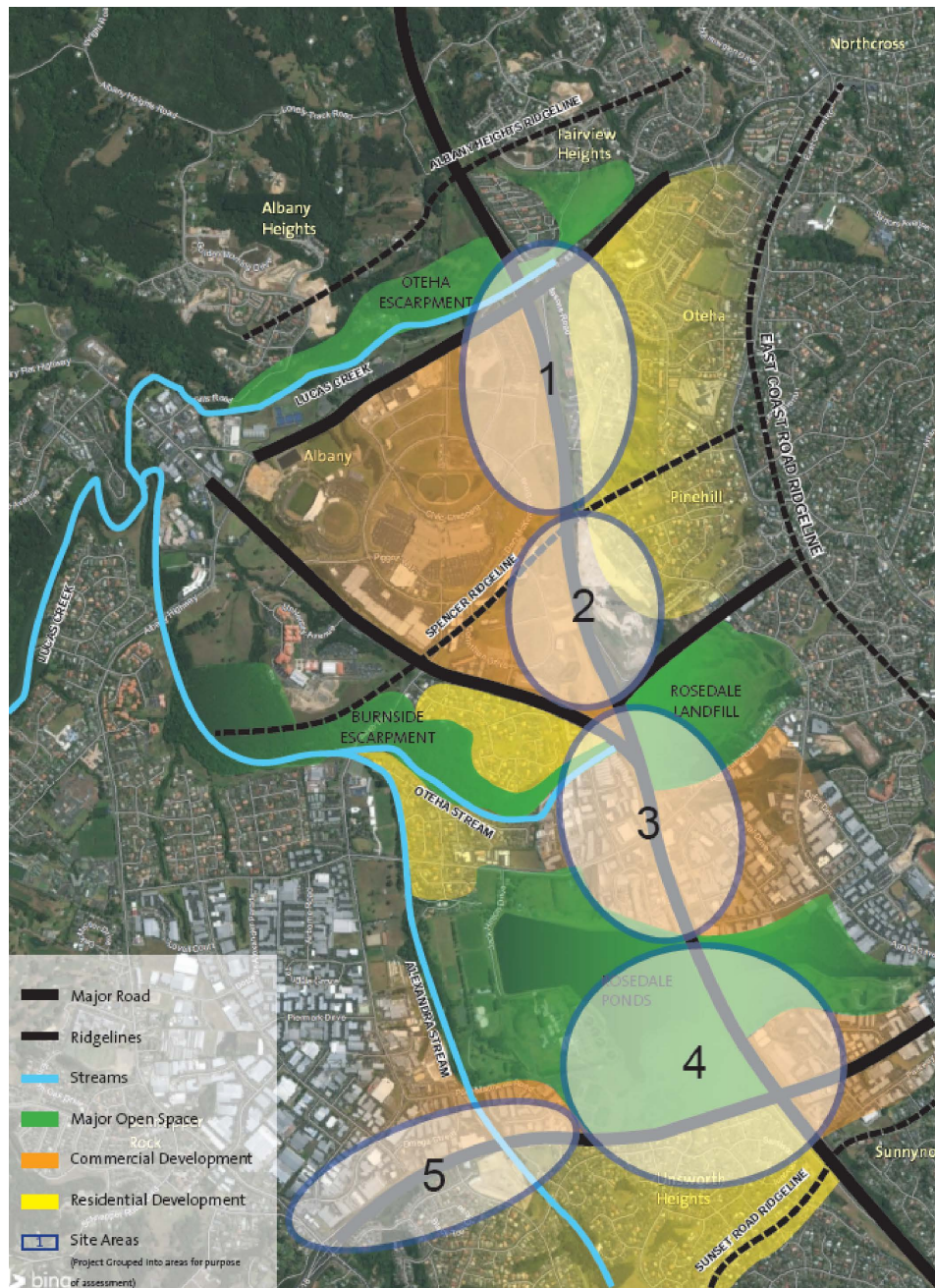
9.8 Landscape and Visual Effects

A landscape and visual assessment has been prepared by Boffa Miskell to assess the effects from the construction and operation of the Project and is included as the Assessment of Landscape and Visual Effects (**Technical Assessment 8**).

The assessment has been undertaken with regard to the New Zealand Institute of Landscape Architect's Assessment Guidelines and the UK guidelines for landscape and visual impact assessment.

The Project area has been divided into five areas for landscape and visual analysis as depicted in **Figure 48**.

Figure 48 Site areas for Landscape Analysis



Source: Boffa Miskell



9.8.1 Effects

9.8.1.1 Temporary effects during construction

The predominant visual effects during construction will be experienced by the residential viewing audiences to the east of SH1, namely Fairview Heights and Oteha, and Unsworth Heights to the south of SH18. The temporary landscape and landscape character effects would primarily be a result of bulk earthworks and the removal of vegetation within stream embankments and associated with the construction of the carriageway, Busway and SUP, in addition to the cut and fill of modified slopes along SH1 and SH18.

Site Area 1

The residential areas of Fairview Heights and Oteha are the viewing audiences most likely to experience visual effects during the construction phase within Site Area 1. While hoarding is proposed, existing views will be interrupted by the Project and due to the proximity of the works to residential properties, overall moderate – low adverse visual effects during construction are anticipated. The landscape effects will be low during construction in this area since the removal of vegetation and earthworks are primarily alongside the existing road corridor which is highly modified.

Site Area 2

Within Site Area 2, grass occupying the State highway verges would be removed, as would some isolated trees within the proposed Greville Road construction yard. These effects will be most apparent to residential audiences to the east of SH1. Adverse visual effects from the west are anticipated to be limited due to the audience's transient nature. Overall, both the landscape and visual effects within Site Area 2 during construction of the Project are considered to be low.

Site Area 3

The general landscape of Site Area 3 is already highly modified and therefore the landscape and character effects during construction are considered to be low for most viewing audiences in this area. For those within close proximity to the proposed Busway and SUP across Rosedale Road, there will be a higher magnitude of visual change, but overall, adverse visual effects will be low.

The Rosedale Closed Landfill will be impacted due to the location of the SUP and Busway proposed along the eastern edge of SH1. While the works require the removal of part of the western face of the Rosedale Closed Landfill, requiring earthworks and removal of some vegetation, the works represent the option with the least physical landscape effects and associated visual impacts on the surrounding viewing audiences. The landscape effects upon the site area are determined to be low in significance. The adverse visual effects during construction would range from very low to low for the majority of viewing audiences. However, moderate-low adverse visual effects are anticipated for viewing audiences located at 9 Arrenway Drive and 121 Rosedale Road, who are in close proximity to the proposed Rosedale Road Busway and SUP bridge.

Site Area 4

Temporary landscape effects will be moderate as a consequence of the loss of grassed open space in Constellation Reserve.

It is considered that the temporary adverse visual effects resulting from the reduction in open space for viewing surrounding Constellation Reserve would be high. The elevated landform of Unsworth Heights will allow residents to view a wide area of construction. Therefore, it is considered that the adverse visual effects for residential viewing audiences facing north, during construction would be moderate (depending on their position relative to the works). Unsworth Heights residents who have views of the works along SH1 and at the existing Northern Busway are expected to experience low adverse effects during construction. It is considered that viewing audiences from these relatively close proximity locations are to some degree, desensitised to the proposed infrastructure works given the presence of the existing transport corridor of SH1, and views towards Constellation Bus Station.



Therefore, overall the adverse visual amenity effects during construction upon viewing audiences within this site area are considered to be moderate.

Site Area 5

Temporary adverse effects within Site Area 5 will primarily be generated by earthworks in relation to the construction of the SUP, the cut and fill of modified slopes along SH18 and the formation of a wetland. Vegetation removal will be required which will consist of grass in highway verges and some isolated trees. Some tree removal will be required within the vicinity of the Alexandra Stream embankment. These areas are mainly alongside the existing road corridor in a highly modified environment. The overall landscape and landscape character effects during construction are considered to be moderate to low.

While residential audiences will be affected during the construction phase, the works will be viewed in the context of a commercial environment. Transient visual audiences (road users and pedestrians) would experience a moderate level of visual change when viewing the Project from within the existing road environment. This change will result in some adverse visual effects albeit for only a short duration within the road corridor. Therefore, the resultant overall adverse visual effects during construction will be low.

9.8.1.2 Effects during operation

The principal elements of the Project that will give rise to permanent landscape and visual effects include:

- The extent of the proposed road widening, new ramps between SH18 to SH1, SUP and Busway;
- Ancillary structures, including signage, bridges and lighting;
- Existing vegetation (to be retained and removed) and proposed new vegetation; and
- Physical changes to watercourses and stormwater ponds and other landscape features.

Site Area 1

The existing modified environment at Site Area 1 is not considered to be particularly sensitive or of high value. The permanent visual effects would be the highest for some residents immediately to the east of SH1 and the Project area. In some cases, the visibility of SH1 would be increased and would be in closer proximity to the eastern viewing audiences. The addition of the SUP would bring in some beneficial visual amenity effects and improve the amenity value of the view for some close proximity viewing audiences, particularly along Masons Road. The assessment considers that road users and residents would experience low adverse effects with the inclusion of the new Busway bridge to the Albany Bus Station, as bridge structures within road corridors are a common built feature in transport oriented environments. Overall, the permanent adverse visual effects will be low and landscape effects very low.

Site Area 2 and 3

There may be some permanent adverse effects at Site Area 2 and Site Area 3 through the inclusion of the Busway and SUP, particularly given the volume of earthworks and the loss of some areas of isolated grass and vegetation. However, the landscape and visual effects of the loss of small areas of vegetation will be low to very low.

Site Area 4

The permanent landscape effects at Site Area 4 will include the loss of open space at Rosedale South Park and NHHS, and vegetated areas within close proximity to the Project. The inclusion of the Busway, a larger Constellation Bus Station and the SUP will have some permanent landscape impacts as a result of the earthworks and loss of isolated areas of grass and vegetation. The permanent landscape, and landscape character effects are considered to be moderate to low. Consequently, the



level of adverse visual amenity effects will be moderate at the completion of the Project, with some beneficial visual effects resulting from mitigation planting.

Site Area 5

The permanent adverse effects at Site Area 5 are likely to include a slight reduction of vegetation along the northern edge of SH18 and some impacts from earthworks and a loss of isolated areas of grass and vegetation, with the most sensitive viewing audience being the Unsworth Heights residential area. The permanent landscape, landscape character and natural character effects are considered to be very low in this area. The permanent visual amenity effects will be low after mitigation measures have been implemented.

9.8.2 Mitigation

Section 5.1 of the Assessment of Landscape and Visual Effects sets out a number of mitigation measures to address temporary effects during construction and permanent effects during operation. A Landscape Management Plan will be required under the conditions of the NoRs. The landscape plan will be developed using the guiding principles in the draft UDLF. The draft UDLF has been developed to guide the detailed design and, in part to mitigate the permanent visual effects of the Project where these are considered to be necessary.

Mitigation planting and additional planting (including street trees) will be included as permanent features of the Project. The mitigation planting shown in the proposed planting plans is proposed to be over 30ha. An additional 5.9ha of planting and street trees is also shown in the proposed planting plans.

The mitigation outlined at **Table 36** identifies those elements proposed in relation to built elements of the Project:

Table 36 Proposed Mitigation of Visual Effects

Item	Description
Elevated ramps, bridges and other structures	Use visually recessive colours and materials Ensure height of structures is as low as practicable Consider earth mounding with vegetation to provide visual relief of elevated structures Vegetate with tall species where public are in close proximity to the back of buildings to avoid vandalism to properties
MSE Block Wall, L-Shape Gravity Wall, Board Pile Wall	Use visually recessive colours and materials Ensure overall height of structures is as low as practicable Consider mounding or vegetating in front of walls particularly where the wall meets adjacent properties to screen structures
Wetland / stormwater ponds / dry basins and swales	Provide native vegetation around wetland and pond surroundings Consider vegetating swale with plant species suitable for roadside swale planting
Steel UC Wall with concrete panels	Use visually recessive colours and materials Ensure overall height of structures is as low as practicable Consider visually aesthetic designs or graphics to make walls less visually intrusive
Stormwater drainage outflow	Recontour embankments to provide an environment for planting Vegetate disturbed areas with appropriate plant species



Item	Description
1V:3H Earthworks slope with rip rap armour	Rising slope of armour should be as steep as practicable to avoid greater visibility of structure extending into pond environment
Noise walls	Refer to the NZ Transport Agency State Highway Noise Barrier Design Guide Version 1 2010 Consider visually aesthetic designs or graphics to make walls less visually intrusive

9.8.3 Summary

The construction of the Project is anticipated to be staged over a period of time and therefore visual effects will occur progressively. The resulting corridor will result in some low adverse visual effects from an increased prominence of structures within the road corridor associated with the Project. Contextually appropriate noise walls, extensive mitigation planting, and views towards new pedestrianised features will provide an acceptable level of visual change. In addition, the introduction of over 35ha of additional vegetation coupled with improved connectivity for road users, and provision of new walking and cycling facilities, will provide an improved journey experience for these users.

It is therefore considered that potential permanent adverse landscape and visual effects can be managed and mitigated to the extent that they will be no more than minor.

9.9 Effects on Public Reserves

As set out in **Sections 3 and 5** above, the Project will require land from public reserves, both temporarily for construction purposes and in some instances permanently, for structures associated with the Project. The reserves in question range from recreation reserves with no public access to the NHHS sporting complex. On-going consultation with AC Parks is continuing as described in **Section 8**.

9.9.1 Effects

It is acknowledged that the Project will affect a number of reserves which provide for both passive and active sports recreation activities for the local and wider community. The Project will impact on the following public reserves:

- Tawa Reserve;
- Arrenway Reserve;
- Centorian Reserve;
- Rosedale Park South;
- Constellation Park;
- Meadowood Reserve;
- Omega Reserve;
- Alexandra Stream Reserve;
- Rook Reserve; and
- Bluebird Reserve.

Tawa Reserve has no public access but provides a grassed buffer between SH1 and the adjacent industrial uses. The Project requires encroachment into the reserve for the purposes of construction and the provision of a permanent stormwater wetland and retaining walls. As indicated in the Assessment of Landscape and Visual Effects (**Technical Assessment 8**), additional planting is



proposed in this area. The direct effect of the Project is the loss of this area as public reserve as part of AC Parks' overall land asset. As no loss of public active space will result and the buffer function of the reserve will be maintained through the Project, the overall effect is considered to be negligible.

The proposed route of the SUP encroaches on Arrenway Reserve and it is also proposed to provide a link from the SUP to the local network on Arrenway Drive. While the whole of the reserve is indicated as being required within the NoR, this is for construction purposes only. The Project will result in a reduction of grassed open space which acts as a buffer between SH1, the adjacent industrial uses and the RWWTP. This area is not currently used by the public but as a consequence of the Project it will be activated by means of the SUP link. This is considered to be a positive local effect. Post construction, the designation will be drawn back to an agreed position.

Centorian Reserve currently has no passive or recreation function and is another reserve providing a buffer area between SH1, the warehousing on Holder Place and the RWWTP. With the development of the SUP, the Busway extension and associated retaining wall, the area of the reserve will be reduced. However, with the proposed planting of the batter slope and the westerly location of the proposed structures, the reserve will continue to provide its current function and therefore, the effect on this reserve is considered to be no more than minor.

Rosedale Park South will be required in full in order to provide the SH18/1 interchange. This area of open space is currently used for grazing and is not formally accessible to the public. AC Parks has indicated that the proposed long term use for this site is sports playing fields. As a result of the Project, this land-banked area for future active recreation use will be lost.

While a number of options for the SH18/SH1 interchange and Paul Matthews Interchange have been considered (see **Section 7**), land is required at Constellation Park to facilitate the Project. The land requirement at this reserve is limited to the southern portion. The area includes a marginal strip located between SH1 and the RWWTP that has no public access, however, it also includes Turf 3 and the adjacent grassed sports field which form part of the NHHS complex. Hockey and its tenant North Harbour Hockey have indicated that this land requirement will compromise its existing operations NHHS that occupies this reserve as well as its intended upgrade plans previously noted in **Section 8**. Therefore, without mitigation, the Project generates a potential significant adverse effect without mitigation for the operator and all users of the facility. Consideration of the Project effects with respect to the wider community use of the NHHS is provided in **Section 9.10** (Social Effects).

Upgrades to Caribbean Drive are required as part of the Project and result in the need for a minor encroachment of up to 3m along the western boundary of Meadowood Reserve for construction access, vegetation clearance and footpath realignment. The area of reserve subject to the proposed works is boundary planting and boundary fencing. The Project will result in a very minor reduction in public reserve land which will be less than minor. Consideration of the Project effects with respect to the occupiers and users of this reserve is provided in **Section 9.10** (Social Effects).

Omega Reserve and Alexandra Stream Reserve provide a riparian reserve to the Alexandra Stream to either side of SH18. Both contain a pedestrian/cycle way as well as riparian planting. The Project land requirement relates to the provision of a retaining wall associated with the SH18 widening at Alexandra Stream Reserve with an extension to the existing embankment and to the roof of the existing underpass. It is proposed to provide a link from the SUP to the existing SUP located within Omega Reserve. New rip rap aprons to the existing culverts in both Reserves are proposed which will require construction access and vegetation removal. While construction work will have an adverse impact on the immediate works areas this will be short term and very localised. Any permanent land requirement will be minimal. As such the effects on these public reserves are considered to be minor localised effects only. The SUP link is considered to provide a net-benefit with further activation of the reserve through increased accessibility.



A permanent stormwater management device is necessary along the SH18 section of the Project and a wetland device is the best practicable option with the preferred location at Rook Reserve and an alternative area identified within Bluebird Reserve for the reasons explained at **Section 7**. The size of treatment necessitates a large wetland area at either location which will reduce the grassed area of reserve currently available for use by the surrounding residential properties for passive recreation purposes (dog walking, children's play). This may result in the increased use of adjacent parks within the neighbourhood (e.g. Barbados Reserve). While the Project will reduce the overall availability of passive recreation space along this section of the Project area, this will be a localised adverse effect requiring mitigation with respect to the final design of the stormwater wetland. A proprietary device will also be installed on what is currently the berm located between the off-ramp to the Z Energy service station and the UHH.

The Project also necessitates a requirement for land at Bluebird Reserve for the purposes of improved sight lines which will result in the removal of vegetation and the provision of a retaining wall. This area of Bluebird Reserve is bush covered with no formal access. Planting of a suitable species mix is proposed in this area to replace the removed bush vegetation while maintaining the required line of sight for the motorway. The Project will result in a localised minor reduction in public reserve land.

9.9.2 Mitigation

With respect to reserves land affected by the Project in public use, measures to mitigate construction impacts will be agreed as part of a reserve reinstatement package with AC Parks to ensure remediation and return to public use in an effective and efficient manner. These discussions are progressing with AC Parks.

The design of the stormwater management wetland at Rook Reserve (currently preferred) will be progressed in agreement with AC Parks so that the Project provides an additional amenity area within the reserve, subject to meeting public safety requirements.

The NZ Transport Agency is progressing a mitigation package with AC Parks addressing the Project's effect on Rosedale Park South. A joint working group has been convened to consider a number of options for compensatory land for future sports playing fields, the outcome of which is awaited. Options being explored include the provision of an alternative site for the proposed sports fields.

A specific mitigation package with AC and Hockey that addresses the Project's effect on the NHHS is being progressed by the NZ Transport Agency. AC, Hockey and the NZ Transport Agency have agreed to temporary upgrades of the existing NHHS, to ensure training and international events can still occur during construction. The construction timetable also allows Hockey to remain on the existing NHHS until after the events scheduled for November 2017 have concluded. With respect to a permanent mitigation solution, a site in the western corner of Rosedale Park West has been identified as the preferred option for the full relocation of hockey facilities. This option has the support of the joint working group including Hockey, AC and Watercare. It has also received support from the Upper Harbour Local Board, subject to details being worked through with the incumbent tenants located on the site that is the preferred option (Rosedale Pony Club and North Harbour BMX). Any resource consents required for the permanent reconfiguration or relocation of the facility will be sought separately from those required for the Project. At the time of writing, the resource consent application for the relocation of the hockey facility to Rosedale Park West was being prepared and is due to be lodged in late December 2016.

Where land is required, the NZ Transport Agency will engage in a separate statutory process under the PWA to acquire the land, which shall include appropriate compensation. Separate statutory processes under the RA will be progressed by the NZ Transport Agency with respect to the revocation of reserve status where permanent occupation is required.



9.9.3 Summary

Effects on public reserves will range from temporary to permanent. Effects on public reserves are considered to be greatest at Rosedale Park South which is required to provide for the SH18/SH1 interchange and to Constellation Park which compromises the use of the park, currently used by the NHHS. Planning for an alternative facility for NHHS is well advanced. While the loss of Rosedale Park South will not be offset by an alternative area of reserve land, and discussions are taking place with AC Parks regarding this matter, the Project area does contain an extent of open space.

Overall, while the Project will result in the reduction of public reserve land (much of which is not currently used for active recreation), considering the range of reserves affected and their uses, as well as the mitigation measures being progressed through ongoing discussions with AC and the strategy to relocate hockey and associated other users, it is concluded that any potential effects on public reserves and associated active and passive recreation values will be minor.

9.10 Social Effects

An Assessment of Social Effects (**Technical Assessment 10**) has been prepared by Aurecon NZ Limited which considers the actual or potential social impacts that may as a result of the Project during its construction and operational phases. The assessment focuses on the experiences (actual or anticipated, direct or indirect) of individuals, families / households, or communities in response to changes introduced by the Project. Social impacts are often the 'human' experiences of other impacts, and it is not the actual or potential effect of these impacts that is assessed below as this assessment has taken place above with respect to the relevant individual technical area (air quality, noise, traffic and visual).

9.10.1 Effects

Social effects have the potential to occur during both the construction and the operation of the Project. The potential effects from each phase are different and have, therefore, been considered separately. Social impacts are often the 'human' experiences of other impacts, and it is not the actual or potential effect of these impacts that is assessed below.

9.10.1.1 Temporary effects during construction

Recognising the Project's timeframes and scale of the works, it is a major construction project with the potential for adverse social effects, if not well managed. Potential effects associated with the Project during the construction phase include:

- Annoyance and disruption from unmanaged construction effects such as noise, vibration and dust and general disturbance;
- Stress or anxiety from unmanaged construction effects such as noise, vibration and dust and general disturbance;
- Traffic disruptions associated with construction restricting people's accessibility to go about their normal living patterns and participation in social/cultural activities when compared to the current situation;
- Construction effects challenging local residents' expectations of neighbourhood amenity, character and safety (such as the CSA between Paul Matthews Road and SH1);
- Construction activities restricting people's accessibility to pedestrian routes (e.g. Rosedale Road during road lowering, Paul Matthews Road and McClymonts Road during the switch from the existing alignments, and the Alexandra Stream underpass during SH18 widening); and



- Access to passive recreation reserves (e.g. the development of the proposed stormwater wetland at either Rook Reserve or Bluebird Reserve will result in the temporary loss of access to the wider reserve area).

Overall, there is the potential for reduced “liveability” for the local community varying according to proximity to construction activities and the duration of exposure.

The construction works within Meadowood Reserve have the potential to disrupt the play area and passive recreation space located in its south-western corner. Noise and disturbance effects may also arise for the Community House and Crèche if unmanaged.

It is acknowledged that the Project area contains a well-established business community providing services to the local and wider community. The following potential social impact issues for businesses which have road frontage access and which will be disrupted by the construction works (e.g. Paul Matthews Road, Rosedale Road, Constellation Drive) or by way of construction access through lots (e.g. Rosedale Road, Arrenway Drive, Cowley Place, Saturn Place, Bush Road) include:

- Partial severance / restriction for access to operations;
- Potential loss of business vitality/ viability if disruption is for extended periods (e.g. reduced customer visibility, reduced customer access, reduced servicing area); and
- Potential loss of staff or viability of operations due to staff / employment pressures (e.g. loss of car parking, accessibility issues, annoyance and disruption from unmanaged construction effects).

In addition, some business premises which are directly affected by the Project will need to relocate as the building in which they are currently accommodated will be demolished (e.g. at 121 Rosedale Road, 9-15 Arrenway Drive, 78-80 Paul Matthews Road). The NZ Transport Agency has implemented a Property Strategy and is working with these businesses and land owners in respect of specific contingency/ mitigation packages which best suit them.

9.10.1.2 Effects during operation

Once the Project is operational, it will generate accessibility and connectivity improvements for local residents in this area. It is considered this will result in positive effects on people’s patterns of daily living and wellbeing. These benefits are attributed to the following Project outcomes:

- A direct link between SH1 and SH18 which will reduce the reliance on local roads, resulting in improved travel times for local residents who use these routes;
- Dedicated local road to local road connection between Unsworth Heights and North Harbour East;
- Dedicated pedestrian/cycle facilities along both SH1 and SH18 as well as improved linkages to local reserves and community areas;
- Improved east-west connectivity with the upgrades to McClymonts overbridge, Rosedale Road and Constellation Drive including pedestrian/cycle provision; and
- Better access to public transport with the extension to the Busway.

It is acknowledged that the Project will affect a number of reserves which provide both passive and sports recreation to the local and wider community. The Project requirements in relation to these areas are discussed at **Section 9.9** and is not repeated here. While Rosedale Park South is currently not a publically accessible reserve, it has potential to contribute to the local community’s sports and recreation requirements is noted. The mitigation to be between AC and the NZ Transport Agency should ensure a commensurate level of future service.

The NHHS is recognised as a regional and local sports recreation facility. Its community function relates to school use for training and games as well as local club activities and summer programmes. The loss of this facility would be a significant adverse effect in respect of its community uses. The strategy with respect to this facility is discussed above at **Section 9.9**.



The Project's preferred option for a stormwater wetland within Rook Reserve will reduce the area available for passive recreation purposes at this location as currently enjoyed (open sloping grassed area) by the local community. The location of the wetland in the north-eastern corner of the reserve and the ability to adopt a "safety in design" approach to its layout, provide opportunities for the wetland to be an amenity feature within the reserve and part of its passive recreation function in conjunction with the wider reserve. The alternative location for this wetland is Bluebird Reserve at a grassed area identified in the north-eastern corner. Similar to the Rook Reserve design, the wetland would provide an amenity feature but the balance of passive recreation land would be much reduced, being limited to the small play area adjacent Bluebird Crescent.

As noted above, a number of businesses will be displaced permanently from their current location. Acquisition of properties or the takeover of tenancies will allow the owners/tenants to be compensated and move on or relocate, and in that way mitigates the effects on affected landowners or tenancies. However, it is recognised that effects of displacement and relocation may remain.

The two off-ramps (Z service station and Unsworth Drive) from the west bound carriage way of the UHH will be permanently closed as a consequence of the Project. Neither access can be maintained for safety reasons as one of the key purposes of the Project is to upgrade UHH to motorway standard. Improved access at Caribbean Drive forms part of the Project design with traffic modelling predicting better travelling time for users of the Unsworth Drive off-ramp as reported in the Assessment of Transport Effects. The owners and tenants of Z service station and the Greenwich Shops have raised concerns that the ramp closures will result in their businesses failing, as there will no longer be passing trade. This group is of the view that tenants will need to relocate while owners will be unable to either attract new tenants or on-sell the properties, as a consequence. Additionally, without an income, they would be unable to keep the properties leading to blight.

9.10.2 Mitigation

A key element in addressing the actual and potential social effects will be liaison and interaction with the local community ensuring they are aware of the Project's construction programme and when works will commence in their area so they can plan and prepare in advance. Therefore, it is proposed that a Stakeholder and Communications Plan to keep the community and stakeholders informed about construction activities and the construction programme be developed. In more detail, this Plan would include:

- The appointment of a Community Liaison Manager providing a key contact for the resident and business community within the Project area with a community reference group;
- A communication strategy detailing how/when construction management information will be communicated to directly affected landowners, neighbours, stakeholders and the wider community;
- Community involvement in the construction works (e.g. community planting days);
- Measures to maximise opportunities for customer and service access to businesses that will be maintained during construction;
- Measures to mitigate potential severance and loss of business visibility issues by way-finding and supporting signage for pedestrian detours required during construction;
- Other measures to assist businesses to maintain client/customer accessibility, including but not limited to client/customer information on temporary parking or parking options for access and delivery;
- Management and monitoring of key environmental issues such as noise, vibration, dust and traffic effects as part of the CEMP; and
- Implementation of a formal complaints/feedback process as part of the Stakeholder and Communications Plan.



With respect to reserves land affected by the Project, measures to mitigate construction impacts will be agreed as part of a reserve reinstatement package with AC to ensure remediation and return to public use (where possible) in an effective and efficient manner. The design of the stormwater management wetland at either Bluebird Reserve or Rook Reserve will be progressed in agreement with AC such that it provides an additional amenity area within the reserve, and subject to meeting public safety requirements.

The NZ Transport Agency is progressing a specific mitigation package with AC and Hockey addressing the Project's effect on the NHHS. The mitigation measures outlined at **Section 9.9**, will ensure that the community use of the facility will continue at the current site until all uses transfer to the intended new facility. Retention of the NHHS in the immediate local area is an important community outcome.

A number of businesses are directly affected by the Project and premises will be acquired. It is recommended that the NZ Transport Agency continue progressing its property strategy which includes a business resettlement assistance strategy that has been implemented through the planning phase. With respect to the Greenwich Shops and Z service station, it is recommended that the NZ Transport Agency specifically work with these businesses in respect of signage and advertising.

9.10.3 Summary

The Project will generate a variety of social effects of which some are adverse in nature while others are beneficial. Taken as a whole, the Project will not result in significant adverse social effects and any such effects are able to be managed through the management of construction effects and disturbance as well as stakeholder engagement and communications.

Overall, the proposed social effects are expected to be positive. The proposed works are considered essential for Auckland's transport network. Although there are potential adverse effects on the immediately adjacent community and surrounding environment, various mitigation measures will be employed to manage these effects and ensure a positive outcome for directly affected parties and the wider community.

The NZ Transport Agency will continue to engage with those landowners whose properties are directly affected by the NoRs and establish mitigation measures. Where land is required, the NZ Transport Agency will engage in a separate statutory process under the PWA to acquire the land where required, which shall include appropriate compensation.

9.11 Cultural Heritage and Tangata Whenua Values Effects

Engagement with nine Mana Whenua groups who have self-identified an interest in the Project (outlined in **Section 4 and 8** above) has been on going through the Central – North Area IIG and targeted Project hui. The extent of this consultation with Mana Whenua is recorded in **Section 8** and in the Consultation Report at **Appendix E**. Three CVAs have been prepared by Ti Ākitai Waiohua, Ngāti Manuhiri and Ngāi Tai Ki Tāmaki and these are provided at **Appendix F**.

9.11.1 Effects

Through the Project hui described in **Section 8**, the actual or potential effects of the Project which are of concern to Mana Whenua have been identified. Having regard to the CVAs provided, matters of importance from a Mana Whenua perspective for each interested group are summarised below.

9.11.1.1 Ti Ākitai Waihoua

For Ti Ākitai Waihoua cultural values reflect their traditional importance and association with the land and water. As such they wish to assert their kaitiakitanga obligations, to ensure that the impact of the development on the terrestrial and aquatic environment is managed.



9.11.1.2 Ngāti Manuhiri

There are no wāhi tapu or archaeological sites of significance to Ngāti Manuhiri recorded within the Oteha area. Living taonga within the Project area such as plants, birds and reptiles, are likely to be impacted by varying degrees of development. Ngāti Manuhiri support all initiatives that will protect or enhance their continued presence and environment.

9.11.1.3 Ngāi Tai Ki Tāmaki

Ngāi Tai Ki Tāmaki have expressed the importance of upholding their responsibility as kaitiaki particularly where species within the Project area are to be relocated or managed. Iwi support the use of low impact and water sensitive design in the Project as well as water quality management and stormwater treatment responses.

9.11.1.4 Other Mana Whenua

While CVAs as yet have not been received from others with an interest in the Project area, the matters raised by Ti Ākitai Waihoua, Ngāti Manuhiri and Ngāi Tai Ki Tāmaki have been reflected in Project hui discussions.

9.11.1.5 Discussion

Mana Whenua concerns have centred on maintaining or enhancing environmental values. These largely relate to the protection of waterways and vegetated areas, with Lucas Creek (in particular the western reach) being identified as a culturally significant area. The protection of the stream environments from contaminants such as stormwater and improved water quality outcomes in the Project catchments are a preferred outcome. Mana Whenua have also identified the risk of leachate migration from the excavation work at the Rosedale Closed Landfill as being of concern due to the potential to impact downstream water quality. Additionally, Mana Whenua have sought to have built elements of the Project express the historical connection that they have with the locality.

9.11.2 Mitigation

Mitigation planting is proposed as part of the Project. This planting seeks to remediate any adverse visual effects generated by the Project and restore ecological values to fragmented areas of vegetation. Where practicable planting will be sourced from local native stock.

Stormwater treatment has been provided throughout the Project to comply with the hydrology mitigation requirements outlined within the AUP and the matters of concern expressed by Mana Whenua throughout the design of the Project. These measures include the use of swales as conveyance mechanisms for runoff to the proposed stormwater ponds for treatment prior to discharge into the receiving environment. The design has mitigated water quality and quantity effects to the greatest extent possible by treatment, detention, attenuation and outlet protection.

The construction water management approach adopted for the Project will ensure a high level of erosion and sediment control avoiding untreated loads reaching the freshwater environment and adversely affecting water quality and aquatic habitat.

The freshwater ecology technical assessment outlines the measures for mitigation for the direct and indirect effects of the Project on freshwater bodies. This includes the installation of culverts to provide for fish passage in waterways. It also includes retaining as much riparian vegetation as possible at Lucas Creek and Alexandra Stream, due to the importance of the vegetation in providing habitat and reducing stream erosion.

Measures adopted in the Project design for works within the Rosedale Closed Landfill will ensure no leachate migration will occur during construction.



The proposed designation and consent conditions include the following measures to involve Mana Whenua in Project design and construction:

- Feedback must be sought from the NZ Transport Agency Northern IIG on the draft CEMP;
- The CEMP is to require cultural and environmental monitoring by Mana Whenua representatives, where this is requested by the above group;
- There must be an opportunity for an Mana Whenua representative to be present during any native fish recovery and relocation;
- The NZ Transport Agency Northern IIG is a key stakeholder to be specifically identified in the Stakeholder and Communications Plan; and
- A requirement for the Urban Design and Landscape Plans to be prepared together with the NZ Transport Agency Northern IIG.

9.11.3 Summary

Overall it is assessed that the design of the Project responds positively to the matters raised by Mana Whenua and is consistent with iwi values identified.

9.12 Archaeology and Historic Heritage Effects

An archaeological assessment has been prepared by Clough & Associates Ltd to assess potential effects on identified locations of potential archaeological significance from the construction and operation of the Project in the Assessment of Archaeological Effects (**Technical Assessment 2**).

To determine whether any archaeological or other cultural heritage sites had previously been recorded on or in the immediate vicinity of the Project area, an initial literature review was completed followed by field surveys of higher risk areas as detailed in Section 3 of the Assessment of Archaeological Effects.

9.12.1 Effects

As outlined at Section 4.2 of the Assessment of Archaeological Effects, no heritage sites are recorded within the Project corridor, and subsequent field surveys and assessment did not indicate any areas with archaeological or heritage potential. This is primarily due to the majority of the assessment area having undergone previous development. The proposed works are unlikely to have an impact on land that has not been modified in the recent past. Previous earthworks throughout the Project area would have destroyed any archaeological features or deposits that may have been present.

The potential for both the construction works and the operational works to impact on any unrecorded archaeological or heritage site is considered to be low to nil within the Project area.

Three reserves within the assessment area were identified having the potential to contain archaeological deposits: Bluebird Reserve, Rook Reserve, and Constellation Reserve. However, aerial photographs illustrated that the Bluebird Reserve and the western part of the Constellation Reserve had undergone past modifications which would have directly impacted on any archaeological resources present. No archaeological features or deposits were identified during the site visit at either Rook Reserve or Constellation Reserve. In addition, there were no other areas of archaeological sensitivity or areas of archaeological potential identified that could be affected by the Project.

Overall, any potential effects on unrecorded archaeological values are considered likely to be less than minor.



9.12.2 Mitigation

The Project archaeologist considers that site-specific mitigation measures are not required. Where any sites are encountered, accidental discovery protocols will be adhered to in order to avoid any damage or irreversible effects. The proposed Project conditions include a requirement for a contractor's briefing by the Project Archaeologist, and set out steps to take should any unrecorded historic heritage sites be exposed.

9.12.3 Summary

Overall, with the implementation of the mitigation proposed, it is assessed that the effect of the Project on archaeological and heritage values will be less than minor.

9.13 Construction Water Effects

An Assessment of Construction Water Management (**Technical Assessment 4**) has been prepared by Ridley Dunphy Environmental Ltd to assess the potential effects of earthworks and management sediment on waterways generated through the construction of the Project. This assessment informs and should be read in conjunction with the Assessment of Freshwater Ecology and Assessment of Surface Water Quality.

As outlined in **Section 5.9.4**, the total area of earthworks for the Project equate to approximately 61ha. The earthworks areas are predominantly within a narrow corridor and include works associated with pavement repair and replacement. The most significant bulk earthworks activity is proposed at the SH18/SH1 tie-in (north and west bound ramps) as well as the Paul Matthews Road Link.

Works are also proposed within stream systems located to the south of RWWTP Pond 1 (including filling). In addition, works are proposed within the banks of the Alexandra Stream, Oteha Stream and Lucas Creek associated with the construction of outfall structures. A number of artificial watercourses (stormwater drains) are also affected by the Project including the stormwater discharge channel from the Masons Road stormwater pond and the channels adjacent to the Moro Pond. These artificial watercourses drain to the Auckland Council stormwater network. The Project works also involve the widening of the crest of the existing SH1 causeway on both the eastern and western side of the existing motorway.

The assessment identifies the erosion and sediment control philosophy and the principles to be applied on the Project, along with a series of risk mitigation tools. This includes compliance with both the Technical Publication No. 90 Erosion and Sediment Control: Guidelines for Land Disturbing Activities (TP90), Auckland Council and the NZTA Erosion and Sediment Control Guidelines for State Highway Infrastructure, Construction Stormwater Management (dated September 2014) (NZ Transport Agency Guideline) in the design of all erosion and sediment control measures.

One of the key principles of construction water management for the Project is the future submission to Auckland Council of Construction Erosion and Sediment Control Plans (CESCPs) prior to works commencing. These plans will be developed for each specific area of works or activity and will be undertaken in accordance with the key principles outlined within the Assessment of Construction Water Management.

9.13.1 Effects

While the assessment notes that the Project is essentially a road widening exercise, exposing land surfaces through earthwork activities has the potential to result in soil mobilisation and an increase sediment loads above the normal levels that are discharged to waterbodies. This can result in the potential for adverse effects on the receiving environment and habitats. An increased sediment load discharged to a watercourse can affect water quality and the ability of aquatic organisms to survive and/or migrate.



The effects of increased sediment loads discharged to waterbodies will vary, as different waterbodies and habitats have varied capacities to manage elevated levels of sediment. Without appropriate management, the adverse effects of sediment-laden runoff has the potential to be significant, with long-term effects on freshwater systems, estuaries and harbours into which the catchment discharges.

9.13.2 Mitigation

CESCPs are proposed to be developed, and which will follow the principles outlined in Section 6 of the Assessment of Construction Water Management. These plans form part of the wider CEMP framework which is recommended as part of the Project. In order to minimise sediment from escaping the works area and entering waterways, a series of controls are proposed to be installed, depending on the specific environment. These will be designed, constructed and maintained in accordance with recognised guidelines and will at all times achieve, as a minimum, the requirements of the NZ Transport Agency Guideline and TP90. A detailed management approach has also been identified to ensure that erosion and sediment control measures are fit for purpose, monitored and well maintained. Monitoring will ensure a process of continuous improvement for construction water management methodologies and specific measures can be implemented (i.e. adaptive management).

The erosion and sediment control measures that have been developed for the different construction activities are detailed in the following subsections.

9.13.2.1 Erosion and sediment control devices

Sediment Retention Ponds (SRP) are proposed primarily for the SH1/SH18 works and will be designed with a length to width ratio of 3:1, side slopes of 2:1 and a depth of 1.5m. The SRP depth can be amended to ensure effective operation if required. SRPs will also be utilised in Construction Support Areas. Proposed new stormwater management wetlands, or the footprint of these wetlands, will be utilised as SRPs where possible.

Cleanwater diversion channels required for the Project works will use a hot mix bund, to be established on the edge of the existing sealed carriageway in order to divert flows away from the works locations. Within the Project area, there are a wide range of catchment sizes and characteristics that will require specific cleanwater diversion channel designs. However, for the existing motorway surface the cleanwater diversions will be sized for the 1% annual exceedance probability (AEP) storm event with discharge locations for every 100m lineal length of motorway.

Dirty water diversion channels will be utilised in a few places to allow surface flow to be diverted to treatment devices. These will be based on NZ Transport Agency standard of 1% AEP storm event with adequate room assessed within the necessary catchment areas to install such devices.

9.13.2.2 Culverts and outfalls

Replacement culverts are proposed to be installed in sections and fully completed and stabilised within the day works programme. All culvert works are to be established in dry environments. This will be achieved by undertaking the works either during a period of no flow, or if flow occurs, during the works period using pumping. This pumping will temporarily divert upstream flows around the work area to discharge back downstream of the culvert works. Once the culvert is installed, rip-rap erosion control is required to be installed at the inlet and outlet of the culvert. Any rip-rap work or associated concrete works are to be undertaken in a dry environment to minimise likelihood of sediment-laden runoff. A silt fence is required to be erected during the culvert backfilling process, until the area has been fully stabilised. Processes to manage effects during high-rainfall events are also proposed.

9.13.2.3 Retaining wall construction

Retaining wall works are to be constructed from hard stand areas with machinery on stabilised platforms. Where this cannot occur, a silt fence is to be placed around the lower area of the works to



ensure any sediment generated is fully captured and treated. Any spoil from the construction of the walls is to be loaded immediately onto a truck or equivalent, and removed from the area to a location that has been approved in the CЕССР.

Any cement contaminated water will require treatment prior to discharge. This is to be conducted on-site using treatment tanks with water pH tested prior to discharge, or the water removed from the site and treated elsewhere through the use of sucker trucks.

9.13.2.4 Drainage/utility installation

When placing pipe networks for stormwater or other utilities, the nature of the environment is an important consideration. For works outside streams or overland flow paths, cesspit protection is to be provided for all adjacent cesspits. Where the works are adjacent to a watercourse, a silt fence or filter sock is to be erected between the watercourse and the works area. This is to be maintained to ensure functionality remains and can be moved with the works as they progress. The excavation works, placement of pipes and any backfilling are to be fully stabilised on a daily basis.

