Supporting Growth

North West

Assessment of Effects on the Environment – Trig Road Corridor Upgrade

Volume 2

December 2022

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

Document Status

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The Assessment of Effects on the Environment report and supporting documents are structured as set out in the table below:

Volume	Title	Contents
1	Form 18	• Attachment A: Designation plans • Attachment B: Schedule of Directly Affected Property • Attachment C: Proposed NoR Conditions
2	AEE (this report)	• Appendix A: Assessment of Alternatives Report • Appendix B: Statutory Assessment • Appendix C: Rules Assessment • Appendix D: Matters of discretion and assessment criteria • Appendix E: Proposed NoR Conditions • Appendix F: Proposed Regional Consent Conditions
3	Design and Designation Boundaries	Designation and Indicative Design Drawings
4	Supporting Technical Reports	• Appendix A: Assessment of Transport Effects • Appencix B: Assessment of Construction Noise and Vibration • Appendix C: Assessment of Traffic Noise and Vibration • Appendix D: Assessment of Historic Heritage Effects • Appendix E: Assessment of Landscape and Visual Effects • Appendix F: Assessment of Ecological Effects • Appendix G: Assessment of Stormwater Effects • Appendix H: Draft Erosion and Sediment Control Plan • Appendix I: Preliminary Site Investigation • Appendix J: Geotechnical Reports (Factual and Interpretive)

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Acronyms

Acronym/Term	Description
AC DBC	Auckland Council Housing Infrastructure Fund Detailed Business Case
ACNV	Assessment of Construction Noise and Vibration
ADR	AUP:OIP Accidental Discovery Protocol
AEP	Annual Exceedance Probability (Stormwater)
AEcE	Assessment of Ecological Effects
AEE	Assessment of Effects on the Environment (this report)
AHHE	Assessment of Historic Heritage Effects
ALVE	Assessment of Landscape and Visual Effects
ATNV	Assessment of Traffic Noise and Vibration
ASE	Assessment of Stormwater Effects
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
ATE	Assessment of Transport Effects
AUP:OIP	Auckland Unitary Plan Operative in Part 2016
BPO	Best Practicable Option (Noise and Vibration)
CEMP	Construction Environmental Management Plan
CIA	Cultural Impact Assessment
CNVMP	Construction Noise and Vibration Management Plan
CNVMS	Construction Noise and Vibration Management Schedule
CTMP	Construction Traffic Management Plan
DBC	Detailed Business Case
dB LA_{eq}	Decibels equivalent continuous sound level (Noise and Vibration)
DSI	Detailed Site Investigation (Contaminated Land)
ESCP	Erosion and Sediment Control Plan
FULSS	Future Urban Land Supply Strategy (2017)
FUZ	Future Urban Zone
GD01	GD01: Stormwater Management Devices Guide
HAIL	Hazardous Industries and Activities List
HGMPA	The Hauraki Gulf Marine Park Act 2000
HIF	Housing Infrastructure Fund
HNZPTA	Heritage New Zealand Pouhere Taonga Act 2014
IBC	Indicative Business Case
LGA	Local Government (Auckland Council) Act 2009
MCA	Multi Criteria Analysis

MHU	Residential – Mixed Housing Urban Zone
NES: Soil	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES: FW	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NoR	Notice of Requirement
NPS	National Policy Statement
NPS: FM	National Policy Statement for Freshwater 2020
NZS 6806	New Zealand Standard 6806:2010 'Acoustics – Road-traffic noise – New and altered roads
PBC	Programme Business Case
PPC5	Proposed Plan Change 5
PPF	Protected Premises and Facilities (Noise & Vibration)
PSI	Preliminary Site Investigation (Contaminated Land)
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
SG DBC	Supporting Growth North West Housing Infrastructure Fund Detailed Business Case 2019
SH16	State Highway 16
SH18	State Highway 18
TDM	Transport Design Manual
THAB	Residential – Terrace Housing and Apartment Zone
The Council	Auckland Council
The Design Framework	Te Tupu Ngātahi Design Framework
The Programme	The Supporting Growth Programme
Waka Kotahi	Waka Kotahi NZ Transport Agency

1 Introduction

This Assessment of Effects on the Environment (**AEE**) has been prepared for the Trig Road Corridor Upgrade Project (**the Project**), and includes a Notice of Requirement (**NoR**) and resource consent applications sought by Auckland Transport (**AT**) as the requiring authority and applicant under the Resource Management Act 1991 (**RMA**).

The Project forms part of the Supporting Growth Programme (**the Programme**) to enable the future construction, operation and maintenance of transport infrastructure in the North West area of Auckland. The Project consists of an upgrade of Trig Road, Whenuapai, to form an urban arterial corridor to support the anticipated urban development in Whenuapai. To achieve a logical transport connection into the existing urban network it also includes the upgrade of approximately 500 metres of Hobsonville Road at the southern extent of the Project area. This includes signalisation of the existing intersections of Hobsonville Road with Trig Road and Luckens Road. Figure 1 provides an illustration of the Project context and extent.

The purpose of the proposed designation is for the “Construction, operation and maintenance of a transport corridor”.

A lapse period of 15 years is proposed in respect to the NoR, with appropriate conditions to enable the proposed work and to manage potential adverse effects on the environment (provided in Appendix E).

Resource consents are also being sought under the Auckland Unitary Plan Operative in Part 2016 (**AUP:OIP**), the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (**NES: Soil**) and the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (**NES:FW**) to enable those activities required for the construction, operation and maintenance of the Project which are not otherwise enabled by the proposed designation. The applications for resource consent are made pursuant to sections 9, 13, 14, and 15 of the RMA. Overall, the activity status of the resource consents being sought is **discretionary**. A detailed list of the reasons for consent is provided in Section 4.4 and a full description of the permitted activities which form part of the proposal is provided in Appendix C, in accordance with Clause 3(a) of Schedule 4 of the RMA.

A lapse period of 15 years is proposed in respect of the resource consents, with appropriate conditions to enable the proposed work and to manage potential adverse effects on the environment (provided in Appendix F).

This AEE has been prepared in accordance with section 168A and Schedule 4 of the RMA in such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

Figure 1: The Project context and extent

1.1 Supporting Growth Programme

The Programme is a collaboration between AT and the Waka Kotahi NZ Transport Agency (**Waka Kotahi**) to plan and identify the required transport network to support Auckland's future urban growth areas over the next 30 years.

AT and Waka Kotahi have worked in close alignment with Auckland Council (the **Council**), Manawhenua and KiwiRail Holdings Limited and are working closely with stakeholders and the community to develop the strategic transport network to support Auckland's growth areas.

The key objective of the Programme is to identify and protect land for future implementation of the required strategic transport corridors / infrastructure.

The Programme has identified the North West Preferred Transport Network in the North West Growth Area (Figure 2) which includes the Project.

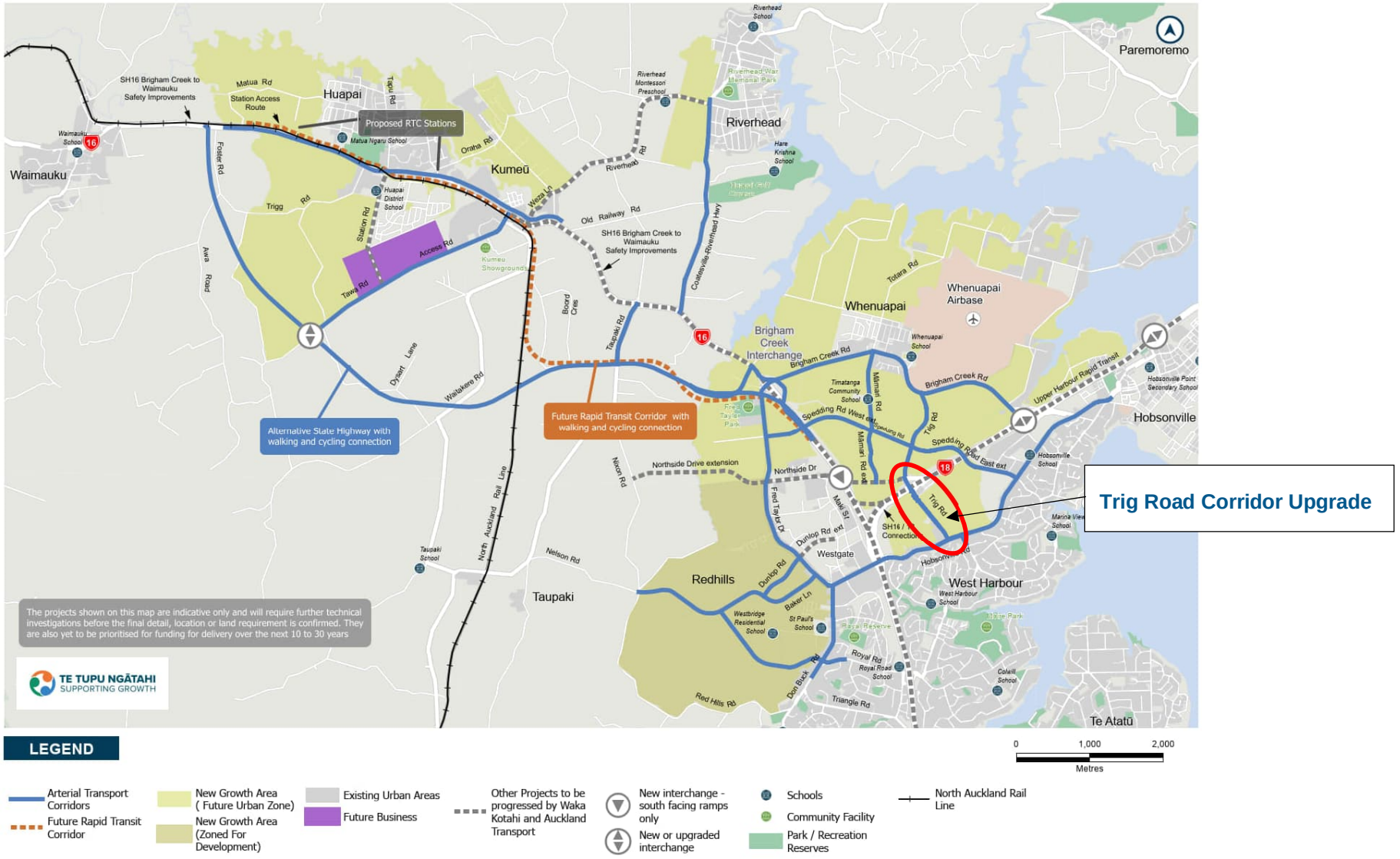

Figure 2: North West Preferred Transport Network – North West Growth Area

1.2 Housing Infrastructure Fund

The Housing Infrastructure Fund (**HIF**) was established by the Crown in 2016 to help address the funding constraints of high-growth councils, with the purpose of providing Crown loans to fund bulk infrastructure (water and transport) which enables housing development. The Council made an application for funds from the HIF to accelerate the development of houses in greenfield areas identified in the Future Urban Land Supply Strategy 2017 (**FULSS**). In July 2017 the Crown announced its recommendation (in principle) to provide a $300 million loan through the HIF for bulk infrastructure in North West Auckland, estimated at the time to support the early construction of at least 10,500 new homes in North West Auckland.

Between 2017 and 2019, two business cases were developed to determine how the HIF could be used for the delivery of bulk infrastructure to support housing development in the North West, including the Project.

Firstly, the *Auckland Council Housing Infrastructure Fund Detailed Business Case 2018* (**AC DBC**) considered the extent to which the HIF could be used to fund investment in all infrastructure required to support accelerated development. The AC DBC concluded that as Whenuapai was identified in the FULSS for Decade 1 housing development and was subject to a plan change to rezone the area for urban land uses (refer to Section 5.2.2 for further detail), the upgrade of Trig Road between SH18 and Hobsonville Road would be a key transport project to support housing development to occur in this area. As such the AC DBC recommended HIF funding for the construction of the Project.

The *Supporting Growth North West Housing Infrastructure Fund Detailed Business Case 2019* (**SG DBC**) further developed the transport network identified in the AC DBC resulting in identification of the Project.

As the HIF funding provides for construction, the necessary resource consents to enable construction are sought in conjunction with the NoR.

2 Background and Context

2.1 Need for the Supporting Growth Programme

Auckland is New Zealand's largest city, home to approximately 1.65 million people. In 2017, Auckland attracted 36,800 new residents; more than the rest of the country combined. The Auckland Plan 2050 – Development Strategy signals that Auckland could grow by 720,000 people to reach 2.4 million over the next 30 years. This will generate demand for more than 400,000 additional homes and require land for 270,000 more jobs [1]. Most of this growth will go into existing urban areas. However, around a third will go into future urban zoned (**FUZ**) areas (greenfields) as identified in the AUP:OIP.