Where works are to be undertaken within a swale or overland flow path, temporary cofferdams may be used within swales with connected solid novacoil pipes to take any swale water around the works area on a temporary basis. The cofferdams are to be removed upon completion and the surface stabilised.

9.13.2.5 Bridge construction and demolition

Bridge construction will involve piling operations and reinforced concrete column and crosshead construction. This is proposed to occur in various locations throughout the Project. Specific erosion and sediment control measures are to be applied to these areas.

Machinery is to be utilised on a fully stabilised surface, to ensure the machinery does not generate sediment. Stockpiled material is to be removed from the site on sealed truck units. Below any earthworks or drilling activities, a super silt fence is to be established in a horseshoe configuration around the perimeter of the activity which will capture any sediment in runoff from this activity. As an alternative, or backup to the super silt fence, bark or mulch filled filter socks may be appropriate to assist with filtering sediment and in reducing the pH of concrete discharge.

Concrete slurry is to be minimised through good site management. A dedicated concrete wash area is proposed for relevant construction support areas. Any concrete slurry generated is to be removed from the site via sucker trucks or discharged through a filter sock and the pH levels checked.

9.13.2.6 Pumping

Pumping may be necessary for some parts of the Project. Sediment retention ponds are to be installed and fitted with floating decants with a mechanism to control outflow.

9.13.2.7 Rosedale Wastewater Treatment Plant ponds

In addition to the basic erosion and sediment controls identified, a hot mix bund is to be established along the edge of the existing sealed carriageway between the RWWTP ponds in order to divert surface runoff from the carriageway away from the earthworks area. A cofferdam or groyne is to be established, after which the earthworks area is to be dewatered and contaminants removed. Clean hardfill is to be utilised to ensure that sediment generation is minimised. The construction works in this area are to be staged to limit sediment yield. Only the area needed for the immediate activity should be exposed, with no more than 0.25ha exposed to erosion during each phase.

9.13.2.8 Flocculation

Flocculation treatment is proposed for various sediment retention devices as well as specific activities such as pumping. A flocculation management approach will be detailed within the CEMP and implemented through the CЕССР. As the soil type differs throughout the Project area, the flocculent



will be effective in different dosages. On-going testing will be required to confirm particular details to be outlined in the CЕСCP.

9.13.2.9 Construction support areas

Construction support areas are required to have adequate erosion and sediment control and due to the temporary nature of the exposed area, will typically be based upon runoff diversion channel and sediment retention ponds followed by a progressive cover of hard fill material. Where necessary silt fences are to be installed around the yard establishment phase of works until the yard area has been stabilised with clean hard fill material.

In order to manage construction water during the operation of the construction support areas, vehicle movements are only to occur within designated areas of hardstand, non-sediment contaminant products are to be stored within bunds, contaminated material is to be managed within self-contained locations, sealed hardstand is to be regularly cleared, and stockpiles of material within the yard are to be treated through sediment control measures.

9.13.2.10 Stormwater wetland establishment

The proposed stormwater wetlands are to be constructed in an isolated manner. The perimeter of the excavation area is to be marked with a topsoil bund to prevent machinery from disturbing unnecessary areas, whilst acting as an impoundment area with decanting devices installed if necessary.

The proposed stormwater wetlands are to be formed and fully stabilised with the permanent planting and mulching programme installed prior to removal of any erosion and sediment controls. The outlet structure device for the sediment retention ponds is to be the same as that of the permanent wetland with the outlet changed after construction to reflect operational requirements and flocculation may not be necessary any longer.

9.13.2.11 Adaptive management framework

As previously discussed, CЕСCP(s) are a key tool for mitigating potential adverse effects. Monitoring will also be required as part of the CЕСCP, and is a key tool for the success of the Project. Monitoring outcomes will be implemented in an adaptive management framework whereby there is a continuous improvement process at all times for construction water management methodologies and specific measures. This approach enables flexibility and innovation while still ensuring the potential adverse effects are managed appropriately, in accordance with best practice.

9.13.3 Summary

A range of construction activities that will be undertaken as part of the Project have the potential to impact on the ecological values of the receiving environments. While the report is based on a conceptual approach and provides a suite of methodologies for certain activities, it provides certainty that the construction activities can occur with minimal discharges and associated construction related effects. An adaptive management regime is a key part of the methodology proposed. Subject to the development of detailed CЕСCPs (as required under the proposed conditions), and which are developed in accordance with the principles, management processes and the erosion and sediment control measures outlined, it is considered that the actual and/ or potential effects associated with erosion, soil mobilisation and sedimentation to receiving water bodies and stormwater discharges will be temporary in duration and appropriately avoided or mitigated.

9.14 Land Contamination Effects

An Assessment of Land Contamination Effects (**Technical Assessment 6**) and PSI has been undertaken by Aurecon to identify a range of on-site sources of contaminated land (HAIL activities), as a result of both historic and existing activities. These assessments also determine potential



contamination pathways in order to assess the potential effects arising from construction and operation of the Project on contaminated land.

9.14.1 Effects

Twelve sites have been identified as posing a greater risk due to potential land contamination and their proximity to the Project corridor. These include; Constellation Drive sub-station (pre-1970s), Z Energy service station (SH18), Caltex service station (SH18/Paul Matthews Road), Gull service station (Albany Highway), Rosedale Closed Landfill, scrap metal dealer and electroplater, RWWTP, channel at CH14300, channel at CH14700, and the stream near the Rosedale Closed Landfill (CH14000).

Adverse effects are likely to occur where there are linkages between the source, pathway and receptor. This is described in Section 3.7.2 of the Assessment of Land Contamination Effects. During construction, there is the potential for linkages to be created through soil disturbance and surface seal removal. Adverse effects that may arise as a result of pathways being created during construction include:

- Inhalation exposure to works on site and members of the public;
- Ingestion and dermal contact exposure to works and neighbouring site users;
- Discharge to stormwater;
- Passive discharge to groundwater or air;
- Accumulation in impacted sediment;
- Loss of amenity values (e.g. odour); and
- Vegetation impacts.

The potential adverse effects of works within each of these sites are summarised in **Table 37**.

Table 37 Summary of Potential Adverse Effects of concern from works within HAIL Sites

Location	Contaminants	Effects
Uncontrolled Fill		
Watercare Causeway	Asbestos containing material Metals Hydrocarbons Semi volatile organic compounds	Inhalation exposure to workers and neighbouring site users
Infilling of gully (CH14700)		Discharge to stormwater
Infilling of gully (CH14300)		Passive discharge to groundwater Accumulation of sediment
Infilling of stream (CH14000)		Amenity values
Power Substation		
Constellation Drive	Polychlorinated biphenyls	Dermal contact, ingestion of onsite workers Passive discharge to groundwater
Petrol Station		
Caltex service station SH18	Hydrocarbons Metals	Dermal contact, ingestion, inhalation to onsite workers and neighbouring site users Passive discharge to groundwater Amenity values
Z service station SH18	Hydrocarbons	



Location	Contaminants	Effects
Gull service station SH18		Dermal contact, ingestion, inhalation to onsite workers and neighbouring site users Passive discharge to groundwater Amenity values
Rosedale Closed Landfill		
SH1 CH1370-14200	Metal Methane Hydrocarbons Semi volatile organics Pathogens	Inhalation exposure to workers and neighbouring site users Discharge to stormwater Passive discharge to groundwater Accumulation of sediment Amenity values
Rosedale Wastewater Treatment Plant		
SH1 CH15000-15500	Pathogens Metals Methane	Inhalation exposure to workers and neighbouring site users Discharge to stormwater Passive discharge to groundwater Accumulation of sediment Amenity values
Scrap Metal Dealer/ Electroplater		
SH18 - CH1990	Hydrocarbons PFC's Metals	Inhalation exposure to workers and neighbouring site users Passive discharge to groundwater Amenity values

The Assessment of Land Contamination Effects states that all potential adverse effects generated during construction will be transient, however some contaminants such as asbestos, lead and benzene can lead to irreversible impact from additional exposure. However, this is considered to be highly unlikely and that well managed contaminated sites should not result in a significant increase to human health risk.

During operation of the Project, any residual contamination will be sealed beneath the State highway, or landscaped over, to ensure that no migration of contaminants occurs whilst the site remains undisturbed. The migration of contamination may occur during routine maintenance where soil is disturbed. Examples of such activities include trenching for installation of underground services, drilling for small scale civil works or alterations, and earthworks for landscaping. Adverse effects of such works during operation are likely to generate the same set of adverse effects as during construction.

Section 4.1.1 of the Assessment of Land Contamination Effects notes that there are some positive effects from the proposed works within these sites. These include:

- Characterisation of areas of potentially contaminated land which would have not otherwise have been assessed;
- Identification of areas of historical contamination previously unknown allowing controls to be implemented to protect human health and the environment;
- Possible removal of the contaminated material from the proposed development areas within the Project area; and



- Removal of some contaminated soils.

9.14.2 Mitigation

Section 6 of the Assessment of Land Contamination Effects outlines the proposed mitigation measures to address land contamination effects. In order to manage the adverse effects from earthworks in contaminated sites along the alignment, a draft Contaminated Site Management Plan (CSMP) has been prepared. The CSMP details the specific measures to be put in place to control and manage potential hazards from working with contaminated soils. Measures include:

- Any soil or recycled aggregate imported to the Project corridor shall be sourced from a site for which a PSI or DSI has been produced demonstrating the site is not a HAIL site and that the soil is likely to be representative of background concentrations for non-volcanic soils. In addition, any soil or recycled aggregate being imported for the Project is to be sampled and tested at a minimum rate of one sample for every 500m³;
- Any material not demonstrated to be imported from virgin ground shall be tested at a minimum rate of one sample per 250m³ of fill, but not less than three samples, for an appropriate suite of contaminants to demonstrate that it is acceptable for reuse within the Project corridor as cleanfill;
- Soil and surface stability is to be maintained at all times in accordance with AC's TP90;
- Soil stockpiles are to be located in designated stockpile areas which will be established prior to generation of waste soil. Stockpiled soil will be managed to control contamination of underlying soil and erosion. Sediment control measures will be used to minimise siltation of any surface and water or blockage of any existing drainage channels;
- Daily records of where excavation of contaminated or suspected material has occurred, including the type and volume of any contaminated material excavated, and where the material has been stockpiled or disposed of;
- Contaminated waste is to be disposed of off-site at a facility authorised to accept such material and a record is to be kept of such activities;
- Maintaining a register of landfill soil disposal and liquid disposal activities, and recording the location of contaminated soil excavations, disposal location quantity of contaminated material and off-site weighbridge documents;
- Maintaining a register of deposition/disposal of excavated contaminated soil that qualifies as waste soil. If material is transported off-site, it will be done using appropriately authorised waste transporters for disposal at an appropriately licensed landfill;
- Upon completion of soil excavation, all plant and equipment shall be cleansed and decontaminated in an appropriate manner;
- General uncontaminated fill material generated within the Project corridor should be separated from areas of potentially contaminated fill;
- Any groundwater encountered is to be sampled and if found to be contaminated should be pumped and collected in drums or tanks on-site for removal to an appropriate facility;
- Minimising dust by dampening the surface of the site, protecting stockpiles within sealed waste skips or wetting down the surface of the stockpile;
- Ceasing works in strong winds;
- Undertaking the loading or unloading of dry soil at the source to prevent the spread of loose material within and outside the Project corridor;
- Spill response kits are to be located at the site with contractors operating within the Project corridor are to adhere to an emergency spill response plan;
- Stockpiled materials with the potential to produce leachate or contaminated runoff are to be stored in a sealed and bunded area to divert stormwater away from the waste; and



- Liquid levels within the bunds shall be monitored and if exceeding more than 10% of the bund volume shall either be resprayed onto the stockpile or be removed from the site as hazardous liquid waste by an approved waste handler.

A DSI is currently being undertaken to assess the actual site conditions within areas of potential contamination. This is required to better understand the risk profile of each site and to develop specific management approaches appropriate to any identified risks during construction and to provide input to the detailed design to avoid land contamination risks following Project completion.

9.14.3 Summary

The PSI has identified potentially contaminated land associated with current or historical activities within the Project area. These activities include landfill sites, waste water treatment plants, the placement of fill of unknown origins, and petroleum service stations.

Potential adverse effects associated with the proposed development works could arise from human or environmental exposure to the identified contaminants during excavation activities, stormwater runoff carrying contaminated sediment impacting off-site areas, or members of the public being exposed to contaminants carried in airborne dust. To manage these risks a draft CSMP has been prepared and is to be updated with the results of the DSI prior to works commencing within the Project area.

The risks associated with these potential adverse effects can be managed for the Project to ensure that they are avoided through design or process to the extent that they are minor.

9.15 Freshwater Ecological Effects

An Assessment of Freshwater Ecological Effects (**Technical Assessment 5**) has been prepared by Bioreserches Group Ltd to assess potential effects on freshwater ecology from the construction and operation of the Project.

The aquatic ecological values within the Project area were assessed to determine the quality of freshwater habitats and the presence freshwater flora and fauna. The assessments were undertaken over the entire Project area and included desktop and database reviews, site visits and formal surveys.

9.15.1 Effects

9.15.1.1 Temporary effects during construction

Sedimentation from disturbed soils presents a risk to all watercourses within the vicinity of the proposed construction works area. In particular, the construction of the proposed outfall (OF3) has the potential to result in increased sedimentation within Lucas Creek.

Sedimentation, bank failure and loss of low or moderate quality aquatic habitat could also occur at Oteha Valley Stream and Alexandra Stream. Construction works could also potentially obstruct or restrict fish passage within Alexandra Stream.

9.15.1.2 Effects during operation

Adverse water quality effects during the operational phase of the Project may rise from increased stormwater runoff due to the increase in impervious surfaces. Runoff may include hydrocarbons and trace metals and the effects of these contaminants entering the downstream freshwater environment without treatment are considered to be moderate. However, stormwater treatment devices are proposed as part of the Project which will provide treatment, detention and attenuation of stormwater runoff from impervious areas as part of the Project.

Culverts have the potential to form barriers to fish passage and alter the hydrology of the watercourses. All sections of the stormwater drains that will be piped are highly modified aquatic habitats designed for stormwater conveyance. The operational effects of the proposed culverting of



the existing open channel stormwater drains is considered to be less than minor in those drains that are considered to have very low value aquatic habitats.

Several stormwater channels within the Project area are affected by the proposed works through either piping, culverting or filling as follows:

- The stormwater pond discharge channel between Masons Road and SH1 southbound – this discharge channel will be lost as a result of the removal of the stormwater pond. This ephemeral watercourse is an ‘artificial watercourse’ as defined under the AUP. The channel provides a refuge for native freshwater fish and its ecological values have been assessed as moderate;
- The stormwater drain south of Arrenway (Moro Pond) – this channel is an ‘artificial watercourse’ as defined under the AUP. The channel is lined and its ecological values are low;
- The channel downstream of SH1 UHH on ramp north – this ephemeral watercourse is also an ‘artificial watercourse’ under the AUP and its ecological values are low;
- Pond 1 open drain (follows the southern boundary of Pond 1) – this channel is an artificial watercourse and its ecological values are low;
- RWWTP watercourses south of Pond 1 – while these watercourses are highly modified concrete lined channels which contain very low quality aquatic habitat, historic aerial photographs show there was historically a stream in this approximate location within the catchment. Accordingly, Auckland Council considers that it should be classified as a ‘stream’ under the AUP. The works will result in approximately 602m of ‘streams’ and stormwater drains with very poor quality aquatic habitat being piped between UHH and Pond 1 at the RWWTP; and
- The extension of the SH1 causeway between the two ponds at the RWWTP will result in the loss of a small portion of low quality artificial aquatic habitat. The removal of existing stormwater ponds will also result in the loss of some low quality aquatic habitat. New stormwater ponds, if not designed well, have the potential to increase the temperature of stormwater discharges to streams.

9.15.2 Mitigation

Erosion and sediment control measures are proposed with CESCPS to be certified by Council prior to construction commencing (refer to **Section 9.13**). The CESCPS will detail the specific measures to control sediment from entering the downstream freshwater environment and the proposed monitoring and adaptive management is proposed. Specific sedimentation controls are also proposed for works in the vicinity of streams, including the construction of outfalls as outlined in the Assessment of Construction Water Management. The Assessment of Surface Water Quality Effects concludes that the potential effects of sedimentation from earthworks on water quality will be no more than minor. Accordingly, the potential sedimentation effects of the construction works on streams and watercourses can be readily managed to the extent that they will be no more than minor.

The Project will treat 99% of all new and existing HUR from within the Project area in accordance with TP10. As a result, the quality of stormwater discharges from within the Project area will improve (refer to the Assessment of Surface Water Quality Effects). The inclusion of detention and attenuation devices, rip-rap aprons and basins will also mitigate the adverse effects of increased flows in the downstream freshwater environment such as stream erosion.

Any native fish or eels located in watercourses that are to be affected by the Project will be recovered and relocated by a suitably qualified freshwater ecologist. Fish movement barriers are proposed to be installed to the lower and upper limits of stream works and over the inlet and outlets of stormwater ponds to prevent fish from re-entering the stream works area. Native fish are to then be captured and relocated on the same day to a suitable and similar habitat immediately downstream of the works area within the same catchment.



While some watercourses are affected by the Project, these generally provide very low ecological habitat and are highly modified aquatic habitats designed for the movement of stormwater between various stormwater devices and/or culverts. New stormwater management wetlands are proposed and riparian planting around the wetlands will increase shading and substrate, increase temperature control and provide backside shelter and habitats for birds using the wetlands. One such area is that within the RWWTP south of Pond 1, where 'stream' and stormwater drains with very low quality aquatic habitat is proposed to be piped, but where a wetland structure (to manage stormwater) is to be constructed. This will result in a vastly improved environmental outcome.

9.15.3 Summary

There is the potential for adverse freshwater ecological effects arising from stormwater runoff from roads, including hydrocarbons, and from sediment discharge during construction. However, the Assessment of Freshwater Ecological Effects concludes that both in construction and operation phases of the Project, these potential adverse effects can be mitigated to ensure that those effects will be no more than minor.

9.16 Terrestrial Ecological Effects

An Assessment of Terrestrial Ecological Effects (**Technical Assessment 13**) has been prepared by Bioresearches Group Limited to assess the extent to which terrestrial ecology will be affected by the construction and operation of the Project.

The potential terrestrial ecological values considered within the Project area include vegetation (flora) and fauna (including lizards, birds and long-tailed bats).

9.16.1 Effects

9.16.1.1 General/Project-wide

Overall, the existing terrestrial ecological environment is considered to be of low value. Given the highly urbanised nature of the Project area, the majority of vegetation is areas of planting associated with the management of the State highway network rather than natural or regenerating vegetation. While vegetation clearance is proposed within the Project area, the overall value of this vegetation is low. Consequently for the majority of the extent of the Project, the potential adverse terrestrial ecological effects are minor or negligible.

9.16.1.2 Oteha Valley Road near Lucas Creek

To the north-west of the Project area is an SEA (SEA_T_8297) with a large area of native vegetation extending between it and existing State highway designation to the north of Oteha Valley Road and bounding Lucas Creek. The fragmented vegetation extending under SH1 and along Oteha Stream is considered to have moderate botanical value. A new culvert is proposed to drain to Lucas Creek between the southbound on-ramp and the existing motorway which will pass through mainly juvenile planted vegetation surrounding the existing stormwater pond and riparian vegetation. No works are proposed within SEA_T_8297 nor the vegetation surrounding it.

9.16.1.3 Rosedale Wastewater Treatment Plant ponds

Two SEA overlays are located over the RWWTP; SEA_T_8364 overlays Pond 1 and SEA_T_8365 overlays Pond 2. There is some potential for parts of the Project area around the RWWTP to be used for nesting by At Risk or Threatened birds, such as dabchick, from July to December inclusive. These areas include the northern sides of Ponds 1 and 2 (including the pines) and these areas may also be used for nesting by other native waterfowl, including New Zealand scaup or Australasian shoveler. Construction effects that result in nest destruction or abandonment (if any were established) would be a significant adverse effect.



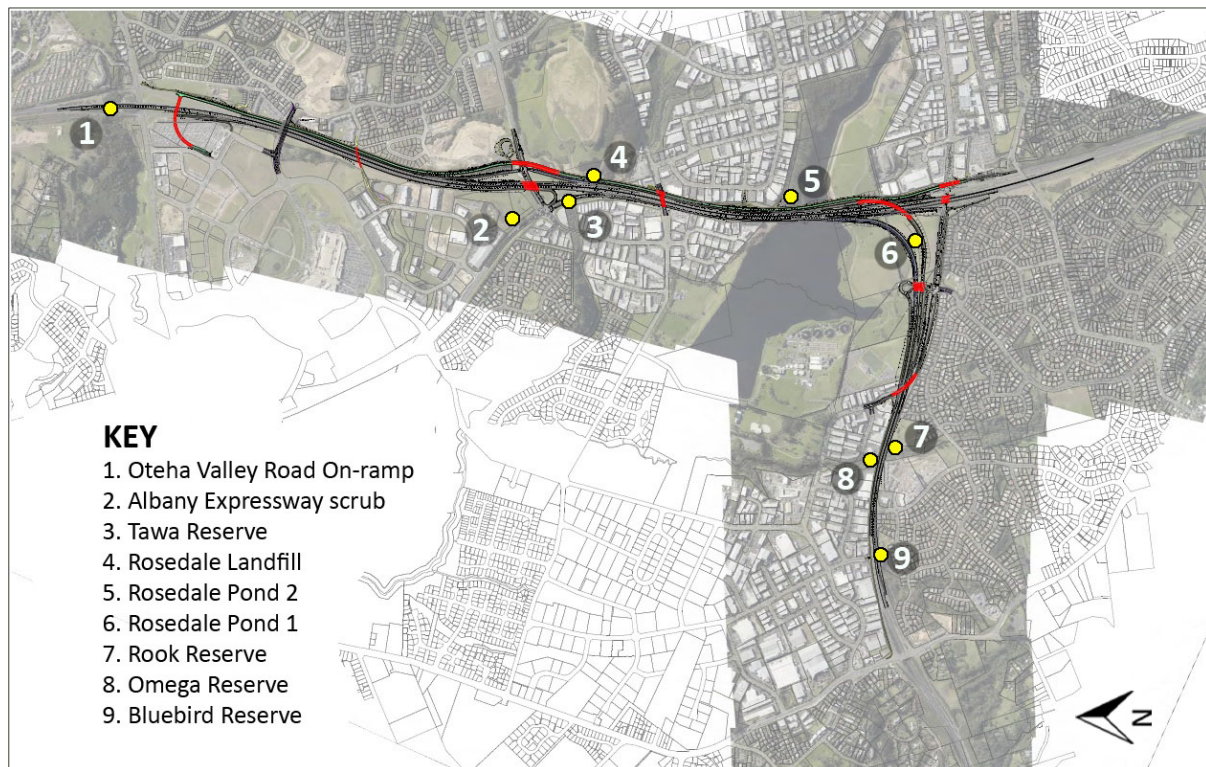
In terms of the potential effects on the birds within the RWWTP during operation, the population has adapted to industrial activities at the RWWTP, farming activities and motorway works and operation, together with overflights of helicopters using the adjacent Helitransz heliport. The probability of the population being adversely affected by the operation of the Project is negligible. The networks of stormwater ponds and associated vegetation may have a habitat enhancement effect, particularly for waterfowl that currently use RWWTP.

9.16.1.4 Lizard habitats

No lizards were recorded from all habitat searches and funnel trapping. The habitat quality was low to marginal at most sites investigated. Vegetation at Sites 1, 2 and 4 provided the greatest potential to support lizard habitat.

Clearance or disturbance of potential lizard habitat was identified as being limited to two sites (being Sites 1, and 4 as identified in **Figure 49**). The potential habitat values for Site 1 are high (four 'At Risk' species may occur there) while the potential habitat values at Site 4 are considered to be of low quality although there is some potential for the presence of 'At Risk' ornate skinks.

Figure 49 Sites identified as supporting Potential Habitat for Indigenous Lizards



9.16.1.5 Birds/Avifauna (outside the RWWTP area)

Two New Zealand dotterel were observed at the proposed construction yard alongside Elliot Rose Avenue on three occasions in August 2016 however none were observed during the seven subsequent visits during September and October 2016. Given these birds are known to roost, forage and breed on vacant land at the nearby Albany commercial block (adjacent to the proposed designation), dotterel may choose to roost or nest at the construction yard at Elliot Rose Avenue and potentially in other similar parts of the Project area during construction if they are not discouraged from nesting within the works areas.



9.16.1.6 Bats

No bats were found during bat surveys and it is considered very unlikely that bats are present within the Project area, even on an intermittent basis. Accordingly, construction of the Project is not expected to affect bats.

9.16.2 Mitigation

The following mitigation is recommended in the Assessment of Terrestrial Ecological Effects:

- Replanting should occur in general accordance with the Landscape Mitigation and Enhancement Plan attached to the Assessment of Landscape and Visual Effects;
- Measures should be implemented to protect native vegetation where it lies adjacent to the construction works where practicable;
- The potential effects of construction on nesting native birds adjacent to the RWWTP ponds can be appropriately managed by vegetation clearance prior to the nesting season; and
- Prior to construction and the removal of vegetation at Sites 1 and 4, any lizards found to be present should be removed and relocated to areas of suitable habitat.

9.16.3 Summary

The Assessment of Terrestrial Ecological Effects concludes that in overall terms, the terrestrial ecological values within the Project area are low, being predominantly planted areas. With the mitigation measures described above in place, all the ecological effects of the Project can be mitigated to a level that the effects of the Project on the terrestrial environment are negligible.

9.17 Stormwater Effects

The Project will increase the coverage of impervious areas throughout the Project area and will generate increased runoff from motorway surfaces and other surfaces including the Busway extension and SUPs. The Assessment of Stormwater Management (**Technical Assessment 11**) has been prepared by Aurecon NZ Limited to describe the design for the proposed stormwater management system, outline the level of treatment that will be achieved and assess the potential effects of stormwater on flooding during the operation of the Project. The effects of the Project on water quality are assessed in the Assessment of Surface Water Quality Effects (**Technical Assessment 12**).

Hydrologic and hydraulic modelling has been undertaken for the Lucas Creek and Oteha Valley catchments to determine the potential effects of the additional runoff generated by the Project. Any changes to stormwater infrastructure associated with the Project are also assessed. AC's flood models has been used as a basis. These models are used to identify habitable floors at risk of flooding within existing flood areas and assess the performance of the existing and proposed stormwater drainage network system. Due to limitations and difficulty separating existing and predicted motorway runoff, the proposed stormwater management system design is based on the conveyance, treatment, detention and attenuation (where required) of all stormwater runoff from existing and proposed pavement areas as one combined network.

9.17.1 Effects

The Project will create an increase in impervious surfaces for the additional lanes along SH1 and SH18 corridors, the Busway extension, the new SUPs which run along SH18 and SH1, the upgrade of Constellation Bus Station and local roads which are affected by the Project. The management of runoff from external catchments has also been considered in the stormwater design.

Stormwater generated within the Project area is to be either discharged into AC's stormwater network and discharged via outfalls consented under the NDC, or is to be discharged via NZ Transport Agency



owned stormwater outfalls to the receiving environment (Lucas Creek, Oteha Valley Stream and Alexandra Stream).

9.17.1.1 Stormwater quality

The AUP categorises roads with volumes exceeding 5,000 vehicles per day as high use roads. High use road excludes the Busway and the SUPs proposed as part of the Project. The Project will add approximately 8.3ha of additional impervious surfaces classified as HUR under the AUP. The stormwater runoff from these areas is likely to contain pollutants and therefore Chapter E9 of the AUP requires additional treatment prior to discharge.

The proposed stormwater management devices described below will provide for 99% of HUR impervious areas (existing and new) within the Project area to be treated at levels of 75% TSS removal in accordance with TP10. This is a significant increase from the existing 52% of discharges within the Project area that currently meet this standard. The effects of the stormwater discharges on the water quality of the receiving environments is assessed in Section 10.2 of the Assessment of Surface Water Quality Effects.

9.17.1.2 Stormwater quantity - Flow

The increase in impervious surfaces within the motorway corridors will increase the volume of runoff from the identified catchments and potentially the peak flows during flood events.

The Project area is covered by two SMAF areas in the AUP - a SMAF 1 area to the north of the McClymonts Road bridge and a SMAF 2 area to the south of the McClymonts Road bridge. These stormwater management areas indicate that the identified streams and their contributing catchments are particularly susceptible to the effects of development or have relatively high ecological values, and therefore require specific treatment or attenuation measures. Chapter E10 of the AUP requires the provision of additional hydrology mitigation in the form of detention for the 90th and 95th percentile rainfall events to manage the flow of stormwater discharge and to avoid deteriorating the downstream receiving environment. Full detention of the 95th and 90th percentile rainfall events is provided for the Project through the use of wetlands and/or dry ponds, without any reduction allowance for retention. This is achieved using controlled outlets within these devices.

Discharges of stormwater will either be to AC's network where authorised under the NDC, or to the receiving environment post-treatment. The Project will require the installation of additional culverts to convey stormwater. Additional outfall structures will be required with erosion protection to control the flow of stormwater as it discharges to the receiving watercourse (as discussed in **Section 9.17.2.2**).

9.17.1.3 Stormwater quantity - Flooding

Discharges to the receiving environment are required to comply with the flooding provisions in order to minimise the likelihood of adverse effects on the downstream receiving environment. Standard E8.6.1(3) of the AUP provides that discharges should not increase flooding to other properties in rainfall events up to the 10 per cent AEP or the inundation of buildings on other properties up to the 1 per cent AEP.

AC's flood assessment of the Oteha Valley Stream catchment identifies building floor flood risks downstream of the Project in the 100 year average recurrence interval (ARI) event. The AC flood assessment predicts that there are currently six residential and four business floors likely to be inundated in the 100 year ARI Maximum Probable Development (MPD) floodplain. There are no predicted increases in peak flood levels due to the Project at these properties in any event up to the 100 year ARI event.

The stormwater management devices proposed as part of the Project aim to reduce the risk of increased flooding on properties outside of the Project area. The design has achieved this except for



several properties at Tait Place that will experience a slight increase of the 10 per cent AEP or the 1 per cent AEP. It is important to note that these properties have been assessed as already being within a flood prone area or are at potential risk of flooding due to their low-lying nature within close proximity to a watercourse or outfall location.

Within the Oteha Valley and Lucas Creek catchments there are approximately nine locations that will experience an increase in peak flood levels of between 10mm to 80mm in the 10 year ARI. A number of these properties include the open channel itself within their property boundary and do not have a building floor which is at risk of flooding.

It is also anticipated that the likelihood of flooding occurring at several sites within this catchment will be reduced as a result of the Project. These properties include:

- Meadowood Reserve (300mm decrease in 2 year ARI, 410mm decrease in 10 year ARI, 460mm decrease in 100 year ARI);
- Upstream of Albany Lakes Reserve (270mm decrease in 10 year ARI, 120mm decrease in 100 year ARI); and
- Rosedale Road/SH1 interchange ponding area (40mm decrease in 2 year ARI, 150mm decrease in 10 year ARI).

There are no properties predicted to receive increases in peak flood levels up to the 100 year ARI event at properties at risk of above floor flooding.

Peak water levels are expected to decrease for several properties along Mills Lane, Gills Road, and Oteha Valley Road.

All of the properties referred to above are already located within existing floodplains. Overall, the proposed stormwater management devices are considered to be appropriate for managing the stormwater runoff from the Project. Of particular note, however, are the significant decreases (of between 40mm and 460mm) that are predicted at several properties (as identified above). Any increases in flooding are to occur at properties that have already been identified as being at risk of flooding.

Overland flow paths have also been assessed to ensure the 100 year ARI peak is safely accommodated with the Project. Where existing stormwater cross-drainage exists under the motorway in areas where widening is proposed, these pipelines are to be extended as necessary.

9.17.1.4 Existing Auckland Council ponds

Three existing stormwater management devices are proposed to be affected by the Project. These include:

- Moro Pond (attenuation only) – live volume is approximately 50m³;
- ARC Refuse Pond (treatment and attenuation) – volume is approximately 1,600m³ and live volume is 3,400m³; and
- Constellation Pond (attenuation only) – volume is approximately 19,100m³.

Consultation has occurred with AC relating to the replacement of these ponds which currently accommodate stormwater runoff from residential and commercial properties outside the Project area. Where these ponds are to be filled in or altered, their loss in treatment and attenuation performance is to be compensated for in the stormwater treatment devices or they will be replaced as part of the Project.

9.17.2 Mitigation

The effects of stormwater discharges from the Project during the operational phase will be mitigated by the treatment devices that are proposed as part of the design. The BPO approach has been used



to determine the most appropriate treatment devices for the Project design, in accordance with the assessment criteria set out in the AUP. The merits of each treatment device are discussed in detail within the Assessment of Stormwater Management.

9.17.2.1 Stormwater quality

Planted wetlands are proposed as the primary treatment and flow management solution for the Project and have been sized to treat the 90th percentile event. Wetlands are favoured as BPO over stormwater ponds due to their increased filtering and biological treatment performance. Constructed wetlands are also the stormwater management device preferred by AC, the NZ Transport Agency and Mana Whenua. **Figure 50** below shows the proposed stormwater devices which will treat and convey stormwater from the existing and proposed State highway (HUR) within the Project area.

The majority of additional impervious areas identified as HURs have been treated to the levels set out in the standards in Chapter E9 of the AUP. This includes:

- Treating all stormwater runoff from the impervious areas by stormwater management devices; and
- Designing all stormwater management devices in accordance with TP10 or are designed to achieve an equivalent level of performance to TP10.

The overall treatment level of 75% TSS removal is achieved for 99% of HUR impervious areas along the Project corridor. However, it is important to note that this has not been achieved solely for the new impervious areas. There are areas of the existing corridor that currently does not receive any treatment. As a result of the Project, the vast majority of HUR within the Project area will gain treatment to the required current standard.

The stormwater management devices included to treat stormwater runoff from HURs are designed in accordance with the standards in TP10. This will ensure that any adverse effects from contaminants in runoff from the majority of the HURs and other impervious surfaces will be treated to minimise any adverse environmental effects on the quality of receiving waters and the wider environment. Therefore no additional mitigation is required.

Engineered planted swales are the desired informal pre-treatment solution for the Project. These have been proposed in locations where the inclusion of swales does not impact the designation boundary by requiring additional land. Two dedicated treatment swales have been provided in accordance with TP10 in locations where wetlands cannot be located (SW-SER-1, 160m and SW-C2PM-1, 230m shown in Figure 9 of the Assessment of Stormwater Management). Swales generally convey runoff and provide informal pre-treatment, and eliminate the impacts and costs associated with piping runoff over the same distance. Therefore informal pre-treatment planted swales have been provided where there is sufficient width within the designation footprint.

As detailed in the Assessment of Stormwater Management, the effects on hydrology and the hydrological cycle within the downstream freshwater environment of the catchments are appropriately mitigated by the proposed treatment devices.

9.17.2.2 Stormwater quantity – Flow

The Project incorporates detention devices in accordance with the criteria set out within Chapter E10 of the AUP (SMAF controls), including providing detention for the 95th and 90th percentile runoff volumes. Discharges from new impervious areas and any existing impervious areas that discharge to the same network point are to be in accordance with the hydrology mitigation requirements. Retention of collected stormwater is not required due to soil infiltration rate expected to be less than 2mm/hr (approximately 0.004mm/hr) and there is no opportunity to reuse the runoff on-site.

New culverts are proposed in addition to the existing culverts to convey the flow of stormwater where necessary. In addition, a number of extensions are necessary to existing culverts due to the widening of the motorway.



All proposed pipe outfalls to the receiving environment will contain erosion protection measures (rip-rap aprons and basins designed to accommodate for the 100 year ARI event). Existing outfalls for the Project are generally able to be retained without the need for modification due to there being no changes to existing peak flow rates and existing outfall structure being considered to be in good working order. The channel downstream of OF12 has been identified as being vulnerable to further erosion during future extreme storm events and discussions are currently occurring with AC regarding rock armouring and lining the channel bend outside of the Project.

9.17.2.3 Stormwater quantity - Flooding

The Project manages existing flood risk from the motorway by increasing the size of the existing culvert at the Caribbean Drive intersection with SH18 and replacing the existing naturally occurring watercourse (overland flow path) along SH18 with a concrete channel of the same capacity, but with increased velocity mitigated by outfall protection.

Stormwater management devices have been incorporated into the design of the Project to minimise (and where possible decrease) flooding on properties in addition to providing treatment.

The capacities of existing culverts are considered to be acceptable and therefore no mitigation or upgrades are required for those culverts being retained as enlarging them may lead to increased downstream flooding. In the event any culverts are found to be in poor condition as identified by CCTV and physical survey during the detailed design phase, they are to be replaced or repaired without being upsized. This will ensure that the downstream environment is not adversely affected.

9.17.2.4 Existing Auckland Council ponds

Due to locational requirements of the Project, three AC ponds within the Project area are to be removed. In order to mitigate the effects from their removal, the hydraulic performance of the stormwater system upstream and downstream of these three ponds is to be replicated via the proposed new stormwater wetlands and devices to minimise the effects to the receiving environment and the RWWTP ponds.

9.17.3 Summary

The proposed stormwater management system for the Project addresses both quality and quantity and has been selected using a BPO approach. The proposed stormwater devices include a combination of planted swales and wetlands, dry ponds, wet ponds and AC approved proprietary treatment devices.

The Project results in an overall increase in the volume of stormwater runoff generated during rainfall events in the Oteha and Lucas Creek catchments due to the increase in impervious areas. Unmitigated, the increase in runoff volume has the potential to increase downstream peak discharges during flood events, causing stream erosion and increased flood water levels.

As a result of the stormwater management controls proposed for the Project, the assessment in the Assessment of Stormwater Management shows that predicted increased flood levels will be no more than minor for nine identified properties and will decrease for a number of properties previously identified on flood maps and reporting as being at risk of flooding. The devices are also expected to result in a water quality improvement over the current situation.

The implementation of the proposed stormwater system design and consent conditions will ensure potential adverse effects associated with the Project are mitigated. Overall, the Project is expected to result in an improved situation with respect to stormwater quality over that which currently exists. A net benefit in terms of potential stormwater quality will result.



9.18 Effects of Encroachment on Rosedale Closed Landfill

Elements of the Project will encroach into the Rosedale Closed Landfill (an Auckland Council asset). An assessment of the Project works which encroach into the Rosedale Closed Landfill has been prepared by Riley Consultants Ltd. The Assessment of Effects – Corridor Encroachment on Rosedale Landfill is contained in **Technical Assessment 7**.

The Busway and SUP elements of the Project will encroach into the Rosedale Closed Landfill along the entire length of the site's western boundary (a length of approximately 475m). The proposed works may encroach up to 250m into the Rosedale Closed Landfill refuse mass itself. This will result in effects on some of the existing landfill infrastructure, particularly along the western edge of the Rosedale Closed Landfill where a series of gas pipes, leachate pipes, bores, manholes, and outlet pipes are located. There is also infrastructure related to the compliance monitoring network (subject to resource consents held by AC). An important consideration, discussed with AC, is the requirement for much of the landfill infrastructure needing to remain operational during the landfill aftercare phase and beyond (i.e. 30 to 50 years).

As noted in the Assessment of Effects – Corridor Encroachment on Rosedale Landfill, refuse within the western part of the Rosedale Closed Landfill adjacent to the Project works is likely to have been in place for at least 30 years. As such, it is expected that this area will have a lower gas generation potential. However, there is some more recent refuse in the north-western section of the Rosedale Closed Landfill where parts of the Project works including the SUP and the Busway are proposed.

The Landfill Reinstatement Concept, which has been the subject of detailed discussions with AC and ongoing refinement, aims to:

- Minimise excavation into refuse;
- ensure the removal of refuse from within/below the Busway and SUP alignment;
- provide a new sidewall liner;
- reinstate the affected landfill infrastructure and the landfill monitoring network; and
- Provide a two-tier system for preventing lateral migration of landfill gas.

The Rosedale Closed Landfill owner (AC) holds all consents associated with the on-going discharges to land, air and water. The aftercare management and monitoring of the Rosedale Closed Landfill is the responsibility of AC's CLCLR.

9.18.1 Effects

There will be a number of actual and potential effects associated with Project works encroaching on the landfill infrastructure. These actual and potential effects arise as a result of construction activities and during the operational phase.

9.18.1.1 Temporary effects during construction

Construction activities that require encroachment into the landfill infrastructure will result in potential short-term adverse effects in the vicinity of, and on, the Rosedale Closed Landfill itself. These effects have the potential to be significant if not carefully managed. These potential effects include the discharge of odour, the release of landfill gas, uncovering of hazardous materials, refuse, release of leachate, contaminated runoff, and the effects of the works on the stability of the Rosedale Closed Landfill itself.

The perforation of the existing Rosedale Closed Landfill cap will result in a release of landfill gas and odour into the atmosphere. The effects of odour on off-site receptors are potentially significant, with the nearest residential receptors being 400m to the east of the proposed works and the nearest commercial buildings being approximately 120m away. It is anticipated that carbon dioxide (CO₂) and



methane levels will be elevated at the ground surface. One of the main risks of working within levels of elevated CO₂ and methane is the risk of explosion hazards.

The effects on construction workers encountering hazardous materials or leachate within the refuse as a result of skin contact, ingestion or inhalation during excavation is considered to be a key issue that will require close management. Refuse may contain materials which contain human pathogens which could present a biological hazard to staff. Dust generated from excavations into the Rosedale Closed Landfill may result in adverse health effects due to the potential presence of heavy metals and other contaminants that have the potential to become airborne.

Leachate is currently collected via a leachate collection system and discharged as trade waste to the sewer. Any contaminated runoff from minor seepages through the Rosedale Closed Landfill cover are intercepted via perimeter drains and conveyed to the stormwater pond for treatment prior to discharge. Excavation into the refuse will result in perched leachate being released into the excavated area. Contaminated runoff could be generated from leachate coming into contact with surface water. Any discharges to land are potentially significant as excavated refuse has the potential to cross-contaminate other areas of land if not managed appropriately.

The excavations are likely to intersect zones of perched groundwater between the Rosedale Closed Landfill and the State highway. The majority of perched groundwater in the excavation is to be removed and very low rates of seepage through the cut face are expected during the excavation phase itself. The predicted effects of construction activities on the groundwater system within the Rosedale Closed Landfill are therefore expected to be negligible (refer to Section 7.2.10 of the Assessment of Effects – Corridor Encroachment on Rosedale Landfill).

Due to the nature of the Rosedale Closed Landfill, the effects of works on the stability of the Landfill are assessed as being a potentially significant issue if not managed through careful construction management practices. Instability could result in severe harm to construction workers and discharges to land, air and surface water.

9.18.1.2 Effects during operation

The actual and potential effects following completion of construction (the operational phase) include the potential lateral migration of landfill gas off-site and the associated potential effects on the regional groundwater system and perched groundwater layers.

Following construction and during the operation of the Project, it is also possible that migration pathways could potentially form to the lighting and underground services infrastructure to be installed as part of the Project. The Assessment of Effects – Corridor Encroachment on Rosedale Landfill concludes that the likelihood of such pathways forming is low given the nature of the retaining wall design proposed.

The addition of paved surfaces as a result of the Project will reduce recharge to the regional groundwater table, however due to the increase in impervious coverage being small in comparison to the total catchment, the effects will be negligible. The perched groundwater layer between the Rosedale Closed Landfill and the State highway will be removed as a result of the works and the land above this perched system will be replaced with paved surfaces limiting the likelihood of any notable perched groundwater reform. There are no users of the perched groundwater system at the Rosedale Closed Landfill nor any dependent ecological systems. Consequently, the predicted effects on groundwater once the Project is constructed will be negligible.

Once the design has been constructed and the resultant Rosedale Closed Landfill area capped, Landfill maintenance staff will not need to access the operational Project area with the exception of the area around Pond 7 at the north-western corner of the Rosedale Closed Landfill. This area is isolated from the resulting Rosedale Closed Landfill operational area and the operational Project area. Given



the design which has been developed, maintenance staff exposure to environmental influences following completion of construction/ operation is expected to be minimal. It is expected that normal health and safety procedures will be employed.

9.18.2 Mitigation

Section 8 of the Assessment of Effects – Corridor Encroachment on Rosedale Landfill describes the mitigation measures proposed to address the effects outlined above in both the construction phase and following completion of construction (i.e. the operational phase).

9.18.2.1 Construction effects mitigation

Specific construction management aspects and health and safety issues will be considered and addressed during detailed design and construction of the elements of the Project in the vicinity of the Rosedale Closed Landfill and those aspects associated with the landfill reinstatement works. These include:

- Preparation and certification of Landfill Construction Method Statements (LCMS) for all landfill reinstatement works;
- Preparation and certification of a Landfill Reinstatement Works Plan (LRWP) for the elements of the Project in the vicinity of the Rosedale Closed Landfill to address specific issues principally associated with refuse, leachate, and landfill gas management during construction (including a specific Landfill Health and Safety Plan (LHSP)); and
- Supervision of landfill reinstatement works by appropriately qualified and experienced persons.

Refuse that is required to be removed is to be disposed of at an off-site licenced waste disposal facility. This would be required to occur as soon as possible following excavation (depending on gas levels in the works area). This would include any excavated cover material or undercut material. Exposed refuse is to be managed to minimise potential odour effects. The contractor is to minimise odour by limiting the areas of exposed refuse as far as practicable. Refuse is not to remain on-site for more than eight hours and odour suppressant sprays and heavy tarpaulins shall be available on site and used where necessary to manage the potential odour risk. To further minimise odour effects, works in refuse material are to be closed/covered overnight and excavated refuse is not to be stockpiled on-site overnight.

Safety fences are to be erected around open work areas with health and safety procedures, as set out in the LHSP, to be followed if any refuse is exposed. In the event that material with potentially higher hazard levels than municipal refuse is identified, work is to cease immediately until the hazard has been investigated by a suitably qualified environmental scientist. AC's Resource Consenting and Compliance team is required to be informed immediately if hazardous material is identified.

Leachate that accumulates in excavations will not be suitable for discharge to the stormwater system. All groundwater and surface water that has come into contact with refuse is to be treated as contaminated, and therefore contained, collected, and removed by sucker truck for discharge at a licenced facility or via a trade waste discharge to the sewer.

Site specific measures will be included in the LRWP to control dust emissions during the construction period, particularly the potential effects on on-site and off-site receptors. Dust monitoring will need to include a provision for control of the release of asbestos fibre.

Asbestos management and removal measures will be prepared by the contractor (and included in the LRWP) prior to the disturbance of Rosedale Closed Landfill capping material in order to manage the risks associated with the potential presence of asbestos on the site. The LRWP will detail how the asbestos removal will be carried out (including the method of work used), details of the asbestos to be removed, a detailed description of the asbestos removal work area and air monitoring points, and details of the means of transport and disposal of asbestos waste.



Landfill gas released from the excavation may contain explosive concentrations of methane. In order to minimise the hazard no naked flames or hot work shall occur on-site while intrusive works are being undertaken, or in open excavations. No smoking will be allowed on site. Warning notices are to be posted in appropriate positions along with dry powder chemical or CO₂ type fire extinguishers being available. Continuous gas monitoring shall be undertaken at the ground surface in the intrusive works area during works. If oxygen and methane concentrations in these areas do not comply with the limits set out in the Assessment of Effects – Corridor Encroachment on Rosedale Landfill, works shall cease until such time as the limits are met. If explosive gas levels are found to be regularly in excess of the limits, improved engineering controls are to be employed to minimise the explosion hazard. In particular, the ventilation of confined spaces shall be used to help ensure that landfill gas levels are kept at a non-hazardous level.

As proposed to form part of the LHSP, Personal Protective Equipment is to be worn by all personnel in the works area including chemical resistant gloves and overalls until the refuse is removed. Care is to be exercised when using equipment to avoid the splashing of liquids. If water has ponded in an area it is to be pumped from the site for disposal at an approved facility. Any breaks in skin shall be disinfected immediately and covered.

9.18.2.2 Design to manage longer-term effects

In order to control gas migration within the Rosedale Closed Landfill and minimise the likelihood of gas migrating to the west from the site once reinstated, it is necessary to break the migration pathway between the source and the receptor. This is to be achieved by installing a two-tier gas migration barrier system adjacent to the SUP which consists of a low permeability barrier and a passive venting trench behind the barrier which will intercept landfill gas and leachate from migrating further west. The adoption of this method will ensure that any adverse effects of lateral gas migration during the operation of the Project will be less than minor.

9.18.3 Summary

There are significant risks associated with encroachment by the Project into the Rosedale Closed Landfill during construction with the potential for exposure of construction workers to hazardous materials including asbestos, the release of landfill gas, and effects relating to leachate. However, the adoption of a LRWP, LHSP and LCMS for dust, construction safety, landfill stability, odour, asbestos and gas monitoring will mitigate these risks and ensure there is no discharge of contaminants to stormwater, surface water, or groundwater. Leachate is to either be removed from the site or discharged as trade waste to the sewer. The Assessment of Effects – Corridor Encroachment on Rosedale Landfill concludes that the effects of operation of the Project on the Rosedale Closed Landfill are assessed to be negligible or less than minor with mitigation measures implemented and the implementation of the proposed conditions.

9.19 Surface Water Assessment

An Assessment of Surface Water Quality Effects (**Technical Assessment 12**) has been prepared by Pattle Delamore Partners to establish a baseline of existing surface water quality and flow within the Project area and to undertake an assessment of the effects of the construction and operation activities on surface water quality.

Baseline data was acquired from six sites within the Oteha Valley, Alexandra Stream and Lucas Creek catchments. Results were analysed against AC long term monitoring records, ANZECC (2000) guidelines and typical mature landfill leachate values.

As detailed at Section 7 of the Assessment of Surface Water Quality Effects, elevated values were recorded for zinc and copper, however there were no physical stressors of concern at the monitoring



sites. Water quality data was found to be representative of the existing urbanised stormwater catchments having roads, residential and industrial land use upstream.

The assessment concluded that there is no measureable influence of landfill leachate on the surface waters monitored.

9.19.1 Effects

Temporary effects during construction

Sediment is the key contaminant expected to be discharged to surface water during construction. The assessment of effects assumed that all construction sediment retention ponds would utilise chemical treatment.

AC's 2006 Contaminant Load Model was used to determine the predicted sediment load of discharges. The assessment predicted that the loads discharged to the Alexandra Stream and Lucas Creek will be smaller than those to the Oteha Stream via sites 1 and 2. The smaller area of disturbance within the catchments of Alexandra and Lucas Creeks are also more favourable and reduces the potential for adverse effects. The larger earthworks area within the Oteha Stream catchment contribute to predicted discharges having temporary greater sediment loads than what currently exist.

Effects during operation

Metals are expected to be the key contaminant to be discharged with stormwater during operation. The annual stormwater loads have been estimated for the current level of development within the Project area and compared to the proposed development which includes stormwater treatment detailed within the Assessment of Surface Water Quality Effects. With the proposed stormwater treatment devices installed and maintained, annual loads of TSS, zinc and copper from the Project are predicted to decrease. It is therefore predicted that overall quality of stormwater discharged from the Project area will improve which would contribute to enhancing water quality.

9.19.2 Mitigation

A CЕСCP is to be implemented throughout the construction phase of the Project as detailed in the Assessment of Construction Water Management. The CЕСCP must require all sediment retention ponds to utilise flocculants, where practical, and incorporate a regime of surface water discharge and freshwater quality monitoring consistent with Section 12 of the Assessment of Surface Water Quality Effects.

To further inform the water quality monitoring with the CЕСCP, as outlined in Section 11 of the Assessment of Surface Water Quality Effects, further baseline monitoring is recommended to be undertaken during the summer periods within the Lucas Creek, Alexandra Stream and Oteha Stream catchments for specific parameters.

9.19.3 Summary

With the implementation of the proposed mitigation, the effects of construction on water quality will be no more than minor.

During the operational phase, the proposed stormwater quality treatment of existing impervious areas is predicted to result in loads of key metals to be reduced. This will result in the Project having a net beneficial effect on stormwater quality and the receiving environment.

9.20 Air Quality Effects

An Assessment of Air Quality Effects (**Technical Assessment 1**) has been prepared by Golder Associates Ltd to assess the potential effects on air quality from the construction and operation of the Project. Reference has been made to the Ministry for the Environment (MfE) ambient (outdoor)



NES_{AQ} and to the AUP for the Auckland Ambient Air Quality Standards (AAAQS) in preparing this assessment.

9.20.1 Effects

9.20.1.1 Temporary effects during construction

Section 5 of the Assessment of Air Quality Effects identifies the main discharge into air arising from the proposed construction activities is particulate matter (dust). Combustion emissions from construction vehicles and machinery engine exhausts will also occur.

Construction support areas, haul roads, excavation and backfilling activities are most likely to generate dust. The potential adverse dust impacts of such activities can be exacerbated by weather conditions. Wind can make particulates airborne and carry them beyond the site and dry conditions can provide the potential particulates, particularly along exposed surfaces.

As outlined at Section 5 of the Assessment of Air Quality Effects, health effects are unlikely because fine particles less than 10 microns will constitute only a small fraction of dust emissions. However, if the Project were to be undertaken in an unmanaged or uncontrolled manner, there would be a moderate to high potential for dust to create amenity and nuisance effects and for such effects to be considered objectionable and/or offensive (albeit for a short period of time). Such effects are to a large extent location-specific within the Project area.

9.20.1.2 Effects during operation

A detailed technical assessment of the potential operational effects associated with the Project and network under a range of scenarios is provided at Section 8 of the Assessment of Air Quality Effects. The scenarios calculate ground level concentrations of pollutants discharged from the vehicles that are predicted to utilise the road system.

'With Project' scenarios have been compared with 'without Project' scenarios across a range of timeframes (2015, 2021, and 2031) and relative to current air quality standards.

This assessment shows that none of the relevant air quality standards are likely to be exceeded in any of the scenarios. A comparison of the 2021 'with Project' and 'without Project' scenarios shows that, with the Project being built, the concentration of pollutants at residential receptors is likely to remain at similar levels (Unsworth Heights) or increase slightly (Oteha). Between 2021 and 2031 the effects are likely to decrease over time as the effects of lower vehicle emissions outweigh the effect of increased vehicle numbers.

Section 8.5 of the Assessment of Air Quality Effects assesses the regional air quality effects of the Project. Overall, it is predicted that the Project is likely to result in a small net improvement to regional air quality relative to the Project not being built.

9.20.2 Mitigation

9.20.2.1 Construction effects mitigation

Potential adverse dust effects are responsive to a range of tested management and avoidance techniques that can be applied systematically such that mobilisation can be generally avoided and if not, then minimised. The staging of works can limit the extent of the areas generating potential effects at any one time. If a construction dust management methodology is instituted, potential adverse dust impacts can be avoided such that any resultant potential adverse impact is minor or less than minor.

As outlined at Section 6 of the Assessment of Air Quality Effects, it is recommended that the CEMP include the provision of a Construction Air Quality (Dust) Management Plan (CAQMP). The CAQMP would include measures to (so far as practicable):



- Reduce dust from the Project at any point beyond the designation boundary that borders a highly sensitive receiver;
- Ensure Total Suspended Particulate limits are maintained;
- Describe the works, anticipated processes and duration, and periods of time when dust might arise from construction activities;
- Identify highly sensitive receivers likely to be affected by dust emissions from the Project;
- Mitigate dust that might arise from ground disturbing activities and construction support areas;
- Undertake monitoring and reporting; and
- Communicate with stakeholders and handle complaints.

Note: the proposed conditions of consent refer to this document as a Dust Management Plan.

9.20.2.2 Operational effects mitigation

No mitigation is recommended for operational air quality effects of the Project.

9.20.3 Summary

Overall, with the mitigation proposed during construction, it is assessed that the Project effects on air quality are no more than minor.

9.21 Summary of effects

The Project has the potential to give rise to a range of potential adverse effects and these have been covered in the preceding assessment and in the Technical Assessments in **Volume 3**.

Potential construction noise and vibration is considered to be an effect that, while temporary, could have a significant effect on receivers for short durations. While there is the potential for adverse effects (many of them temporary in nature, particularly when staging is taken into account), a range of monitoring and mitigation measures have been recommended through the proposed conditions to ensure that these potential effects can be avoided, remedied or mitigated. In particular, standard construction mitigation measures will be implemented through a certified CEMP and a range of associated management plans. This will address and seek to avoid or minimise potential construction noise and vibration, traffic, earthworks, contamination, odour, water quality and ecological effects (terrestrial and freshwater).

From an operational perspective, the Project has been designed to ensure that the longer-term visual effects associated with larger structures and the corridor itself are mitigated to the extent practicable, through the requirement to adhere to design principles during detailed design and through planting, flooding effects are largely avoided and the on-going potential effects associated with the discharge of gas, odour and leachate from the Rosedale Closed Landfill are minimised.

The Project will bring significant benefits to the local and wider community through increased efficiency and capacity of the State highway network and Busway in the UHH and Albany area, improved walking and cycling facilities and through facilitating the delivery of improved recreation and reserve facilities for the wider community. Other benefits include improvements in the level of stormwater treatment associated with the increased impervious surface areas, which will greatly exceed the minimum requirements of TP10 and will also significantly improve the runoff quality from those existing today. In particular, proposed new stormwater management wetlands will result in vastly improved outcomes from an ecological habitat perspective to that existing in the Project corridor today.

Overall, while the Project will result in some short term temporary construction related effects, the longer term benefits that the Project will deliver, will result in an overall positive effect.



10 Proposed Measures to Avoid, Remedy or Mitigate Effects

10.1 Introduction

The assessment of actual and potential effects of the Project in **Section 9** has identified a variety of potential positive and adverse effects predicted to result from the construction and operation of the Project and also sets out measures to mitigate or remedy adverse effects where this is considered necessary.

The assessment of alternatives in **Section 7** discusses how the process for determining the Project design and proposed designations has led to the avoidance of various potential adverse effects. Potential adverse environmental effects may be further avoided or mitigated through the detailed design phase of the Project with the residual potential adverse effects requiring remediation or mitigation to ensure that they are appropriately managed throughout the construction and operation of the Project.

This Section summarises the mitigation, management and monitoring processes that are proposed prior to, during and post construction in order to avoid, remedy, or mitigate potential adverse environmental effects resulting from the Project.

10.2 Principles for Project delivery

The following principles form the basis for the development of the proposed conditions and management plans for the delivery of the Project:

- The construction and operation of the Project will use the best practicable options to avoid, remedy or mitigate adverse effects;
- All works are to be undertaken in compliance with current New Zealand standards and legislation;
- An integrated team approach has been and will continue to be used throughout development of the design and the methods to avoid, remedy or mitigate actual and potential effects. This means that no one particular discipline is more important than another; and
- Each technical specialist, consultant or contractor involved in the Project has equal responsibility to use best endeavours to avoid, remedy or mitigate adverse effects.

In addition to these principles, the methods used will seek to:

- Maintain on-going communication with AC who will be responsible for monitoring and enforcing conditions placed on the designations and resource consents sought;
- Maintain strong communication links with the directly affected landowners, Tangata Whenua, key stakeholders, affected landowners and the wider community; and
- Mitigate adverse effects during design and construction of the Project through which the above environmental principles will be implemented

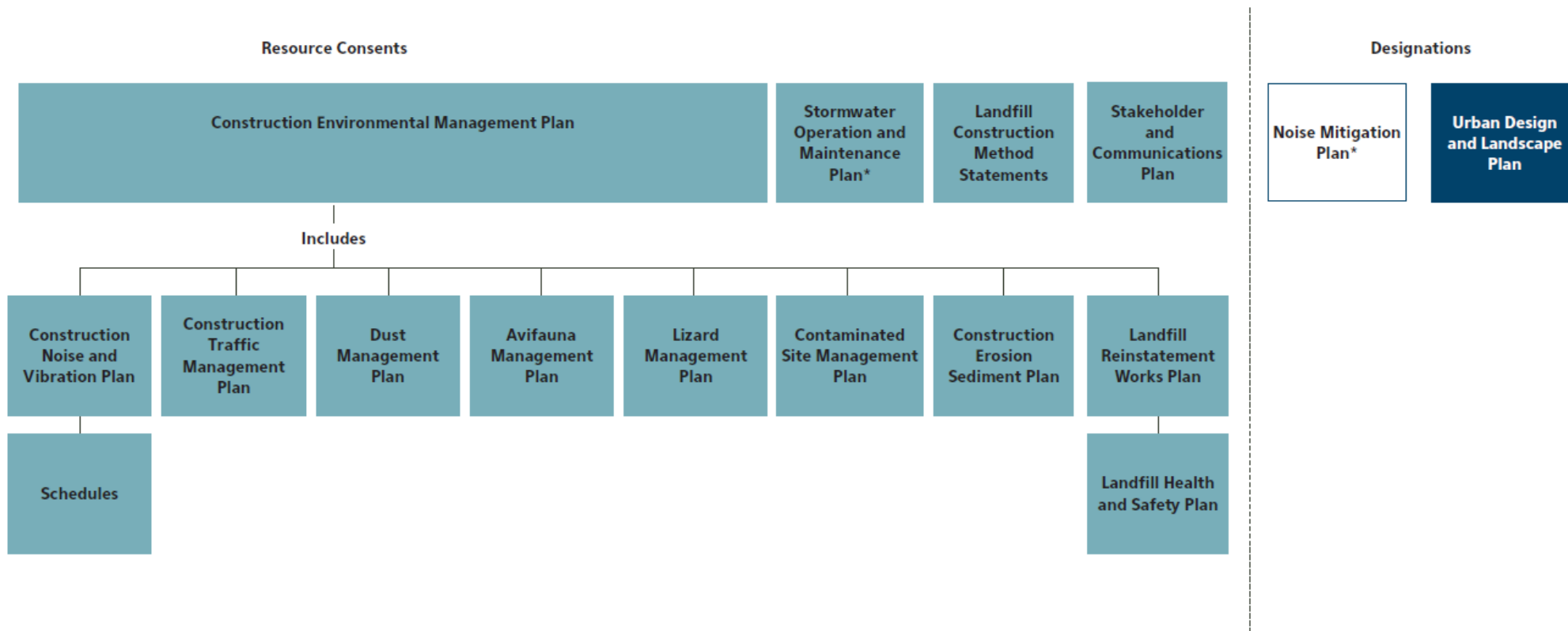
10.3 Methods to avoid, remedy or mitigate potential effects

The Project's design and methods to avoid, remedy and mitigate the potential adverse effects will be implemented through proposed designation conditions, Resource consent conditions and management plans.

- The proposed designation and resource consent conditions (provided at **Appendix A**) require the implementation of a suite of management plans.
- The proposed framework of management plans and their incorporation into the resource consent and designations conditions are illustrated in **Figure 50**.



Figure 50 Project Management Plan Structure



The draft conditions require:

- the management plans shaded blue to be provided to the Council for certification;
- the management plan shaded dark blue to be provided as part of the OPW.

* Indicates that the management plan regulates operation of the Project. All other management plans regulate construction only.



The CEMP will set out the overarching framework for how the environmental and social aspects of the project will be managed and measures to be employed to address the conditions of consent. Topic specific management plans, as appendices to the CEMP, consistent with the conditions of consent will detail specific risks and mitigation measures to be implemented prior to and during construction, including ongoing monitoring throughout the duration of the works. Plans for the longer term aspects following project completion are also specified.

10.3.1 Project stages and mitigation measures

The methods identified within the proposed conditions (NoR and resource consents), and proposed management plans/ plans can broadly be delineated between the three stages of project delivery:

- Pre-construction;
- Construction; and
- Operation.

10.3.1.1 Pre-Construction Mitigation Measures

Prior to the commencement of construction the following mitigation measures will be undertaken:

- Implementation of a Stakeholder and Communications Plan that would require engagement with stakeholders and establishment of a Community Liaison Group prior to commencement of construction;
- The draft CEMP will be provided to the IIG, and feedback sought during a hui;
- Additional baseline water quality and flow monitoring of Lucas Creek, Alexandra Stream and Oteha Stream Valley catchments;
- Undertake the following ecology surveys and or relocation programmes:
 - Avifauna nesting survey;
 - Lizards survey and relocation of identified specimens to habitat that will not be disturbed by the works; and,
 - Relocation of native fish and or eels located in watercourses that will be impacted by the works;
- Demarcating areas that are ecologically sensitive and not to be impacted by the works; and
- Completion of a Noise Mitigation Plan to confirm that the detailed design noise mitigation options meet the requirements of standards mandated by the conditions of Designations.

10.3.1.2 Construction Mitigation Measures

During the construction phase, the following will be implemented to mitigate actual and potential effects:

- Construction Environmental Management Plan, including:
 - The following sub plans as appendices:
 - Construction Noise and Vibration Management Plan;
 - Construction Traffic Management Plan;
 - Dust Management Plan;
 - Lizard Management Plan;
 - Avifauna Management Plan;
 - Contaminated Site Management Plan;
 - Construction Erosion and Sediment Control Plan;
 - Landfill Reinstatement Works Plan, which includes the Landfill Health and Safety Plan;
- Accidental discovery protocols;



- Landfill Construction Method Statements;
- Stakeholder and Communications Plan;
- Noise Management Plan; and
- Urban Design and Landscape Plan (to support OPWs).

10.3.1.3 Operational Mitigation Measures

Following the completion of the works and commissioning, compliance will be required with the following:

- Maintenance and treatment requirements for stormwater wetlands and devices consistent with a Stormwater Operation and Maintenance Plan;
- On-going maintenance of landscaping proposed as part of the Project under the Urban Design and Landscape Plan and Planting Plan; and
- The requirements of the Noise Mitigation Plan including maintenance of noise barriers and reporting.

10.4 Summary of Proposed Mitigation

To avoid, remedy or mitigate the adverse effects on the environment, the Project has adopted a process of initially utilising engineering design where feasible and, where residual effects remain, implementing a management plan framework.

The implementation of the management plans is to be required by the proposed resource consent conditions, the contents of which will ensure that the potential adverse effects that may arise from the construction of the Project will be adequately avoided, remedied or mitigated to a level necessary to achieve the purpose of the RMA.

Effects resulting from the operation of the Project are the subject of the proposed conditions on the NoRs.

Table 38 provides a summary of proposed mitigation of effects addressed through engineering design and management approaches. These effects could be further reduced during the detailed design phase of the Project.

Table 38 Summary of Mitigation of Effects

Effect	Mitigation	
	Engineering Design	Management approach
Preconstruction		
Terrestrial and Aquatic Ecology	Demarcation of disturbance areas prior to construction.	<ul style="list-style-type: none"> ■ Pre-construction ecology surveys and relocation of identified fauna; and ■ Water quality and flow baseline monitoring.
Cultural and Social	Minimise potential work within known culturally sensitive areas and private landholding.	Implementation of a Stakeholder and Communications Plan.
Construction		
Archaeology	Avoidance of known archaeological sites.	Implementation of an Accidental Discovery Procedure protocol included within the CEMP.
Air Quality/Dust		Implementation of: <ul style="list-style-type: none"> ■ Dust Management Plan.
Noise	Acoustic attenuation barriers to be constructed at specific locations.	Implementation of a Construction Noise and Vibration Management Plan.



Effect	Mitigation	
	Engineering Design	Management approach
Vibration		Implementation of a Construction Noise and Vibration Management Plan.
Transportation	<p>Temporary reduced speed limits and lane widths.</p> <p>Temporary parking spaces provided for Busway.</p> <p>Construction of a replacement McClymonts Road Bridge offline.</p>	Implementation of a Construction Traffic Management Plan.
Construction Water	<p>Temporary and permanent erosion and sediment control devices.</p> <p>Temporary and permanent surface water diversions.</p>	Implementation of a Construction Erosion Sediment Control Plan.
Terrestrial Ecology	<p>Design to avoid or minimise disturbance to ecologically sensitive areas.</p> <p>Implementation of stormwater treatment measures.</p>	<p>Implementation of:</p> <ul style="list-style-type: none"> ■ CEMP; ■ an Avifauna Management Plan; and ■ a Lizard Management Plan.
Freshwater Ecology	Fencing off proposed work areas.	Implementation of a Construction Erosion Sediment Control Plan.
Land contamination	Undertake a Detailed Site Investigation.	Implementation of a Contaminated Site Management Plan.
Rosedale Closed Landfill	Refuse removal and disposal to off-site licensed waste disposal facilities.	<ul style="list-style-type: none"> ■ Implementation of a: <ul style="list-style-type: none"> ■ Landfill Reinstatement Works Plan; ■ Landfill Health and Safety Plan; and ■ Landfill Construction Method Statements.
Social	NZ Transport Agency will acquire directly affected premises and will continue its Business Resettlement Assessment Strategy.	Implementation of a Stakeholder and Communications Plan.
Cultural	<p>Minimisation of disturbance areas</p> <p>Relocation of fish and eels within waterbodies impacted by the Project.</p>	<p>Implementation of:</p> <ul style="list-style-type: none"> ■ A Stakeholder and Communications Plan; and ■ An Accidental Discovery protocol.
Operation		
Noise	<p>Implementation of OGPA on new road surfaces along the main alignment.</p> <p>Dense asphalt on new road surfaces along ramps.</p> <p>Installation of noise attenuation barriers at specific locations.</p> <p>Installation of building modifications at receivers, if required.</p>	Implementation of a Noise Mitigation Plan.
Stormwater	<p>Permanent stormwater treatment devices.</p> <p>Permanent stormwater detention devices to manage flow and flood risk.</p>	Implementation of a Stormwater Operation and Maintenance Plan.



Effect	Mitigation	
	Engineering Design	Management approach
Freshwater Ecology	Permanent stormwater treatment devices.	Implementation of a Stormwater Operation and Maintenance Plan.
Landscape and Visual	Maintenance of planting.	Implementation of: <ul style="list-style-type: none"> An Urban Design and Landscape Plan consistent with the guiding principles identified in the indicative Urban Design Landscape Framework.
Rosedale Closed Landfill	Implementation of a two-tier gas migration barrier system as part of the works.	Assisting Auckland Council to alter the conditions of its existing resource consents, if necessary.
Cultural	Permanent stormwater treatment devices. Maintenance of indigenous plantings.	Implementation of a: <ul style="list-style-type: none"> Stormwater Operation and Maintenance Plan; and An Urban Design and Landscape Plan consistent with the guiding principles identified in the indicative Urban Design Landscape Framework.



11 Assessment of Planning Documents

11.1 Introduction

The planning documents relevant to the NoRs and resource consents are as follows:

- National Policy Statement for Freshwater Management 2014 (NPS_{FM});
- National Policy Statement on Electricity Transmission 2008 (NPS_{ET});
- National Environmental Standards for Electricity Transmission Activities (NES_{ETA});
- National Environmental Standard for Air Quality (NES_{AQ});
- National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES_{Soil});
- Auckland Unitary Plan Operative in Part (AUP).
- Auckland Council Regional Policy Statement (ACRPS)
- Auckland Regional Plan: Air, Land and Water (ACRP:ALW)

These identified documents contain a number of objectives and policies relevant to the Project. For reference, the relevant objectives and policies are contained within **Appendix D** of this AEE. Additional discussion and assessment has been undertaken against the relevant non-regulatory documents at **Sections 2 and 3** as referenced in **Section 11.10** below.

The following assessment demonstrates that the Project is consistent with the relevant planning documents in accordance with sections 171(1)(a), 104(1)(b), 104C, and 104D(1)(b) of the RMA.

11.2 National Policy Statement for Freshwater Management

The NPS_{FM} is about recognising the national significance of freshwater for all New Zealanders and Te Mana o te Wai. The NPS_{FM} is primarily relevant to developing regional plans but is also a matter to consider when assessing regional resource consents involving water takes and discharges. The NPS_{FM} contains policies and objectives grouped into the following relevant topics:

- Water quality (A);
- Water quantity (B);
- Integrated management (C);
- Accounting for freshwater takes and contaminants (CC); and
- Tangata whenua roles and interests (D).

11.2.1 Water quality

The following water quality provisions are of particular relevance to the Project:

- Objective A1 states:
 - To safeguard:*
 - a) *the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
 - b) *the health of people and communities, at least as affected by secondary contact with fresh water;*
 - in sustainably managing the use and development of land, and of discharges of contaminants.*
- Objective A2 states:



The overall quality of freshwater within a region is maintained or improved while:

- a) *protecting the significant values of outstanding freshwater bodies;*
- b) *protecting the significant values of wetlands; and*
- c) *improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

The NPS_{FM} provides for a staged implementation programme over which time councils are required to include objectives and policies in their plans to reflect the stated objectives. The relevant policies have been incorporated into the AUP and are discussed under Chapter E1 below. The interim freshwater quality guideline will be replaced by more comprehensive water quality and quantity objectives and limits to be developed with communities in accordance with the NPS_{FM} and subsequently given effect to through changes to the AUP.

Section 10 outlines the methods proposed to treat stormwater prior to discharge, which will be achieved by diverting stormwater to stormwater wetlands, in conjunction with the use of treatment and conveyance swales and devices. Treatment of stormwater for 99% of new and existing HUR will lead to an improvement of the water quality of discharges. During the operational phase, the proposed enhanced stormwater quality treatment of existing impervious areas will result in the overall loads of key metals from the Project's impervious areas being reduced. This means the Project will have a net beneficial effect on stormwater quality and the downstream water quality. However, given the larger loads of contaminants from the wider catchments, any net positive change in water quality at the baseline monitoring sites is likely to be minor.

Construction water management will adopt an approach that provides certainty that the construction activities can occur with minimal sediment discharges and associated construction related effects to the extent that water quality will be maintained and at a minimum will meet the requirements of the NZ Transport Agency Guideline and TP90.

As described in **Section 9.15**, the aquatic ecology values within the Project area are considered to have a range of values from very low to moderate. It is considered that any potential adverse effects can be appropriately mitigated to a less than minor effect, following sediment control and ground stabilisation, fish recovery and relocation, and riparian planting.

11.2.2 Water quantity

Construction of the Project will require dewatering and groundwater diversion. The following water quantity objective is of relevance to the Project:

- Objective B1 states:

To safeguard the life-supporting capacity; ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming or diverting of freshwater.

As outlined in **Section 10**, the Project proposes a Construction Water Management Plan to safeguard the life-supporting capacity of freshwater and of the associated ecosystem during water diversion and the taking of water during construction. The taking and diverting of groundwater during construction is principally to dewater areas to improve access and avoid adverse effects on water quality during earthworks and construction of structures. These effects will be temporary and the discharge of this water will recharge these water resources with a minimal effect on water quantity. During the operation phase of the Project, water quantity will be managed through the stormwater wetlands and stormwater devices with water retained within the catchment. Overall, it is considered that the Project is consistent with the overall intent of the NPS_{FM} in relation to water quantity and its objectives relating to water quantity.



11.2.3 Tangata whenua roles and interests

Part D of the NPS_{FM} contains the following objective:

To provide for the involvement of iwi and hapu, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement have been given effect to.

Part D requires local authorities to take reasonable steps to work with iwi and hapu and to reflect tangata whenua interests (Policy D1). While the NPS_{FM} requires actions to be taken by councils to develop policies (rather than requiring actions by requiring authorities and applicants for consents and approvals), it is relevant to highlight that the Project has been developed in consultation with tangata whenua, including in terms of how the Project may affect freshwater systems and terrestrial habitats. Feedback from Mana Whenua at Project hui included discussions on avoiding effects on natural areas and waterways such as the Oteha Valley as discussed in **Section 8.7.6**. A series of baseline assessments were presented to Mana Whenua included stormwater, water quality, and freshwater, ecology. Mana Whenua have made suggestions for amendments to draft conditions and matters to be included in the management plans that are of relevance to water management and these are being considered by the NZ Transport Agency.

11.3 National Policy Statement on Electricity Transmission

The NPS_{ET} sets out the objective and policies to enable the management of the effects of the electricity transmission network under the RMA. It recognises the crucial role that the efficient transmission of electricity plays in the well-being of New Zealand and that its characteristics create challenges for its management under the RMA.

- The objective of NPS_{ET} is:

To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:

- *managing the adverse environmental effects of the network; and*
- *managing the adverse effects of other activities on the network.*

Policies 10 and 11 seek to manage the potential adverse effects of third party activities on the transmission network. The Project affects Transpower's transmission lines along SH18. Transpower has been consulted and various options to address the potential impacts of the Project on the transmission lines are currently being worked through by Transpower and the NZ Transport Agency. Accordingly, it is considered that the Project is consistent with the NPS_{ET} and its objective and policies.

11.4 National Environmental Standards for Electricity Transmission Activities

The NES_{ETA} contains regulations relating to the operation, maintenance, upgrade, relocation or removal of existing transmission lines and permits or controls these activities. No work is proposed in relation to Transpower's underground transmission line within the Project area (as the current proposal is to culvert over the top of it). If any additional work is required, this will be undertaken in conjunction with Transpower and consent under the NES_{ETA} will be sought if necessary.



11.5 National Environmental Standards for Air Quality

Regulation 13 of the NES_{AQ} sets the ambient air quality standards and the requirements for management of air quality within identified air sheds. It is the responsibility of Regional Councils to manage air quality and to comply with the Regional Air Quality targets for their airshed(s).

No consents are required under the NES_{AQ} as the operational pollutant concentrations from the Project will be below the relevant standards. However, the NES_{AQ} has informed the assessment of construction and operational air quality effects and the proposed mitigation measures outlined in **Section 9** and **Section 10**. This assessment concluded that potential dust effects can be effectively managed through mitigation measures and the implementation of a dust management plan that will ensure that compliance is achieved with the Total Suspended Particulate (TSP) limits. Accordingly, the potential adverse air quality effects arising from the Project will be suitably avoided or mitigated in accordance with NES_{AQ}.

11.6 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The NES_{Soil} provides a mix of permitted activities and resource consent requirements for certain activities on land affected or potentially affected by contaminants in soil.

Regulation 5(7) of the NES_{Soil} states that these regulations apply to land where an activity or industry scheduled in the HAIL is being, or has been, undertaken on that land. The NES_{Soil} provides a nationally consistent set of planning controls and soil contaminant values, and ensures that land affected by contaminants is appropriately identified and assessed prior to development, and if necessary the land is remediated to make it safe for human use.

Given the extent of the Project and the urban nature of the existing environment, a precautionary approach has been taken to the potential existence of contamination. A PSI has been undertaken in accordance with Regulation 6 which has informed the Assessment of Land Contamination Effects (**Technical Assessment 6**). The PSI has identified a number of locations within the Project area where there is some basis for an activity or industry listed in the HAIL to be assumed as having been undertaken. Further sampling of these identified sites will be undertaken in accordance with Regulation 8(2) as part of the preparation of a DSI during the detailed design phase.

Land use consent is required under Regulation 11 of the NES_{Soil} as a discretionary activity. The NES_{Soil} sets out controls and standards to manage soil disturbance on contaminated land and potentially contaminated land. A draft CSMP has been prepared to support this resource consent application which outlines the soil management protocols that will be implemented and will ensure that all potential risks will be appropriately managed.

The potential impacts of the Project on the Rosedale Closed Landfill has been assessed separately in Assessment of Effects – Corridor Encroachment on Rosedale Landfill (**Technical Assessment 7**) and it is proposed to manage these effects through the LRWP and the LHSP as further discussed in **Section 9.18** and confirmed in the draft conditions described in **Section 10**.

11.7 Auckland Unitary Plan Operative in Part

On 15 November 2016, AC gave public notice that it had resolved to make parts of the Proposed Auckland Unitary Plan 'operative in part'. At the same time AC issued an annotated version of the AUP that identifies those provisions that are operative, and those that are subject to appeal to the High Court or the Environment Court. In addition, the regional coastal plan provisions are not yet operative the AUP since these are yet to be confirmed by the Minister of Conservation.



All rules relevant to the Project (regional plan and district plan) are operative. The relevant objectives and policies of the AUP that are subject to appeal (regional policy statement and regional plan) relate to Urban Growth and Form, Vegetation Management and Biodiversity, Natural Hazards and Flooding, and Significant Ecological Areas. The Project team's analysis of the appeals has indicated that they only affect the following objectives and policies that are relevant to the Project:

- Objectives: Urban Growth and Form (**B2.5.1.1**)
- Policies: Urban Growth and Form (**B2.2.2.4**)
- Policies: Significant Ecological Areas Overlay (**D9.3.1, D9.3.2, D9.3.6**)
- Policies: Vegetation management and biodiversity (**E15.3.2, E15.3.4, E15.3.7**)
- Policies: Natural hazards and flooding (**E36.3.1**)

The corresponding objectives and policies from the ACRPS and the ACRP:ALW have been identified and an assessment made.

11.7.1 Regional Policy Statement

The RPS forms Chapter B of the AUP and sits above the suite of regional and district planning provisions. The purpose of the RPS, under section 59 of the RMA, is to “achieve the purpose of the Act by providing an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region”.

The RPS contains nine issues of regional significance for resource management in Auckland. The following issues are relevant to the Project:

- Infrastructure, transport and energy;
- Issues of significance to Mana Whenua;
- Natural resources; and
- Environmental risk.

11.7.1.1 B2 Urban growth and form

Chapter B2 of the RPS states that growth needs to be provided for as the demand for housing, employment, business, infrastructure, social services and services increases. The objectives and policies of Chapter B2 are relevant insofar as infrastructure is required to support the growth of the Region and are therefore the Project indirectly supports these objectives.

Objective in B2.2.1 aims to achieve a quality compact urban form that enables, amongst other things, better use of existing infrastructure and efficient provision of new infrastructure. The Project will be consistent with both these objectives since it will result in the upgrading of SH1 and SH18, the provision of new busway and new SUP facilities that will support compact urban growth.

Policy B2.2.2.4 focuses on achieving a quality compact urban form within the metropolitan area 2010 and enabling growth within the Rural Urban Boundary. The Project is consistent with, and supports, this policy since it provides for capacity improvements and multi-modal transport choices within the Rural Urban Boundary.

Objective B2.7.1 and the relevant corresponding policies in B2.7.2 aim to ensure that the recreational needs of people are met through the provision of a range of quality open space and recreation facilities. Policy B2.7.2.7 states that significant adverse effects of land use or development on open spaces and recreation facilities are to be avoided, remedied, or mitigated. The Project will result in the



loss of some open space in Rosedale South Park in order to accommodate the new SH1/SH18 ramps. In addition, several stormwater wetlands will be located on existing Council reserves. As set out in **Sections 9.9** and **9.10** of this AEE conclude that the potential for significant adverse effects on open spaces and the NHHS will be mitigated through:

- A Reserve Reinstatement package to be agreed with AC to ensure remediation and return to public use in an effective and efficient manner;
- The design of the stormwater management wetland at either Bluebird Reserve or Rook Reserve be progressed in agreement with AC such that it provides an additional amenity area within the reserve, and meets public safety requirements; and
- A specific mitigation package during construction and a permanent mitigation solution following the completion of construction to offset the effects on the hockey recreation facilities.

The proposed SUPs will also provide better connections between existing open spaces along the length of the Project as well as providing safer walking and cycling facilities and more direct connectivity for pedestrians and cyclists. Therefore, the Project appropriately provides for the recreational needs of people.

11.7.1.2 B3 Infrastructure, transport and energy

Chapter B3 recognises that realising Auckland's full economic potential will need to address, amongst other things, the efficient development, operation, maintenance and upgrading of infrastructure and traffic management (B3.1 Issues).

The infrastructure objectives (B3.2.1) focus on ensuring that the benefits of infrastructure are recognised while managing the adverse effects of the development of that infrastructure. Specific recognition is given to the 'functional and operational needs' of infrastructure, and the explicit identification of the necessity to locate in a particular environment when the operational functionality of the infrastructure requires that it be located in that environment.

Policies B3.2.2.1, B3.2.2.2, B3.2.2.3, B3.2.2.6, and B3.2.2.8 enable the development of infrastructure in a way that:

- Provides for the efficient development, operation, maintenance and upgrading of infrastructure;
- Recognises the value of investment in existing infrastructure;
- Recognises the locational requirements of infrastructure by recognising a functional or operational need to be located in sensitive areas;
- Enables infrastructure within sensitive areas whilst ensuring that the adverse effects on values can be avoided, remedied or mitigated; and
- Avoids, remedies or mitigates the adverse effects from the construction, operation, maintenance, or repair of infrastructure.

The Project relates, in part, to improvement of existing infrastructure, this being SH1 and SH18 and an extension to the Busway.

Given the existing location of SH1, SH18 and the Busway, parts of the Project are required to be in areas identified in the AUP as SEAs due to existing locational constraints and lack of feasible alternatives. The methods to avoid, remedy or mitigate adverse effects are outlined in **Section 9** of this AEE. In terms of sensitive areas, vegetation removal within the two SEAs within the Project area is small in area and has been minimised to the greatest extent possible. Extensive replanting is proposed to mitigate the effects of vegetation removal and measures will be implemented to protect nesting birds. The Project represents the efficient development and upgrading of infrastructure and will be consistent with the objectives and policies by mitigating adverse effects in this way.



Transport objective, Objective B3.3.1.1, aims to ensure the development of an effective, efficient and safe transport network that:

- Supports the movement of people, goods and services;
- Integrates with and supports a quality compact urban form;
- Enables growth;
- Avoids, remedies or mitigates adverse effects on the quality of the environment and amenity values and the health and safety of people and communities; and
- Facilitates transport choices, recognises different trip characteristics and enables accessibility and mobility for all sectors of the community.