In July 2017, the FULSS was updated in line with AUP:OIP zonings, with 15,000 hectares of land allocated for future urbanisation. The FULSS provides for sequenced and accelerated greenfield growth in ten areas of Auckland.

The significant growth anticipated will pose a number of future transport challenges for the region. Given the scale and duration of the growth proposed, the early route protection of critical transport corridors provides the required certainty for AT, Waka Kotahi, stakeholders and the community. The implementation of the strategic transport network required to support the growth will be staged over the next 30 years. A key part of this integrated approach is collaborating with the Council as it develops Structure Plans and works towards progressing subsequent plan changes to rezone land in the future urban areas.

The required transport networks will play a vital role in the success of new neighbourhoods by providing safe, accessible and sustainable travel choices that connect communities and encourage a transformational shift from private vehicles to public transport, walking and cycling. The early protection of these strategic transport corridors will provide for the following outcomes at a Programme-wide level:

Supporting and enabling growth: Protecting improved and new transport corridors will support Council's growth aspirations for the growth areas of Auckland, including intensification or density of growth, resulting in more efficient urban land development.

Improved access to economic and social opportunities and resilience of the strategic transport network: Protecting improved and new transport corridors will improve travel choices and access to the critical economic and social needs of the existing and future communities, reduce an over-reliance on existing strategic transport corridors, and better align the form and function of existing transport corridors with the planned urban form. Key to this is achieving a transformational mode shift from private vehicles to public transport, walking and cycling – which will provide for greater people moving capacity and greater travel choice for all people as the city grows.

Land use and transport integration: Integrating transport solutions with Council's aspirations for land use and urban form can provide for growth in a way that delivers high quality urban outcomes,

[1] Draft Auckland Plan 2050 Development Strategy: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/future-auckland/Pages/what-auckland-look-like-future.aspx

placemaking and enhanced liveability – including the desire for a quality, connected urban environment

Improved safety: Protecting improved and new transport corridors will help to address existing and increasing safety risks on transport corridors as growth areas urbanise, including:

- improved safety for all transport modes;
- provision of dedicated space for cyclists and pedestrians to safely accommodate these modes;
- specific safety improvement projects, such as improvements to existing road and rail corridors; and
- a reduction in private vehicle travel as a result of mode shift towards public transport and walking and cycling.

Sustainable outcomes: Protecting improved and new transport corridors will support the Government's policy shift towards more sustainable outcomes. This includes a reduction in greenhouse gas emissions and improved climate change resilience – through effective land use and transport integration and supporting mode shift towards more sustainable travel choices such as public transport and walking and cycling.

Infrastructure integration: Integrating the transport response with the needs and opportunities of network utility providers to provide a better whole of system outcome.

2.2 Reasons for the Project

Two key transport problems were identified in the AC DBC and SG DBC when considering housing development and the provision of infrastructure in the Whenuapai area:

Problem 1: Uncertainty in the provision of infrastructure coupled with fragmented land ownership in North West Auckland creates risk aversion and leads to delays in the delivery of houses.

Problem 2: Lack of an appropriate, integrated multi-modal transport system for Whenuapai is limiting travel choice, quality community outcomes and efficient access to jobs, education, and core services for our customers.

Derived from these problems, the following more specific issues have been identified for the Project area:

Whenuapai is within close proximity of the existing strategic transport network (State Highway (SH18) and Hobsonville Road), but Trig Road currently provides limited ability to enable the connection of surrounding growth areas to the strategic network.

Trig Road is currently a rural road corridor with limited pedestrian, cycling or public transport facilities.

The current mode share for private vehicles is at least 85%, highlighting a lack of viable alternatives.

The forecast vehicle trip demand is projected to at least double for the North West by 2048, which will significantly increase existing congestion on key linkages if action is not taken.

As noted in Section 1.2 and further discussed in Section 5.2.2, the Project is needed to support future housing development in Whenuapai, as this area of Future Urban zoned land is expected to be

subject to private development initiatives in the near future. The purpose of the Project is to provide an urban standard transport corridor that will support urbanisation of the surrounding land.

It is critical that the Project and wider transport network supports and shapes the growth proposed. If the Project corridor is not protected and constructed in the near future this may result in a combination of more expensive acquisition costs, a lack of certainty around public infrastructure investment, and a loss in ability to influence good urban form.

To assist with assessing the relative strengths or weaknesses of alternate corridor options for the Project, investment objectives were developed as part of the AC DBC and further refined in the SG DBC. The investment objectives are an important tool for informing decisions on funding which were developed from the key transport problems identified above.

The RMA Project Objectives for the Project were then developed from the investment objectives once the required route was confirmed. The diagram below (Figure 3) shows how the investment objectives have evolved through the business case options assessment process into the current Project Objectives.

2.3 Project timeframes

Investigation and reporting of this Project commenced in 2015 as part of Supporting Growth Programme Business Case 2016 (**PBC**). This was progressed through to 2020 when the NoR was first prepared. Due to funding constraints, the Project was placed on hold, until 2022 when work recommenced.