The Project is consistent with this objective and the supporting policies in B3.3.2 as follows:

- This multi-modal project involves the upgrade of SH1 and SH18 as well as a new busway extension and SUP (B3.3.2.1);
- The additional lanes along SH1 and the provision of the connections between SH18 and SH1 will result in efficiency gains throughout the Project area and enhance the capacity and efficiency of movement for people and freight travelling within Auckland and to the north (B3.3.2.2);
- The proposed extension to the Northern Busway will allow for modal choice and increased movement of people and integration with employment and commercial centres; and,
- The proposed SUP will provide effective pedestrian and cycle connections (B3.3.2.4).

In addition, Policy B3.3.2.7 requires the adverse effects associated with the construction or operation of transport infrastructure on the environment and the community to be avoided, remedied or mitigated. **Section 9** of this AEE provides an overview of the potential effects of the Project and **Section 10** outlines the methods to avoid, remedy or mitigate adverse effects.

11.7.1.3 B6 Mana Whenua

Chapter B6 of the RPS addresses the importance of Mana Whenua values and recognises the relationship of Mana Whenua with natural and physical resources including freshwater, land and air.

The objectives in B6.3.1 seek to ensure that:

- Mana Whenua values, matauranga and tikanga are properly reflected and accorded sufficient weight in resource management decision making;
- The mauri of, and relationship of Mana Whenua with, natural and physical resources are enhanced overall; and
- The relationship of Mana Whenua with the matters scheduled in the AUP is recognised and provided for (there are no scheduled Mana Whenua sites within the Project area).

In particular, Policy B6.3.2.3 aims to ensure that Mana Whenua values are considered in any assessment of environmental effects. The consultation undertaken with Mana Whenua for this Project is outlined in **Section 8** Consultation. Regular hui have been held with Mana Whenua and will continue to be held throughout the detailed design phase of the Project. Cultural Values Assessments have been produced by several iwi groups which have emphasised the desire to act as kaitiaki for the natural environment, particularly the natural watercourses and areas of valued vegetation within the Project area.

Policy B6.3.2.4 recognises the need to integrate Mana Whenua values into the management of natural and physical resources. As outlined above, extensive engagement with Mana Whenua has occurred throughout the development of the Project and has fed into the development of the design for the Project. In particular, concerns about the intrinsic values of Lucas Creek and the taniwha located there



have influenced decision-making around the design of the Project north of the Oteha Valley Interchange.

In accordance with Policy B6.3.2.6, consultation with Mana Whenua has assisted the Project team in understanding the potential impacts of the Project on Mana Whenua values including kaitiakitanga, mauri and customary activities. **Section 9.11** also provides further information on the effects raised by nine Mana Whenua groups, and how they are to be mitigated through:

- Mitigation planting;
- Retention of riparian planting as far as possible at Lucas Creek and Alexandra Stream;
- Stormwater treatment;
- Construction water management; and
- Management of leachate and construction activity at the Rosedale Closed Landfill.

11.7.1.4 B7 Natural resources

The RPS acknowledges that urban growth and past practices have placed pressure on land and water resources, and reduced air quality and that the pressures of natural resources need to be managed to ensure environmental, social, economic and cultural well-being (B7.1 Issues).

11.7.1.5 B7.2 Indigenous Biodiversity

Objectives B7.2.1.1 and B7.2.1.2 focus on ensuring that:

- Areas of significant indigenous biodiversity value are protected from the adverse effects of subdivision, use and development; and
- Indigenous biodiversity is maintained through the protection, restoration and enhancement of areas where ecological values are degraded or where development is occurring.

Aquatic and terrestrial ecological values have been assessed, as discussed in **Section 9.15** and **Section 9.16** respectively. Those values are generally low given the urbanised nature of the catchment. The RWWTP supports important avifauna populations including the Threatened New Zealand dabchick but adverse effects on avifauna there, and elsewhere in the Project area, can be effectively managed during the construction phase of the Project, and the new wetlands in the area will further improve local habitat during operation. Vegetation (flora) and fauna (including lizards, birds and long-tailed bats) have the potential to be present within the Project area. Conditions requiring the following management plans will ensure effects on indigenous biodiversity will be appropriately avoided, remedied, or mitigated, and therefore indigenous biodiversity will be maintained:

- CEMP;
- Avifauna Management Plan;
- Lizard Management Plan; and
- Urban Design and Landscape Management Plan.

The relocation of native fish populations affected by the Project works will also be required.

Policy B7.2.2.5 aims to avoid adverse effects on areas scheduled as SEAs. Two SEAs are affected by the Project:

- SEA_T_8364 – Pond 1, RWWTP; and
- SEA_T_8365 – Pond 2, RWWTP.

Works within SEA_T_8364 and SEA_T_8365 include new stormwater ponds, stormwater connections and works to the causeway. The ecological survey found that the terrestrial values within these SEAs



are low. While a relatively large population of birds is present, the population is acclimatised to the existing urban environment including activities at the RWWTP, the motorway and the adjacent Helitransz heliport. Therefore, the risk of the bird population being adversely affected by the Project is negligible. A bird survey is proposed prior to the commencement of work to re-confirm nesting locations. Conditions are also proposed to avoid effects on potential nesting areas.

Minor works are proposed adjacent to SEA_T_8082 (Alexandra Stream) including vegetation clearance to accommodate required work on the stormwater outfalls. Any required vegetation removal can be mitigated through mitigation planting. In addition, SEA_T_8297 (Lucas Creek), is located proximate to works being undertaken as part of the Project but is not affected by those works.

11.7.1.6 B7.3 Freshwater Systems

Objective B7.3.1.1 requires degraded freshwater systems to be enhanced, Objective 7.3.1.2 requires the loss of freshwater systems be minimised and Objective 7.3.1.3 requires the adverse effects of changes in land use on freshwater to be avoided, remedied or mitigated. Policies B7.3.2.1, B7.3.2.5, and B7.3.2.6 follow from these objectives in requiring development in lakes, rivers and streams to, amongst other things:

- Control the use of land and discharges to minimise the adverse effects of runoff on freshwater systems and progressively reduce existing adverse effects where those systems or water are degraded;
- Avoid development where it will significantly increase adverse effects on freshwater, unless these adverse effects can be adequately mitigated;
- Avoid the permanent loss and significant modification or diversion of lakes, rivers, streams (excluding ephemeral streams), and wetlands and their margins;
- Minimise erosion and modification;
- Limit the establishment of structures within those waterbodies to those that have a function need or operational requirement to be located there;
- Maintain or where appropriate enhance freshwater systems not protected under management areas;
- Maintain or where appropriate enhance existing riparian vegetation;
- Maintain or where appropriate enhance areas of significant indigenous biodiversity; and
- Restore and enhance freshwater systems where practicable when development, change of land use, and subdivision occur.

The stream to the south of Pond 1 is to be removed. As has been noted in Section 6.1.1, while the watercourse in this location is a highly modified stormwater drainage channel, there is an argument that it falls within the definition of 'stream' within the AUP because there was originally a watercourse in this approximate location within the catchment. A conservative approach has therefore been adopted and the watercourse has been treated as a 'stream'. Under Policy B7.3.2.4 the permanent loss of water bodies is to be avoided unless no practical alternative exists, the adverse effects are mitigated, and if they cannot be adequately mitigated environmental benefits including on-site or off-site works are provided. There are no feasible alternatives that would retain these channels given the existing location of SH18 and the difficulty of culverting the streams under a large embankment at a significant depth. The ecological values of the channel are very low and there will be on-site benefits through the creation of a new stormwater pond (wetland) in this location. The measures to avoid, remedy, or mitigate adverse effects on freshwater environments already outlined above including improvement in the quality of stormwater discharges and measures to prevent erosion and scour at the new outfalls, will ensure the remaining objectives and policies are achieved.



New structures are proposed in the following waterbodies:

- A widening of the crest of the existing causeway structure within Ponds 1 and 2 (Ponds 1 and 2 fall within the definition of 'lake' in the RMA);
- New outfall structures in Lucas Creek, Oteha Valley Stream and Alexandra Stream; and
- Three new culverts (Oteha Valley Road and Caribbean Drive) and the extension of various existing culverts.

The CESCPS will minimise erosion and modification of waterbodies in the Project area during construction, and riparian planting will enhance the habitat value of streams and their margins. It is necessary to locate these structures at the identified locations due to the existing topography and natural water flows. The outfall structures are designed to avoid erosion and will likely improve the current unmanaged flows within this urbanised area.

Policy B7.3.2.6 requires the restoration and enhancement of freshwater systems where practicable when development occurs. As outlined above, mitigation planting will be carried out where work within streams is to occur and the new stormwater ponds will provide additional habitat.

11.7.1.7 B7.4 Coastal water, freshwater and geothermal water

Objective B7.4.1.2 requires the maintenance of the quality of freshwater and coastal water where it is excellent or good and progressive improvement over time where it is degraded. Objective B7.4.1.4 relates to the adverse effects of point and non-point discharges on water resources, and Objective B7.4.1.6 to the mana whenua values of these water resources. The Project has the potential to impact on freshwater, but as outlined in **Section 9.17** and **Section 9.19** of this AEE, the water quality is of low to moderate value and there will be an overall improvement relating to the quality of stormwater discharges from the Project area and water quality of surface water as a consequence of the stormwater management system proposed. In this way, the Project will meet the objective of progressively reducing existing adverse effects on the freshwater receiving environment. For this reason, the Project is also consistent with Policy B7.4.2.7(b) and (c). During construction the potential for non-point source discharges will be managed through the CESCPS. As a consequence, the Project is consistent with these policies. Further discussion of mana whenua values associated with freshwater resources is also set out in **Section 11.7.1.3** above.

Policy B7.4.2.1 is relevant in that it relates to controlling the use of land and discharges to minimise the adverse effects of runoff on water, and to avoid development where it will significantly increase adverse effects on freshwater, unless they can be adequately mitigated. For the reasons outlined above in Section 11.2, the Project is consistent with this policy.

Policy B7.4.2.8 requires the minimisation of the loss of sediment from development and the management of discharges into freshwater by promoting management measures to retain sediment and requiring the use of industry best practice, having regard to the nature and scale of the activity and the sensitivity of the receiving environment. The Assessment of Construction Water Management (**Technical Assessment 4**) identifies a range of techniques available to the NZ Transport Agency that will ensure that potential sediment lost into watercourses will not result in significant adverse effects. The Assessment of Surface Water Quality Effects (**Technical Assessment 12**) and Assessment of Freshwater Ecological Effects (**Technical Assessment 5**) conclude that the anticipated sediment levels are within the tolerances of the receiving environment.

Policy B7.4.2.9 requires the management of stormwater to:

- Minimise the generation and discharge of contaminants and minimise adverse effects on freshwater and the capacity of the stormwater network; and



- Adopt the BPO for every stormwater diversion and discharge.

The BPO has been considered both in terms of the effects of discharges both during construction and operation as outlined in the:

- Assessment of Stormwater Management (**Technical Assessment 11**); and
- Assessment of Construction Water Management.

Overall, and the proposed conditions and associated management plan based approach will ensure the Project minimises the discharge of contaminants and accords with the objectives and policies set out above.

11.7.1.8 B7.5 Air

Objective B7.5.1.2 enables the establishment of infrastructure by providing for reduced ambient air quality amenity in appropriate locations.

The policies in B7.5.2 aim to manage air discharged to, amongst other things:

- Avoid significant adverse effects on human health and reduce exposure to adverse air discharges;
- Protect activities that are sensitive to the adverse effects of air discharges;
- Enable the development of infrastructure, industrial and rural production activities by providing for low air quality amenity in appropriate locations; and
- Meet the AAAQS.

The Assessment of Air Quality Effects (**Technical Assessment 1**) has concluded that no exceedance of the relevant air quality standards is likely to occur as a result of the operation of the Project and the potential adverse effects of the Project during operation are therefore less than minor. If the Project achieves the aim of increasing network capacity, traffic will flow more freely through the region, the total emissions will decline and on an airshed scale this is likely to result in a slight net benefit for regional air quality as compared to the air quality if the Project were not built.

During construction, any potential dust effects will be managed in accordance with the requirements of the proposed CAQMP. The measures in the CAQMP will ensure that dust is effectively managed and therefore will be in accordance with this objective and these policies.

11.7.1.9 B10 Environmental Risk

Chapter B10 considers environmental risks, namely natural hazards and land contamination that are relevant to the Project.

Objective B10.2.1.5 focuses on the protection of floodplains and other natural systems from inappropriate subdivision, use and development, and Objective B10.2.1.6, the maintenance of the conveyance function of overland flow paths.

The potential effects of flooding have been assessed in **Section 9.17** to highlight that stormwater devices will provide an overall improvement to flooding risk across the catchment, except for a minor adverse effect for a small number of properties. Stormwater management for the Project has specifically considered overland flow paths for:

- Oteha Valley Road;
- McClymonts Road (partially);
- Greville Road;
- Rosedale Road (partially);
- Caribbean Drive; and
- Paul Matthews Road (partially).



In all the above cases, the local road is proposed to be either widened or realigned without decreasing its width, at similar grades. As such, the Project works does not adversely affect the capacity of local roads to act as overland flow paths.

Policies B10.2.2.5, B10.2.2.7, and B10.2.2.12 are relevant to the Project since they aim to:

- Manage subdivision, use, and development of land subject to natural hazards by reference to the probability and scale of the natural hazard, vulnerability and resilience, and the cumulative effects on other activities and resources;
- Avoid or mitigate the effects of activities in areas subject to natural hazards, such as earthworks, changes to natural and built drainage systems, vegetation clearance and new or modified structures, so that the risks of natural hazards are not increased; and
- Minimise the risks from natural hazards to new infrastructure which functions as a lifeline utility.

As outlined above, the Project has been designed to ensure that flooding as a result of the Project is minimised. Overall, there will be an improvement to flooding risk across the catchment and only a minor adverse effect on a small number of properties. The State highway system is a lifeline utility and the Project has been designed to ensure that flooding of the carriageway will not occur.

Objective B10.4.1.1 focuses on protecting human health and the quality of air, land and water resources by the identification, management and remediation of land that is contaminated. Policy B10.4.2.3 requires the management or remediation of contaminated land where the level of contamination renders the land unsuitable for its proposed use, the discharge of contaminants is generating significant adverse effects on the environment or development is proposed.

Section 9.14 and the Assessment of Land Contamination Effects address land contamination as an environmental risk, other than for the Rosedale Closed Landfill which has been assessed separately. A PSI has been completed and a draft CSMP prepared. The DSI currently being undertaken will assess the actual site conditions within areas of potential contamination to further refine the draft CSMP. These measures are consistent with protecting human health and will ensure the Project is consistent with this objective and policy for managing environmental risk.

The construction works will also require the disturbance of the Rosedale Closed Landfill and the Project team has been working closely with the CLCLR team to agree the methodology for the work. All refuse will be removed from the area to be occupied by the busway and SUP and a new sidewall liner will be provided. Works within the Rosedale Closed Landfill will be managed under an approved Landfill Management Plan that will ensure that all air and leachate discharges from the Rosedale Closed Landfill are appropriately managed. Any affected landfill infrastructure will be reinstated (including a monitoring network) and a two-tier system implemented for preventing lateral migration of landfill gas.

11.7.2 Regional Plan

The regional plan section of the AUP contains the objectives and policies that inform the overlay and Auckland-wide provisions within the AUP. The relevant sections of the regional plan that are assessed below are:

- D9 Significant Ecological Areas;
- E1 Water quality and integrated management;
- E2 Water quantity, allocation and use;
- E3 Lakes, rivers, streams and wetlands;
- E9 Stormwater quality;
- E10 Stormwater management area – Flow 1 and Flow 2;
- E11 Land disturbance;



- E13 Cleanfills, managed fills and landfills;
- E14 Air quality;
- E15 Vegetation management and biodiversity;
- E26 Infrastructure; and
- E30 Contaminated land.

11.7.2.1 D9 Significant Ecological Areas overlay

Objective D9.2.1 requires the protection of areas of significant indigenous biodiversity values from the adverse effects associated with subdivision, use and development, the enhancement of the indigenous biodiversity of SEAs and that the relationship of Mana Whenua and their customs and traditions with indigenous vegetation is recognised and provided for.

Policy D9.3.1 aims to manage the effects of activities on SEAs by:

- Avoiding adverse effects as far as practicable, and where avoidance is not practicable, minimising adverse effects on the identified values;
- Remedying adverse effects on the identified values where they cannot be avoided;
- Mitigating adverse effects on the identified values where they cannot be avoided or remediated; and
- Considering the appropriateness of offsetting of any residual significant adverse effects through protection, restoration and enhancement measures, having regard to biodiversity offsetting in Appendix 8.

Policy D9.3.2 specifies that the effects which are required to be avoided, remedied, mitigated or offset include, but are not limited to fragmentation or reduction in the size of indigenous ecosystems, fragmentation or disruption of connections between ecosystems, increased threats from pests, loss of buffering of indigenous ecosystems and other matters.

Policy D9.3.3 requires the enhancement of indigenous biodiversity values in SEAs through a number of methods including re-vegetation of areas using indigenous species sourced from naturally growing plants in the vicinity.

Policy D9.3.6 focuses on avoiding, as far as practicable the removal of vegetation and loss of biodiversity by, amongst other things. Assessing any practicable alternative locations and/or methods that would reduce the need for vegetation removal or land disturbance.

As noted above, three SEAs are affected by the Project at the RWWTP (two SEAs) and at Alexandra Stream. The affected area within Alexandra Stream is very small in area and mitigation planting of indigenous planting will be undertaken in respect of any vegetation removal. With regard to the RWWTP, the ecological surveys have found that the terrestrial and aquatic ecological values within the SEAs are low. Similarly, indigenous mitigation planting will be implemented within the RWWTP.

Vegetation removal has been avoided at SEA_T_8297 adjacent to Lucas Creek at Oteha Valley Road through design development and the decision to delete the proposed northbound climber lane along the western side of this stretch of SH1. As a consequence of the approach taken to avoid, remedy, or mitigate adverse effects on significant ecological areas, the Project is in accordance with the relevant objective and policies.

11.7.2.2 E1 Water quality and integrated management

The focus of Chapter E1 is to avoid adverse effects on freshwater resources as far as practicable, and where this is not possible the provisions of the AUP seek to minimise and reduce the adverse effects. The specific requirements of Objective E1.2.1, Objective E1.2.2, and Objective E1.2.3 are to:



- Maintain freshwater and sediment quality where it is excellent or good and progressively improve it over time in degraded areas;
- Maintain the mauri of freshwater or progressively improving it over time; and
- Manage stormwater and wastewater networks to protect public health and safety and to prevent or minimise adverse effects of contaminants on freshwater and coastal water quality.

Supporting Policy 1.3.1 focuses on managing discharges to maintain or enhance water quality where that quality is good and enhance water quality where it is degraded. Policy E1.3.4 requires the Council to have regard to the following matters when considering an application for a discharge:

- The extent to which the discharge will avoid adverse effects on the life-supporting capacity of the freshwater and its ecosystems; and
- The extent to which any more than a minor adverse effect would result from the discharge and could be avoided.

The Assessment of Surface Water Quality Effects concludes that, in terms of current water quality:

- There are no physical stressors of concern at the monitoring sites and these are consistent with the level of urban development in the catchments.
- Elevated values were recorded for zinc and copper, although this is to be expected of the existing urbanised stormwater catchments.

During construction, sediment discharges will be controlled under the CESCPs developed in accordance with the principles outlined in the Assessment of Construction Water Management. During operation, the overall quality of stormwater being discharged from SH1 and SH18 will be improved in comparison to the existing situation. The Assessment of Surface Water Quality Effects concludes that the effects of sediment discharges from construction and stormwater discharges during operation on water quality will be no more than minor. Similarly, the Assessment of Freshwater Ecological Effects has concluded that the effects of these discharges on the receiving environments will be no more than minor. In addition, during the operational phase, the proposed enhanced stormwater quality treatment of existing impervious areas will result in the overall loads of key metals from the Project's impervious areas being reduced. This means the Project will have a net beneficial effect on stormwater quality and the downstream water quality and to the mauri of freshwater resources.

Policy E1.3.9 seeks to minimise or mitigate new adverse effects of stormwater runoff. Policy E1.3.10 requires the Council in taking an integrated stormwater management approach to have regard to a number of factors including the nature and sensitivity of the receiving environments and the need to minimise adverse effects on those receiving environments. Approximately 99% of the discharges from the new and existing HURs will be treated in accordance with TP10 to 75% TSS removal. Some of the discharges will be to the Council's stormwater management system to be discharged in accordance with its NDC. As outlined above, the remaining discharges to the receiving environment will not have a significant impact on the receiving environment and therefore ensures the Project meets the requirements of both of these policies.

Policy E1.3.12 requires stormwater runoff from high use roads to be managed to minimise adverse effects and progressively reduce existing adverse effects on the receiving environment. Policy E1.3.13 requires the management of stormwater quality and flow management to be generally achieved on-site or downstream if there is a communal device or facility. The Project will a mixture of stormwater wetlands, swales and proprietary devices to ensure that all the new high use road and a significant proportion of the existing high use road is treated to achieve 75% TSS removal. This is a significant improvement from the existing level of treatment.

Policy E1.3.14 requires the adoption of the best practicable option to minimise the adverse effects of stormwater discharges from infrastructure including roads, having regard to a list of factors. Set out below is how the factors relevant to the Project have been addressed:



- The BPO as set out in section 2 of the RMA – A comprehensive BPO analysis has been undertaken for both construction and operational discharges as set out in the Assessment of Construction Water Management and the Assessment of Stormwater Management;
- The scale and significance of the adverse effects – As set out in the Assessment of Freshwater Ecological Effects, the potential effects of the discharges on the receiving environment have been assessed and given that the proposed stormwater management approach will result in an improvement on the existing environment, the effects are considered to be no more than minor; and
- Operational requirements and space limitations – Space requirements within this confined urban corridor have limited the wetland size that can be provided. The need to provide stormwater detention to prevent flooding has generally restricted the type of stormwater device that can be used to devices that will provide that attenuation. There is limited space to incorporate treatment swales into the Project design. However, two treatment swales have been provided at Rosedale Road. In addition, two proprietary devices are proposed.

In accordance with Policy E1.3.26, the potential adverse effects of construction on freshwater quality will be prevented or minimised by adopting best management practices in accordance with TP90 and the requirements set out in the approved CSMP and the Landfill Management Plan.

Erosion and sediment control devices as described in the Assessment of Construction Water Management will ensure that potential effects arising from sediment runoff generated by construction of the Project are effectively managed. Runoff produced within the excavations at the Rosedale Closed Landfill will be treated as if highly contaminated and leachate is to be treated as trade waste and disposed of at an appropriate waste facility.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to water quality and integrated management.

11.7.2.3 E2 Water quantity allocation and use

Objective E2.2.1 provides that water in surface rivers is available for use provided the natural values of water are maintained and established limits are not exceeded. The reclamation of a stormwater drainage channel that is classified as a 'stream' under the AUP is required as part of the Project. This stormwater discharge will be diverted into a new pipe and discharged into the stormwater network in a different location. This diversion will not impact on the natural values of water or result in any limits being exceeded

Policy E2.3.22 requires proposals to divert surface water to demonstrate that the diversion will to the extent practicable avoid significant adverse effects and remedy or mitigate other adverse effects on existing buildings, structures and services, existing flood hazard risks, people and communities and the life supporting capacity of freshwater ecosystems.

Policy E2.3.23 requires proposals to divert groundwater to ensure that the proposal avoids, remedies or mitigates any adverse effects on people and communities and does not cause or exacerbate any flooding.

Full detention of the 95th and 90th percentile rainfall events is provided for the Project by using wetlands and/or dry ponds, without any reduction allowance for retention. Some minor increases in flood levels will be experienced by a small number of properties but the flood risk will also be significantly improved at a number of properties. Overall, the flood risk has been managed to avoid adverse effects on flooding as far as practicable.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to water quantity allocation and use.



11.7.2.4 E3 Lakes, rivers, streams and wetlands

Chapter E3 manages the effects of activities within the beds of lakes, rivers and streams. The introduction to the chapter notes that there is a balance to be struck between the need to provide for the urban growth including the requirements of infrastructure and the need to protect, maintain and enhance lakes, rivers streams and wetlands.

For the purpose of this assessment, the RWWTP has been considered as a 'lake'. However, as outlined in the Assessment of Freshwater Ecological Effects, the ecological values within the lake are low. Works are required to raise the causeway to accommodate the Busway and SUP. Due to the location of the existing SH1 carriageway being a causeway between two oxidation ponds at the RWWTP, the raising of the causeway will necessarily require works to occur in the confines of the ponds. The Project will also affect a number of streams within the Project area, including the construction of several outfalls and the reclamation of a 'stream' south of Pond 1 within the RWWTP.

The objectives in E3.2 focus on ensuring that lakes, rivers, streams and wetlands with high natural values are protected from degradation and permanent loss, that significant adverse effects are avoided, remedied, mitigated or offset and that structures are provided for where there is a functional or operational need for the structure to be in that location. As set out in the Assessment of Freshwater Ecological Effects, none of the streams or stormwater wetlands affected by the Project have high natural values. The corresponding policies (Policy E3.3.5 and Policy E3.3.7) require significant adverse effects to be avoided and other adverse effects to be remedied or mitigated where practicable within SEAs and the beds of lakes and rivers. There are streams in the wider catchment with higher values and the Project has been designed to avoid aquatic habitats where possible; improve stormwater inputs to aquatic habitats by increasing the number of stormwater retention devices; increase the capacity and retention of the stormwater system; replace most stormwater ponds that are required to be relocated with stormwater wetlands, thereby increasing the quality of stormwater entering the streams; and where impacts on aquatic systems are unavoidable mitigate any adverse effects.

Reclamation of the stream within the RWWTP cannot be avoided due to locational and design constraints to upgrade the infrastructure, and stormwater will be directed to other watercourses and wetlands. That approach is consistent with Objective 3.2.6.

Works within the SEA over Ponds 1 and 2 are required to raise the causeway to accommodate the busway and SUP. These works will not result in significant adverse effects in terms of the aquatic or terrestrial ecology at the RWWTP and within the ponds. There are no other options for the location of the busway or the SUP other than to extend the causeway to accommodate the additional lanes adjacent to the existing SH1 carriageway. The RWWTP ponds are man-made structures that form part of the treatment system and provide final treatment of wastewater prior to its discharge into the receiving environment. The ecological values within the ponds are low. The water within the ponds is not of significance to Mana Whenua nor is it considered to significantly contribute to the mauri of the freshwater environment.

The existing slopes (or batters) of the causeway are 'man-made'. The Assessment of Freshwater Ecological Effects concludes that the overall ecological values of the RWWTP and nearby watercourses are low in the areas where works are proposed.

Minor works are proposed within Lucas Creek and Alexandra Stream. A stormwater outfall is proposed within Lucas Creek to the east of the Oteha Valley interchange and a new rip-rap apron is proposed within Alexandra Stream. The potential impact of these works on the terrestrial and aquatic ecology is assessed in the Assessment of Freshwater Ecological Effects and Assessment of Terrestrial Ecological Effects (**Technical Assessment 13**). Mitigation planting is proposed in relation to any



vegetation removal required as part of the proposed works in these streams on a 'like for like' and 'no net loss' basis.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to lakes, rivers streams and wetlands.

11.7.2.5 E10 Stormwater management area – Flow 1 and Flow 2

Stormwater management areas seek to protect and enhance Auckland's rivers, streams and aquatic biodiversity in urban areas. Objective E10.2.1 aims to ensure that high value rivers, streams and aquatic biodiversity in identified urbanised catchments are protected from further adverse effects of stormwater runoff associated with urban development and where possible enhanced. Policy E10.3.1 requires the management of stormwater runoff within SMAF 1 and 2 areas to minimise the effects of stormwater runoff to retain and where possible enhance stream naturalness, biodiversity, bank stability and other values. Policy E10.3.2 requires hydrological mitigation in SMAF 1 and 2 area where there are new impervious areas. Policy E10.3.3 recognises that there are limits to the hydrological mitigation that can practicably be achieved, particularly where there are space limitations.

The Project area is covered by both SMAF 1 and 2 overlays. As outlined above, full detention of the 95th and 90th percentile rainfall events is provided for the Project by using wetlands and/or dry ponds, without any reduction allowance for retention. This is achieved using controlled outlets in wetlands and dry ponds. Some additional outfall structures will be required and erosion protection will be implemented to control the flow of stormwater as it discharges to the receiving watercourse.

Based on the above, the Project is considered consistent with the objectives and policies of the AUP as they relate to SMAF 1 and 2.

11.7.2.6 E11 Land disturbance – Regional

The regional objectives and policies for land disturbance seek to manage the adverse effects (including cumulative effects) of land disturbance including sediment laden runoff and the impacts on the quality of water. The Project will generate large volumes of earthworks, in many cases on steep gradients and/or within a Sediment Control Protection Area (SCPA).

The objectives in E11.2 require that sediment generation from land disturbance is minimised and that adverse effects on the environment are avoided, remedied or mitigated. The corresponding policies require land disturbance to be managed by adopting the best practicable option for erosion and sediment control, managing the amount of land being disturbed, avoiding, remedying or mitigating adverse effects on accidental discoveries and maintaining the cultural and spiritual values of Mana Whenua. Provision is made for enabling land disturbance necessary for activities to provide for people and communities social, economic and cultural well-being and their health and safety.

The construction of the Project will be undertaken using a staged approach so the area of earth exposed will be as minimised as far as practicable. Compliance will be achieved with TP90 and an erosion and sediment control plan will be prepared as a part of the CEMP.

Earthworks will to be monitored closely throughout the duration of construction works and stockpiles will be located in dedicated construction areas away from waterbodies and watercourses. Sampling of stockpiled soils is to occur prior to disposal methods being undertaken to ensure that any contaminated soil is disposed of appropriately.

Policy E11.3.2 requires management of land disturbance and the CESCPS developed for the Project will address all of the matters referred to in this policy through the implementation of a suite of methodologies for specific activities, as described in **Section 9**. This will ensure that management of land disturbing activities is consistent with this policy.



Policy E11.3.4 allows for land disturbance where it is necessary for the social and cultural well-being of people and communities and for their health and safety. The Project, which involves State highway improvements for efficiency and safety purposes, and the provision of a busway and SUP, supports this policy.

Policy E11.3.5 requires that earthworks are to be designed and implemented with recognition of environmental site constraints and integrated water principles. The Project has considered this to date and proposes erosion and sediment control measures appropriate for the management of different construction activities. Through the development and implementation of these measures the Project will meet the requirements of Policy E11.3.5.

There are several watercourses and waterbodies within the Project area and therefore Policy E11.3.7 is of particular relevance to the Project as it requires the management of sediment-laden discharges to avoid generating adverse effects on high value areas. As outlined above, a CЕСCP is proposed in addition to the preparation of a CEMP to manage sediment generation and minimise the likelihood of sediment and any associated contaminants from entering freshwater bodies within the catchment or the AC stormwater network.

The Lucas Creek area has been identified by Mana Whenua at a Project hui on 4 August 2016 as a place of value. The installation of the culvert and new outfall will occur downstream of the sensitive part of the watercourse which has been identified by Mana Whenua. The area of particular importance to Mana Whenua has been avoided. The design response has been to minimise impacts on riparian planting where possible and to implement mitigation planting.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to land disturbing activities.

11.7.2.7 E13 Cleanfills, managed fills and landfills

Although the Chapter E13 does not contain any rules in relation to the proposed works at the Rosedale Closed Landfill, the objectives and policies are still relevant.

Objective E13.2.2 focusses on ensuring that human health is protected from the adverse effects of closed landfills and Policy E13.3.5 requires management to contain contaminants and tailor aftercare appropriate to the type of material contained within the Rosedale Closed Landfill. This objective and policy apply to both the works in the Rosedale Closed Landfill and the space around it after construction has been completed. A Landfill Management Plan will be prepared in conjunction with AC's Landfill Management Team which will outline the construction methodology and the measures to be implemented to protect human health and the environment from any potential adverse effects that may arise from working within the Rosedale Closed Landfill. During the construction process, leachate will be collected to a treatment device and/or discharged to sewer as trade waste or to an approved disposal facility. As noted above, all refuse will be removed from the area to be occupied by the busway and SUP and a new sidewall liner will be provided. Any affected landfill infrastructure will be reinstated (including a monitoring network) and a two-tier system implemented for preventing lateral migration of landfill gas. CLCLR has been closely involved in the review of these designs, and is in principle in support of the Project which achieves their principal objectives

The proposed management approach for the Rosedale Closed Landfill is consistent with the objectives and policies of the AUP as they relate to clean fills, managed fills and landfills.

11.7.2.8 E14 Air quality

The objectives in E14.2 aim to:

- Maintain air quality where it is high;
- Ensure that air discharges meet the AAAQS;



- Protect human health and the environment from significant adverse effects; and
- Ensure incompatible uses are separated.

Objective E14.2.5 also recognises that the operational requirements of infrastructure need to be recognised and provided for.

The corresponding Policy E14.3.2 similarly require air discharges to be managed to avoid adverse effects on human health and the environment.

There is a high risk of dust being generated through land disturbance activities associated with the Project. There are some sensitive activities including residential areas to the south of SH18 and the east of SH1 that are likely to be affected if dust generation is not adequately managed. Potential dust effects are responsive to a range of tested management and avoidance techniques that can be applied systematically to ensure that such mobilisation can be generally avoided and if not, then minimised. A Dust Management Plan is proposed to manage the impact of airborne contaminants and dust. For example, stockpiled areas of materials are to be covered in high winds to ensure that materials do not become airborne, with works areas being sprayed with water until they are damp prior to earthworks to minimise dust generation.

A detailed Technical Assessment of the potential adverse operational effects associated with the Project and network under a range of scenarios has been undertaken and is included within the technical assessment. These scenarios calculate ground level concentrations of pollutants discharged from the vehicles that utilise the road system. This assessment identified that any exceedance of relevant air quality standards is unlikely to occur. In broader terms, at the air shed scale the Project is likely to result in a small net improvement to regional air quality relative to the Project not being built.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to air quality.

11.7.2.9 E15 Vegetation management and biodiversity

The vegetation management and biodiversity objectives and policies seek to protect areas of indigenous biodiversity, particularly sensitive areas. However, Chapter E15 covers only those areas not identified as SEAs (SEAs are addressed in Chapter D9 SEA Overlay).

The objectives in E15.2 aim to:

- Maintain or enhance ecosystems and indigenous biological diversity values while providing for appropriate subdivision, use and development (E15.2.1); and
- Restore and enhance indigenous biodiversity in areas where values are degraded or development is occurring (E15.2.2).

The policies in E15.3 focus on protecting areas of contiguous indigenous vegetation cover and managing the effects of activities to avoid significant effects as far as practicable, minimise significant adverse effects where avoidance is not practicable and avoid, remedy or mitigate other adverse effects. Policy E15.3.3 encourages offsetting of any significant residual effects.

The terrestrial ecological values within the Project area are generally low which is unsurprising given the urban landscape. The vegetation is predominantly planted landscaping areas. Some vegetation removal potentially including native vegetation adjacent to the Alexandra Stream SEA will be required. While some vegetation removal will be necessary to facilitate the construction of the Project, clearance will be minimised wherever possible and mitigation planting will be undertaken in accordance with the Landscape Management Plan prepared using the principles of the UDLF.

Mitigation planting for the Project will be over 30ha with an additional 5.9ha of planting and street trees proposed. Other mitigation measures relevant to vegetation management and biodiversity are the relocation of native fish, the Lizard Management Plan, and the Avifauna Management Plan as



proposed as draft conditions of designations and resource consents. Reclamation of the stream south of Pond 1 is proposed, but this watercourse is highly modified within a concrete channel with low ecological value. There is limited opportunity to implement riparian planting at that location, but it will be implemented along other watercourses where it will enhance the habitat within and along the watercourse and the new wetlands that will provide new habitat for the area.

Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to vegetation management and biodiversity.

11.7.2.10 E26 Infrastructure

Chapter E26 recognises the critical role of infrastructure in providing for the social, economic and cultural well-being of people and communities. Chapter E26 also acknowledges that as well as benefits, infrastructure can have adverse effects on the environment, visual amenity of an area, and public health and safety.

Objective E26.2.1.1 and Policy E26.2.2.1 recognise the benefits of infrastructure including enabling economic growth, development and enabling the transportation of freight, goods and people. Objective 26.2.1.3 aims to enable safe, efficient, and secure infrastructure which are all outcomes of the Project. Objective E26.2.1.4 and Policy E26.2.2.2 support the Project since they provide for the development, operation, maintenance, repair, upgrade, and removal of infrastructure throughout Auckland. Policy E26.2.2.4 focuses on avoiding, remedying or mitigating the adverse effects of infrastructure. Section 1 describes the importance of the Project as a key component of the WRR which upon completion will enable economic growth, unlock potential for development along its length by improving trip reliability and access from the west to the south and north of the region, and from the CBD to the airport.

Sections 9 and 10 contain a detailed analysis of the potential adverse effects of the Project and the mitigation measures proposed.

Policies E26.2.2.5 and E26.2.2.6 require a number of matters to be considered when assessing the effects of infrastructure and these have been addressed as follows:

- The degree to which the environment has already been modified – **Section 4** describes the existing environment. In summary, the existing environment is highly urbanised with the existing transport corridor, adjacent business, commercial and industrial uses and established residential neighbourhoods in Unsworth, Pinehill and Fairview Heights;
- The nature, duration, timing and frequency of the adverse effects, the extent of existing adverse effects and potential cumulative adverse effects, and the type, scale and extent of adverse effects on identified values or features (and whether they should be avoided pursuant to any NPS, NES or RPS) – A summary of the potential adverse effects of the Project is set out in **Section 9** and an analysis of the relevant NPS, NES and RPS is included within this Section above;
- The impact on the network and levels of service if the work is not undertaken, the need for the infrastructure in the context of the wider network, the benefits provided to the communities within Auckland and beyond and the need for the Project to enable an effective and efficient network – Project will have numerous benefits for transport within the Project area and beyond including more efficient connections between SH18 and SH1 (north) ensuring effective continuity of capacity, greater reliability of travel times for bus travel through to Albany Bus Station and additions and enhancements to walking and cycling facilities. In summary, overall, the Project will increase traffic volumes on SH1 and SH18 while generally reducing volumes on the local road network for the benefit of local traffic, public transport and walking and cycling modes;
- Whether the infrastructure has a functional or operational need to be located in or traverse the proposed location and whether there are any practicable alternatives to avoid or reduce adverse effects – A thorough assessment of alternatives has been undertaken as set out in Section 7 of this AEE. The existing location of SH1, SH18 and the Constellation and Albany Bus Stations has influenced the design of Project; and



- How the proposed infrastructure contributes to the strategic form or function or enables the planned growth and intensification of Auckland – The Project will enhance the capacity and efficiency of movement, for people and freight travelling within Auckland, and between Auckland and the north.

The specific policies relating to the road network in E26.2.2.14 and E.26.2.2.15 focus on the following:

- Avoid, remedy or mitigate adverse effects on residential or other sensitive activities, the amenity values of adjoining properties and the streetscape, including construction effects – The mitigation measures proposed are outlined in **Section 10**;
- Maintain or enhance the safety and efficiency of the transport network – As outlined above, the Project will enhance the capacity and efficiency of movement, for people and freight travelling within Auckland, and between Auckland and the north. Extensive safety improvements are proposed as part of the Project as outlined in **Section 2.3.10**; and
- Provide for the needs of all road users and modes of transport – The Project involves improvements to the road, walking and cycling networks and an extension of the Busway.

The Project is in full accordance with the objectives and policies of the AUP as they relate to infrastructure. The Project benefits Auckland and New Zealand as a whole through the provision of a safe, resilient and efficient transport network that supports social, economic, cultural and environmental benefits while avoiding, remedying or mitigating potential adverse effects.

11.7.2.11 E27 Transport

Chapter E27 contains specific objectives and policies relating to transport. Objective E27.2.2 aims to provide an integrated transport network including public transport, walking, cycling, private vehicles and freight. The Project is consistent with this objective since it will provide for all of these modes of transport.

Objective E27.2.5 prioritises pedestrian safety and amenity along public footpaths and Policy E27.3.14 aims to support increased cycling and walking, and the SUP is consistent with this objective and policy in providing for cycling and walking and in a location with high amenity for users away from roads.

11.7.2.12 E30 Contaminated land

Chapter E30 addresses contaminant discharges that are not covered by the NES_{Soil}, including direct discharges from soil disturbance, passive discharges over longer time periods, legacy discharges and the assessment of risk from on-going discharges.

Objective E30.2.1 aims to manage the discharge of contaminants to protect the environment and human health, and to enable land to be used for suitable activities now and in the future. Policy E20.3.2 requires any use or development of contaminated land resulting in discharges to air, land or water to manage or remediate contamination to a level that allows contaminants to remain in the land (without significant adverse effects on human health or the environment), avoids adverse effects on potable water supplies and avoids, remedies or mitigates significant adverse effects on ecological values, water quality, human health and amenity values. Physical and operational constraints, financial costs, the BPO and the disposal of contaminated material need to be taken into account when considering how to manage the adverse effects of contamination.

Potentially contaminated land has been identified in various locations throughout the Project area. As a DSI for these sites has not been produced, the exact contaminants and their concentrations have not yet been established.

A draft CSMP has been prepared to provide a detailed methodology for the management of contaminated land and the proposed measures to be undertaken to ensure risks to human health and the environment are minimised. As part of the finalisation of the CSMP, a DSI is underway and the results will be used to classify the material present on site and develop site specific remedial action plans appropriate to any identified risks.



Based on the above the Project is considered consistent with the objectives and policies of the AUP as they relate to contaminated land.

11.7.3 District Plan Provisions in the AUP

The relevant district level objectives and policies for the Project are outlined below.

11.7.3.1 E12 Land disturbance – district

Objective E12.2.1 provides that land disturbance should be undertaken in a manner that protects the safety of people and avoids, remedies or mitigates adverse effects on the environment. The corresponding policies in E12.3 largely mirror those outlined in Chapter E11 above.

11.7.3.2 E16 Trees in open spaces and E17 – Trees in roads

Some vegetation removal is required within existing open space zoned land. Objective E16.2.1 aims to protect trees in open space zones that contribute to cultural, amenity, landscape and ecological values. Objective E16.2.2 seeks to increase the quality and extent of tree cover in open space zones particularly within areas identified for intensified living. Policy E16.3.3 encourages the use of indigenous trees and vegetation for planting within open space zones where appropriate. Vegetation removal within open spaces will be kept to a minimum and mitigation planting will be implemented with a view to use indigenous trees and vegetation.

In addition, in order to accommodate the Project, some trees within the existing SH1 and SH18 road corridor will be removed. Replacement planting is proposed in order to balance the locational requirements of the road network with the ecological and amenity values of trees within road corridor. This approach is consistent with Objective E17.2.3 and Policy E.17.3.1 which aim to balance the safe and efficient development of the road network with the protection of trees in roads.

11.7.3.3 E24 Lighting

Policy E24.3.2 requires the intensity, location and direction of artificial lighting to avoid significant glare and light spill onto adjacent sites, maintain safety for road users and minimise the loss of night sky viewing.

Lighting is addressed in **Section 5.6.6** of the AEE. The proposed lighting will comply with the relevant provisions of the AUP, in particular in relation to sensitive neighbouring activities such as residential sites. Accordingly, the Project is consistent with the policies relating to lighting glare and spill.

11.7.3.4 E25 Noise and vibration

The relevant objectives in E25.2 aim to ensure that:

- People are protected from unreasonable levels of noise and vibration (E25.2.1);
- The amenity values of residential zones are protected from unreasonable noise and vibration, particularly at night (E25.2.2); and
- Construction activities that cannot meet noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects (E25.2.4).

Policy E25.3.2 requires activities to minimise, where practicable, noise and vibration at its source to mitigate adverse effects on adjacent sites. The mitigation approach for operational noise is set out in the Assessment of Operational Noise and Vibration Effects (**Technical Assessment 9**) and includes the use of a low noise road surface, noise barriers where appropriate and building modification where necessary.

Policy E25.3.5 prevents significant noise-generating activities other than roads and railway lines from establishing in or immediately adjoining residential zones. This recognises the essential role of roads and railway lines in servicing communities even to the extent that they may generate significant noise.



Policy E25.3.10 requires construction activities to avoid, remedy or mitigate adverse effects while having regard to the sensitivity of the receiving environment, the duration and hours of operation and the practicality of complying with permitted noise and vibration standards. As set out in the Assessment of Construction Noise and Vibration Effects (**Technical Assessment 3**), a thorough regime of noise management will be required to ensure that noise and vibration effects are mitigated as far as practicable. This management approach, which is typical of any large infrastructure project, will include noise and vibration monitoring along the route, clear communication with the public, condition surveys of dwellings likely to receive high levels of vibration and strategies for mitigation such as resident relocation where necessary. That approach is consistent with the objectives and policies relating to noise and vibration.

11.7.3.5 E36 Natural hazards and flooding

Objective 36.2.4 acknowledges that where infrastructure has a functional or operational need to locate in a natural hazard area the risk will be managed by avoiding adverse effects and, if avoidance cannot be achieved, mitigating any residual effects to the extent practicable.

Policy E36.3.4 controls subdivision, use, and development of land that is subject to natural hazards so that risks are not increased and, where practicable, are reduced.

Policy E36.3.21 requires all development in the 1 per cent AEP floodplain to not increase adverse effects from flood hazards or increased flood depths and velocities, to other properties upstream or downstream of the site.

Policy E36.3.23 provides for flood mitigation measures which reduce flood-related effects and culverts and bridges do not increase flood hazards upstream or downstream. Policy E36.3.27 supports the construction and maintenance of flood mitigation works to reduce flood risks to people, property, infrastructure, and the environment.

Stormwater devices in the form of wetlands, detention ponds and swales are proposed for the Project and will control the risk of flooding and minimise the exposure of flood risk to vulnerable properties. As outlined above in relation to the flooding objectives and policies in the RPS, full detention of the 95th and 90th percentile rainfall events is provided for the Project by using wetlands and/or dry ponds, without any reduction allowance for retention. Some minor increases in flood levels will be experienced by a small number of properties but the flood risk will also be improved at a number of properties. The Project is required to be located adjacent to the existing State highways and the extension to the Busway so there is a functional need to locate the Project in this area, and as a consequence the flooding effects have been managed to as far as practicable. Overall, the flood risk has been managed to avoid adverse effects on flooding as far as practicable to ensure that the Project is in accordance with these objectives and their related policy.

11.7.4 Summary

A thorough analysis of relevant objectives and policies has been undertaken. The Project is deemed to be consistent with the objectives and policies of the AUP (regional and district) for the following key reasons:

- The Project involves the construction of transport infrastructure that is specifically recognised as a key element in servicing the growth envisaged for the region;
- As set out above and in **Section 10**, the potential adverse effects of the Project will be appropriately avoided, remedied, or mitigated; and
- The Project will result in some significant positive effects as set out in **Section 9.2**:
 - There will be a wide range of travel-time savings for both private vehicles and public transport, congestion on the local network will be reduced and the Project will be built to a higher safety standard;



- The establishment of the SUP for the full extent of the Project will positively affect the modal choice available.
- There is likely to result in a small net improvement to regional air quality relative to the Project not being built; and
- The quality of the stormwater discharges from within the Project area will be improved.

11.8 Auckland Council Regional Policy Statement

The following regional policy statement objectives and policies from the AUP that are relevant to the Project are subject to appeal:

- Urban Growth and Form Objective B2.5.1.1; and
- Urban Growth and Form Policy B2.2.2.4.

The following assessment considers those objectives and policies from the Auckland Council Regional Policy Statement which align with the appealed objective and policy noted.

11.8.1 Strategic Objectives

Strategic Objectives 2.6.1.1 and 2.6.1.3 seek to accommodate the region's growth in a compact form that is well designed and more sustainable by reference to the purpose and principles of the RMA. Those strategic objectives and those that follow (2.6.1.4, 2.6.1.6, 2.6.1.12, and 2.6.1.17) are relevant to the Project since transport systems are recognised as having a role in enabling this growth to occur in a manner that is efficient and sustainable. The Project involves redevelopment and changes to different modes of transport (i.e. private vehicles, public transport, walking and cycling) providing for more efficient travel times in around commercial and industrial centres, and is therefore in accordance with these relevant objectives.

11.8.2 Strategic Policies – Land Use and Transport Integration

Strategic Policy 2.6.11.1 seeks to integrate land use and transport and sets the policy framework for ensuring that transport corridors are not compromised by subdivision and development and the outcomes expected for the transport network that improve connectivity, safety, efficiency, and improves links for all modes of transport. The Project achieves this by the various components (Busway, road, and the SUP) and is therefore in accordance with this policy.

Strategic Policy 2.6.11.2 goes further in providing for similar outcomes relating to land use and transport integrating high density centres along intensive corridors. The bus stations, redevelopment of the SH1 and SH18 routes, and the SUP, are all in accordance with supporting this policy since they are intensive corridors supporting high density centres, and multi-modal transport options.

11.8.3 Strategic Policies – Infrastructure

Strategic Policy 2.6.14 for infrastructure makes reference back to the strategic direction of the ACRPS, the Regional Growth Strategy, and the objectives and policies described immediately above. The Project represents redevelopment of regional significant infrastructure and supports the strategic growth objectives for a compact urban form and in a manner that avoids, mitigates, or remedies significant adverse effects. As a consequence, and for the reasons outlined above, the Project is also in accordance with these strategic policies for infrastructure.

11.8.4 Summary

The Project is consistent with the relevant objectives and policies of the ACRPS since it involves the construction of regionally significant transport infrastructure which supports the strategic objectives for the region's growth in a manner that is efficient and sustainable while avoiding, mitigating, or remedying adverse effects.



11.9 Auckland Regional Plan: Air, Land and Water

The following regional objectives and policies from the AUP that are relevant to the Project and subject to appeal are:

- SEA overlay policies D9.3.1, D9.3.2 and D9.3.6 (managing the effects of activities on indigenous biodiversity values in SEAs); and
- Vegetation management and biodiversity policies E15.3.2 (managing effects to avoid significant adverse effects on biodiversity), E15.3.4 (protecting, restoring and enhancing biodiversity when undertaking new development), E15.3.7 (managing adverse effects from the development of infrastructure recognising that it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values).

An assessment of the corresponding objectives and policies from the ACRP:ALW is set out below.

11.9.1 Objectives – Natural Values

Objectives 2.1.3.1, 2.1.3.2, 2.1.3.3, and 2.1.3.4 are relevant to the project since they seek to provide for sustainable management of natural values, particularly relating to the natural character and quality of wetlands, lakes, and rivers, and their margins, and protecting significant indigenous terrestrial and aquatic vegetation and habitat.

The Project will enhance and protect existing natural values through improvements to stormwater management, revegetation, creation of new wetland habitats and measures to protect lizards, native birds and native fish.

11.9.2 Policies – Natural Character

Policies 2.1.4.1, 2.1.4.2, 2.1.4.3, 2.1.4.4, and 2.1.4.5 relate to the natural character of wetlands, lakes, and rivers and their margins and seek to avoid, remedy, or mitigate adverse effects on the natural character of permanent rivers and streams in urban areas with high ecological, habitat or water quality values.

The watercourses of low to moderate ecological value as assessed in the Assessment of Freshwater Ecological Effects, and are highly modified in the case of those in the RWWTP. The temporary adverse natural character effects are interim effects only and would reduce once the Project is complete as outlined in the Assessment of Landscape and Visual Effects (**Technical Assessment 8**), and that following mitigation, it is concluded that permanent adverse natural character effects at the completion for the Project can be managed and mitigated to result in low adverse effects overall. Furthermore, the natural character of the area will be enhanced through the addition of new wetlands for stormwater management. As a consequence, the Project is in accordance with these policies relating to natural character.

11.9.3 Policies – Ecosystems and Habitats

Policy 2.1.4.6 approach to permanent rivers and streams in urban areas is to maintain ecosystems and habitats as far as practicable where they are assessed as having significant ecological, water quality, and habitat values, and to enhance degraded ecosystems and habitats and water quality where practicable.

As noted for Chapter E3 of the AUP, the Project involves minor works are proposed within Lucas Creek and Alexandra Stream. The ecological value of these areas is low and the potential impact of these works on the terrestrial and aquatic ecology is assessed in the Assessment of Freshwater Ecological Effects and Assessment of Terrestrial Ecological Effects. Mitigation planting as part of the proposed works in these streams may assist in enhancing their value as potential ecosystems and habitats. Stormwater management will also enhance water quality through treatment to remove contaminants including sediment.



Policy 2.1.4.7 specifically addresses fish passage and modifying existing artificial barriers of dams, weirs, or culverts where it is practicable.

New culverts, under the proposed intersection of SH1 and SH18, between UHH and RWWTP Pond 1, and the proposed stormwater wetlands will result in the loss or modification of up to 602m of very poor quality aquatic habitat. Fish passage is not a consideration in this area, as there is no upstream native fish habitat (the catchment is fully urbanised and culverted); there are significant barriers downstream, including vertical manholes; and there is currently only very poor quality habitat for native fish (exposed, concrete drains). The Assessment of Freshwater Ecological Effects concludes that the Project will not adversely affect fish passage at other locations.

Policy 2.1.4.8 addresses land disturbance, and discharges of contaminants or other activities affecting water quality and impacts on areas of terrestrial indigenous vegetation, and habitats of terrestrial indigenous fauna that have been identified to be of significance. The ACRP:ALW provides a guide to the determining the significance of the ecosystem based on:

- Schedules in the plan;
- Appendix B of the ACRPS, the Auckland Conservation Management Strategy, or a significant area in any district plan;
- A published Protected Natural Area report; or
- Habitat of any nationally or regionally threatened, rare, or endangered species.

There are no Urban Lake Management Areas, Wetland Management Areas, or Natural Stream Management Areas or other areas within schedules of the ACRP:ALW that fall within the Project area. Of the other criteria, these do not apply except that the Project area may contain habitat for threatened, rare, or endangered species as discussed in the Assessment of Freshwater Ecological Effects and the Assessment of Terrestrial Ecological Effects. However, this is unlikely to apply to aquatic ecology since it will not be classed as significant based on its low to moderate value if those species are found to be present. Notwithstanding this, the effects of the Project from land disturbance, on water quality, indigenous vegetation, and habitats of fauna are all to be avoided, remedied, or mitigated to the extent that there is no significant effect that remains and discussed above.

Policy 2.1.4.9 provides guidance on assessing the effects of use and development on natural character and terrestrial and aquatic ecosystems and minimising impacts of discharges where a best practicable option is to be used.

As outlined in Chapter B7.4 of the AUP above, in overall terms, and the proposed conditions and associated management plan based approach for stormwater management will ensure the Project minimises the discharge of contaminants to the extent that it will be in accordance with Policy 2.1.4.9.

11.9.4 Policies – Environmental Compensation

Policies 2.1.4.10 and 2.1.4.11 describes how adverse effects of use and development may be offset by mitigation measures elsewhere within the region where they cannot be avoided, or directly remedied or mitigated, and further that areas of high natural character of significant ecosystems should be avoided to the fullest extent practicable. No offset mitigation is proposed for this Project because the potential adverse effects are able to be appropriately avoided, remedied or mitigated within the Project area.

11.9.5 Summary

The Project is consistent with the relevant objectives and policies of the ACRP:ALW since it will involve mitigation planting, enhancement of degraded natural values and ecological values and otherwise avoid, remedy, or mitigate adverse effects relating to vegetation management, biodiversity, and significant ecological areas.



11.10 Non-statutory Planning Documents

Section 2.3 provides the strategic context for the Project with a discussion of the relevant non-statutory strategic documents. In summary, the Project is supported by these strategic documents for the following reasons:

- SHS promoted the upgrading of SH18 to part of a standard four lane road network and improving its connectivity to SH1;
- Roads of National Significance 2009 announced the WRR as one of the first seven RoNS;
- Accelerated Auckland Transport Projects Package 2013 announced priority would be given to three State highway projects in the Auckland region as an accelerated programme;
- NIP 2015 was first released in 2010 and a key component of this was the RoNS, and in 2015 this was updated with specific reference to the Accelerated Auckland Transport Package;
- GPSLT 2015 specifically references the Project and the Project is consistent with its priorities for economic growth and productivity, road safety, and value-for-money and with its objectives;
- NLTP 2015-18 identifies the components of the Project as key routes and investments that address both travel time reliability and transport choice;
- Draft State Highway Plan 2016/17 specifically references the Project in its Auckland Accelerated Programme;
- The Auckland Plan is a 20 to 30 year strategy for Auckland's growth and development that identifies the existing and future location and the mix of critical infrastructure that includes transport investment;
- Safer Journeys aims to improve transport system safety, and the Project contains a range of safety improvements including new margin and median barriers, additional lanes, and dedicated share use pedestrian and cycle paths; and
- New Zealand Transport Agency SOI 2015-2019 sets the overarching purpose for its transport solutions and contains objectives relevant to the project in integrating national and local transport networks, shaping efficient travel choices, providing greater resilience for the State highway network, and providing significant transport infrastructure. The Project relates to SH1 and SH18 to improve safety and efficiency and provides for travel choice (road, public transport, and pedestrians/cycles).

There are further non-statutory documents developed by AC that are relevant to, and supportive of, the Project as follows:

- The Long Term Plan 2012-2022 recognises that while roads continue to be a cornerstone of the Auckland, a multi-modal shift to public transport, and walking and cycling as transport solutions is required, and the Project provides for all of these modes of transport;
- The Regional Land Transport Strategy (RLTS) seeks to ensure that travel is quick, easy, and reliable between key destinations such as the regional growth centres and Auckland International Airport, and the Project is a series of improvements to provide for safer and more efficient travel;
- The Regional Public Transport Plan (RPTP) is to facilitate the Auckland Plan's goal of improved and more effective public transport to achieve a modal shift, and the Project extends the Northern Busway and provides the SUP to improve transport options; and
- Local Board Plans:
 - Hibiscus and Bays Local Board Plan places an emphasis on planning for growth, facilitating a strong local economy as well as excellent transport choices (public transport, cycleways and efficient roads) to provide for connected communities and easy access to community facilities that in turn support a sense of well-being, safety and connection to others; and
 - Upper Harbour Local Board Plan with the Project directly satisfying one of the outcomes sought which is for a well-connected and accessible Upper Harbour.



11.11 Summary

The Project is the subject of NoRs for alterations to existing designations in the AUP and new designations (Busway and SUP).

A resource consent will be required under the NES_{Soil} (Regulation 11) and the following regional resource consents are required to enable construction and operation of the Project:

- Applications for land use consents pursuant to sections 9 and 13 of the RMA;
- Applications for the taking, using, damming and diversion of water pursuant to section 14 of the RMA; and
- Applications for discharge permits pursuant to section 15 of the RMA.

Given the above assessment, this document supports the NoRs as outlined within **Section 1.3** and applications for the resource consents described within **Section 6.1**. The Project is consistent with the policy direction of the relevant planning documents, these being:

- NPS_{FM} since there will be an overall improvement of the water quality of the receiving environment, by removing contaminants and sediment from degraded streams with low to moderate ecological value, and enhancement of riparian planting;
- NPS_{ET} and NES_{ETA} since Transpower has been consulted and options to address effects on the electricity transmission network are being explored;
- NES_{AO} since dust effects can be effectively managed through the Dust Management Plan and there will be a small net gain in air quality during operation following from efficiency improvements for traffic flows;
- NES_{Soil} as a consequence of the draft CSMP for the Project relating to areas outside the Rosedale Closed Landfill, and the LWRP and LHSP for the Rosedale Closed Landfill to effectively manage risks associated with land contamination;
- AUP (regional policy statement, regional plan, and district plan) since it is transport infrastructure that is specifically recognised as a key element in servicing the growth envisaged for the region, and that all of the discussion above and other sections of the AEE demonstrate that adverse effects will be avoided, remedied, or mitigated;
- ACRPS since it is transport infrastructure supporting the strategic objectives for the Region's growth in a manner that is efficient and sustainable while avoiding, mitigating, or remedying adverse effects;
- ACRP:ALW since it will involve mitigation planting, enhancement of degraded natural values and ecological values and otherwise avoid, remedy, or mitigate adverse effects relating to vegetation management, biodiversity, and significant ecological areas; and
- Non-Statutory Planning Documents that developed the RoNS and included the Project as an accelerated project.

The effects associated with the construction of the Project, such as dust, construction noise and vibration, sediment, contamination, vegetation removal, groundwater diversion and take, settlement, flooding and water quality are temporary in nature and can be managed and mitigated through implementation of an approved CEMP and a range of associated management plans required by the designation and resource consent conditions.

From an operational perspective, the Project has been designed to ensure that the longer-term visual impacts associated with larger structures and the corridor itself are mitigated to the extent practicable, through the requirement to adhere to design principles during detailed design and through planting. Noise levels are predicted to be generally within the same noise criteria category as would be the case without the Project. Flooding effects are largely avoided and the on-going potential effects associated with the discharge of gas, odour and leachate from the Rosedale Closed Landfill are also to be minimised. Stormwater discharges will be mitigated by a treatment system tailored to treat



contaminants to an acceptable standard and new culverts and structures will be designed to avoid or mitigate potential scour.

Overall, is consistent with the relevant objectives and policies of those statutory and non-statutory instruments discussed above.



12 Statutory Assessment

12.1 Introduction

The purpose of the statutory planning assessment is to provide analysis of the Project against the relevant legislative framework within which the designations and resource consents are sought.

Section 3 of this AEE has set out the statutory framework in which the Project sits and the relevant provisions of the RMA. It also comments on other relevant legislative documents as appropriate.

12.2 Statutory Framework

The statutory documents relevant to the consideration of the Project in terms of both the NoRs and resource consents are as follows:

- Resource Management Act (RMA);
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES_{Soil});
- Land Transport Management Act 2003 (LTMA);
- Government Roothing Powers Act 1989 (GRPA);
- Reserves Act 1977 (RA);
- Wildlife Act 1953 (WA);
- Fisheries Act 1983 (FA); and
- Heritage New Zealand Pouhere Taonga Act 2014.

Copies of the relevant provisions from these documents are attached in **Appendix E- Relevant Statutory References**. This Section assesses the Project against the requirements of the RMA, and briefly comments on other relevant legislation.

The relevant statutory provisions are set out in **Section 3** (Statutory and Policy Context).

This Section should also be read together with **Section 7** (Assessment of Alternatives) and **Section 9** (Assessment of Actual and Potential Environmental Effects).

12.3 Resource Management Act 1991

As detailed in **Section 3**, the consent authority must, when considering the matters set out in section 171 of the RMA, do so subject to Part 2 of the RMA. In addition, a consent authority's consideration of applications for resource consent under section 104 must also be subject to Part 2 of the RMA.

This section sets out the assessment of the Project against the statutory requirement of Part 2 and sections 171, 104D, 104, 105 and 107 of the RMA. **Sections 3 and 6** identify the NoRs and resource consents sought in this process respectively.

The following sections assess the Project against purpose and matters outlined in Part 2 of the RMA relevant to the proposal.

12.3.1 Consideration of notices of requirement

As set out in **Section 1**, the NZ Transport Agency proposes to alter the following existing designations to widen them and generally authorise the Project works:

- Designation 6751 – SH1-Greville North;
- Designation 6750 – SH1-Greville to Harbour Bridge;



- Designation 6756 – SH18-State highway; and
- Designation 6758 – Constellation Bus Station (alteration to conditions only; no change to designation footprint).

In addition, notices of requirement have been issued for two new designations, in order to authorise:

- The extension to the Busway, adjacent to SH1 (on the eastern side); and
- The proposed new shared use path (walkway and cycleway) adjacent to the extension to the Busway.

Section 171 of the RMA sets out the various matters to which particular regard must be had when considering notices of requirement for a designation (as outlined in **Section 3**). Under section 181, those same matters are to be considered 'with any necessary modifications', in relation to a notice of requirement for an alteration as if it were a notice of requirement for a new designation.

These matters have been discussed and assessed throughout the AEE and associated Technical Assessments. The purpose of this Section is to draw these matters together to provide a clear outline of the section 171(1) considerations and where these are addressed in more detail.

12.3.1.1 Section 171 considerations

Effects on the environment (s 171(1))

Under section 171 the decision maker must, subject to Part 2, consider the effects of the environment of allowing the requirement. Consideration of the Project against the matters within Part 2 of the RMA is set out below in **Section 12.3.3**.

The Project will have a range of effects, some of which are positive and others that are potentially adverse and vary in potential significance, scale and duration. The effects on the environment associated with the NoRs are assessed in detail in **Section 9**. **Sections 9 and 10** set out the proposed measures to avoid remedy or mitigate the adverse effects of the Project on the environment.

The Project will have significant positive transport effects (benefits) at a local and regional level, as it will improve the efficiency and capacity of the State highway and public transport network, including safety improvement features.

The Project is expected to increase daily flows on the Northern Motorway by up to 28,600 vehicles per day, two way, between the Greville interchange and the SH18 direct connections (based on 2031 traffic forecasts). Daily flows along the Upper Harbour Motorway, east of the Albany Highway interchange are expected to increase by 22,500 vehicles/day, two way (based on 2031 traffic forecasts). However, the additional capacity and new direct connections provided by the Project mean that travel times are predicted to improve, relative to the future scenario without the Project, even with these increases in flows.

While the Project is predicted to increase flows along both SH1 and SH18, decreases in flows are forecast on a number of parallel routes (based on 2031 traffic forecasts).

The Project will offer significant benefits for public transport in terms of providing quicker and more reliable journeys by bus, through the extension of the Busway to Albany Bus Station. In particular, northbound buses will no longer need to travel with general traffic at the Upper Harbour Interchange, as they leave the Constellation Bus Station. This will lead to benefits in terms of reduced travel times for buses and increased patronage. The increased patronage will in turn lead to less traffic congestion. In addition, the reduced traffic volumes on arterial routes will provide indirect benefits to public transport operators and users, by reducing congestion on these routes and improving bus travel times, where bus priorities are not already in place.

The Project will also deliver a number of safety improvements. Crash reductions are predicted through sections of motorway that the Project will fundamentally change, particularly on SH18 east of



Albany Highway. Small crash rate increases are predicted on sections outside the Project but where increases in traffic are expected. In total however, a net reduction in annual injury crashes on the motorway network is expected.

Finally, the Project includes shared use paths parallel to SH1 from Oteha Valley Road to Constellation Bus Station, and parallel to SH18 from Albany Highway to Constellation Bus Station, together with connections to the local transport network. Accordingly, the Project's effects on pedestrians and cyclists are predominantly positive, and the Project will result in significantly increased safety and connectivity outcomes for active modes.

There are related positive social effects associated with these transport benefits. The Project will enhance movement and accessibility through the Project area with improved east – west connections at McClymonts Road, Rosedale Road and Constellation Drive. Consequently, access between schools, commercial/retail, employment areas and neighbourhoods will be enhanced. With the SH1 SUP better connectivity between communities along the SH1 access are anticipated for north – south cycle/ pedestrian movements avoiding local road options. Currently, pedestrian/cycle movement across SH18 from Unsworth Heights to North Harbour East is restricted to the underpass at Alexandra Stream. With the Project in place, north-south connectivity will be augmented from the residential area to the range of services within North Harbour East by way of the SH18 SUP and its local road linkages at Caribbean Drive, Paul Matthews Road and William Pickering Drive. A dedicated crossing at Constellation Drive will facilitate better accessibility to the range of services located to the east as well as to Constellation Bus Station.

There is also the potential for adverse effects associated with the Project. The effects of the Project are assessed in detail in **Section 9** (and the supporting Technical Assessments), and the proposed mitigation measures are summarised in **Section 10**. In summary:

- There is some potential for increased operational noise in some locations as a result of the Project. New noise barriers are proposed in a number of locations where this is considered the BPO to manage noise effects. In other locations, operational noise levels will be reduced;
- Operational vibration levels are not likely to increase as a result of the Project. As such no specific mitigation is considered necessary;
- Air quality (dust) effects during construction can be managed. The Project itself, once completed, will not generate adverse air quality effects;
- There will be some adverse effects on terrestrial ecology associated with the clearance of vegetation. Overall, the terrestrial ecological values within the Project area are considered to be low, with the exception of a SEA along the western side of the Oteha Valley Road northbound on-ramp (SEA_T_8297). The vegetation near the on-ramp will be impacted by the installation of a new culvert. However, provided mature trees are not removed, the adverse effects will be minor. It is considered that the overall effects of the Project on terrestrial ecology, with mitigation and appropriate monitoring, will be negligible;
- There will be landscape and visual effects associated with the removal of vegetation as well as with works within higher areas of natural character such as Lucas Creek, Oteha Stream and Alexandra Stream. Replacement planting and revegetation is proposed to address these effects;
- The Project will increase the amount of impervious area throughout the Project area generating increased runoff from motorway surfaces. Although not all stormwater effects are able to be avoided, the design of the Project has mitigated water quality and quantity effects to the greatest extent possible through treatment, detention, attenuation and outlet protection, and will improve the quality of stormwater runoff from existing and new impervious surfaces within the Project area. This is seen as a benefit of the Project;
- There is also the potential for adverse freshwater ecology effects arising from stormwater runoff from roads, including hydrocarbons. However, through appropriate mitigation, any potential adverse effects on freshwater ecology are anticipated to be no more than minor;



- A number of sites along the Project alignment have been identified as a risk due to potential land contamination. Potential contaminants have been assessed based on the historic land uses, and measures proposed to minimise any adverse effects that may occur with the exposure to contaminated soils. In addition, the Project will include works within the Rosedale Closed Landfill. Without mitigation this could have the potential to generate significant adverse effects during construction on the environment and the health of personnel working within the site and the wider community. Mitigation measures will include consideration of specific construction management aspects and health and safety issues and be addressed during detailed design and construction in the vicinity of the Rosedale Closed Landfill. With these measures in place it is anticipated that any actual or potential adverse effects from contaminated land and the Rosedale Closed Landfill during the operation of the Project will be minor;
- No archaeological sites or historic heritage remains that may be encountered or adversely affected by the development of the Project have been identified. Notwithstanding this, if any sites are encountered, accidental discovery protocols are to be adhered to in order to avoid any damage or irreversible effects. Overall, it is considered that with the implementation of the mitigation proposed, the effect of the Project on archaeological and heritage values will be less than minor; and
- On-going engagement has occurred throughout the development of this Project with interested mana whenua groups. The Project has taken into consideration the views and concerns raised through various hui and in cultural values assessments that have been prepared. Overall, it is considered that the Project has addressed the concerns identified and appropriately addressed any adverse effects on mana whenua values that have been identified.

Finally, there will be a number of temporary adverse effects associated with the initial construction works, as follows:

- Large volumes of earthworks are required for the construction of this Project generating sediment with the potential to enter waterways. A variety of erosion and sediment control measures are proposed to first minimise erosion and then control and treat any sediment-laden runoff prior to any discharge of construction waters. The pH levels are to be tested for construction waters potentially containing contaminants such as concrete prior to removal or discharge to an appropriate location. The preparation and adherence to CESCPS will ensure that the adverse effects of construction water will be appropriately avoided or mitigated such that overall they will be no more than minor;
- In terms of construction noise, there are locations where the recommended noise levels for both residential and commercial activities will be exceeded during the construction works, which is not unusual for the construction of major infrastructure projects. Many of the effects arising from construction noise are site-specific and the actual effects will vary from activity to activity. It is considered that night-time works over one or two nights is acceptable provided residents have been kept informed and a clear timeframe is provided. Where more than two consecutive nights are proposed for night works where the noise standards may be exceeded, alternative strategies are to be implemented;
- There is the potential for vibration generated from the construction phase of the Project to have adverse effects on the properties adjacent to the Project corridor. However, it is considered that the adverse effects associated with vibration during the construction phase while can be managed to reduce effects as far as practicable;
- The construction of the Project will see the control of dust emissions during the construction phase through the preparation of, and compliance with, a CEMP and a Dust Management Plan. These documents will control factors such as frequency, intensity, duration, offensiveness, location, buffer distances, erosion, dust mitigation, response programme and on-going monitoring. It is expected that if these documents are strictly adhered to throughout the construction phase of the Project and consequently, the adverse effects, although not avoided, will be no more than minor; and
- During the construction period, adverse transport effects will be encountered due to road closures, temporary lane closures, and temporary speed restrictions which will cause increased congestion in some parts of the State highway and local road network. A CTMP is to be prepared which will manage the adverse transport effects throughout the construction of the Project.

Overall, it is considered that the Project will have significant benefits, while any adverse effects (both during construction and longer term) will be able to be appropriately avoided, remedied or mitigated.



RMA planning documents (s 171(1)(a)(i) – (iv))

Relevant provisions of the applicable statutory planning documents are considered in **Section 11**. In summary, it is considered that:

- The Project is in accord with the objectives and policies of the NPS_{FM};
- In terms of the NPS_{ET}, the design of the Project has been mindful of the significance of the electricity transmission network, and solutions have been identified to avoid any disruptions or major relocations of transmission. As such, the Project works are considered to be consistent with the NPS_{ET};
- The Project is consistent with the relevant objectives and policies in the AUP, including the RPS; and
- The Project is consistent with the relevant objectives and policies of the ACRPS and the ACRP:ALW which still have legal effect.

The overall conclusion of this assessment outlined in **Section 0** is that the Project is not contrary to the objectives and policies of all relevant instruments.

Adequate consideration of alternative sites, routes or methods (s 171(1)(b))

The alternatives assessment process undertaken in the development of the Project is explained in detail in **Section 7**.

There have been a number of alternatives assessments throughout the development of the Project in order to progressively refine the options for improving network connections in the Project area. This process has been thorough and robust in terms of the requirements of section 171(1) and Schedule 4 of the RMA

Whether the work and designations/alterations are reasonably necessary to achieve the objectives of the NZ Transport Agency (s 171(1)(c))

The NZ Transport Agency's objectives for the Project are:

- To help facilitate interregional travel between Auckland and Northland by completing the Western Ring Route to motorway standard;
- To improve connectivity of the SH1 and SH18 interchange;
- To improve safety, efficiency, reliability and the capacity of:
 - SH1 between SH18 and Albany; and
 - SH18 between SH1 and Albany Highway.
- To provide safe walking and cycling facilities adjacent to SH1 and SH18 and connections to local transport networks; and
- To extend the Busway from Constellation Bus Station to the Albany Bus Station.

Both the works and the designations and alterations are considered to be reasonably necessary because:

- The works are reasonably necessary to provide motorway standard connections between SH1 and SH18, increase the capacity of the State highways, and provide for the new walking and cycling facility and Busway extension;
- The alterations to designations 6750 (SH1), 6751 (SH1), 6756 (SH18) and 6758 (Constellation Bus Station) are reasonably necessary because they will:
 - Widen the Project corridor to provide for additional features such as the new connections between SH1 and SH18 and additional State highway lanes;
 - Authorise the NZ Transport Agency to undertake the proposed works;
 - Allow the Project to be clearly and accurately identified in the AUP, by updating the existing designations to show what will be constructed;



- Provide a more efficient planning tool than using resource consents or plan changes to authorise the Project, given the complexity of the design detail and mitigation planning. In addition:
 - Altering (i.e. widening) the existing State highway designations is more appropriate than adding on new designations to enable these works outside of the current designation footprints, because it will mean conditions can be imposed over the Project works and operations in a coherent way.
 - It is reasonably necessary for the SH1 designation (6751) to be extended over the same area as the busway and shared use path, in order to enable services beneath those assets which will support the State highway.
 - The expanded designations will provide space for construction service areas. Following completion of construction, there may be the opportunity to reduce the designation subject to providing sufficient space for maintenance activities.
- The new designations are reasonably necessary because they will:
 - Enable the construction and ongoing operation of the Busway extension and the new shared use path.
 - Allow the required land to be identified in the AUP, to provide a clear indication of the intended land use.
 - Provide a more efficient planning mechanism than a resource consent or plan change. In addition, it is reasonably necessary for these aspects of the Project to be authorised by separate designations (rather than alteration of existing designations) because they will be functionally separate, and in order to better facilitate the possible transfer of those assets in the future. Having separate designations for these facilities is also consistent with the existing Northern Busway being authorised by a separate designation.

Relevant other matters (s 171(1)(d))

In terms of 'other matters' that may be considered reasonably necessary for considering the NoRs, it is relevant that a substantial portion of the proposed works will occur within the boundaries of (and would be authorised under) existing State highway purposes designations. Community expectations will be that State highway works will occur in these areas. This is a relevant contextual matter in understanding the scale and character of the effects of confirming the NoRs.

It is also relevant to consider the extent to which activities to be authorised by the designations are permitted land use activities under the AUP. For example, Rule E25.6.29 (3) relates to noise from works within a road reserve and enables works that exceed the noise limits in the AUP, provided the period exceeding the limits at any one receiver is less than 10 days and it meets the other requirements in parts of the rule, including the requirement for a CNVMP in E25.6.29 (5). Many of the activities to be authorised by the NoRs would have been permitted by the AUP in any event.

For context, it is noted that activities associated with the Project that are assessed to be permitted by the regional rules in the AUP are identified and discussed at **Section 6.2**.

12.3.1.2 Lapse period for new designations

Section 184 provides that, unless a designation specifies otherwise, it lapses on the expiry of five years from the date that it is included in the district plan. A lapse period of seven years is considered appropriate for the new designations to authorise extension to the Busway, and the proposed new shared use path.

Lapse periods are not sought for the alteration NoRs because the designations being altered have already been given effect to. The alterations will not have their own separate legal identity, but will merge with the existing designations 6750 (SH1), 6751 (SH1), 6756 (SH18) and 6758 (Constellation Bus Station).



12.3.2 Consideration of resource consents

The resource consents required as part of the Project are set out in **Section 6** (refer **Tables 17-22**). In essence, the NZ Transport Agency is seeking resource consents to authorise those aspects of the Project which cannot be authorised by way of a designation – being generally those aspects that do not comply with regional rules in the AUP. Resource consent is also required under the NES_{Soil}.

In summary, these are:

- Earthworks exceeding the specified volumes or criteria in the AUP (regional rules), including earthworks in a SEA (SEA_T_8364 and SEA_T_8365);
- Earthworks exceeding the specified area and volumes including within the SCPA;
- Installation of a new structure (waste water outfall) within an SEA (SEA_T_8365);
- Installation of a new structure (surface water intake structure) within an SEA (SEA_T_8364);
- Tree trimming, alteration and removal activities in a SEA, and in riparian margins (within the riparian margins of Lucas Creek, Oteha Stream and Alexandra Stream);
- Works on existing structures and associated bed disturbance (within the oxidation ponds, Pond 1 and Pond 2 subject to SEA at the RWWTP, and the extension of culverts for more than 30m outside of the SEA), deposition and temporary damming;
- New reclamation or drainage including filling over a piped stream (modified watercourse to the south of the RWWTP);
- Diversion of surface water;
- Diversion of groundwater caused by excavation, and associated dewatering or groundwater level control;
- Diversion and discharges of stormwater from impervious areas of the Project, including within SMAF areas and from high use roads;
- Discharges to land and water associated with the construction of network utility infrastructure;
- Discharges of water and contaminants from works over or bordering waterbodies;
- Discharges to air associated with earthworks and road construction, and with earthworks within the Rosedale Closed Landfill;
- Stormwater runoff from contaminated land; and
- Disturbance, removal and sampling of soil at a HAIL site, in terms of the NES_{Soil}.

The activity status for these resource consents is generally restricted discretionary or discretionary, although there is one activity with non-complying activity status. Non-complying activity status is only triggered because the Project will involve reclaiming a modified watercourse.

However, given the extent to which the proposed activities are interrelated or overlapping, it is considered appropriate for the resource consent applications to be ‘bundled’ together and considered jointly as a non-complying activity.

Section 104D contains gateways which non-complying activities must pass in order to qualify for further consideration. Section 104 RMA sets out the relevant matters to be considered by a consent authority in determining an application for resource consent. Sections 105 and 107 set out additional matters that must be considered with regard to discharge permits.

12.3.2.1 Section 104 considerations

The decision maker is required to have regard to specified matters in section 104, “subject to Part 2”. Consideration of the Project against the matters within Part 2 of the RMA is set out in **Section 12.3.3**.



12.3.2.2 Non-Complying activity status (s 104D)

As outlined earlier in this report, because of the reclamation work which affects a modified watercourse, non-complying activity status is triggered under Rule E3:A49 of the AUP. It is considered appropriate for the resource consent applications to be 'bundled' together and considered jointly as a non-complying activity.

In determining an application for a non-complying activity, the decision maker must first consider whether one of the two tests under section 104D of the RMA can be met. In summary these tests are:

- Whether the adverse effects of the activity on the environment will be minor (section 104D(1)(a)); or
- Whether the application for an activity will not be contrary to the objectives and policies of relevant plans and proposed plans (section 104D(1)(b)).

A discussion of the effects on the environment in **Section 9** has determined that the potential adverse effects of the Project will be minor or less than minor, with the exception of some temporary adverse noise and vibration effects of the proposal which will be more than minor. The assessment of the proposal against the objectives and policies of the relevant plans set out in **Section 11** finds the proposal to be consistent with the relevant objectives and policies. As the application passes the section 104D(1)(b) test of section 104D, all resource consents sought in this application can therefore be considered for determination by the decision maker pursuant to section 104B and s104.

Effects on the environment (s 104(1)(a))

The decision maker is required to consider "any actual and potential effects on the environment of allowing the activity".

The actual and potential effects on the environment associated with the Project as a whole (i.e. including both those aspects to be authorised by resource consent as well as by way of designations or alterations) are assessed in **Section 9** (and the associated Technical Assessments), and summarised in **Section 12.3.1.1**.

It is considered that the environmental effects associated with the activities to be authorised by resource consent (earthworks, vegetation clearance, and various discharges (both during construction and operation)) are all able to be appropriately managed through the mitigation measures set out in **Section 10**. These activities are required in order to enable the Project, and as such the effects of allowing these activities include the positive effects associated with the Project as a whole.

Relevant provisions of RMA statutory documents (s 104(1)(b))

Relevant provisions of the applicable statutory planning documents are considered in **Section 11**, and summarised above. It is considered that the activities for which resource consent is sought are not inconsistent with the relevant objectives and policies in these documents, provided the adverse effects are appropriately managed.

12.3.2.3 Matters relevant to applications for discharge permit (s 105)

Section 105 of the RMA requires that, for discharge permits that would contravene section 15, the decision maker also have regard to:

- The nature of the discharge and sensitivity of the receiving environment;
- The applicant's reasons for the proposed choice; and
- Any possible alternative methods of discharge, including discharge into any other receiving environment.



Nature of the discharge and the sensitivity of the receiving environment

Discharges will occur both during construction and in the course of the operation of the Project. The nature of the discharges and the receiving environment are described in **Sections 4 and 9** of this report respectively and in the following Technical Assessments included in **Volume 3**:

- Assessment of Air Quality Effects;
- Assessment of Construction Water Management;
- Assessment of Stormwater Management;
- Assessment of Surface Water Quality Effects;
- Assessment of Contaminated Land Effects; and
- Assessment of Freshwater Ecological Effects.

Construction discharges

During construction, the Project involves bulk earthworks which will contribute to associated discharges. In more detail, these include:

- Discharge of construction water (sediment-laden water);
- Discharge to air (dust); and
- Discharges associated with the Rosedale Closed Landfill works.

The Assessment of Land Contamination Effects (**Technical Assessment 6**) has confirmed that fill material and natural soils will be disturbed during construction of the Project. A detailed list of actions to be taken in order to manage issues associated with potentially contaminated or contaminated soil and a reporting requirement are recommended. Adherence to these mechanisms will ensure that the best practicable option is met with respect to the management of earthworks on-site (including the management of dust and odour).

There is the potential to encounter contaminated groundwater during earthworks, and the potential for stormwater to encounter sediment and contaminated material. In terms of water discharges, a series of control measures are identified and available to manage the quality of the discharge and these will be confirmed in the CESCPS. If any tested water is found to be contaminated (in excess of relevant guidelines), it will be pumped and either collected in drums or tanks for further treatment on-site or removed to a suitable facility authorised to receive wastewater for treatment and disposal. If the quality of the discharge is acceptable, it will be discharged to the receiving environment.

The potential for adverse dust effects is due to the close proximity of various land uses (some which could be considered sensitive). The Assessment of Air Quality Effects (**Technical Assessment 1**) recommends that a DMP be developed which will set out a detailed framework for the management, mitigation and monitoring measures to be implemented during construction. This will ensure that the best practicable option will be employed to ensure the potential effects of dust are managed.

Perforation of the Rosedale Closed Landfill cap is required in order to construct the SUP and associated retaining walls. Construction activity in the Rosedale Closed Landfill will release gas and odour into the atmosphere, and there are significant residential receivers, and commercial receptors nearby. Measures such as limiting the extent of area opened up, covering excavated refuse, and off-site removal and odour suppression management are considered to represent the best practicable option in respect to managing the air discharge. Leachate will continue to be discharged via the existing consented trade waste system. All ground and surface water that comes into contact with refuse will be treated as contaminated, contained and removed to an appropriate facility for treatment and discharge.