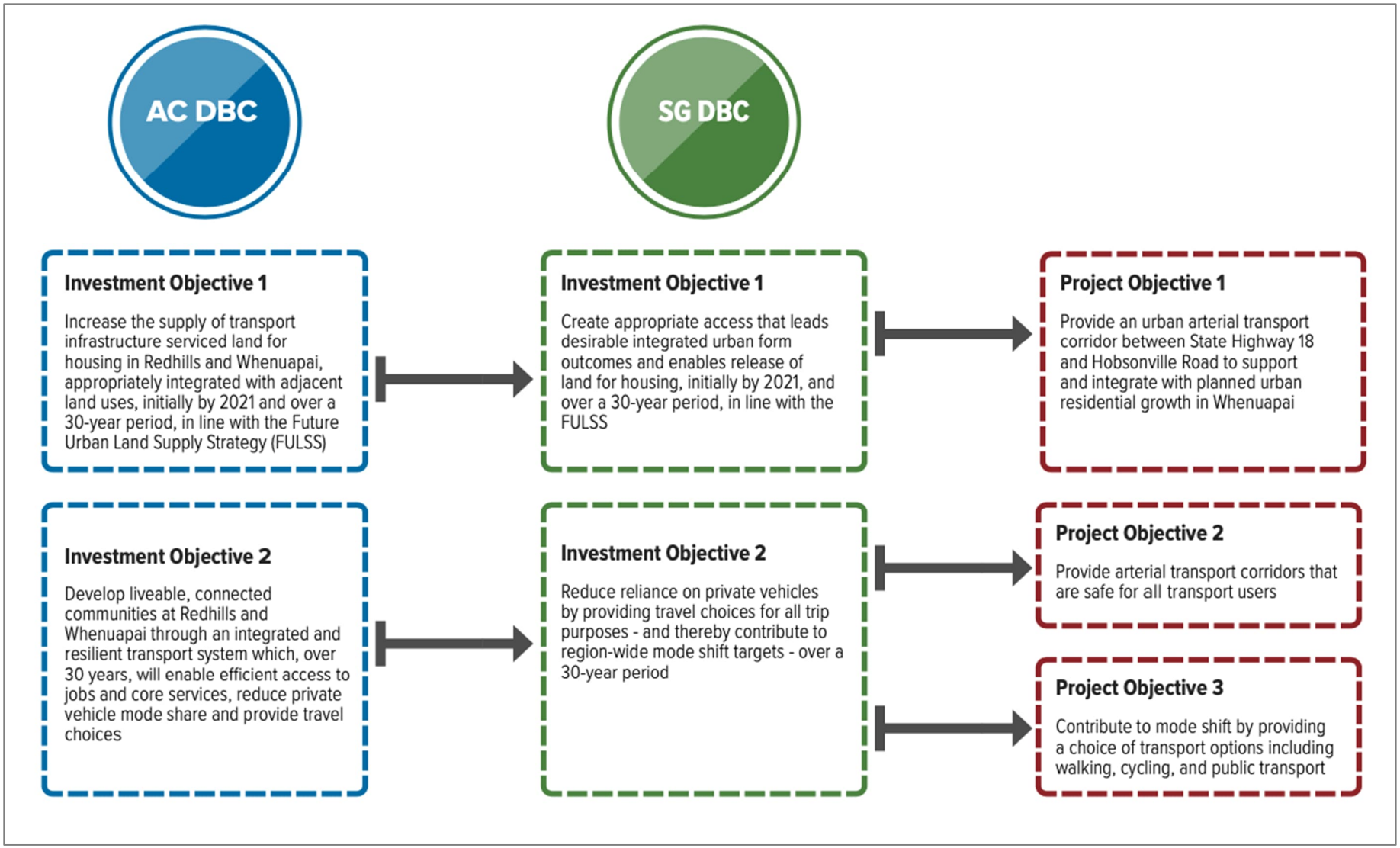

Figure 3: Development Process for Project Objectives

3 The Trig Road Project

The Project provides for the widening and upgrade of the existing Trig Road transport corridor from a 20m wide, two-lane rural road to a 24m wide, two-lane arterial standard transport corridor between the SH18 off-ramps and Hobsonville Road. The widening of the transport corridor will provide for an urban standard arterial which includes walking, cycling and public transport provisions. The Project includes signalisation of the intersections at Trig Road/Hobsonville Road and Luckens Road/Hobsonville Road and a similar upgrade of Hobsonville Road between these intersections. The Project will also include changes to the SH18 bridge layout to accommodate walking and cycling facility upgrades and tie in works within the existing road reserve north of SH18.

An overview of the upgrades along the corridor is provided in Volume 3, with indicative cross-sections of the Project shown in Figure 4, Figure 5 and Figure 6. The full set of indicative design drawings for the Project are provided in Volume 3.

The information provided throughout this report and accompanying documentation (including design drawings), describes the indicative alignment of the proposed Trig Road corridor and other ancillary permanent works. Any numbers, areas or dimensions outlined in this section are approximate and may change as a result of detailed design. The final alignment for the Project (including the design and location of ancillary components, such as stormwater treatment devices and soil disposal sites), will be refined and confirmed at the detailed design stage.

Figure 4: Trig Road Corridor Upgrade

3.1 Road Layout

3.1.1 Trig Road (South of SH18)

The Project will provide for the widening and upgrading of a 900m length of the existing Trig Road corridor to an urban arterial road standard. This involves widening its general width from the existing 20m to a corridor cross-section of 24m wide. This road widening is proposed to be undertaken to the east to minimise impacts on the existing residential properties on the west side of Trig Road.

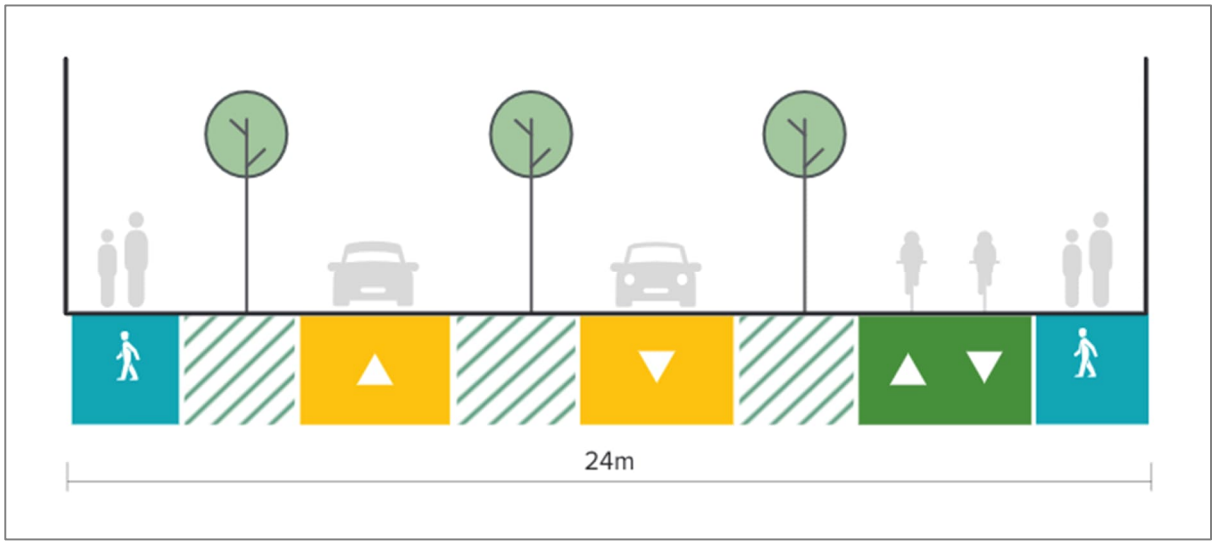

Figure 4: Trig Road Corridor Upgrade Indicative Typical Cross-section

The corridor will be in the form of a two-lane carriageway suitable for all traffic movements including freight on an arterial road. The proposed speed environment will be 50kph throughout, with no on-street parking and the inclusion of a flush or solid median. A 4m wide, dedicated, bi-directional cycleway is indicatively proposed on the eastern side of the Trig Road corridor as well as 1.8m wide footpaths on either side of the corridor.