Operational discharges

During operation the Project involves the discharge of stormwater.



The Assessment of Stormwater Management (**Technical Assessment 11**) has thoroughly considered the BPO in respect of stormwater quality matters (locations, devices and sizing and taking account of available space). In addition, the effects on downstream hydrology (including flows and flooding) are considered to be appropriately managed through the application of the BPO.

Subject to ensuring the ongoing adoption of best practice approaches (as identified above), it is considered that the proposed control and mitigation of potential discharges to local waterways from the construction and operation of the Project represents the best practicable option.

Reasons for the proposed choice and possible alternative methods of discharge

In terms of the discharges, the available choice of locations or methods is constrained by the Project for which the authorisations are sought. There are no practicable alternatives available with respect to the discharges into the respective receiving environments, given the constrained or 'tight' nature of the corridor and the measures available. As noted, air discharges will be actively managed while all discharges of construction water will be treated (prior to discharge) and all points of discharge will be designed to ensure that potential (ongoing) sedimentation of any watercourse is managed appropriately.

A range of best practice management techniques have been identified in the various Technical Assessments and these will ensure that the loss of sediment into water courses is minimised while stormwater quality, flow and volume discharges are managed (during operation). All discharges from the Rosedale Closed Landfill are able to be actively managed through a range of measures. Given the nature of construction and operational discharges and the fact it is not practical to discharge to an alternative receiving environment, there are considered to be no appropriate alternative discharge methods, subject to the 'control' or 'treatment' methods used to minimise discharges and their effects, which are discussed in **Section 11**.

Overall, it is considered appropriate for the applications for discharge permits to be granted, having regard to the matters in section 105.

12.3.2.4 Restrictions on granting certain discharge permits (s 107)

Section 107 of the RMA prevents discharge permits to authorise the discharge of water or contaminants into water (or onto land in circumstances that may result in it entering water) being granted in certain circumstances.

The assessment of effects associated with the discharges (identified at 12.3.2.3) concludes that their effects will be minor. In particular, in terms of the s107 considerations, the discharges will not (after reasonable mixing) give rise to:

- The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
- Any conspicuous change in the colour or visual clarity;
- Any emission of objectionable odour;
- The rendering of fresh water unsuitable for consumption by farm animals; or
- Any significant adverse effects on aquatic life.

The Project is considered to meet the s107 test, such that the applications for discharge permits are able to be granted for the following reasons:

- The potential for significant adverse effects from sediment discharges is low. Any adverse effects experienced will be temporary and minor in nature, as earthworks will be limited in extent and well contained given the constrained nature of the site and through the application of a range of BPO measures (as discussed in the Assessment of Construction Water Management);
- The potential for effects on receiving waters associated with conspicuous oil or grease films, scums or foams, or floatable or suspended materials or odour both through construction and operation is



considered to be limited, based on the Assessment of Construction Water Management, Assessment of Stormwater Management, Assessment of Effects – Encroachment on Rosedale Landfill (**Technical Assessment 7**), and Assessment of Surface Water Quality Effects (**Technical Assessment 12**);

- The Assessment of Construction Water Management (**Technical Assessment 4**) concludes that downstream effects on water quality will be negligible after reasonable mixing;
- The Assessment of Freshwater Ecological Effects (**Technical Assessment 5**) has confirmed that the aquatic ecological values within the Project area is generally low. Consistent with this, only a limited range of species have been found. Significant adverse effects on aquatic life are therefore not anticipated; and
- Once completed, the Project will treat all stormwater runoff from the motorway to the BPO standard, prior to discharging to surrounding watercourses, while water quality will be substantially enhanced (noting there is no existing treatment along some parts of the Project corridor i.e. SH18).

Overall, it is considered that the requested discharge permits can be granted.

12.3.2.5 Conditions of resource consent (s 108)

In accordance with s108, proposed resource consent conditions are provided in **Appendix A**. The assessment of effects of the Project should be on the basis of the mitigation provided by these conditions, as proposed by the NZ Transport Agency.

12.3.2.6 Consent durations and lapse periods (s 123 and 125)

Section 123 of the RMA defines the period for which consents may be granted. Under section 123(b) the period for which any land use consent is granted is unlimited unless otherwise specified in the consent.

Section 123 goes on to set an upper limit of 35 years for discharge and water permits but section 123(d) limits discharge and water permits to five years unless an alternative duration is specified in the consent.

Under section 125, a resource consent lapses on the date specified in the consent, or (for discharge permits, water permits and land use consents) five years after the consent commences if no date is specified.

It is requested under section 123(b) that the duration of the resource consents related to land use 'construction' activities is seven years. Similarly, it is requested that the duration of resource consents related to the 'operational' aspects (i.e. discharge and water permits) is 35 years, as provided by section 123(d) of the RMA.

As outlined in **Section 5** of this report, the construction of the Project is accelerated and is estimated to take 3.5 years. The Project is expected to commence in June 2018 and finish in September 2021. Consequently, a lapse period of seven years is requested for all resource consents.

12.3.3 Part 2 Purpose and Principles (ss 5 – 8)

The assessments under section 171 and section 104 (or aspects of those assessments) are subject to Part 2.

12.3.3.1 Section 5 Purpose

The Project and its associated works and structures will enable the people of the Auckland Region, and the communities on the North Shore of Auckland to provide for their wellbeing, health and safety. In particular, the Project will provide for their social and economic wellbeing by upgrading the connection between SH1 and SH18, extending the Busway to the Albany Bus Station, and providing walking and cycling facilities. There are also health and safety benefits associated with the Project due to reductions in crashes.



The Project forms a key component of the WRR, which creates an additional north-south State highway link through the Auckland Region which is necessary for the residential and commercial growth that is projected for the North Auckland region. The WRR is also an important freight route to Northland.

Through the realisation of the objectives set out in **Section 1**, the Project will sustain the potential for the State highway system (as a physical resource) to meet the foreseeable local and regional needs for road transport.

The life supporting capacity of the ecosystems within and adjoining the Project area will be safeguarded by the proposed mitigation measures outlined in **Sections 9 and 10**. Moreover, this capacity will be improved by the treatment of stormwater runoff from both the existing and new State highway impervious areas.

For the reasons set out in **Section 9**, any potential or actual adverse effects of the proposal on the environment can be appropriately avoided, remedied, or mitigated and accordingly section 5(2)(c) of the RMA will be satisfied.

Accordingly, the Project will promote the sustainable management of natural and physical resources, consistent with the purpose of the RMA.

12.3.3.2 Section 6 Matters of National Importance

For the reasons detailed in **Section 9**, the Project recognises and provides for the relevant matters in section 6 of the RMA. In particular, the Project:

- Does not affect the coast, or any outstanding natural features and landscapes;
- Will preserve the existing character of the freshwater environment and its margins;
- Will enhance public access throughout the Project area, with the provision of a SUP along the lengths of SH1 and SH18, connecting various open spaces and freshwater bodies;
- Will protect the ecological values of identified areas of significant indigenous vegetation and significant habitats of indigenous fauna within the Project area; and
- Will not adversely affect historic heritage, or the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu or other taonga.

Overall, it is considered that the Project appropriately recognises and provides for the applicable Matters of National Importance in section 6 of the RMA.

12.3.3.3 Section 7 Other Matters

Particular regard has been given to Other Matters set out in section 7 of the RMA in the development of the Project. In terms of the relevant “other matters” listed in that section:

- Consultation with mana whenua has been undertaken in order to recognise their status as kaitiaki;
- The Project will increase efficiency and improve travel times for those utilising this area of the State highway network and the wider local road network, including public transport users. In this respect it will contribute to the efficient use and development of the State highway network as a physical resource in terms of section 7(b). The SUP is to be constructed, providing pedestrian and cycling connections across the Project area, which will enhance access and improve safety for active modes of transport in and around the State highway corridor; and
- Amenity values are likely to be affected by construction of the Project, most notably for those within close proximity to the construction works. The Technical Assessments appended to this AEE and the proposed mitigation will manage the impact of the Project on amenity values. Acoustic attenuation will be erected to minimise adverse noise effects on those properties adjacent to the Project. The management plans proposed will ensure dust, odour and other construction effects are appropriately mitigated and managed. During the construction phase, clear communication will



assist to manage the expectations of residents and commuters who are likely to be affected by the works, such as traffic management, construction noise and construction vibration.

12.3.3.4 Section 8 Treaty of Waitangi

The Project has addressed the requirements of section 8 of the RMA through engagement with iwi who have identified themselves as mana whenua with an interest in the Project corridor. Where possible, the matters raised by mana whenua through hui and cultural values assessments have been addressed in the Project design to date. It is anticipated that mana whenua will continue to be involved in the detailed design of the Project.

12.4 Other Legislation

Other legislation that is broadly relevant to the Project or the functions of the NZ Transport Agency is described in **Section 3**.

In terms of these:

- Aspects of the Project will occur within parks and reserve land, held under the RA. The reserve status for some of this land may need to be revoked and processes undertaken where a Reserve Management Plan is in existence (i.e. Rosedale Reserve Management Plan);
- If required, a separate application will be made under the WA to relocate any protected species prior to construction commencing;
- The approval of the Director-General of Conservation will be sought for culverts as required under the FA; and
- Authorities may separately be required under the Heritage New Zealand Pouhere Taonga Act 2014.



13 Conclusion

The Project has been identified as being of national significance, and is intended to deliver the final motorway connection of the WRR RoNs being the link between the WRR and SH1. The Project will provide an alternative north-south motorway route to the current SH1 route through the Auckland Region for freight and commuters. It will also provide significant transportation and safety benefits, including reduced travel times to the Upper Harbour and North Shore communities and to the wider Auckland region. The physical works necessary to achieve this link include the construction of west and northbound motorway on-ramps connecting SH18 to SH1 together with capacity improvements to SH18 and SH1, including additional lanes and upgraded connections to the local roading network.

Additional elements of the Project include an extension of the existing Northern Busway from the current terminus at Constellation Bus Station to the Albany Bus Station and an upgrade of the Constellation Bus Station to enable it to be served by buses travelling north and south. A SUP is also proposed adjacent to the busway extension from the Constellation Bus Station to Oteha Valley Road and on the southern side of SH18 from the Albany Highway to the eastern side the SH18 - SH1 Interchange.

While the majority of the Project works will be contained within the existing State highway designations it has been necessary to seek alterations to enlarge the footprint of these existing designations and seek new designations to accommodate elements of the Project, and thus achieve the Project objectives.

In addition to the above alterations to existing designations and new designations, a number of resource consents are required to carry out the necessary works as detailed in Section 6. The activities subject of these resource consents range from controlled to non-complying. The “bundling” principle applied to the consideration of related applications with the presence of a non-complying activity has triggered the requirement for assessment against the non-complying activity tests of section 104D of the RMA.

Section 104D of the RMA requires that such applications pass through a “gateway” whereby applications for non-complying activities may only be granted if either the adverse effects of the activity on the environment will be minor; or the application is for an activity that would not be contrary to the objectives and policies of the relevant plans or proposed plans.

The Project will generate some adverse environmental effects, particularly during the construction stage. Where the adverse effects cannot be avoided or remedied through the design, mitigation has been identified to inform the suite of conditions that will accompany the designations and regional resource consents.

The Assessment of Construction Noise and Vibration Effects (**Technical Assessment 3**) establishes that these effects could be more than minor at certain locations adjacent to the works. While these effects may be mitigated through the use of construction techniques and the management of construction activities, the possibility remains that they may not be reduced to a level where they can be considered to be minor. For this reason, it is concluded that the test of 104D(1)(a) may not be met.

The Project has also been assessed against the relevant objectives and policies of the relevant planning instruments at **Section 11** where it is concluded that the activity is not contrary to the overall objectives and policies of these instruments and thus meets the test of section 104D(1)(b) and passes through the s104D “gateway”.

The activities have also been assessed with regard to the matters set out in section 104 of the RMA. Given the scale of the Project it is considered to have regional and project-wide effects that include



positive as well as adverse effects. Effects assessed in the appended Technical Assessments and in **Section 9** of this AEE include social, cultural, traffic and transport, landscape, visual, vegetation, archaeology, streams, avian ecology, herpetofauna ecology, freshwater ecology, emissions to air, noise, vibration, light, discharge of contaminants (stormwater) and contamination effects. Positive effects include the improved capacity and efficiency of the State highway network, enhanced public transport facilities, opportunities for walking and cycling and improved quality of stormwater discharges.

On balance, the conclusion of this assessment is that an holistic assessment of both the positive and negative effects of this Project together with the proposed measures to avoid, remedy and mitigate the adverse effects will ensure that on balance the Project will have positive effects.

Consideration has been given to alternative sites, routes and methods of undertaking the Project pursuant to section 171(1)(b) of the RMA. This is detailed in **Section 7**. This assessment has been undertaken notwithstanding that, as detailed in **Section 9 and 10**, the majority of any adverse effects of the Project have been avoided through the design of the Project or can be mitigated through the offered conditions. While at the time this proposal was lodged the NZ Transport Agency had acquired some of the land that is the subject of the NoRs, there is a substantial number of properties that it does not yet own. Accordingly, the assessment at **Section 7** includes consideration of alternatives where such properties are affected by the Project. The conclusion of this Section is that an adequate consideration has been given to alternatives such that the tests of section 171(1)(b) have been met.

Section 171(c) requires consideration of whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought. In this regard, **Section 2** details the need for the Project and the reasons why, in order to meet the objectives, the Project must go beyond the existing designations.

In summary, it is considered that the assessments contained in this AEE clearly demonstrate the need for the Project and the benefits that it will bring. In doing so, the Project promotes the sustainable management of natural and physical resources and is consistent with the purpose and principles of the RMA. Accordingly, it is considered that the purpose of the RMA is achieved by the granting of the designations and resource consents sought.

Appendices





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Appendix A

Proposed Conditions



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NOR CONDITIONS

General Conditions

- DC.1 Except as modified by the conditions below, and subject to final design, the Northern Corridor Improvements Project ('**NCI Project**') shall be carried out in general accordance with the General Arrangements Sheets 1 – 10 (250310-3PRE-3DES-DRG-0201-G).
- DC.2 For the avoidance of doubt, none of these conditions prevent or apply to works required for the ongoing operation or maintenance of the NCI Project following construction such as changes to street furniture or signage over time. Depending on the nature of such works, outline plans or outline plan waivers may be required for such works.
- DC.3 The designation shall lapse if not given effect to within seven years from the date on which it is included in the Auckland Unitary Plan ('**AUP**').
- DC.4 As soon as practicable following completion of the construction of the NCI Project, the Requiring Authority shall give notice in accordance with Section 182 of the RMA to the Manager Regional and Local Planning, Auckland Council, for the removal of those parts of the designation that are not required for the long term operation, maintenance and mitigation of effects of the NCI Project.

Traffic noise (operation) (ON)

- ON.1 For the purposes of conditions ON.2 to ON.14:
- a. BPO – means the Best Practicable Option;
 - b. Building-Modification Mitigation – has the same meaning as in NZS 6806:2010 *Acoustics – Road-traffic noise – New and altered roads*;
 - c. Habitable Space – has the same meaning as in NZS 6806;
 - d. Noise Assessment – Means the *Traffic Noise and Vibration Assessment Report* submitted with the NoR;
 - e. Noise Criteria Categories – means the groups of preference for sound levels established in accordance with NZS 6806 when determining the BPO for noise mitigation (i.e. Categories A, B and C);
 - f. NZS 6806 – means New Zealand Standard NZS 6806:2010 *Acoustics – Road-traffic noise – New and altered roads*;
 - g. P40 – means the Transport Agency's NZTA *P40:2014 Specification for noise mitigation*;
 - h. PPFs – means only the premises and facilities identified in green, orange or red in the Noise Assessment; and
 - i. Structural Mitigation – has the same meaning as in NZS 6806.

Structural mitigation

- ON.2 The road-traffic noise mitigation measures identified as the 'Preferred Traffic Noise Mitigation' in Chapter 6 of the *Noise Assessment* must be implemented to achieve the Noise



Criteria Categories indicated in the *Noise Assessment* ('Identified Categories'), where practicable and subject to conditions ON.3 to ON.14.

- ON.3 Prior to construction of the Project, a suitably qualified acoustics specialist must undertake the detailed design of the Structural Mitigation measures in the Noise Assessment (the 'Detailed Mitigation Options'), which, subject to Condition ON.4, must include at least:
- Noise barriers with location, length and height in general accordance with the Noise Assessment; and
 - Low-noise road surfaces with location in general accordance with the Noise Assessment.
- ON.4 If it is not practicable to implement a particular Structural Mitigation measure in the location or the length or height included in the Noise Assessment, a changed design can be included in the Detailed Mitigation Options if either:
- the changed design would result in the same Identified Category at all PPFs, and a suitably qualified person certifies to the Team Leader that the changed Structural Mitigation would be consistent with adopting the BPO in accordance with NZS 6806; or
 - the changed design would result in the Identified Category changing to a less stringent Category, e.g. from Category A to B or Category B to C at any PPF, and the Team Leader confirms that the changed Structural Mitigation would be consistent with adopting the BPO in accordance with NZS 6806.
- ON.5 Prior to construction of the Project, a **Noise Mitigation Plan** prepared in accordance with Transport Agency's *P40 Specification for Noise Mitigation 2014* must be provided to the Team Leader.
- The purpose of the Noise Mitigation Plan is to confirm that the Detailed Mitigation Options meet the requirements of ON.2-ON.4. The Noise Mitigation Plan shall include confirmation that consultation has been undertaken with affected property owners for site specific design requirements and the implementation programme.
- ON.6 The Detailed Mitigation Options must be implemented prior to completion of construction of the Project.
- ON.7 Within twelve months of completion of construction of the Project, a post-construction review report written in accordance with Transport Agency *P40 Specification for Noise Mitigation 2014* must be provided to the Team Leader.
- ON.8 The Detailed Mitigation Options must be maintained so they retain their noise reduction performance as far as practicable.

Building-Modification Mitigation

- ON.9 Prior to construction of the Project, a suitably qualified acoustics specialist must identify those PPFs which, following implementation of all the Detailed Mitigation Options, will receive noise levels above Noise Criteria Category B and where Building-Modification Mitigation might be required to achieve 40 dB $L_{Aeq(24h)}$ inside habitable spaces ('Category C Buildings').
- ON.10 Prior to construction of the Project in the vicinity of each Category C Building, the Requiring Authority must write to the owner of the Category C Building requesting entry to assess the noise reduction performance of the existing building envelope. If the building owner agrees



to entry within twelve months of the date of the Requiring Authority's letter, the Requiring Authority must instruct a suitably qualified acoustics specialist to visit the building and assess the noise reduction performance of the existing building envelope.

- ON.11 For each Category C Building identified, the Requiring Authority is deemed to have complied with condition ON.10 if:
- a. The Requiring Authority's acoustics specialist has visited the building; or
 - b. The building owner agreed to entry, but the Requiring Authority could not gain entry for some reason (such as entry denied by a tenant); or
 - c. The building owner did not agree to entry within twelve months of the date of the Requiring Authority's letter sent in accordance with condition ON.10 (including where the owner did not respond within that period); or
 - d. The building owner cannot, after reasonable enquiry, be found prior to completion of construction of the Project.

If any of (b) to (d) above apply to a Category C Building, the Requiring Authority is not required to implement Building-Modification Mitigation to that building.

- ON.12 Subject to condition ON.11, within six months of the assessment required by condition ON.10, the Requiring Authority must write to the owner of each Category C Building advising:
- a. If Building-Modification Mitigation is required to achieve 40 dB $L_{Aeq(24h)}$ inside habitable spaces; and
 - b. The proposal for Building-Modification Mitigation to the building, if required; and
 - c. That the owner has three months to decide whether to accept Building-Modification Mitigation to the building and to advise which option for Building-Modification Mitigation the owner prefers, if the Requiring Authority has advised that more than one option is available.
- ON.13 Once an agreement on Building-Modification Mitigation is reached between the Requiring Authority and the owner of a Category C Building, the mitigation must be implemented, including any third party authorisations required, in a reasonable and practical timeframe agreed between the Requiring Authority and the owner.
- ON.14 Subject to condition ON.11, where Building-Modification Mitigation is required, the Requiring Authority is deemed to have complied with condition ON.13 if:
- a. The Requiring Authority has completed Building-Modification Mitigation to the building; or
 - b. An alternative agreement for mitigation is reached between the Requiring Authority and the building owner; or
 - c. The building owner did not accept the Requiring Authority's offer to implement Building-Modification Mitigation within three months of the date of the Requiring Authority's letter sent in accordance with condition ON.12 (including where the owner did not respond within that period); or
 - d. The building owner cannot, after reasonable enquiry, be found prior to completion of construction of the Project.



Urban Design and Landscape

- UDL.1 The Transport Agency shall submit an Urban Design and Landscape Plan (UDLP) to the Council as part of the outline plan required under section 176A of the Resource Management Act 1991.
- UDL.2 The purpose of the UDLP is to outline:
- The methods and measures to avoid, remedy and mitigate adverse effects on landscape amenity during the construction phase of the Project;
 - The requirements for the Project's permanent landscape mitigation works; and
 - The maintenance and monitoring requirements.
- UDL.3 The UDLP shall be prepared in accordance with:
- The Transport Agency's Urban Design Guidelines: Bridging the Gap (2013) or any subsequent updated version; and
 - The Transport Agency's P39 Standard Specification for Highway Landscape Treatments, 2013.
- UDL.4 The Corridor Requirements set out in Chapter 5 of the draft Urban Design and Landscape Framework (UDLF) shall be given effect to through the UDLP in relation to the following matters:
- Earthworks contouring including cut and fill batters, benching, and spoil disposal sites, median treatment and roadside treatment;
 - Architectural and landscape treatment of all major structures, including bridges, underpasses, retaining walls and noise walls and barriers;
 - Architectural and landscape treatment of the new structures at Constellation and Albany Bus Stations;
 - Landscape treatment of permanent stormwater management ponds, wetlands and swales; and
 - Pedestrian and cycle facilities including paths, road crossings and dedicated pedestrian/cycle bridges or underpasses.
- UDL.5 The UDLP shall include mitigation planting in general accordance with the requirements of Section 6 of the draft UDLF and shall include the following planting details:
- Identification of vegetation to be retained, protection measures, and planting to be established along cleared edges;
 - Proposed planting including plant species, plant/grass mixes, spacing/densities, sizes (at the time of planting) and layout and planting methods;
 - The staging of planting in relation to the construction programme shall, as far as practicable, include provision for planting within each planting season following completion of works in each stage of the Project and detailed specifications relating to (but not limited to) the following:
 - Weed control and clearance;
 - Pest animal management;
 - Ground preparation (topsoiling and decompaction);
 - Mulching;
 - Plant sourcing and planting, including hydroseeding and grassing; and
 - A maintenance regime including monitoring and reporting requirements, which is to apply for a minimum 2 year period following that planting being undertaken.
- UDL.6 All work shall be carried out in accordance with the UDLP.



- UDL.7 For the purpose of staging works, the Transport Agency may prepare staged or site specific UDLPs. The Transport Agency shall consult with the Council (Team Leader Northern Monitoring) about the need and timing for any site-specific or staged UDLPs.
- UDL.8 The Transport Agency may submit amendments to the UDLP to the Council. Any works in accordance with the amended UDLP shall not commence until the process under section 176A of the Resource Management Act 1991 has been completed in relation to those aspects of the UDLP that are being amended.
- UDL.9 The UDLPs shall be prepared in partnership with the NZ Transport Agency Central Northern Iwi Integration Group. This consultation shall commence at least 30 working days prior to submission of each UDLP to Council. Any comments and inputs received from the Central Northern Iwi Integration Group shall be clearly documented within the UDLP, along with a clear explanation of where any comments or suggestions have not been incorporated and the reasons why.



PROPOSED RESOURCE CONSENT CONDITIONS

General Conditions

These conditions apply to all resource consents.

- RC.1 The works shall be carried out in general accordance with the General Arrangements Sheets 1 – 10 (250310-3PRE-3DES-DRG-0201-G) and all referenced as consent numbers [insert numbers].
- RC.2 Where there is inconsistency between:
- The General Arrangements referred to in Condition RC.1 above and these conditions, these conditions shall prevail;
 - The General Arrangements referred to in Condition RC.1 and further information presented post lodgement and/or at the Hearing, the most recent information and plans shall prevail.

Lapse date

- RC.3 Under section 125 of the RMA, these consents shall lapse seven years after the date they are granted unless:
- The consent is given effect to; or
 - The Council extends the period after which the consent lapses.

Site Access

- RC.4 Subject to compliance with the Consent Holder's health and safety requirements and provision of reasonable notice, the servants or agents of the Auckland Council shall be permitted to have access to relevant parts of the construction sites controlled by the Consent Holder at all reasonable times for the purpose of carrying out inspections, surveys, investigations, tests, measurements and/or to take samples.

Construction Environmental Management Plan (CEMP)

- CEMP.1 At least 20 working days prior to the commencement of the construction works authorised by these resource consents, the Consent Holder shall submit a CEMP for the relevant project stage, or specific construction activity, to the Council (Team Leader Northern Monitoring), to certify compliance and consistency with the conditions of the consent.
- CEMP.2 If the Consent Holder has not received a response from the Council (Team Leader Northern Monitoring) within 20 working days of submitting the CEMP or a site-specific CEMP, the Consent Holder will be deemed to have approval and may commence the construction activity to which the CEMP relates.
- CEMP.3 For the purpose of staging works, the Consent Holder may provide staged or site-specific CEMPs for those works to the Council (Team Leader Northern Monitoring). The Consent Holder shall consult with the Council (Team Leader Northern Monitoring) about the need and timing for any other site-specific or staged CEMPs. The Consent Holder shall provide any required site-specific or staged CEMPs to the



Council (Team Leader Northern Monitoring) to certify compliance and consistency with the conditions of this consent at least 20 working days prior to commencement of the specific stage or site works.

- CEMP.4 Where minor enabling works or isolated works are to be undertaken prior to commencement of the main construction works, a site-specific CEMP commensurate with the scale and effects of the proposed works, may be submitted for the approval of the Team Leader.
- CEMP.5 At least two weeks month prior to the lodgement of the CEMP with the Council, the Consent Holder shall provide a copy of the draft CEMP to the NZ Transport Agency Northern Mana Whenua Iwi Integration Group (IIG) and seek feedback on the draft CEMP during at least one hui with the IIG.
- CEMP.6 The purpose of the CEMPs is to set out the management procedures and construction methods to be undertaken in order to avoid, remedy or mitigate potential adverse effects arising from construction activities.
- CEMP.7 All CEMPs shall be prepared in accordance with the NZ Transport Agency's Guideline for preparing Environmental and Social Management Plans (April 2014) and shall include:
- a. The roles and responsibilities of construction management staff, including the manager responsible for the erosion and sediment control;
 - b. The name of the Consent Holder's representative on the Project;
 - c. A description of the training and education programme for all site personnel, including training for construction water management, that will be implemented to ensure compliance with conditions;
 - d. A requirement for a cultural induction programme for appropriate contractor's staff prior to work commencing;
 - e. A requirement for cultural monitoring of construction works through the presence of iwi representatives on site where requested by the IIG;
 - f. Procedures for hazards, including fire hazard, identification and control;
 - g. The details of at least two emergency contact people and responses who shall be contactable 24 hours 7 days a week during construction who shall have authority to initiate immediate response actions;
 - h. Methods for amending and updating the CEMP as required; and
 - i. The management plans set out in condition CEMP.8 below.

Advice Note

Where access to any privately owned property is required, the NZ Transport Agency shall undertake consultation with the property owner to determine an appropriate site access protocol in respect of obtaining access to the site.



In respect of any privately owned property, the NZ Transport Agency and/or its agents shall provide 3 weeks (15 working days) notice of the intention to commence construction.

CEMP.8 The management of the potential adverse environmental effects associated with the construction phase of the NCI Project shall be addressed within the following management plans to be included in the CEMP:

- a. Construction Noise and Vibration Management Plan (CNVMP) prepared in accordance with conditions CNV.1 to CNV.6;
- b. Construction Traffic Management Plan (CTMP) prepared in accordance with conditions CTMP.1 to CTMP.3;
- c. Dust Management Plan (DMP) prepared in accordance with conditions DMP.1 to DMP.4;
- d. Lizard Management Plan (LMP) prepared in accordance with conditions LMP.1 to LMP.3;
- e. Avifauna Management Plan (AMP) prepared in accordance with conditions AMP.1 to AMP.4;
- f. Contaminated Site Management Plan (CSMP) prepared in accordance with conditions CL.1 to CL.2;
- g. Construction Erosion and Sediment Control Plan (CESCP) prepared in accordance with conditions EW.1 to EW.13; and
- h. Landfill Works Plan (LWP) prepared in accordance with conditions LW.1 to LW.8.

CEMP.9 The Consent Holder may request amendments to any of the management plans required by these conditions by submitting material amendments in writing to the Council (Team Leader Northern Monitoring) for certification at least 10 working days prior to any changes taking effect. Any changes to management plans shall remain consistent with the overall intent of the relevant management plan and shall be consistent with the requirements of the relevant conditions of these consents.

CEMP.10 All certified CEMPs shall be implemented and maintained for the relevant stage of works throughout the entire construction period.

Construction Noise and Vibration (CNV)

CNV.1 A Construction Noise and Vibration Management Plan (CNVMP) shall be prepared by an appropriately qualified person, and shall be submitted as part of the CEMP.

CNV.2 The purpose of the CNVMP is to provide a framework for the development and implementation of measures to avoid, remedy or mitigate adverse construction noise and vibration effects, and to minimise any exceedance of the criteria set out in Conditions CNV.5 and CNV.6.

CNV.3 The CNVMP shall be prepared in accordance with the Noise Management Plan requirements of Annex E2 of *New Zealand Standard NZS 6803:1999 'Acoustics –*



Construction Noise' (NZS 6803:1999) and shall describe the measures adopted to, as far as practicable, meet the criteria in conditions CNV.5 and CNV.6. The CNVMP shall also be prepared in accordance with the NZ Transport Agency's *State highway construction and maintenance noise and vibration guide* (version 1.0, 2013).

- CNV.4 The CNVMP shall identify which mitigation measures required by conditions ON.1 to ON.14 imposed on the designations for the Project would also attenuate construction noise. Where practicable, those measures shall be implemented prior to commencing major construction works that generate noise in the vicinity.
- CNV.5 Noise arising from construction activities on land shall be measured and assessed in accordance with NZS 6803:1999 Acoustics - Construction Noise and shall comply, as far as practicable, with the noise limits set out Table CNV1:

Table CNV1: Construction noise limits

Day	Time	L _{Aeq} (15min)	L _{AFmax}
Residential buildings			
Weekdays	0630h - 0730h	55 dB	75 dB
	0730h - 1800h	70 dB	85 dB
	1800h - 2000h	65 dB	80 dB
	2000h - 0630h	45 dB	75 dB
Saturdays	0630h - 0730h	45 dB	75 dB
	0730h - 1800h	70 dB	85 dB
	1800h - 2000h	45 dB	75 dB
	2000h - 0630h	45 dB	75 dB
Sundays and Public Holidays	0630h - 0730h	45 dB	75 dB
	0730h - 1800h	55 dB	85 dB
	1800h - 2000h	45 dB	75 dB
	2000h - 0630h	45 dB	75 dB
Commercial and industrial receivers			
All	0730h – 1800h	70dB	
	1800h – 0730h	75dB	

Advice Note:

There may be occasions when it is not practicable for construction activity to achieve the guideline criteria in the standard. In such circumstances, mitigation that is consistent with the best practicable option shall be adopted in accordance with CNV.6.

- CNV.6 Construction vibration shall be measured in accordance with ISO 4866:2010 Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures, and shall, as far as practicable, comply with the Category A construction vibration criteria in Table CNV2.



Table CNV2: Construction vibration criteria

Receiver	Details	Category A	Category B
Occupied PPFs*	Night-time 2000h - 0630h	0.3mm/s ppv	1mm/s ppv
	Daytime 0630h - 2000h	1mm/s ppv	5mm/s ppv
Other occupied buildings	Daytime 0630h - 2000h	2mm/s ppv	5mm/s ppv
All other buildings	Vibration - transient	5mm/s ppv	BS 5228-2** Table B2
	Vibration - continuous		BS 5228-2** 50% of table B2 values

* For vibration, protected premises and facilities (PPFs) are dwellings, educational facilities, boarding houses, homes for the elderly and retirement villages, marae, hospitals that contain in-house patient facilities and buildings used as temporary accommodation (e.g. motels and hotels).

** BS 5228-2:2009 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'

- a. If measured or predicted vibration from construction activities exceeds the Category A criteria, a suitably qualified person must assess and manage construction vibration during those activities.
- b. If measured or predicted vibration from construction activities exceeds the Category B criteria, those activities may only proceed if vibration effects on affected buildings are assessed, monitored and mitigated by a suitably qualified person.

CNV.7 If measured or predicted noise and vibration from a construction activity exceeds the criteria in conditions CNV.5 or CNV.6, a Schedule to the CNVMP for that activity shall be prepared in accordance with the NZ Transport Agency's *State highway construction and maintenance noise and vibration guide* (version 1.0, 2013). The Schedule shall, where practicable, be provided to the Council (Team Leader Northern Monitoring) for certification at least five working days in advance of the activity commencing. Where no response is received from the Council within three working days, the Schedule shall be deemed to have been certified and work may commence. The Schedule shall provide details of the best practicable option for noise mitigation to be implemented for the construction activity.

CNV.8 If any vibration-induced damage is shown to have occurred as a result of Project construction activities, any such damage shall be remedied by the Consent Holder.

Construction Traffic Management

CTMP.1 A CTMP shall be prepared by a suitably qualified person and submitted as part of the CEMP.



CTMP.2 The purpose of the CTMP is to manage the potential impacts of the construction of the NCI Project on the transportation network during the construction period.

CTMP.3 The CTMP shall describe the methods for avoiding, remedying or mitigating the local and network wide transportation effects resulting from construction of the NCI Project, and will address, as far as practicable, the following matters:

- a. Methods to avoid, remedy or mitigate the local and network wide effects of the construction of individual elements of the Project (e.g. intersections/overbridges) and the use of staging to allow sections of the Project to be opened to traffic while other sections are still under construction;
- b. Methods to manage the effects of the delivery of construction material, plant and machinery (including oversized trucks);
- c. The numbers, frequencies, routes and timing of construction traffic movements;
- d. Traffic management measures to address and maintain traffic capacity as far as reasonably practicable and minimise adverse effects, including on bus services and bus travel times, at peak traffic periods during weekdays (06:30 to 09:30 and 16:00 to 19:00), including:
 - i. Retaining the existing number of traffic lanes along SH1 (between Tristram Avenue and Oteha Valley Road);
 - ii. Retaining the extent of existing bus priority measures along SH1 (between the Albany Station and the Constellation Station), as far as reasonably practicable and subject to the requirement that the bus only on ramp from McClymonts Road and the bus only access to the Constellation Station may need to be temporarily closed;
 - iii. Retaining the existing number of through traffic lanes along SH18 between the Upper Harbour interchange and the Albany Highway interchange, as far as reasonably practicable and subject to the requirement that right turning movements to and from Paul Matthews Road may need to be temporarily closed;
 - iv. Retaining two traffic lanes on McClymonts Road, over SH1, as far as reasonably practicable and subject to the requirement that temporary restrictions to one lane or temporary full closures may be required; and
 - v. Retaining at least one traffic lane on Rosedale Road, under SH1, as far as reasonably practicable;
- e. Measures to maintain existing vehicle access to private properties, as far as possible, or where the existing property access is to be removed or becomes unsafe as a result of the construction works, measures to provide alternative access arrangements in consultation with Council (Team Leader Northern Monitoring) and the affected landowner; and



- f. Measures to maintain pedestrian and cycle access with thoroughfare to be maintained on all roads and footpaths adjacent to the construction works, where practicable (e.g. unless provision of such access is severed by the works or such access will become unsafe as a result of the construction works). Such access shall be safe, clearly identifiable, provide permanent surfacing and seek to minimise significant detours.

CTMP.4 The Consent Holder shall ensure that, when developing the CTMP, the suitably qualified person preparing the CTMP shall:

- a. Use best practice to better understand the effects of construction of the Project or Project stage on the affected road network, which may include the use of traffic modelling tools. Any such assessment should be undertaken in consultation with Auckland Transport, and have the ability to simulate lane restrictions and road closures; and
- b. As far as practicable, include measures to avoid road closures and also the restriction of vehicle, cycle and pedestrian movements.

Dust Management Plan

DMP.1 A DMP shall be prepared by an appropriately qualified person and submitted as part of the CEMP.

DMP.2 The purpose of the DMP is to describe the measures to be adopted to ensure the dust arising as a result of the Project does not cause an offensive or objectionable effect at any point beyond the designation boundary (as defined in the Guide to Assessing Air Quality Impacts from State Highway Projects (NZTA 2015)).

DMP.3 The DMP shall include the following:

- a. A description of the measures to be adopted that, so far as practicable, seek to:
 - i. Reduce the dust arising as a result of the Project at any point beyond the designation boundary that borders a highly sensitive receiver;
 - ii. Ensure that the 1-hour average of Total Suspended Particulate (TSP) at any point beyond the designation boundary that borders a highly sensitive receiver does not exceed 250 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$); and
 - iii. Ensure that the 24-hour average concentration, measured midnight to midnight, of Total Suspended Particulate (TSP) at any point beyond the designation boundary that borders a highly sensitive receiver does not exceed 80 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$);
- b. A description of the works, anticipated equipment/processes and duration;
- c. A description of the periods of time when emissions of dust might arise from construction activities;
- d. Identification of highly sensitive receivers likely to be adversely affected by emissions of dust from construction activities;



- e. Methods for mitigating dust that may arise from ground disturbing construction activities and construction support areas;
- f. Methods for monitoring the state of air quality during construction, including continuous monitoring of Total Suspended Particulate (TSP) and wind speed and wind direction in general accordance with the Good Practice Guide for Air Quality Monitoring and Data Management, Ministry for Environment, 2009c; and
- g. A requirement for log books to be maintained containing information regarding dust monitoring required by the DMP and any dust complaints received.

Advice Note:

The DMP shall describe the methods that can be applied to achieve the standard in DMP.3(a)(ii) and (iii). However, there may be occasions where despite all practicable measures being adopted the specified standard is not achieved.

DMP.4 If the monitoring required by the DMP shows that concentrations of TSP in ambient air at or beyond the boundary of the site exceed:

- a. 80 micrograms/m³ as a 24-hour average; or
- b. 250 micrograms/m³ as a 1-hour average

the Consent Holder shall undertake an investigation into the cause of the exceedance in accordance with the DMP.

A report into the outcome of any investigation required by this condition shall be forwarded to Auckland Council within 10 working days of the exceedance. If the cause of the exceedance is identified as being an activity undertaken on the site, the report shall also identify additional measures to be taken to reduce discharges of particulate matter into air from that activity.

Lizard Management Plan

- LM.1 A LMP shall be prepared a herpetologist with DOC authority and submitted as part of the CEMP.
- LM.2 The purpose of the LMP is to ensure the relocation of any rare and endangered lizard species found in the locations identified in the Assessment of Terrestrial Effects Report as having the potential to contain lizard species (Potential Lizard Sites) from the works area prior to the commencement of site works.
- LM.3 The LMP shall include details of the measures to be executed to capture and relocate rare and endangered lizards from within the Potential Lizard Sites prior to the commencement of construction work where reasonably practicable. The LMP shall include the following requirements:
 - a. The LMP shall be implemented by a herpetologist with DOC authority;
 - b. The capture of rare and endangered lizards shall occur at the time vegetation is removed from the site prior to construction activity commencing;



- c. The capture shall be carried out in suitable weather conditions; and
- d. The relocation of any lizards captured, and where necessary the storage of lizards prior to relocation, shall be undertaken by the project herpetologist or an equivalent person with DOC authority.

Avifauna

AMP.1 An AMP shall be prepared by an avian ecologist and submitted as part of the CEMP.

AMP.2 The purpose of the AMP is to ensure that:

- a. Dotterels are deterred from nesting in the locations identified as potential dotterel nesting sites in the Assessment of Terrestrial Effects Report ('Potential Nesting Sites') during the construction period; and
- b. The potential effects of construction on nesting native birds within the Rosedale Wastewater Treatment Plant are appropriately managed by avoiding vegetation clearance during the nesting season.

AMP.3 The AMP shall contain the following:

- a. Details of the measures to be used to deter dotterels from nesting at the locations identified as potential dotterel nesting sites in the Assessment of Terrestrial Ecology Effects Report;
- b. A requirement that the deterrent measures described in AMP.2(a) shall be deployed at the Potential Nesting Sites from July immediately prior to construction activity commencing in those areas and shall be maintained as necessary until the end of the construction period;
- c. Procedures for the management or relocation of any dotterels found nesting within the construction areas during the construction period;
- d. A requirement for vegetation clearance to be undertaken from 1 March to 31 July within that the area adjacent to the Rosedale Wastewater Treatment Ponds where construction activities will occur as identified within Assessment of Terrestrial Ecology Report;
- e. Procedures for managing any native birds found nesting within the Moro Pond area of the Rosedale Wastewater Treatment Ponds.

AMP.4 All measures and procedures relating to dotterels contained within the AMP shall be in general accordance with the NZ Transport Agency's Guidance in Relation to New Zealand Dotterels on NZTA Land (2012).

Contaminated land

CL.1 Prior to excavation and construction works commencing, the Consent Holder shall update the draft Contaminated Site Management Plan (CSMP) to include a summary of the findings of the Detailed Site Investigations. The updated CSMP shall be submitted to Council as part of the CEMP.



- CL.2 The updated CSMP shall describe how land disturbance activities on contaminated sites will be managed, including:
- a. Health and safety requirements (including use of appropriate PPE and decontamination);
 - b. Protocols for accidental discovery;
 - c. Methods for managing excavation and storage of soil (including erosion and sediment controls, dust and odour controls, surface water control and monitoring, imported fill requirements, and stockpile management);
 - d. Methods for classifying and managing transport, disposal (at an appropriate facility) and tracking of spoil and other material taken away from site;
 - e. How any spills and emissions will be managed; and
 - f. Site validation reporting requirements.

Earthworks

General

- EW.1 During the Project earthworks the Consent Holder shall take all practicable measures to minimise erosion and minimise the discharge of sediment beyond the boundaries of the site.
- EW.2 The Consent Holder shall ensure that the erosion and sediment control measures are constructed and maintained in accordance with Auckland Regional Council's Technical Publication 90: Erosion and Sediment Control Guidelines for Soil Disturbing Activities in the Auckland Region and any amendments to this document and the NZ Transport Agency's Erosion and Sediment Control Guidelines for State Highway.

Pre-construction meeting

- EW.3 Prior to the commencement of the earthworks activity or vegetation clearance (either for the whole site or for each stage of works), the Consent Holder shall hold a pre-start meeting that:
- a. Is located on the subject site;
 - b. Is scheduled not less than five days before the anticipated commencement of earthworks;
 - c. Includes Auckland Council representatives; and
 - d. Includes representation from the contractors who will undertake the works and the supervising engineers.

The purpose of the pre-start meeting shall be to discuss the erosion and sediment control measures, the earthworks methodology and shall ensure all relevant parties are aware of, and familiar with, the necessary conditions of this consent.



Construction Erosion and Sediment Control Plan(s) (CESCP)

- EW.4 A CESCP shall be prepared by an appropriately qualified and experienced person and submitted as part of the CEMP for each area of work or activity.
- EW.5 The purpose of the CESCP is to set out the measures to be implemented during the construction period to minimise erosion and the discharge of sediment beyond the boundaries of the construction areas.
- EW.6 The CESCP shall be prepared in general accordance with the principles set out in section 5 of the Construction Water Management Report and include the following matters:
- a. Identification of the construction zones and construction support areas;
 - b. A risk assessment of the sediment yield from that particular area of works or activity that is the subject of the CESCP including slope angle and length, receiving environment, soil types and duration of the works;
 - c. Details of the specific erosion and sediment control works that will be implemented (including location, dimensions and capacity);
 - d. Supporting calculations and design drawings for all erosion and sediment controls;
 - e. A plan showing the catchment boundaries of the works and the control measures;
 - f. Timing and duration of construction and operation of control works (in relation to the staging and sequencing of earthworks);
 - g. Details relating to the management of exposed areas (e.g. grassing, mulching);
 - h. A requirement for a manually raised decant devices on sediment retention ponds where installed;
 - i. Details of the flocculation treatment to be implemented including:
 - i. Specific design details of the flocculent treatment system based on a rainfall activated methodology for the site's sediment retention ponds and batch dosing for decanting earth bunds;
 - ii. Monitoring, maintenance (including post storm) and contingency programme (including a record sheet) for the flocculation management;
 - iii. Use of organic flocculants where practicable provided that the most effective flocculant in terms of sediment removal shall be selected;
 - iv. Details of optimum dosage (including assumptions);



- v. Results of initial treatment trials;
 - vi. A spill contingency plan; and
 - vii. Details of the person or bodies that will hold responsibility for the long term operation and maintenance of the flocculant management system;
- j. Details of the erosion and sediment control monitoring to be implemented consistent with the requirements set out in section 6.2 of the Construction Water Management Report, including:
- i. Pre-construction monitoring;
 - ii. Rainfall monitoring;
 - iii. Routine device monitoring;
 - iv. Triggered device monitoring;
 - v. Flocculent treatment monitoring; and
 - vi. The responses to be adopted in relation to various monitoring outcomes;
- k. Methods for ensuring contracting staff are aware of the erosion and sediment controls employed and do not remove them without seeking appropriate approval.

Advice Note: 'Organic flocculants' means flocculants that are derived from living matter and contain carbon, including but not limited to Polyamine and PolyDAMAC.

- EW.7 The operational effectiveness and efficiency of all erosion and sediment control measures set out in the CESC shall be maintained throughout the duration of earthworks activity, or until the site is stabilised against erosion.
- EW.8 Prior to submission of any CESC for the causeway works between Watercare's Ponds 1 and 2 to Council, the Consent Holder shall consult with Watercare. The details and outcome of that consultation shall be included in the CESC.

Certification of Erosion and Sediment Controls

- EW.9 Prior to earthworks commencing, a certificate signed by an appropriately qualified and experienced person shall be submitted to Council (Team Leader Northern Monitoring), to certify that the erosion and sediment controls have been constructed in accordance with the certified Construction Erosion and Sediment Control Plan(s) as required by Condition EW.6 of this consent.
- EW.10 Certified controls shall include the diversion bunds, silt fences, super silt fences, sediment retention ponds, decanting earth bunds and flocculation management systems. The certification for these controls shall be supplied prior to the



commencement of the works for that area or activity. Information supplied, if applicable, shall include:

- a. Compliance with the conditions of this consent;
- b. Contributing catchment area;
- c. Shape of structure (dimensions of structure);
- d. Position of inlets/outlets; and
- e. Stabilisation of the structure.

EW.11 Each area of earthworks shall be progressively stabilised against erosion, and earthworks shall be sequenced to minimise the discharge of contaminants to groundwater or surface water.

Advice Note:

Earthworks shall be progressively stabilised against erosion during all stages of the earthwork activity. Interim stabilisation measures may include:

- i. The use of waterproof covers, geotextiles, or mulching; and*
- ii. Aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward.*

EW.12 If areas of exposed soil are not subject to earthworks for a 14 day period, the area of exposed soil shall be stabilised until such a time as further earthworks occurs in that specific area.

Retaining walls

EW.13 All retaining wall construction activities shall be undertaken from hard stand stabilised areas. Any spoil generated through the retaining wall activity shall be disposed of offsite and if required to be stockpiled shall be done so on a temporary basis only within the contributing catchments of the sediment retention devices.

Landfill conditions

Landfill Reinstatement Works Plan (LRWP)

- LW.1 A LRWP shall be prepared by a suitably qualified person and submitted as part of the CEMP.
- LW.2 The purpose of the LRWP is to manage the potential adverse effects on the environment of working within the Rosedale Landfill.
- LW.3 The LRWP shall include the following information in relation to the works to be carried out on the Rosedale Landfill, including:



- a. The measures to be undertaken to minimise potential odour effects;
 - b. The dust control measures to be undertaken to control potential effects on on-site and off-site receptors;
 - c. Asbestos management and removal measures in accordance with the Health and Safety at Work (Asbestos Regulations);
 - d. The measures to manage any leachate and contaminated stormwater generated on site during the works;
 - e. Measures relating to the management of refuse including appropriate handling, transport and disposal offsite at an appropriate facility;
 - f. Use of plant and equipment appropriately rated and protected for use in a Hazardous Atmospheric Zone;
 - g. Continuous Landfill gas monitoring for the duration of the construction works in the vicinity of the Rosedale Landfill;
 - h. Landfill gas trigger values for the cessation of works within the works area. Works may not recommence until advice has been sought from a suitably qualified landfill gas specialist;
 - i. The requirement for the landfill reinstatement construction works to be undertaken:
 - vii. under the direction of a New Zealand Chartered Professional Engineer with a minimum of 10 years' experience in geotechnical engineering and landfill engineering with specific experience in landfill rehabilitation or landfill remediation; and
 - viii. in accordance with the IPENZ Practice Note for Construction Monitoring as follows:
 1. Level CM5 for the engineered barrier/side wall liner and any gas protection measures; and
 2. Level CM3 for all other components of the landfill reinstatement works.
- LW.4 The LRWP shall also include a Landfill Health and Safety Plan prepared after consultation with the Auckland Council Closed Landfill and Contaminated Land Response Team and including information regarding:
- a. Management of the risk of gas from refuse and leachate;
 - b. Management of excavations and works in confined spaces;
 - c. Training and supervision of construction workers and Landfill staff;



- d. Measures relating of exposure of construction workers and staff to hazardous materials, refuse and leachate including:
 - ix. Identifying hazardous materials;
 - x. Requiring person protective equipment including full face respirators, chemical resistant overalls and gloves;
 - xi. Requiring the use of observers;
 - xii. Providing shower and boot wash facilities onsite;
 - xiii. Requiring breaks in skin (cuts and abrasions) to be disinfected immediately and covered;
 - xiv. Prohibiting food or drink consumed within the construction area; and
- e. Emergency contacts and procedures.

Landfill Construction Method Statements

- LW.5 Prior to excavation and construction works commencing in the vicinity of the Landfill the Consent Holder shall submit Landfill Construction Method Statements (LCMS) to Council for certification. If the Consent Holder has not received a response from the Council within 10 working days following submission of the LCMS, the Consent Holder will be deemed to have certification and can commence site works.
- LW.6 The LCMS shall include information about how works are to be carried out within the Rosedale Landfill including:
- a. How the landfill will be reinstated once the works are complete;
 - b. Temporary works including temporary reconfiguration of leachate, gas and stormwater infrastructure;
 - c. Temporary support of the excavated refuse profile;
 - d. Reinstatement of the Landfill Rosedale sidewall;
 - e. Reinstatement of the Rosedale Landfill infrastructure (leachate, gas, stormwater, access track);
 - f. Reinstatement of the Rosedale Landfill monitoring network stations including new gas migration monitoring probes and new groundwater monitoring wells;
 - g. Construction of protection measures (such as a gas interception trench) to mitigate Landfill gas effects;
 - h. Commissioning of the reinstatement works;
 - i. How the works will achieve the factors of safety against instability in the relevant codes and standards;



- j. The requirement for reinstatement works to be supervised by a New Zealand Chartered Professional Engineer with experience in geotechnical engineering and landfill engineering.
- LM.7 The LCMS shall be prepared and submitted after consultation with the Auckland Council Closed Landfill and Contaminated Land Response Team.
- LM.8 Landfill reinstatement works shall be carried out in accordance with the certified LCMS required under condition LW.5.

Ecology

Fish recovery and relocation

- EC.1 Prior to the commencement of works within any waterbody that supports a population of native fish, the Consent Holder shall implement the following:
- a A suitably qualified ecologist shall be appointed to conduct native fish recovery and relocation;
 - b The IIG shall be given the opportunity to appoint a representative to be present on site during the native fish recovery and relocation;
 - c A fish movement barrier shall be installed at the lower and upper extents of the stream works to prevent fish from recolonising within the stream works area;
 - d Stormwater ponds shall be dewatered to a depth of no more than 0.5m and fish movement barriers shall be installed over the inlet and outlets of the pond or wetland;
 - e Once the appropriate fish movement barriers are installed, the recovery of native fish shall occur over a two day period, and shall use the following methods:
 - i Gee-minnow traps and fyke nets, placed at appropriate intervals over the length of the watercourse. These shall be left overnight where possible, and checked and cleared the following morning;
 - ii Using an electric fishing machine (EFM300), several electric fishing runs of the watercourse, stormwater pond or wetland shall occur each day;
 - iii During the dewatering process, any remaining freshwater fish shall be captured and relocated;
 - f All captured native fish shall be relocated on the same day to a suitable, similar habitat immediately downstream of the works area within the same catchment;
 - g Native fish shall be transferred into closed buckets, kept at an appropriate temperate and transport to the relocation site;
 - h Any exotic fish capture shall be humanely euthanised and disposed of appropriately; and
 - i The Consent Holder shall provide the Council (Team Leader Northern Monitoring) with a report outlining the number and species of native fish that were recovered and relocated prior to and during stream weeks within 20 working days of the fish recovery and relocation being completed.



Stakeholder and Communications Plan

- SCP.1 At least two months prior to the commencement of construction works, the Consent Holder Authority shall submit a Stakeholder and Communications Plan (SCP) to the Council (Team Leader Northern Monitoring), to certify compliance and consistency with the conditions of this consent. If the Consent Holder has not received a response from the Council within 10 working days following the submission of the SCP, the Consent Holder will be deemed to have certification and can commence construction.
- SCP.2 The purpose of the SCP is to set out the procedures for communicating with the public and stakeholders throughout the construction period and the methods proposed to avoid remedy or mitigate, as far as practicable, disruption to businesses as a result of construction activities.
- SCP.3 The SCP shall contain the following:
- a. Methods for informing the community of construction progress, including proposed hours of operation outside normal working hours and Project contact details;
 - b. Identification of key stakeholders such as community groups, business groups, residents organisations, Auckland Council, Watercare Services Limited, the IIG and the local boards;
 - c. Details of the Community Liaison Manager to be appointed by the Consent Holder; and
 - d. Details of the proposed engagement with the community in order to foster good relationships and to provide opportunities for learning about the Project.
- SCP.4 The SCP shall include details of the measures to be implemented to avoid, remedy or mitigate, as far as reasonably practicable, disruption businesses as a result of construction activities including:
- a. Measures to maximise opportunities for customer and service access to businesses that will be maintained during construction;
 - b. Measures to mitigate potential severance and loss of business visibility issues by way-finding and supporting signage for pedestrian detours required during construction; and
 - c. Other measures to assist businesses to maintain client/customer accessibility, including but not limited to client/customer information on temporary parking or parking options for access and delivery.
- SCP.5 The Consent Holder shall provide a draft SCP to the [insert Council person] for comment at least three months prior to the commencement of construction. The Consent Holder shall consider any comments received from the [insert Council person] when finalising the SCP.



- SCP.6 The Consent Holder shall implement the SCP for the duration of the Construction Works.
- SCP.7 At all times during construction work, the Consent Holder shall maintain a permanent register of any complaints received relating to the construction works.
- SPC.8 The Consent Holder shall respond to any complaint within 48 hours of the complaint, except where an immediate hazard is present, in which case the Consent Holder shall use its best endeavours to respond within 2 hours.
- SPC.9 The Consent Holder shall also maintain a record of its responses and any remedial actions undertaken, such record to also contain the responses and actions taken.
- SPC.10 This record (to be included in the register) shall be maintained on site and shall be made available to the [Council person], upon request. The Consent Holder shall provide the [Council person] with a copy of the complaints register every month.

Archaeology

- ARC.1 A suitably qualified archaeologist shall be appointed to oversee the earthworks required as part of the NCI Project ('Project Archaeologist').
- ARC.2 A contractors' briefing shall be provided to all contractors by the Project Archaeologist prior to the commencement of the NCI Project. The briefing shall provide information to the contractors regarding the following:
- a. What constitutes archaeological / historic heritage materials;
 - b. The legal requirements relating to unanticipated archaeological discoveries;
 - c. The appropriate procedures to follow if archaeological or historic heritage materials are uncovered when the Project Archaeologist is not on site to safeguard the materials; and
 - d. The contact information of the relevant agencies (including the project archaeologist, the Auckland Council Heritage Unit and Heritage New Zealand Pouhere Taonga) and mana whenua.
- ARC3. Documentation demonstrating that the contractor briefing has occurred shall be forwarded to the Council (Team Leader Northern Monitoring).
- ARC.4 Should any unrecorded historic heritage sites (i.e. sites that meet the Resource Management Act 1991 definition of 'historic heritage') be exposed as a result of an activity associated with the consented proposals, then these sites shall be recorded within the Auckland Council Cultural Heritage Inventory by the Project Archaeologist.
- ARC.5 Site record forms in the Auckland Council Cultural Heritage Inventory (www.chi.net/Home.aspx) shall be updated by the Project Archaeologist within 20 working days of completion of on-site earthworks. Electronic copies of all historic heritage reports relating to historic heritage investigations (e.g. evaluation, excavation and monitoring etc.) shall be submitted by the Project Archaeologist to



the Auckland Council Cultural Heritage Inventory within 12 months of the completion of on-site earthworks.

Network Utilities

NU.1 The Consent Holder shall ensure that construction work does not adversely impact on the safe and efficient operation of network utilities. The scope and timing of necessary utility relocation and protection works shall be developed and agreed between the Consent Holder and network utility providers to mitigate any safety hazards and provide cost efficiency for the required works.

Stormwater

Stormwater management devices

SW.1 The Consent Holder shall ensure that stormwater management devices are designed and constructed to achieve the following design requirements as set out in the table below:

Motorway Catchment	Receiving Environment	Design Requirements		
		Total High Use Road Area (new and existing) to be treated in accordance with TP10	Detention for difference of pre- and post-development volume	Peak Flow Attenuation to Pre-Development Flow Rates at the Receiving Environment (with climate change adjustment to 2121)
Oteha Valley to McClymonts (OV2M)	Lucas Creek	3.45ha to 75% TSS removal	SMAF1 (37mm/24hrs)	2-year ARI 10-year ARI
McClymonts to Spencer (M2S)	Open channel upstream of the Albany Lakes Reserve	1.59ha to 75% TSS removal	SMAF1 (37mm/24hrs)	2-year ARI 10-year ARI 100-year ARI
Spencer to Rosedale (S2R)	Oteha Stream	9.42ha to 75% TSS removal	SMAF2 (26mm/24hrs)	2-year ARI 10-year ARI 100-year ARI
Rosedale to Constellation (R2C)	Open channel north of WSL Pond 1	6.54ha to 75% TSS removal	SMAF2 (26mm/24hrs)	2-year ARI 10-year ARI 100-year ARI
Constellation to Paul Matthews (C2PM)	Open channel south of WSL Pond 1	3.37ha to 75% TSS removal	SMAF2 (26mm/24hrs)	2-year ARI 10-year ARI 100-year ARI
Paul Matthews to Albany Highway (PM2AH)	Alexandra Stream	4.57ha to 75% TSS removal	SMAF2 (26mm/24hrs)	2-year ARI 10-year ARI

SW.2 Where existing stormwater management devices are proposed to be removed, the equivalent Water Quality Volume and Detention Volume shall be replaced in the proposed stormwater management devices.

SW.3 The Consent Holder shall ensure that the design of stormwater management measures constructed in accordance with Condition SW.1 do not result in an increase of flood levels greater than 50mm:



- a. At all upstream and downstream properties in rainfall events up to and including the 10-year Annual Recurrence Interval (ARI) event (excluding the properties on Tait Place where flood levels shall increase by up to 80mm in the 10-year ARI event); and
- b. At all upstream and downstream buildings on properties within the 100-year ARI floodplain.

SW.4 Stormwater management devices or systems must be fully operational prior to use of the impervious area.

Detailed designs

SW.5 The Consent Holder shall ensure that the detailed design, including drawings, specification, design report and calculations for the stormwater management devices are submitted to Council (Senior Stormwater / ITA Specialist – Compliance) for certification and at least 30 days prior to initiation of construction of the proposed stormwater management devices. If the Consent Holder has not received a response from the Council within 20 working days following the submission of the detailed design, the Consent Holder will be deemed to have certification and can commence construction.

SW.6 The Consent Holder may make modifications to the stormwater management system shown on the General Arrangements Sheets 1 – 10, including the use of alternative Council approved stormwater management devices, provided that the Consent Holder ensures that equivalent performance and compliance with the requirements of SW.1 is achieved.

Overland flow paths

SW.7 The Consent Holder shall ensure that for stormwater flows in excess of the capacity of the primary drainage systems, overland flow paths shall be provided and maintained to allow surplus stormwater from critical storms (up to the 100 year ARI event), to discharge with the minimum of nuisance and damage. Overland flow paths shall be kept free of all obstructions.

SW.8 The Consent Holder shall ensure that secondary flow paths are kept free from obstructions such as buildings and solid fences.

Planting

SW.9 The Consent Holder shall submit planting plan(s) for the all planted stormwater management devices (including treatment / conveyance swales) to Council (Senior Stormwater / ITA Specialist – Compliance) for certification at least 30 days prior to initiation of construction of the proposed stormwater works. If the Consent Holder has not received a response from Council within 20 working days of submitting the plan(s), the Consent Holder will be deemed to have certification and can commence construction.

SW.10 The planting plan(s) required by Condition SW.9 shall include, but not be limited to, the following:



- a. Details of plant species, plant numbers, density and distribution; and
- b. Details of ongoing pest and weed management.

SW.11 All planting of stormwater management devices (including treatment / conveyance swales) shall be undertaken in accordance with the certified planting plan(s).

Certification of stormwater management works (as-built plans and Validation Report)

SW.12 The Consent Holder shall supply as-built plans and a Validation Report for the stormwater management devices to Council (Senior Stormwater / ITA Specialist – Compliance) within 30 working days of the practical completion of the stormwater management works.

SW.13 The as-built plans shall be signed off by a Chartered Engineer and include but not be limited to:

- a. The surveyed location (to the nearest 0.1m) and level (to the nearest 0.01m) of the discharge structures, with co-ordinates expressed in terms of NZTM and NZGD2000 (Mt Eden circuit); and
- b. Plans and cross sections of all stormwater management devices, including confirmation of the water quality volume, detention / attenuation volumes and levels / sizes of all outflow control structures and discharge outlets.

SW.14 The Validation Report shall be signed off by a Chartered Engineer and shall include details of:

- a. The type and performance of the constructed stormwater management devices in relation to the design requirements in Condition SW.1;
- b. The contributing catchment areas serviced by each stormwater management device;
- c. The provision of access to each stormwater management device, outflow control structure and discharge outlet; and
- d. Plans showing the delineation between the stormwater management infrastructure to be maintained by the Consent Holder and the infrastructure to be vested in Auckland Council.

Contents and submission of operation and maintenance plan

SW.15 A Stormwater Operation and Maintenance Plan shall be submitted to Council (Senior Stormwater / ITA Specialist – Compliance) for certification 5 working days prior to the commencement of the operation of the stormwater management system.

SW.16 The Stormwater Operation and Maintenance Plan shall include but not be limited to:

- a. Details of the person or organisation that will hold responsibility for long-term maintenance of the stormwater management system;
- b. A programme for regular maintenance and inspection of the stormwater management system;



- c. A programme for the collection and disposal of debris and sediment collected by the stormwater management devices or practices;
- d. Procedures for post storm inspection and maintenance;
- e. A programme for inspection and maintenance of the outfalls;
- f. General inspection checklists for all aspects of the stormwater management system, including visual checks;
- g. A programme for inspection and maintenance of vegetation associated with the stormwater management devices; and
- h. A requirement to retain records of all inspections and maintenance for the stormwater management system, for the preceding three years.

If the Consent Holder has not received a response from the Council (Senior Stormwater/ITA Specialist) within 10 working days following the submission of the Stormwater Operation and Maintenance Plan, the Consent Holder will be deemed to have certification.

SW.17 The Consent Holder shall ensure that the stormwater management system is managed in accordance with the certified Stormwater Operation and Maintenance Plan.

Amendments to the Stormwater Operation and Maintenance Plan

SW.18 Any alterations to the Stormwater Operation and Maintenance Plan shall be submitted to Council (Senior Stormwater / ITA Specialist – Compliance) in writing for certification 20 working days prior to implementation. If the Consent Holder has not received a response from the Council (Senior Stormwater/ITA Specialist-Compliance) within 10 working days following the submission of the proposed amendments or alterations, the Consent Holder will be deemed to have certification.

Review Condition

RV.1 Pursuant to section 128 of the Resource Management Act 1991 the conditions of this consent may be reviewed by Council (Team Leader Northern Monitoring) at the consent holder's cost:

- a. As necessary following commencement of consent in order:
 - i. To deal with any adverse effects on the environment which may arise or potentially arise from the exercise of this consent and which it is appropriate to deal with at a later stage.
 - ii. To alter erosion and sediment control requirements as a result of previous monitoring outcomes, and/or in response to changes to the environment and/or hydro-geological knowledge, and/or changes to industry best practice.
- b. At any time, if it is found that the information made available to the Council in the application contained inaccuracies which materially influenced the



decision and the effects of the exercise of the consent are such that it is necessary to apply more appropriate conditions.

General Advice Notes

1. *If you disagree with any of the above conditions, or disagree with the additional charges relating to the processing of the application, you have a right of objection pursuant to sections 357A or 357B of the Resource Management Act 1991. Any objection must be made in writing to Council within 15 working days of notification of the decision.*



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Appendix B

Gazette Notice(s)



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Appendix C

AUP Planning Maps



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Appendix D

Relevant Statutory References (Objectives and Policies)



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Table D1: Relevant Objectives and Policies from the NPS_{FM}

Reference	Objective/Policy
Objectives	
A1	To safeguard: <ul style="list-style-type: none"> a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and b) the health of people and communities, at least as affected by secondary contact with fresh water, in sustainably managing the use and development of land, and of discharges of contaminants.
A2	The overall quality of fresh water within a region is maintained or improved while: <ul style="list-style-type: none"> a) protecting the significant values of outstanding freshwater bodies; b) protecting the significant values of wetlands; and c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.
B1	To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water.
C1	To improve integrated management of fresh water and the use and development of land in whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.
D1	To provide for the involvement of iwi and hapū, and to ensure that tāngata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.
Policies	
A2	Where freshwater management units do not meet the freshwater objectives made pursuant to Policy A1, every regional council is to specify targets and implement methods (either or both regulatory and non-regulatory), in a way that considers the sources of relevant contaminants recorded under Policy CC1, to assist the improvement of water quality in the freshwater management units, to meet those targets, and within a defined timeframe
A3	By regional councils: <ul style="list-style-type: none"> a) imposing conditions on discharge permits to ensure the limits and targets specified pursuant to Policy A1 and Policy A2 can be met; and b) where permissible, making rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water
B1	By every regional council making or changing regional plans to the extent needed to ensure the plans establish freshwater objectives in accordance with Policies CA1-CA4 and set environmental flows and/or levels for all freshwater management units in its region (except ponds and naturally ephemeral water bodies) to give effect to the objectives in this national policy statement, having regard to at least the following: <ul style="list-style-type: none"> a) the reasonably foreseeable impacts of climate change; b) the connection between water bodies; and c) the connections between freshwater bodies and coastal water.
C1	By every regional council managing fresh water and land use and development in catchments in an integrated and sustainable way, so as to avoid, remedy or mitigate adverse effects, including cumulative effects.
C2	By every regional council making or changing regional policy statements to the extent needed to provide for the integrated management of the effects of the use and development of:



	<p>a) land on fresh water, including encouraging the co-ordination and sequencing of regional and/or urban growth, land use and development and the provision of infrastructure; and</p> <p>b) land and fresh water on coastal water</p>
D1	<p>Local authorities shall take reasonable steps to:</p> <p>a) involve iwi and hapū in the management of fresh water and freshwater ecosystems in the region;</p> <p>b) work with iwi and hapū to identify tāngata whenua values and interests in fresh water and freshwater ecosystems in the region; and</p> <p>c) reflect tāngata whenua values and interests in the management of, and decision-making regarding, fresh water and freshwater ecosystems in the region.</p>

Table D2 - Relevant Objectives and Policies from the NPS_{ET}

Reference	Objective/Policy
Objective	
5	<p>To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:</p> <ul style="list-style-type: none"> ▪ managing the adverse environmental effects of the network; and ▪ managing the adverse effects of other activities on the network.
Policies	
Policy 10	<p>In achieving the purpose of the Act, decision-makers must to the extent reasonably possible manage activities to avoid reverse sensitivity effects on the electricity transmission network and to ensure that operation, maintenance, upgrading, and development of the electricity transmission network is not compromised.</p>
Policy 11	<p>Local authorities must consult with the operator of the national grid, to identify an appropriate buffer corridor within which it can be expected that sensitive activities will generally not be provided for in plans and/or given resource consent. To assist local authorities to identify these corridors, they may request the operator of the national grid to provide local authorities with its medium to long-term plans for the alteration or upgrading of each affected section of the national grid (so as to facilitate the long-term strategic planning of the grid).</p>

Table D3 - Relevant Objectives and Policies of the ACRPS

Reference	Objective/Policy
Chapter 2, Regional Overview and Strategic Direction	
2.6.1 Strategic Objectives	
1.	<p>To ensure that provision is made to accommodate the Region's growth in a manner which gives effect to the purposes and principles of the Resource Management Act 1991 and Section 40 of the Local Government (Auckland) Amendment Act 2004, and is consistent with these Strategic objectives and with the provisions of this RPS.</p>
3.	<p>To achieve a compact well designed more sustainable urban form served by an integrated multimodal (private vehicles, public transport, walking and cycling) transport system.</p>
4.	<p>To develop and manage the region's transport system including road, rail, ferry, bus, cycling and pedestrian networks and services in a manner that supports urban development and land use intensification.</p>
6	<p>To achieve a high level of mobility and accessibility within the Region that provides for an integrated, responsive, sustainable, safe, affordable and efficient movement of goods and people.</p>
12	<p>To encourage the efficient use of natural and physical resources, including urban land, infrastructure, and energy resources.</p>



17	To enable the redevelopment, operation and maintenance of existing and provision of new regionally significant infrastructure
2.6.11 Strategic Policies - Land Use and Transport Integration	
1.	<p>Land Use and Transport shall be integrated throughout the region to ensure that:</p> <ul style="list-style-type: none"> (i) within urban areas land use patterns provide communities with improved access to a range of services and activities and opportunities to work locally; (ii) within urban areas new urban development and subdivision provides for improved connectivity for all transport modes including walking and cycling; (iii) within urban areas new development and redevelopment provides for safe and attractive walking and cycling environments; (iv) the transport network is not compromised by inappropriate land use and subdivision and is planned and developed to support land uses; (v) high traffic generating activities, where not located within High Density Centres or on Intensive Corridors, locate on transport corridors served by public transport appropriate to the particular activity; (vi) within rural areas Countryside Living avoids, remedies or mitigates adverse effects on the regional roading network including limiting its provision and only providing for Countryside living in selected locations (refer to Policies 2.6.17); (vii) urban activities shall be located in urban areas, except as provided for in Strategic Policies 2.6.2.1 and 2.6.2.2, as well as Methods 2.6.3; (viii) the roading system is developed and managed to be an efficient, safe and sustainable network utilising, to its full extent, existing roading infrastructure; (ix) land use development along existing and proposed regional arterial roads identified in Appendix K or in District Plans, is to be managed to ensure that adverse effects on the transport function, or functions, and safety of these routes are avoided, remedied or mitigated; (x) so far as is consistent with their statutory authority the funding processes of the RLTS and ARTA shall give effect to the strategic direction and strategic policies set out in this ARPS; (xi) all Future Urban Areas can be: <ul style="list-style-type: none"> (a) effectively served by public transport; (b) provide attractive walking and cycling opportunities and environments; and (c) item (xi)(a) above shall not apply for the expansion of existing coastal and rural settlements that cannot be efficiently served by public transport; (xii) existing urban areas within the MUL are better served by public transport; (xiii) industrial land uses are located where they have good access to freight corridors; (xiv) reverse sensitivity effects on the transport network are considered in land use development; (xv) opportunities for urban intensification at Passenger Transport Nodes within urban areas may be enabled where these: <ul style="list-style-type: none"> (a) are integrated with and supported by rapid, frequent and integrated transit services; and (b) provide for the medium to high density intensification of residential activities within walking distance of the Passenger Transport Node to support public transport.
2.	<p>Land use and Transport shall be integrated within High Density Centres and Intensive Corridors (refer to Policies 2.6.5) to ensure that:</p> <ul style="list-style-type: none"> (i) High Density Centres and Intensive Corridors are able to be served by an efficient and effective public transport network;



	<ul style="list-style-type: none"> (ii) High Density Centres on the rail rapid transit network and on the bus rapid transit system are served by a fast, frequent and reliable public transport service; (iii) High Density Centres and Intensive Corridors are planned to develop to a density which supports planned transport infrastructure and service improvements (refer to Appendix H); (iv) provision is made for transport improvements which deliver a multi-modal transport system (including walking and cycling) in a manner which supports quality, compact and contained High Density Centres and Intensive Corridors; (v) central and local government services, as well as associated support services and facilities (consistent with Policy 2.6.5.6), should locate within High Density Centres and Intensive Corridors; (vi) High Density Centres and Intensive Corridors are not compromised by inappropriate transport infrastructure. This includes avoiding, remedying or mitigating the severance of communities; (vii) High Density Centres and Intensive Corridors and major public transport interchanges and stops should, where possible, develop as multi- purpose destinations; (viii) the road network within all residential development areas should ensure: <ul style="list-style-type: none"> (a) good access by buses; (b) the facilitation of good, direct pedestrian access routes to bus stops; and (c) the Region’s parking issues are planned and managed in a way that supports integrated land use and transport.
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2.6.14 Strategic Policies - Infrastructure

	<p>The operation of existing regionally significant infrastructure and the provision of new or upgraded regionally significant infrastructure shall:</p> <ul style="list-style-type: none"> (i) be consistent with the Strategic Direction of the Regional Policy Statement; (ii) support and reinforce the Regional Growth Strategy and the proposed outcomes of that strategy; and (iii) ensure that any adverse effects of those activities on the environment (including human health) are avoided, remedied or mitigated in a manner consistent with the relevant provisions of this RPS.
2.	Provision is to be made to enable the safe and efficient operation, maintenance and development of regionally significant infrastructure which is necessary for the social and economic wellbeing of the region’s people.
3.	Land use change should avoid significant reverse sensitivity effects on regionally significant infrastructure. Refer also to Strategic Policies 2.6.2(2) (viii), 2.6.11(1) (n), 2.6.17(e) (i) and 2.6.17(4) (ii).
4.	The provision and operation of infrastructure, including transport infrastructure should support the development of high quality urban amenity.
5.	<p>In the operation of existing regionally significant infrastructure and the provision of new infrastructure consideration and appropriate provision is to be made for the following matters:</p> <ul style="list-style-type: none"> (i) the avoidance of significant adverse effects (including cumulative adverse effects) on: <ul style="list-style-type: none"> (a) the environmental values protected by defined limits to metropolitan Auckland and defined limits of rural or coastal settlements; (b) significant and outstanding coastal and natural landscapes, vegetation and fauna areas; (c) amenity values throughout the whole of the region and the rural character of rural areas in the Region; (d) human health; <p>where significant adverse effects cannot be avoided they shall be remedied or mitigated;</p>



	(ii) avoiding prematurely foreclosing, or compromising options for future urban and rural and coastal town growth including areas identified in Schedule 1;
	(iii) consideration of alternative locations (including locations in urban areas) for utility service facilities which give rise to significant adverse effects on the environment;
	(iv) environmental enhancement and/or remediation opportunities

Table D4 - Relevant Objectives and Policies of the ACRP:ALW

Reference	Objective/Policy
Chapter 2, Values	
2.1.3: Objectives	
2.1.3.1	To sustainably manage the quality and diversity of Auckland's natural values by: <ul style="list-style-type: none"> (a) Maintaining areas of high environmental quality; (b) Remedying or mitigating adverse effects on degraded natural and physical resources where these cannot be avoided; (c) Enhancing degraded areas where practicable.
2.1.3.2	To preserve the natural character of wetlands, lakes and rivers and their margins by protecting them from inappropriate use and development.
2.1.3.3	To protect significant indigenous terrestrial and aquatic vegetation and the significant habitats of indigenous fauna, both terrestrial and aquatic from inappropriate use and development.
2.1.3.4	To maintain and enhance the quality of the Region's Permanent rivers and streams where practicable.
2.1.4: Policies: Natural Character	
2.1.4.1	The natural character of wetlands, lakes and rivers and their margins shall be preserved and protected from inappropriate use and development by avoiding, remedying or mitigating adverse effects on the qualities, elements and features that contribute to the natural character of these areas.
2.1.4.2	In assessing the actual or potential effects of use and development on the natural character of wetlands, lakes, rivers and their margins, particular regard shall be had to: <ul style="list-style-type: none"> (a) Maintaining high levels of natural character in Natural Lake, Natural Stream and Wetland Management Areas; (b) Maintaining appropriate remaining elements of natural character in: <ul style="list-style-type: none"> i Other Permanent rivers or streams in rural areas; ii Permanent rivers and streams in Greenfield Areas that have been assessed as having high ecological, habitat or water quality values; and iii Urban Lake Management Areas. (c) Retaining as far as practicable remaining elements of natural character in other Type 2 and 3 Urban Streams, consistent with the management objectives for these streams in Section 3.6. (d) Protecting the natural character of wetlands and Permanent rivers and streams in Water Supply Management Areas as far as practicable, while providing for the use of these areas as water supply areas.
2.1.4.3	When determining the qualities, elements and features that contribute to natural character for the purposes of Policy 2.1.4.1 and 2.1.4.2 (a) to (d), regard should be had to the matters listed in Policy 2.1.4.9.
2.1.4.4	When use and development gives rise to actual or potential adverse effects on the natural character of wetlands, lakes and rivers and their margins, where appropriate these effects shall be remedied or mitigated by restoration or rehabilitation of the natural character of these areas.
2.1.4.5	In determining whether any adverse effects on natural character can be remedied or mitigated by restoration and rehabilitation that is to be carried out, regard shall be had to:



	<ul style="list-style-type: none"> (a) the extent to which the qualities and features of natural character in the area of the proposed use and development will be adversely affected, and the ability to restore or rehabilitate natural character in the area subject to the proposal; (b) where restoration or rehabilitation is not practicable in the area subject to the proposal, the potential to mitigate any adverse effects by the rehabilitation or restoration of natural character in another area of wetland, lake or river and their margins; (c) Where restoration plantings are carried out, preference shall be given to the use of indigenous species with a further preference for local genetic stock. (d) When determining how rehabilitation or restoration of natural character should be carried out, regard should be had to Policy 2.1.4.
2.1.4: Policies: Ecosystems and Habitats	
2.1.4.6	<p>The values of ecosystems and habitats shall be managed by:</p> <ul style="list-style-type: none"> (a) Inside Urban Areas <ul style="list-style-type: none"> i Maintaining as far as practicable Permanent rivers and streams in Greenfield Areas where these rivers and streams are assessed as having significant ecological, water quality and habitat values, or are identified for protection in structure plans or appropriate catchment based planning processes; ii implementing the provisions for Urban Lakes and Urban River and Stream Management Areas in accordance with Chapter 3 of this Plan and (c) Enhancing degraded ecosystems and habitats and water quality both outside and inside Urban Areas where this is practicable; (d) Providing for fish passage between Permanent rivers and streams and the coastal marine area as far as practicable.
2.1.4.7	<p>The provision of fish passage under Policy 2.1.4.6(d) above shall be assessed against the following matters:</p> <ul style="list-style-type: none"> (a) the extent to which there are natural physical barriers (e.g. waterfalls) along Permanent rivers and streams and between Permanent rivers and streams and the coastal marine area that provide natural barriers to fish passage; (b) the extent to which there are existing artificial barriers (e.g. dams, weirs or culverts) that currently prevent the passage of fish and for which it is impracticable to modify to provide for fish passage; (c) the environmental benefit to be obtained from the provision of fish passage along Permanent rivers and streams. Benefits shall be considered to be high where the passage of migratory aquatic fauna is enabled between: <ul style="list-style-type: none"> i Wetland Management Areas, Natural Lake Management Areas and Natural Stream Management Areas; ii Type 2 Urban Streams and the Coastal Marine Area; iii Permanent rivers and streams in rural areas having regard to the location of the stream within the catchment and the availability of actual or potential upstream habitat.
2.1.4.8	<p>Where areas of terrestrial indigenous vegetation and habitats of terrestrial indigenous fauna have been identified as being significant, the ARC will have regard to the adverse effects on the ecological values and significance of these areas, of land disturbance, the discharges of contaminants or other activities affecting water quality or quantity.</p>
2.1.4.9	<p>In assessing the effects of use and development on natural character and terrestrial and aquatic ecosystems in terms of Policies 2.1.4.1 to 2.1.4.8, regard shall be had to maintaining and where practicable enhancing the matters listed in clauses (a) to (n) below, or preventing or minimising the adverse effects of any discharge of contaminants where a Best Practicable Option approach is used</p>



2.1.4 Policies: Environmental Compensation

2.1.4.10	The adverse effects of use and development in one area or on one type of resource may, having regard to the benefits and adverse effects of the activity and Part 2 of the RMA be offset by mitigation measures elsewhere within the Region, to compensate for adverse effects that cannot be avoided, or directly remedied or mitigated. However, any adverse effects on areas of high natural character or significant ecosystems identified in Policy 2.1.4 9(n) should be avoided to the fullest extent practicable in the first instance, with offset mitigation being implemented where adverse effects on those resources are unavoidable.
2.1.4.11	Where offset mitigation measures referred to in Policy 2.1.4.10 are to be implemented by way of works or services, the scope of any necessary works or services and associated conditions of consent imposed under section 108(2)(c) of the RMA, shall be determined having regard to the following matters: (a) that as far as practicable off set mitigation should be of the same kind or scale as and should remedy or mitigate effects caused at least in part by the activity being granted consent; (b) any mitigation shall restore, create or enhance natural or physical resources in order to compensate the adverse effects created by the activity at the original location; or (c) the offset mitigation should be applied as close as possible to the site where the adverse effects occur; and where this is not practicable, the ARC will work with the applicant to identify an alternative site, preferably in the same catchment or receiving environment as the consented activity, having regard to the nature of the environment including the community adversely affected by the consented activity; (d) whether the activity is located inside or outside of Urban Areas and is an existing or new activity; (e) the extent to which the works or services are practicable and effective to remedy or mitigate adverse effects.

Table D5: Relevant Objectives and Policies of the AUP: Regional Policy Statement

Reference	Objective/Policy
Objectives: Urban Growth and Form	
B2.2.1.1	A quality compact urban form that enables all of the following: (a) a higher-quality urban environment; (b) greater productivity and economic growth; (c) better use of existing infrastructure and efficient provision of new infrastructure; (d) improved and more effective public transport; (e) greater social and cultural vitality; (f) better maintenance of rural character and rural productivity; and (g) reduced adverse environmental effects.
B2.2.1.2	Urban growth is primarily focused within the metropolitan area 2010 (as identified in Appendix 1A).
B2.2.1.3	Sufficient development capacity and land supply is provided to accommodate residential, commercial, industrial growth and social facilities to support growth.
B2.2.1.4	Urbanisation is contained within the Rural Urban Boundary, towns, and rural and coastal towns and villages.
B2.2.1.5	The development of land within the Rural Urban Boundary, towns, and rural and coastal towns and villages is integrated with the provision of appropriate infrastructure
B2.7.1.1	Recreational needs of people and communities are met through the provision of a range of quality open spaces and recreation facilities.
B2.7.1.2	Public access to and along Auckland's coastline, coastal marine area, lakes, rivers, streams and wetlands is maintained and enhanced.
Policies: Urban Growth and Form	
B2.2.2.4	Concentrate urban growth and activities within the metropolitan area 2010 (as identified in Appendix 1A), enable urban growth and activities within the Rural Urban Boundary, towns, and rural and coastal towns and villages, and avoid urbanisation outside these areas.