Changes to the geometry of the Trig Road corridor include:

The southern end of Trig Road will be straightened slightly at the intersection with Hobsonville Road to improve the intersection geometry.

The vertical alignment will follow the existing steep alignment (8% for 150m) with only minor changes to smooth out irregularities in the existing road.

The existing minor Ryans Road cul-de-sac located on the west side of the road will remain, with a slightly realigned connection to Trig Road.

Trig Road currently facilitates access to approximately 25 private properties largely concentrated on the south-western portion of the road. As Trig Road will provide an important arterial connection it is assumed that the corridor will be classified as a 'Limited Access Road' under section 346C of the Local Government Act 1974. Consequently, while current existing accesses will be maintained, intensification of access will generally be discouraged as the area urbanises, with future collector roads required to provide access to developed land.

3.1.2 Trig Road (North of SH18)

The Project involves minor upgrades of Trig Road north of SH18 (including the SH18 bridge). Widening of Trig Road will finish at the southern side of the motorway bridge over SH18, with only non-structural footpath and cycle path improvements proposed on the north side of the bridge to safely tie in the new facilities to the existing environment.

The SH18 eastbound on-ramp and westbound off-ramps are located on the eastern side of Trig Road. The Project provides for an indicative bi-directional cycleway within the SH18 bridge corridor along the western side of the existing Trig Road bridge, and a crossing point from the otherwise eastern side cycleway along the remainder of Trig Road. The facilities on the bridge will be provided through the reallocation of space on the existing bridge, and indicatively result in the cross-section shown below in Figure 5. This space is sufficient to allow for reallocation for uni-directional cycling facilities if required.

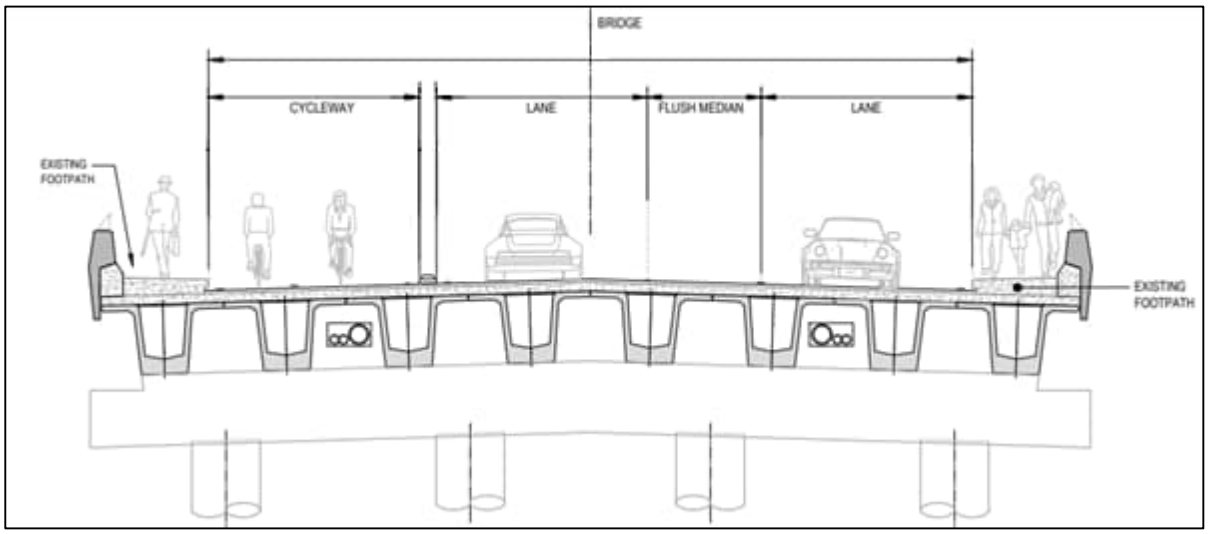

Figure 5: Indicative Proposed Cross-section on Trig Road Bridge

North of the SH18 bridge, the Project will provide for the continuation and tie-in of the new cycleway into the existing road layout. All permanent works will be located within the existing road reserve.

3.1.3 Hobsonville Road

The Project provides for the upgrade of Hobsonville Road along a 450m length generally between Cyril Crescent and Luckens Road. As Hobsonville Road is currently a mix of both two-lane and four-lane sections, localised widening will be required. The existing Hobsonville Road follows a ridgeline and within the Project area has existing housing on both sides, so widening will result in permanent property acquisition, earthworks and driveway modifications. While the widened corridor will require less land on the southern side of the road, due to the steeper terrain of these properties it may require substantial driveway regrading and modifications to maintain vehicle access to these properties.

The Hobsonville Road widening will provide a four-lane corridor which is generally 25m in width and includes 2m wide separated cycle paths and 1.8m wide footpaths on both sides of the corridor.

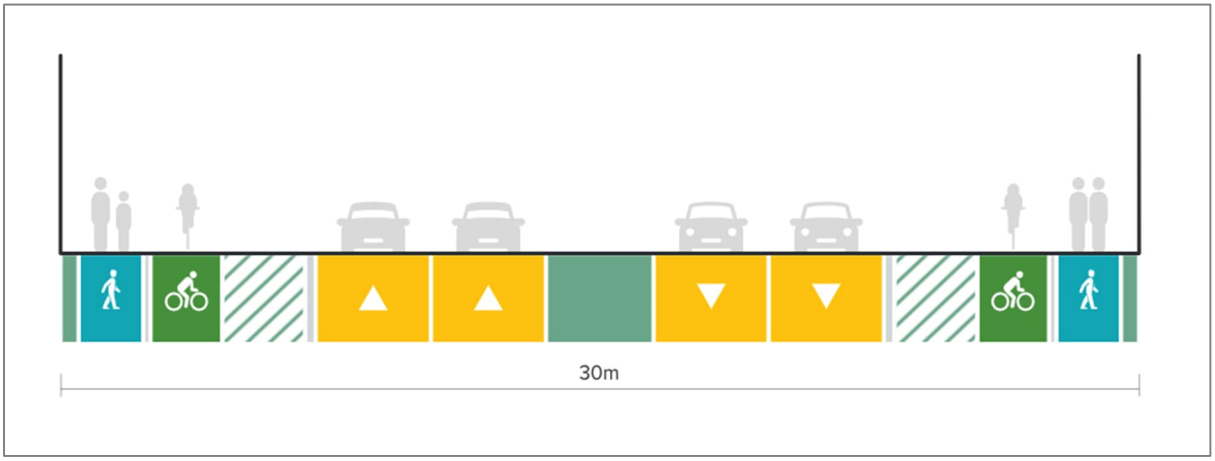

Figure 6: Hobsonville Road Arterial Upgrade Indicative Typical Cross-section

3.1.3.1 Intersection Layout

As the Trig Road/Hobsonville Road intersection and Luckens Road/Hobsonville intersection are located in close proximity to each other (approximately 150m), the configurations of these intersections are closely inter-related. As such, two staggered signalised T-intersections are proposed at Trig Road and Luckens Road intersections (Figure 8).