B2.7.2.2	Promote the physical connection of open spaces to enable people and wildlife to move around efficiently and safely.
B2.7.2.4	Provide open spaces and recreation facilities in areas where there is an existing or anticipated deficiency.
B2.7.2.7	Avoid, remedy or mitigate significant adverse effects of land use or development on open spaces and recreation facilities.
Objectives: Infrastructure, Transport and Energy	
B3.2.1.1	Infrastructure is resilient, efficient and effective.
B3.2.1.2	The benefits of infrastructure are recognised, including: <ul style="list-style-type: none"> (a) providing essential services for the functioning of communities, businesses and industries within and beyond Auckland; (b) enabling economic growth; (c) contributing to the economy of Auckland and New Zealand; (d) providing for public health, safety and the well-being of people and communities; (e) protecting the quality of the natural environment; and (f) enabling interaction and communication, including national and international links for trade and tourism.
B3.2.1.3	Development, operation, maintenance, and upgrading of infrastructure is enabled, while managing adverse effects on: <ul style="list-style-type: none"> (a) the quality of the environment and, in particular, natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character; (a) the health and safety of communities and amenity values.
B3.2.1.4	The functional and operational needs of infrastructure are recognised.
B3.2.1.5	Infrastructure planning and land use planning are integrated to service growth efficiently.
B3.2.1.8	The adverse effects of infrastructure are avoided, remedied or mitigated.
B3.3.1.1	Effective, efficient and safe transport that: <ul style="list-style-type: none"> (a) supports the movement of people, goods and services; (b) integrates with and supports a quality compact urban form; (c) enables growth; (d) avoids, remedies or mitigates adverse effects on the quality of the environment and amenity values and the health and safety of people and communities; and (e) facilitates transport choices, recognises different trip characteristics and enables accessibility and mobility for all sectors of the community.
Policies: Infrastructure, Transport and Energy	
B3.2.2.1	Enable the efficient development, operation, maintenance and upgrading of infrastructure.
B3.2.2.2	Recognise the value of investment in existing infrastructure.
B3.2.2.3	Provide for the locational requirements of infrastructure by recognising that it can have a functional or operational need to be located in areas with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character.
B3.2.2.6	Enable the development, operation, maintenance and upgrading of infrastructure in areas with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character while ensuring that the adverse effects on the values of such areas are avoided where practicable or otherwise remedied or mitigated.
B3.2.2.8	Avoid, remedy or mitigate the adverse effects from the construction, operation, maintenance or repair of infrastructure.
B3.3.2.1	Enable the effective, efficient and safe development, operation, maintenance and upgrading of all modes of an integrated transport system.



B3.3.2.2	Enable the movement of people, goods and services and ensure accessibility to sites.
B3.3.2.4	Ensure that transport infrastructure is designed, located and managed to: <ul style="list-style-type: none"> (a) integrate with adjacent land uses, taking into account their current and planned use, intensity, scale, character and amenity; and (b) provide effective pedestrian and cycle connections.
B3.3.2.7	Avoid, remedy or mitigate the adverse effects associated with the construction or operation of transport infrastructure on the environment and on community health and safety.
Objectives: Mana Whenua	
B6.3.1.1	Mana Whenua values, mātauranga and tikanga are properly reflected and accorded sufficient weight in resource management decision-making.
B6.3.1.2	The mauri of, and the relationship of Mana Whenua with, natural and physical resources including freshwater, geothermal resources, land, air and coastal resources are enhanced overall.
B6.3.1.3	The relationship of Mana Whenua and their customs and traditions with natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, natural resources or historic heritage values is recognised and provided for.
Policies: Mana Whenua	
B6.3.2.3	Ensure that any assessment of environmental effects for an activity that may affect Mana Whenua values includes an appropriate assessment of adverse effects on those values.
B6.3.2.4	Provide opportunities for Mana Whenua to be involved in the integrated management of natural and physical resources in ways that do all of the following: <ul style="list-style-type: none"> (a) recognise the holistic nature of the Mana Whenua world view; (b) recognise any protected customary right in accordance with the Marine and Coastal Area (Takutai Moana) Act 2011; and (c) restore or enhance the mauri of freshwater and coastal ecosystems.
B6.3.2.6	Require resource management decisions to have particular regard to potential impacts on all of the following: <ul style="list-style-type: none"> (a) the holistic nature of the Mana Whenua world view; (b) the exercise of kaitiakitanga; (c) mauri, particularly in relation to freshwater and coastal resources; (d) customary activities, including mahinga kai; (e) sites and areas with significant spiritual or cultural heritage value to Mana Whenua; and (f) any protected customary right in accordance with the Marine and Coastal Area (Takutai Moana) Act 2011.
Objectives: Natural Resources	
B7.2.1.1	Areas of significant indigenous biodiversity value in terrestrial, freshwater, and coastal marine areas are protected from the adverse effects of subdivision use and development.
B7.2.1.2	Indigenous biodiversity is maintained through protection, restoration and enhancement in areas where ecological values are degraded, or where development is occurring.
B7.3.1.1	Degraded freshwater systems are enhanced.
B7.3.1.2	Loss of freshwater systems is minimised.
B7.3.1.3	The adverse effects of changes in land use on freshwater are avoided, remedied or mitigated.
B7.4.1.2	The quality of freshwater and coastal water is maintained where it is excellent or good and progressively improved over time where it is degraded.
B7.4.1.4	The adverse effects of point and non-point discharges, in particular stormwater runoff and wastewater discharges, on coastal waters, freshwater and geothermal water are minimised and existing adverse effects are progressively reduced.
B7.4.1.6	Mana Whenua values, mātauranga and tikanga associated with coastal water, freshwater and geothermal water are recognised and provided for, including their traditional and cultural uses and values.



B7.5.1.2	Industry and infrastructure are enabled by providing for reduced ambient air quality amenity in appropriate locations.
Policies: Natural Resources	
B7.2.2.5	Avoid adverse effects on areas listed in the Schedule 3 of Significant Ecological Areas – Terrestrial Schedule and Schedule 4 Significant Ecological Areas – Marine Schedule.
B7.3.2.1	<p>Integrate the management of subdivision, use and development and freshwater systems by undertaking all of the following:</p> <ul style="list-style-type: none"> (a) ensuring water supply, stormwater and wastewater infrastructure is adequately provided for in areas of new growth or intensification; (b) ensuring catchment management plans form part of the structure planning process; (c) controlling the use of land and discharges to minimise the adverse effects of runoff on freshwater systems and progressively reduce existing adverse effects where those systems or water are degraded; and (d) avoiding development where it will significantly increase adverse effects on freshwater systems, unless these adverse effects can be adequately mitigated.
B7.3.2.4	<p>Avoid the permanent loss and significant modification or diversion of lakes, rivers, streams (excluding ephemeral streams), and wetlands and their margins, unless all of the following apply:</p> <ul style="list-style-type: none"> (a) it is necessary to provide for: <ul style="list-style-type: none"> (i) the health and safety of communities; or (ii) the enhancement and restoration of freshwater systems and values; or (iii) the sustainable use of land and resources to provide for growth and development; or (iv) infrastructure; (b) no practicable alternative exists; (c) mitigation measures are implemented to address the adverse effects arising from the loss in freshwater system functions and values; and (d) where adverse effects cannot be adequately mitigated, environmental benefits including on-site or off-site works are provided.
B7.3.2.5	<p>Manage subdivision, use, development, including discharges and activities in the beds of lakes, rivers streams, and in wetlands, to do all of the following:</p> <ul style="list-style-type: none"> (a) protect identified Natural Lake Management Areas, Natural Stream Management Areas, and Wetland Management Areas; (b) minimise erosion and modification of beds and banks of lakes, rivers, streams and wetlands; (c) limit the establishment of structures within the beds of lakes, rivers and streams and in wetlands to those that have a functional need or operational requirement to be located there; and (d) maintain or where appropriate enhance: <ul style="list-style-type: none"> (i) freshwater systems not protected under Policy B7.3.2(5)(a); (ii) navigation along rivers and public access to and along lakes, rivers and streams; (iii) existing riparian vegetation located on the margins of lakes, rivers, streams and wetlands; and (iv) areas of significant indigenous biodiversity.
B7.3.2.6	Restore and enhance freshwater systems where practicable when development, change of land use, and subdivision occur
B7.4.2.1	<p>Integrate the management of subdivision, use, development and coastal water and freshwater, by:</p> <ul style="list-style-type: none"> (a) ensuring water supply, stormwater and wastewater infrastructure is adequately provided for in areas of growth; and (b) requiring catchment management planning as part of structure planning;



	<ul style="list-style-type: none"> (c) controlling the use of land and discharges to minimise the adverse effects of runoff on water and progressively reduce existing adverse effects where those water are degraded; and (d) avoiding development where it will significantly increase adverse effects on water, unless these adverse effects can be adequately mitigated.
B7.4.2.7	<p>Manage the discharges of contaminants into water from subdivision, use and development to avoid where practicable, and otherwise minimise, all of the following:</p> <ul style="list-style-type: none"> (b) adverse effects on the quality of freshwater and coastal water; (c) adverse effects from contaminants, including nutrients generated on or applied to land, and the potential for these to enter freshwater and coastal water from both point and non-point sources;
B7.4.2.8	<p>Minimise the loss of sediment from subdivision, use and development, and manage the discharge of sediment into freshwater and coastal water, by:</p> <ul style="list-style-type: none"> (a) promoting the use of soil conservation and management measures to retain soil and sediment on land; and (b) requiring land disturbing activities to use industry best practice and standards appropriate to the nature and scale of the land disturbing activity and the sensitivity of the receiving environment.
B7.4.2.9	<p>Manage stormwater by all of the following:</p> <ul style="list-style-type: none"> (a) requiring subdivision, use and development to: <ul style="list-style-type: none"> (i) minimise the generation and discharge of contaminants; and (ii) minimise adverse effects on freshwater and coastal water and the capacity of the stormwater network; (b) adopting the best practicable option for every stormwater diversion and discharge; and (c) controlling the diversion and discharge of stormwater outside of areas serviced by a public stormwater network.
B7.5.2	<p>Manage discharge of contaminants to air from use and development to:</p> <ol style="list-style-type: none"> (1) avoid significant adverse effects on human health and reduce exposure to adverse air discharges; (2) control activities that use or discharge noxious or dangerous substances; (3) minimise reverse sensitivity effects by avoiding or mitigating potential land use conflict between activities that discharge to air and activities that are sensitive to air discharges; (4) protect activities that are sensitive to the adverse effects of air discharges; (5) protect flora and fauna from the adverse effects of air discharges; (6) enable the operation and development of infrastructure, industrial activities and rural production activities that discharge contaminants into air, by providing for low air quality amenity in appropriate locations;

Objectives: Environmental Risk

B10.2.1.5	The functions of natural systems, including floodplains, are protected from inappropriate subdivision, use and development.
B10.2.1.6	The conveyance function of overland flow paths is maintained.
B10.4.1.1	Human health and the quality of air, land and water resources are protected by the identification, management and remediation of land that is contaminated.

Policies: Environmental Risk

B10.2.2.5	<p>Manage subdivision, use and development of land subject to natural hazards based on all of the following:</p> <ul style="list-style-type: none"> (e) the type and severity of potential events, including the occurrence natural hazard events in combination; (f) the vulnerability of the activity to adverse effects, including the health and safety of people and communities, the resilience of property to damage and the effects on the environment; and
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	(g) the cumulative effects of locating activities on land subject to natural hazards and the effects on other activities and resources.
B10.2.2.7	Avoid or mitigate the effects of activities in areas subject to natural hazards, such as earthworks, changes to natural and built drainage systems, vegetation clearance and new or modified structures, so that the risks of natural hazards are not increased.
B10.2.2.12	Minimise the risks from natural hazards to new infrastructure which functions as a lifeline utility by: <ul style="list-style-type: none"> (a) assessing the risks from a range of natural hazard events including low probability but high potential impact events such as tsunamis, earthquake and volcanic eruptions; (b) utilising design, location and network diversification to minimise the adverse effects on infrastructure and to minimise the adverse
B10.4.2.3	Manage or remediate land that is contaminated where: <ul style="list-style-type: none"> (a) the level of contamination renders the land unsuitable for its existing or proposed use; or (b) the discharge of contaminants from the land is generating or is likely to generate significant adverse effects on the environment; or (c) development or subdivision of land is proposed.

Table D6: Relevant Objectives and Policies from the AUP: Regional Plan

Reference	Objective/Policy
Objectives: Significant Ecological Areas Overlay	
D9.2.1	Areas of significant indigenous biodiversity value in terrestrial, freshwater, and coastal marine areas are protected from the adverse effects of subdivision, use and development.
Policies: Significant Ecological Areas Overlay	
D9.3.1	Manage the effects of activities on the indigenous biodiversity values of areas identified as significant ecological areas by: <ul style="list-style-type: none"> (a) avoiding adverse effects as far as practicable, and where avoidance is not practicable, minimising adverse effects on the identified values; (b) remedying adverse effects on the identified values where they cannot be avoided; (c) mitigating adverse effects on the identified values where they cannot be avoided or remediated; and (d) considering the appropriateness of offsetting any residual adverse effects that are significant and where they have not been able to be mitigated, through protection, restoration and enhancement measures, having regard to Appendix 8 Biodiversity offsetting.
D9.3.2	Adverse effects on indigenous biodiversity values in significant ecological areas that are required to be avoided, remedied, mitigated or offset may include, but are not limited to, any of the following: <ul style="list-style-type: none"> (a) fragmentation of, or a reduction in the size and extent of, indigenous ecosystems and the habitats of indigenous species; (b) fragmentation or disruption of connections between ecosystems or habitats; (c) changes which result in increased threats from pests on indigenous biodiversity and ecosystems; (d) loss of buffering of indigenous ecosystems; (e) loss of a rare or threatened individual, species population or habitat; (f) loss or degradation of originally rare ecosystems including wetlands, dune systems, lava forests, coastal forests; (g) a reduction in the abundance of individuals within a population, or natural diversity of indigenous vegetation and habitats of indigenous fauna; (h) loss of ecosystem services; (i) effects which contribute to a cumulative loss or degradation of habitats, species populations and ecosystems; (j) impacts on species or ecosystems that interact with other activities, or impacts that exacerbate or cause adverse effects in synergistic ways; (k) loss of, or damage to, ecological mosaics, sequences, processes, or integrity; (l) downstream effects on wetlands, rivers, streams, and lakes from hydrological changes further up the catchment; (m) a modification of the viability or value of indigenous vegetation and habitats of indigenous fauna as a result of the use or development of other land, freshwater, or coastal resources;



	<ul style="list-style-type: none"> (n) a reduction in the historical, cultural, and spiritual association held by Mana Whenua or the wider community; (o) the destruction of, or significant reduction in, educational, scientific, amenity, historical, cultural, landscape, or natural character values; (p) disturbance to indigenous fauna that is likely or known to increase threats, disturbance or pressures on indigenous fauna; or (q) increases in the extinction probability of a species.
D9.3.3	<p>Enhance indigenous biodiversity values in significant ecological areas through any of the following:</p> <ul style="list-style-type: none"> (a) restoration, protection and enhancement of threatened ecosystems and habitats for rare or threatened indigenous species; (b) control, and where possible, eradication of plant and animal pests; (c) fencing of significant ecological areas to protect them from stock impacts; (d) legal protection of significant ecological areas through covenants or similar mechanisms; (e) development and implementation of management plans to address adverse effects; (f) re-vegetating areas using, where possible, indigenous species sourced from naturally growing plants in the vicinity with the same climactic and environmental conditions; or (g) providing for the role of Mana Whenua as kaitiaki and for the practical exercise of kaitiakitanga in restoring, protecting and enhancing areas.
D9.3.6	<p>Avoid as far as practicable the removal of vegetation and loss of biodiversity in significant ecological areas from the construction of building platforms, access ways or infrastructure, through:</p> <ul style="list-style-type: none"> (a) using any existing cleared areas on a site to accommodate new development in the first instance; (b) assessing any practicable alternative locations and/or methods that would reduce the need for vegetation removal or land disturbance; (c) retaining indigenous vegetation and natural features which contribute to the ecological significance of a site, taking into account any loss that may be unavoidable to create a single building platform for a dwelling and associated services, access and car parking on a site; (d) designing and locating dwellings and other structures to reduce future demands to clear or damage areas of significant indigenous biodiversity, for example to provide sunlight or protect property; (e) avoiding as far as practicable any changes in hydrology which could adversely affect indigenous biodiversity values; (f) implementing measures to maintain existing water quality and not increase the amount of sediment entering natural waterways, wetlands and groundwater; and (g) using techniques that minimise the effects of construction and development on vegetation and biodiversity and the introduction and spread of animal and plant pests.
Objectives: Water quality and integrated management	
E1.2.1	Freshwater and sediment quality is maintained where it is excellent or good and progressively improved over time in degraded areas.
E1.2.2	The mauri of freshwater is maintained or progressively improved over time to enable traditional and cultural use of this resource by Mana Whenua.
E1.2.3	Stormwater and wastewater networks are managed to protect public health and safety and to prevent or minimise adverse effects of contaminants on freshwater and coastal water quality.
Policies: Water quality and integrated management	
E1.3.1	<p>Manage discharges, until such time as objectives and limits are established in accordance with Policy E1.3(7), having regard to:</p> <ul style="list-style-type: none"> (a) the National Policy Statement for Freshwater Management National Bottom Lines; (b) the Macroinvertebrate Community Index as a guideline for freshwater ecosystem health associated with different land uses within catchments in accordance with Policy E1.3(2); or (c) other indicators of water quality and ecosystem health.
E1.3.4	When considering any application for a discharge, the Council must have regard to the following matters:



	<ul style="list-style-type: none"> (a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of freshwater including on any ecosystem associated with freshwater; and (b) the extent to which it is feasible and dependable that any more than a minor adverse effect on freshwater, and on any ecosystem associated with freshwater, resulting from the discharge would be avoided.
E1.3.9	<p>Minimise or mitigate new adverse effects of stormwater runoff, and where practicable progressively reduce existing adverse effects of stormwater runoff, on freshwater systems, freshwater and coastal waters during intensification and redevelopment of existing urban areas by all of the following:</p> <ul style="list-style-type: none"> (a) requiring measures to reduce contaminants, particularly from high contaminant-generating car parks and high-use roads; (b) requiring measures to reduce the discharge of gross stormwater pollutants; (c) requiring measures to be adopted to reduce the peak flow rate and the volume of stormwater flows: <ul style="list-style-type: none"> (i) within sites identified in the Stormwater Management Area – Flow 1 and Flow 2 Control (as shown on the planning maps); (ii) where development exceeds the maximum impervious area for the relevant zone; or (iii) from areas of impervious surface where discharges may give rise to flooding or adversely affect rivers and streams; (d) taking an integrated stormwater management approach for large-scale and comprehensive redevelopment and intensification (refer to Policy E1.3.10 below) and encourage the restoration of freshwater systems where practicable; and (e) ensuring intensification is supported by appropriate stormwater infrastructure, including natural assets that are utilised for stormwater conveyance and overland flow paths.
E1.3.10	<p>In taking an integrated stormwater management approach have regard to all of the following:</p> <ul style="list-style-type: none"> (a) the nature and scale of the development and practical and cost considerations, recognising: <ul style="list-style-type: none"> (i) greenfield and comprehensive brownfield development generally offer greater opportunity than intensification and small-scale redevelopment of existing areas; (ii) intensive land uses such as high-intensity residential, business, industrial and roads generally have greater constraints; and (iii) site operational and use requirements may preclude the use of an integrated stormwater management approach. (b) the location, design, capacity, intensity and integration of sites/development and infrastructure, including roads and reserves, to protect significant site features and hydrology and minimise adverse effects on receiving environments; (c) the nature and sensitivity of receiving environments to the adverse effects of development, including fragmentation and loss of connectivity of rivers and streams, hydrological effects and contaminant discharges and how these can be minimised and mitigated, including opportunities to enhance degraded environments; (d) reducing stormwater flows and contaminants at source prior to the consideration of mitigation measures and the optimisation of on-site and larger communal devices where these are required; and (e) the use and enhancement of natural hydrological features and green infrastructure for stormwater management where practicable.
E1.3.12	<p>Manage contaminants in stormwater runoff from high contaminant generating car parks and high use roads to minimise new adverse effects and progressively reduce existing adverse effects on water and sediment quality in freshwater systems, freshwater and coastal waters.</p>
E1.3.13	<p>Require stormwater quality or flow management to be achieved on-site unless there is a downstream communal device or facility designed to cater for the site's stormwater runoff.</p>
E1.3.14	<p>Adopt the best practicable option to minimise the adverse effects of stormwater discharges from stormwater network and infrastructure including road, and rail having regard to all of the following:</p> <ul style="list-style-type: none"> (a) the best practicable option criteria as set out in section 2 of the Resource Management Act 1991; (b) the reasonable timeframes over which adverse effects can be avoided as far as practicable, or otherwise minimised or mitigated; (c) the scale and significance of the adverse effects;



	<ul style="list-style-type: none"> (d) infrastructure investment priorities and the consequences of delaying infrastructural improvements in other areas; (e) the ability to prevent or minimise existing adverse effects having regard to the effectiveness and timeframes of other feasible methods, including land use controls; (f) opportunities to integrate with other major infrastructure projects or works; (g) the need to maintain and optimise existing stormwater networks and provide for planned land use and development; and (h) operational requirements and space limitations.
E1.3.26	<p>Prevent or minimise the adverse effects from construction, maintenance, investigation and other activities on the quality of freshwater and coastal water by:</p> <ul style="list-style-type: none"> (a) adopting best management practices and establishing minimum standards for the discharges; or (b) where Policy E1.3(26)(a) is not practicable, have regard to the following: <ul style="list-style-type: none"> (i) the nature, volume and concentration of the contaminants in the discharge; (ii) the sensitivity of the receiving environment to the contaminants in the discharge; (iii) other practicable options for the discharge, including reuse or discharge to the trade sewer; and (iv) practicable measures to reduce contaminant concentrations prior to discharge or otherwise mitigate adverse effects.
Objectives: Water Quantity, Allocation and Use	
E2.2.1	Water in surface rivers and groundwater aquifers is available for use provided the natural values of water are maintained and established limits are not exceeded.
Policies: Water Quantity, Allocation and Use	
E2.3.22	<p>Require proposals to divert surface water to demonstrate the diversion will to the extent practicable avoid significant adverse effects and remedy or mitigate other adverse effects including where relevant, effects on:</p> <ul style="list-style-type: none"> (a) existing lawfully established surface water takes including those allowed by section 14(3)(b) of the Resource Management Act 1991; (b) existing buildings, structures and services; (c) existing flood hazard risks; (d) river bank stability; (e) scheduled historic heritage places or scheduled sites and places of significance to Mana Whenua; (f) people and communities; and (g) the life supporting capacity of freshwater, ecosystem processes, and indigenous species and their ecosystems.
E2.3.23	<p>Require proposals to divert groundwater, in addition to the matters addressed in Policy E2.3(6) and (7) above, to ensure that:</p> <ul style="list-style-type: none"> (a) the proposal avoids, remedies or mitigates any adverse effects on: <ul style="list-style-type: none"> (i) scheduled historic heritage places and scheduled sites and places of significance to Mana Whenua; and (ii) people and communities. (b) the groundwater diversion does not cause or exacerbate any flooding; (c) monitoring has been incorporated where appropriate, including: <ul style="list-style-type: none"> (i) measurement and recording of water levels and pressures; and (ii) measurement and recording of the movement of ground, buildings and other structures. (d) mitigation has been incorporated where appropriate including: <ul style="list-style-type: none"> (i) minimising the period where the excavation is open/unsealed; (ii) use of low permeability perimeter walls and floors; (iii) use of temporary and permanent systems to retain the excavation; or (iv) re-injection of water to maintain groundwater pressures.
Objectives: Lakes, Rivers, Streams and Wetlands	
E3.2.1	Auckland's lakes, rivers, streams and wetlands with high natural values are protected from degradation and permanent loss.
E3.2.2	Auckland's lakes, rivers, streams and wetlands are restored, maintained or enhanced.
E3.2.3	Significant residual adverse effects on lakes, rivers, streams or wetlands that cannot be avoided, remedied or mitigated are offset where this will promote the purpose of the Resource Management Act 1991.



E3.2.4	Structures in, on, under or over the bed of a lake, river, stream or wetland are provided for where there are functional or operational needs for the structure to be in that location, or traverse that area.
E3.2.5	Activities in, on, under or over the bed of a lake, river, stream and wetland are managed to minimise adverse effects on the lake, river, stream or wetland.
E3.2.6	Reclamation and drainage of the bed of a lake, river, stream and wetland is avoided, unless there is no practicable alternative.
Policies: Lakes, Rivers, Streams and Wetlands	
E3.3.5	Avoid significant adverse effects, and avoid, remedy or mitigate other adverse effects of activities in, on, under or over the beds of lakes, rivers, streams or wetlands on: <ul style="list-style-type: none"> (a) the mauri of the freshwater environment; and (b) Mana Whenua values in relation to the freshwater environment.
E3.3.7	Provide for the operation, use, maintenance, repair, erection, reconstruction, placement, alteration or extension, of any structure or part of any structure in, on, under, or over the bed of a lake, river, stream or wetland, and any associated diversion of water, where the structure complies with all of the following: <ul style="list-style-type: none"> (a) there is no practicable alternative method or location for undertaking the activity outside the bed of the lake, river, stream or wetland; (b) the structure is designed to be the minimum size necessary for its purpose to minimise modification to the bed of a lake, river, stream or wetland; (c) the structure is designed to avoid creating or increasing a hazard; (d) the structure is for any of the following: <ul style="list-style-type: none"> (i) required as part of an activity designed to restore or enhance the natural values of any lakes, rivers, streams or wetlands and their margins, or any adjacent area of indigenous vegetation or habitat of indigenous fauna; (ii) designed to maintain and/or enhance public access to, over and along any lake, river, stream or wetland and their margins; (iii) necessary to provide access across a lake, river, stream or wetland; (iv) associated with infrastructure; (v) necessary for flood protection and the safeguarding of public health and safety; or (vi) required for the reasonable use of production land. (e) the structure avoids significant adverse effects and avoids, remedies or mitigates other adverse effects on Mana Whenua values associated with freshwater resources, including wāhi tapu, wāhi taonga and mahinga kai.
Objectives: Stormwater Management Area – Flow 1 and Flow 2	
E10.2.1	High value rivers, streams and aquatic biodiversity in identified urbanised catchments are protected from further adverse effects of stormwater runoff associated with urban development and where possible enhanced.
Policies: Stormwater Management Area – Flow 1 and Flow 2	
E10.3.1	Manage stormwater runoff from impervious areas in Stormwater management area - Flow 1 and Flow 2 areas to minimise the adverse effects of stormwater runoff and streams to retain, and where possible enhance, stream naturalness, biodiversity, bank stability and other values.
E10.3.2	Require stormwater hydrology mitigation in Stormwater management area control Flow 1 and Flow 2 areas where there are: <ul style="list-style-type: none"> (a) new impervious areas; (b) redeveloped impervious areas; or (c) entire sites where the area of development or redevelopment comprises more than 50 per cent of the site area.
E10.3.3	Recognise that there may be limitations to the hydrology mitigation that can practicably be achieved in some circumstances, particularly in association with redevelopment, including: <ul style="list-style-type: none"> (a) space limitations; (b) requirements to provide for other utility services; and (c) the function of roads as overland flow paths conveying stormwater runoff from surrounding land uses which the road controlling authority has limited ability to control.



Objectives: Land Disturbance - Regional

E11.2.1	Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment.
E11.2.2	Sediment generation from land disturbance is minimised.
E11.2.3	Land disturbance is controlled to achieve soil conservation

Policies: Land Disturbance - Regional

E11.3.2	<p>Manage land disturbance to:</p> <ul style="list-style-type: none"> (a) retain soil and sediment on the land by the use of best practicable options for sediment and erosion control appropriate to the nature and scale of the activity; (b) manage the amount of land being disturbed at any one time, particularly where the soil type, topography and location is likely to result in increased sediment runoff or discharge; (c) avoid, remedy and mitigate adverse effects on accidentally discovered sensitive material; and (d) maintain the cultural and spiritual values of Mana Whenua in terms of land and water quality, preservation of wāhi tapu, and kaimoana gathering.
E11.3.4	Enable land disturbance necessary for a range of activities undertaken to provide for people and communities social, economic and cultural well-being, and their health and safety.
E11.3.5	Design and implement earthworks with recognition of existing environmental site constraints and opportunities, specific engineering requirements, and implementation of integrated water principles.
E11.3.7	<p>Require any land disturbance that will likely result in the discharge of sediment laden water to a surface water body or to coastal water to demonstrate that sediment discharge has been minimised to the extent practicable, having regard to the quality of the environment; with:</p> <ul style="list-style-type: none"> (a) any significant adverse effects avoided, and other effects avoided, remedied or mitigated, particularly in areas where there is: <ul style="list-style-type: none"> (i) high recreational use; (ii) relevant initiatives by Mana Whenua, established under regulations relating to the conservation or management of fisheries, including taiāpure, rāhui or whakatupu areas; (iii) the collection of fish and shellfish for consumption; (iv) maintenance dredging; or (v) a downstream receiving environment that is sensitive to sediment accumulation; (b) adverse effects avoided as far as practicable within areas identified as sensitive because of their ecological values, including terrestrial, freshwater and coastal ecological values; and (c) the receiving environments ability to assimilate the discharged sediment being taken into account.

Objectives: Cleanfills, Managed Fills and Landfills

E13.2.2	Human health is protected from the adverse effects of operational or closed cleanfills, managed fills and landfills
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Policies: Cleanfills, Managed Fills and Landfills

E13.3.5	<p>Manage closed managed fills and landfills (including the closure of to:</p> <ul style="list-style-type: none"> (a) protect the integrity of the site including the containment of contaminants; and (b) require aftercare that is appropriate to the nature and requirements of the site including the type of material that was deposited during its operative period.
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Objectives: Air Quality

E14.2.1	Air quality is maintained in those parts of Auckland that have high air quality, and air quality is improved in those parts of Auckland that have low to medium air quality.
E14.2.2	Air discharges from use and development meet Auckland Ambient Air Quality Standards.
E14.2.3	Human health, property and the environment are protected from significant adverse effects from the discharge of contaminants to air.
E14.2.4	Incompatible uses and development are separated to manage adverse effects on air quality from discharges of contaminants into air and avoid or mitigate reverse sensitivity effects.



E14.2.5	The operational requirements of light and heavy industry, other location-specific industry, infrastructure, rural activities and mineral extraction activities are recognised and provided for.
Policies: Air Quality	
E14.3.2	Manage the discharge of contaminants to air so that adverse effects on human health, including cumulative adverse effects, are avoided, and all other adverse effects are remedied or mitigated.
Objectives: Vegetation Management and Biodiversity	
E15.2.1	Ecosystem services and indigenous biological diversity values, particularly in sensitive environments, and areas of contiguous indigenous vegetation cover, are maintained or enhanced while providing for appropriate subdivision, use and development.
E15.2.2	Indigenous biodiversity is restored and enhanced in areas where ecological values are degraded, or where development is occurring.
Policies: Vegetation Management and Biodiversity	
E15.3.1	Protect areas of contiguous indigenous vegetation cover and vegetation in sensitive environments including the coastal environment, riparian margins, wetlands, and areas prone to natural hazards.
E15.3.2	Manage the effects of activities to avoid significant adverse effects on biodiversity values as far as practicable, minimise significant adverse effects where avoidance is not practicable, and avoid, remedy or mitigate any other adverse effects on indigenous biological diversity and ecosystem services, including soil conservation, water quality and quantity management, and the mitigation of natural hazards.
E15.3.3	Encourage the offsetting of any significant residual adverse effects on indigenous vegetation and biodiversity values that cannot be avoided, remedied or mitigated, through protection, restoration and enhancement measures, having regard to Policy E15.3(4) below and Appendix 8 Biodiversity offsetting.
E15.3.4	Protect, restore, and enhance biodiversity when undertaking new use and development through any of the following: <ul style="list-style-type: none"> (a) using transferable rural site subdivision to protect areas in Schedule 3 Significant Ecological Areas -Terrestrial Schedule; (b) requiring legal protection, ecological restoration and active management techniques in areas set aside for the purposes of mitigating or offsetting adverse effects on indigenous biodiversity; or (c) linking biodiversity outcomes to other aspects of the development such as the provision of infrastructure and open space.
E15.3.7	Manage any adverse effects from the use, maintenance, upgrading and development of infrastructure in accordance with the policies in E15.3, recognising that it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values.
Objectives: Infrastructure	
E26.2.1.1	The benefits of infrastructure are recognised.
E26.2.1.3	Safe, efficient and secure infrastructure is enabled, to service the needs of existing and authorised proposed subdivision, use and development.
E26.2.1.4	Development, operation, maintenance, repair, replacement, renewal, upgrading and removal of infrastructure is enabled.
Policies: Infrastructure	
E26.2.2.1	Recognise the social, economic, cultural and environmental benefits that infrastructure provides, including: <ul style="list-style-type: none"> (a) enabling enhancement of the quality of life and standard of living for people and communities; (b) providing for public health and safety; (c) enabling the functioning of businesses; (d) enabling economic growth; (e) enabling growth and development; (f) protecting and enhancing the environment; (g) enabling the transportation of freight, goods, people; and (h) enabling interaction and communication.



E26.2.2.2	<p>Provide for the development, operation, maintenance, repair, upgrade and removal of infrastructure throughout Auckland by recognising:</p> <ul style="list-style-type: none"> (a) functional and operational needs; (b) location, route and design needs and constraints; (c) the complexity and interconnectedness of infrastructure services; (d) the benefits of infrastructure to communities within Auckland and beyond; (e) the need to quickly restore disrupted services; and (f) its role in servicing existing, consented and planned development.
E26.2.2.4	<p>Require the development, operation, maintenance, repair, upgrading and removal of infrastructure to avoid, remedy or mitigate adverse effects, including, on the:</p> <ul style="list-style-type: none"> (a) health, well-being and safety of people and communities, including nuisance from noise, vibration, dust and odour emissions and light spill; (b) safe and efficient operation of other infrastructure; (c) amenity values of the streetscape and adjoining properties; (d) environment from temporary and ongoing discharges; and (e) values for which a site has been scheduled or incorporated in an overlay.
E26.2.2.5	<p>Consider the following matters when assessing the effects of infrastructure:</p> <ul style="list-style-type: none"> (a) the degree to which the environment has already been modified; (b) the nature, duration, timing and frequency of the adverse effects; (c) the impact on the network and levels of service if the work is not undertaken; (d) the need for the infrastructure in the context of the wider network; and (e) the benefits provided by the infrastructure to the communities within Auckland and beyond.
E26.2.2.6	<p>Consider the following matters where new infrastructure or major upgrades to infrastructure are proposed within areas that have been scheduled in the Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character:</p> <ul style="list-style-type: none"> (a) the economic, cultural and social benefits derived from infrastructure and the adverse effects of not providing the infrastructure; (b) whether the infrastructure has a functional or operational need to be located in or traverse the proposed location; (c) the need for utility connections across or through such areas to enable an effective and efficient network; (d) whether there are any practicable alternative locations, routes or designs, which would avoid, or reduce adverse effects on the values of those places, while having regard to E26.2.2(6)(a) - (c); (e) the extent of existing adverse effects and potential cumulative adverse effects; (f) how the proposed infrastructure contributes to the strategic form or function, or enables the planned growth and intensification, of Auckland; (g) the type, scale and extent of adverse effects on the identified values of the area or feature, taking into account: <ul style="list-style-type: none"> (i) scheduled sites and places of significance and value to Mana Whenua; (ii) significant public open space areas, including harbours; (iii) hilltops and high points that are publicly accessible scenic lookouts; (iv) high-use recreation areas; (v) natural ecosystems and habitats; and (vi) the extent to which the proposed infrastructure or upgrade can avoid adverse effects on the values of the area, and where these adverse effects cannot practicably be avoided, then the extent to which adverse effects on the values of the area can be appropriately remedied or mitigated. (h) whether adverse effects on the identified values of the area or feature must be avoided pursuant to any national policy statement, national environmental standard, or regional policy statement.
E26.2.2.14	<p>Require road network activities to:</p> <ul style="list-style-type: none"> (a) avoid, remedy or mitigate adverse effects on residential or other sensitive activities, including effects of vibration, noise, glare and vehicle emissions; (b) avoid, remedy or mitigate adverse effects on amenity values of adjoining properties and the streetscape; and (c) maintain or enhance the safety and efficiency of the transport network.
E26.2.2.15	<p>Ensure roads are designed, located and constructed to:</p> <ul style="list-style-type: none"> (a) provide for the needs of all road users and modes of transport; (b) avoid, remedy or mitigate adverse effects on amenity values of adjoining properties;



	<ul style="list-style-type: none"> (c) avoid, remedy or mitigate adverse construction effects including effects of vibration, noise, and dust; (d) avoid, remedy or mitigate adverse operational effects particularly on residential or other sensitive activities, including effects of vibration, noise, glare and vehicle emissions; (e) minimise severance effects and changes to drainage patterns; and (f) maintain or enhance the safety and efficiency of the transport network.
Objectives: Transport	
E27.2.2	An integrated transport network including public transport, walking, cycling, private vehicles and freight, is provided for.
E27.2.5	Pedestrian safety and amenity along public footpaths is prioritised.
Policies: Transport	
E27.3.14	<p>Support increased cycling and walking by:</p> <ul style="list-style-type: none"> (a) requiring larger developments to provide bicycle parking; (b) requiring end-of-trip facilities, such as showers and changing facilities, to be included in office, educational and hospital developments with high employee or student numbers; and (c) providing for off-road pedestrian and bicycle facilities to complement facilities located within the road network.
Objectives: Contaminated Land	
E30.2.1	The discharge of contaminants from contaminated land into air, or into water, or onto or into land are managed to protect the environment and human health and to enable land to be used for suitable activities now and in the future.
Policies: Contaminated Land	
E30.3.2	<p>Require any use or development of land containing elevated levels of contaminants resulting in discharges to air, land or water to manage or remediate the contamination to a level that:</p> <ul style="list-style-type: none"> (a) allows contaminants to remain in the ground/groundwater, where it can be demonstrated that the level of residual contamination is not reasonably likely to pose a significant adverse effect on human health or the environment; and (b) avoids adverse effects on potable water supplies; (c) and avoids, remedies or mitigates significant adverse effects on ecological values, (water quality, human health and amenity values; while <p>taking into account all of the following:</p> <ul style="list-style-type: none"> (d) the physical constraints of the site and operational practicalities; (e) the financial implications of the investigation, remediation, management and monitoring options; (f) the use of best practice contaminated land management, including the preparation and consideration of preliminary and detailed site investigations, remedial action plans, site validation reports and site management plans for the identification, monitoring and remediation of contaminated land; and (g) whether adequate measures are in place for the transport, disposal and tracking of contaminated soil and other contaminated material removed from a site to prevent adverse effects on the environment.

Table D7: Relevant Objectives and Policies from the AUP: District Plan

Reference	Objective/Policy
Objectives: Land Disturbance – district	
E12.2.1	Land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment.
Policies: Land Disturbance – district	
E12.3.1	Avoid where practicable, and otherwise, mitigate, or where appropriate, remedy adverse effects of land disturbance on areas where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character.
E12.3.2	<p>Manage the amount of land being disturbed at any one time, to:</p> <ul style="list-style-type: none"> (a) avoid, remedy or mitigate adverse construction noise, vibration, odour, dust, lighting and traffic effects;



	<ul style="list-style-type: none"> (b) avoid, remedy and mitigate adverse effects on accidentally discovered sensitive material; and (c) maintain the cultural and spiritual values of Mana Whenua in terms of land and water quality, preservation of wāhi tapu, and kaimoana gathering.
E12.3.3	Enable land disturbance necessary for a range of activities undertaken to provide for people and communities social, economic and cultural well-being, and their health and safety.
E12.3.4	<p>Manage the impact on Mana Whenua cultural heritage that are discovered undertaking land disturbance by:</p> <ul style="list-style-type: none"> (a) requiring a protocol for the accidental discovery of kōiwi, archaeology and artefacts of Māori origin; (b) undertaking appropriate actions in accordance with mātauranga and tikanga Māori; and (c) undertaking appropriate measures to avoid adverse effects, or where adverse effects cannot be avoided, effects are remedied or mitigated
E12.3.5	Design and implement earthworks with recognition of existing environmental site constraints and opportunities, specific engineering requirements, and implementation of integrated water principles
E12.3.6	Require that earthworks are designed and undertaken in a manner that ensures the stability and safety of surrounding land, buildings and structures.
Objectives: Trees in Open Space Zones	
E16.2.1	Trees in open space zones that contribute to cultural, amenity, landscape and ecological values are protected.
E16.2.2	There is an increase in the quality and extent of tree cover in open space zones, particularly within areas identified for intensified living.
Policies: Trees in Open Space Zones	
E16.3.3	Encourage the use of indigenous trees and vegetation for planting within open space zones, where appropriate, to recognise and reflect cultural, amenity, landscape and ecological values.
Objectives: Trees in Roads	
E17.2.3	The safe and efficient development, maintenance, operation and upgrading of the transport system and utilities is enable while ensuring that the overall ecological and amenity values provided by trees in roads are maintained.
Policies: Trees in Roads	
E17.3.1	Balance the safe and efficient development, operation, use, maintenance and upgrading of infrastructure, utilities, and road network with the protection of trees in roads.
Policies: Lighting	
E24.3.2	Control the intensity, location and direction of artificial lighting to avoid significant glare and light spill onto adjacent sites, maintain safety for road users and minimise the loss of night sky viewing.
Objectives: Noise and Vibration	
E25.2.1	People are protected from unreasonable levels of noise and vibration.
E25.2.2	The amenity values of residential zones are protected from unreasonable noise and vibration, particularly at night.
E25.2.4	Construction activities that cannot meet noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects.
Policies: Noise and Vibration	
E25.3.2	Minimise, where practicable, noise and vibration at its source or on the site from which it is generated to mitigate adverse effects on adjacent sites.
E25.3.5	Prevent significant noise-generating activities other than roads and railway lines from establishing in or immediately adjoining residential zones.
E25.3.10	<p>Avoid, remedy, or mitigate the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to:</p> <ul style="list-style-type: none"> (a) the sensitivity of the receiving environment; and



	<p>(b) the proposed duration and hours of the operation of the activity; and</p> <p>(c) the practicability of complying with permitted noise and vibration standards.</p>
Objectives: Natural Hazards and Flooding	
E36.2.4	Where infrastructure has a functional or operational need to locate in a natural hazard area, the risk of adverse effects to other people, property, and the environment shall be assessed and significant adverse effects are sought first to be avoided or, if avoidance is not able to be totally achieved, the residual effects are otherwise mitigated to the extent practicable.
Policies: Natural Hazards and Flooding	
E36.3.4	Control subdivision, use and development of land that is subject to natural hazards so that the proposed activity does not increase, and where practicable reduces, risk associated with all of the following adverse effects: <ul style="list-style-type: none"> (a) accelerating or exacerbating the natural hazard and/or its potential impacts; (b) exposing vulnerable activities to the adverse effects of natural hazards; (c) creating a risk to human life; and (d) increasing the natural hazard risk to neighbouring properties or infrastructure.
36.3.21	Ensure all development in the 1 per cent annual exceedance probability (AEP) floodplain does not increase adverse effects from flood hazards or increased flood depths and velocities, to other properties upstream or downstream of the site
E36.3.23	Provide for flood mitigation measures which reduce flood-related effects and provide for the reconstruction of culverts and bridges where those measures do not create or exacerbate flooding upstream or downstream or otherwise increase flood hazards.



Appendix E

Consultation Summary Report



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Appendix F

Mana Whenua Cultural Value Assessments



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