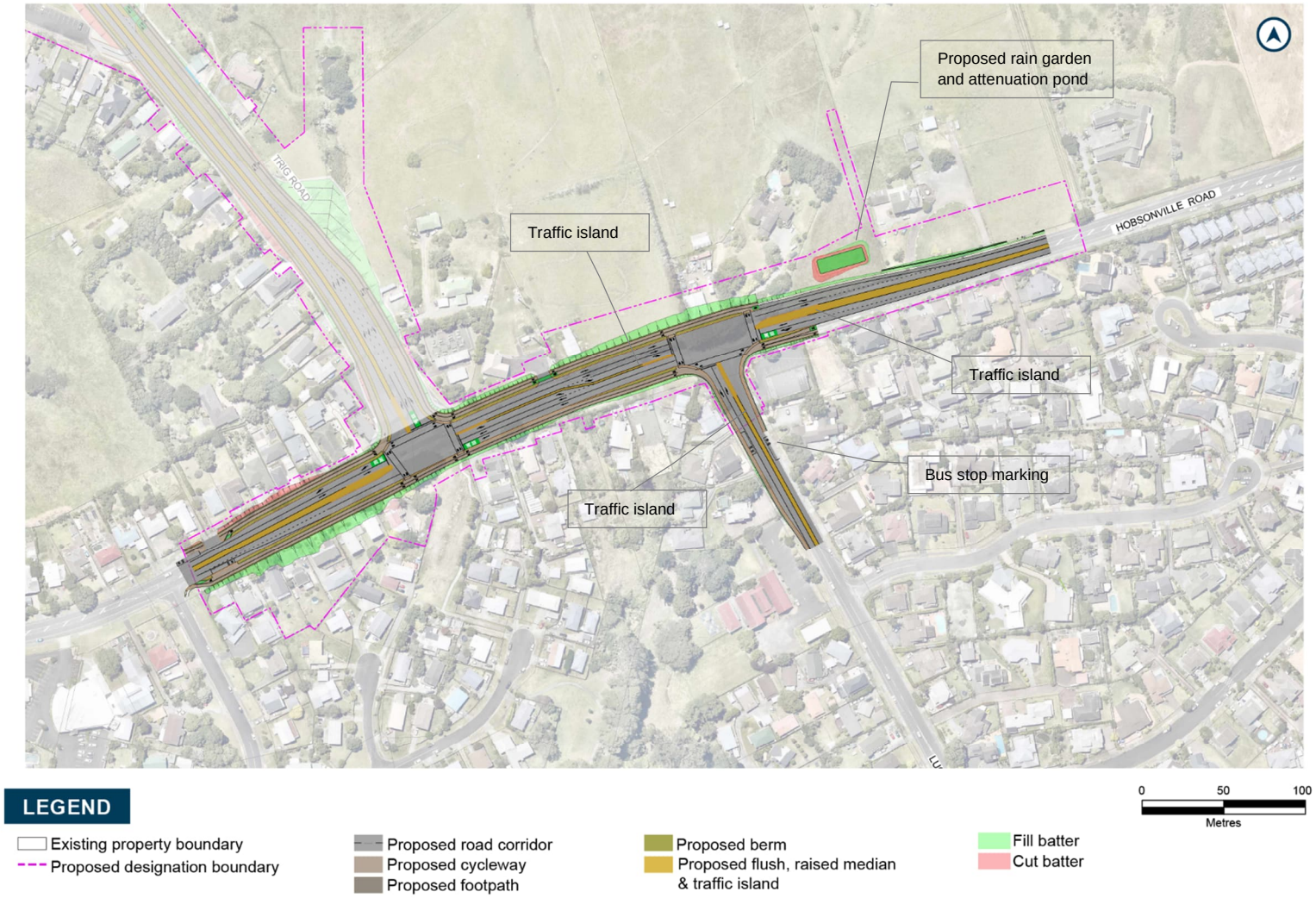

Figure 7: Hobsonville Road Intersection Layout

The proposed intersections will provide:

- Bus priority on all approaches to the Trig Road intersection, and on the eastern approach to Luckens Road;
- Safe and accessible walking and cycling facilities at both intersections and along Trig Road;
- Solid medians on all approaches; and
- Solid medians with right turn bays between the intersections.

Localised widening is required around the intersections to accommodate vehicle stacking and tie-ins to the existing road corridor, as well as walking and cycling facilities/crossings.

3.1.3.2 Public Transport

The Project proposes to improve bus travel time and reliability through the following infrastructure:

- Providing for 'bus only' through movements in the left-turn lanes on Hobsonville Road at the intersections of Luckens Road and Trig Road;
- Providing a dedicated kerb-side lane on both sides of Hobsonville Road; and
- Providing a right-turn bus advance lane on Trig Road.

This infrastructure will allow buses travelling on Hobsonville Road to avoid intersection queuing, reducing delay at intersections and improving travel time reliability.

The Project also proposes to remove the indented bus bays on Hobsonville Road, west of Trig Road and remark them in the same location. Where the buses will stop in the traffic lane, such as Hobsonville Road to the west of Trig Road, this will provide buses with increased reliability and improved ability to re-enter the traffic flow with minimal impact on general traffic.

The bus stop on Hobsonville Road east of Luckens Road will be relocated to be centrally located between the two signalised intersections (within the bus lanes). These will support safe crossing for pedestrians at the signalised intersections.

In terms of new bus stops on Trig Road or potentially the relocation of stops on Hobsonville Road, the proposed road berm in the indicative corridor cross section can accommodate potential new bus shelters.

It is expected that the final location of bus stops will be confirmed when there is more certainty in the adjacent land uses and the location of the collector network.

3.1.4 Stormwater

The stormwater proposal includes upgrades to the existing stormwater culverts which cross beneath Trig Road and the provision of new stormwater management devices. Each of these works is described in the following subsections. Further detail is provided in the *Trig Road Corridor Upgrade: Assessment of Stormwater Effects* (Volume 4) (**ASE**) and Stormwater Layout Plans within the Indicative Design Drawings (Volume 3).

3.1.4.1 Pipe and Culvert Upgrades

The two existing stormwater culverts and one stormwater pipe which cross beneath Trig Road (illustrated in Figure 14) are of insufficient size to cater for pre or post development flows. Upgrading these (as well as the associated inlets and outfall) as part of the Project will enhance the current drainage of the flood prone areas. In addition, extensions of assets are also required to allow for the widening of the road corridor.

The pipe and culvert upgrades are as follows:

- Upgrade and extension of pipeline at chainage 150 by approximately 40m;
- Upgrade of culvert at chainage 430, no extension will be required for this culvert as this pipe already extends beyond the proposed road corridor width; and
- Upgrade and extension of culvert at chainage 640 by approximately 18m.

It is noted that inlets and outfall for both the culverts (chainage 430 and 640) drain and discharge from overland flow paths/ephemeral streams, while the pipe outfall (chainage 150) discharges into a wetland (see Figure 12).

3.1.4.1.1 Groundwater seepage

As identified in Section 5.1.2, groundwater seepage was encountered just off the eastern side of Trig Road at the upper branch of Trig Stream, near the existing outfall for the pipeline at chainage 150. The proposed corridor widening requires fill embankment over this seepage area. Appropriate groundwater management to capture and convey the constant groundwater feed out of the fill embankment footprint will be achieved by the following (to be further specified at detailed design stage and approved by geotechnical engineer):

- In-situ slope drainage using herringbone counterfort drains, daylighting at proposed new headwall;
- Mid-height lateral sand drainage blanket laid within new fill embankment.

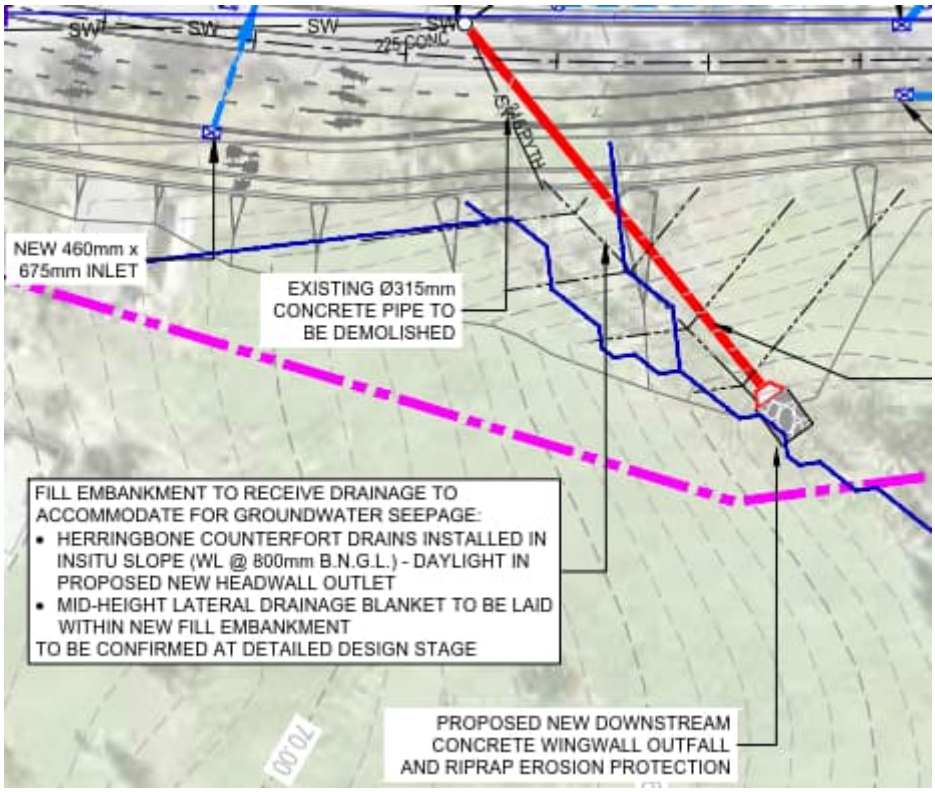

Figure 8: Trig Stream (Wetland) fill embankment

3.1.4.2 Stormwater Management

Through catchment delineation based on topographical information and the proposed vertical alignment of the roads, four major drainage catchments and their drainage low-points were identified for calculation of post-development runoff and comparison to pre-development runoff. Refer Figure 9 below.

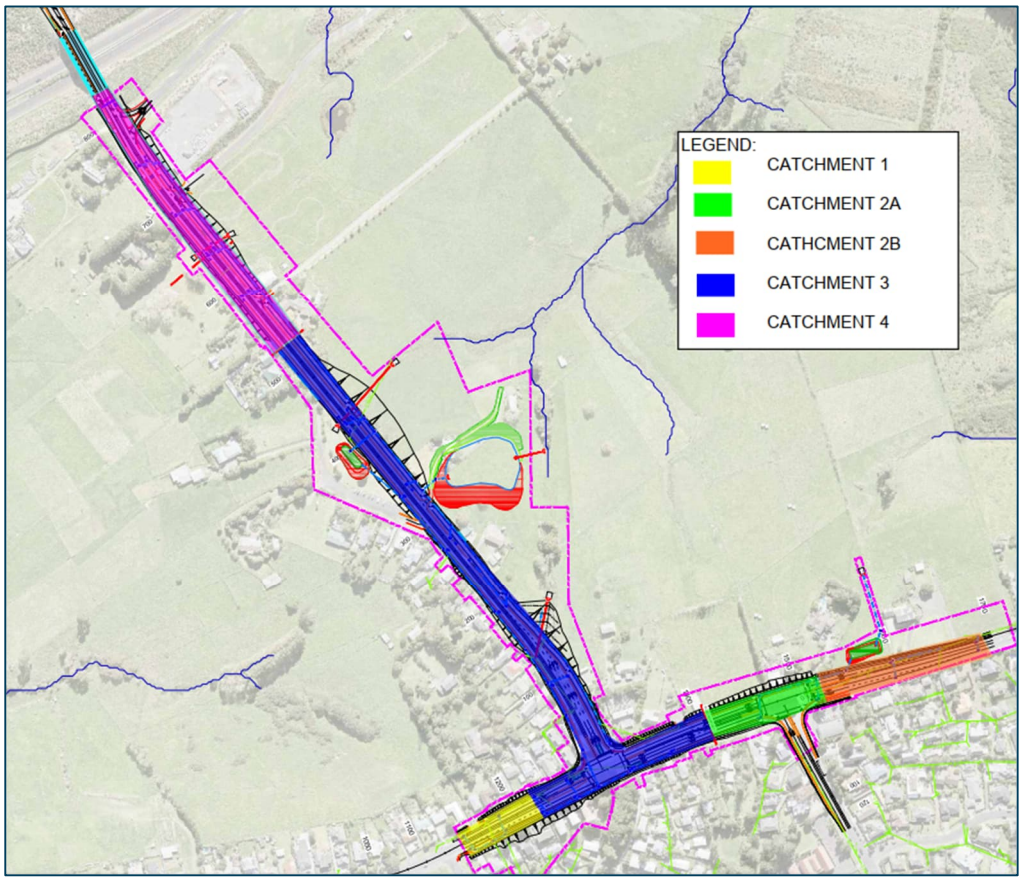

Figure 9: Project Stormwater Catchments

Changes to impervious area have been calculated based on the increased width of corridor, inclusion of footpaths, cycleways, medians and vehicle stacking lanes. Table 1 below provides an overview of the catchment sizes and stormwater management approach for each drainage catchment for the proposed impervious areas of the Project.

Table 1: Catchment Overview

Catchment Description	Area (m²)	Stormwater Management
Catchment 1: Hobsonville Road (West)	2154	Tie into existing underground stormwater network.
Catchment 2.A: Hobsonville Road (East)	3383	Piped stormwater runoff diverted into raingarden/detention pond for treatment and attenuation north of Hobsonville Road, prior to discharge into Rawiri Stream overland flow path.
Catchment 2.B: Hobsonville Road (East)	2013	Tie into existing underground stormwater network.
Catchment 3: Portion of Hobsonville Road Trig Road (South)	13318	Underground stormwater network to discharge into raingarden at low point west of Trig Road (unless treated within berm raingarden) and into dry-pond east of Trig Road for attenuation, prior to discharge into Trig Stream (wetland).

Catchment 4: Trig Road (North)	7497	Treatment by raingardens within the berm, diverted to Catchment 3 low point for discharge into dry-pond for attenuation, prior to discharge into Trig Stream overland flow path.

3.1.4.2.1 Dry Pond

In accordance with GD01: Stormwater Management Devices Guide (**GD01**) and stormwater pond design constraints relating to bird strike risk at the Whenuapai Airbase, a dry pond has been selected for attenuation of additional post-development peak flows and to meet the water sensitive design requirements (refer Figure 11). The minimum design requirements of the stormwater pond for mitigation of bird strike risk are as follows:

- Fully drain down within 48 hours of a 2 per cent AEP storm event; and
- Have side slopes at least as steep as 4 vertical to 1 horizontal (4:1) except for:
- any side slope treated with rock armouring; or
- any area required for vehicle access, provided that such vehicle access has a gradient of at least 1 vertical to 8 horizontal (1:8).

The dry pond caters for a total peak storage volume for the post-development – pre-development 1% AEP rainfall event, with a discharge allowance at the outfall to match pre-development peak flows into a tributary of Trig Stream.

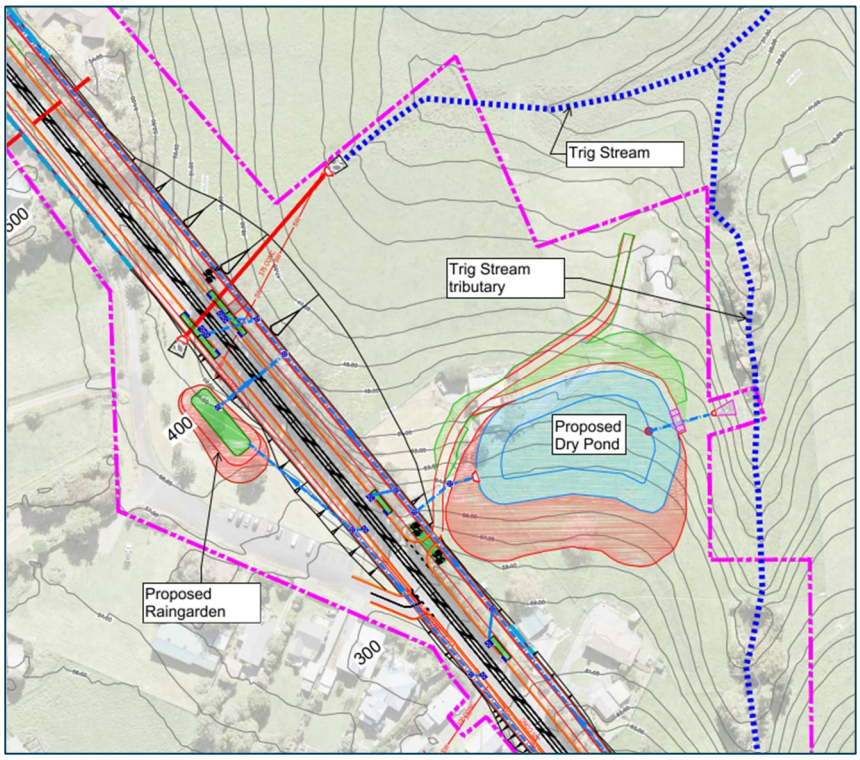

Figure 10: Dry Pond location

3.1.4.2.2 Raingardens

Raingardens are proposed to provide stormwater treatment and retention for Catchment 2A, 3 and 4. These raingardens are located within the berm or outside of the road corridor dependent on the constraints/limitations for sizing and location of each catchment.

Bioretention raingardens were selected for “at source” treatment within the berms along the carriageway as well as “end of pipe” treatment in larger raingardens. Raingardens will also provide for hydrological mitigation requirements for retention and provide for 95th percentile attenuation for Catchment 2A.

3.1.5 Other Utilities

The existing utility infrastructure and proposed changes to utilities within the Project area are discussed in Section 5.1.7.

The following changes to utilities are expected as a result of the permanent works associated with the Project:

- The Watercare trunk watermains are expected to be protected during construction and will not need to be relocated as part of the Project works; however, some of the local watermains may need to be relocated.
- The proposed Project cross-sections include space for a utility/communications duct. Vector overhead power infrastructure can be relocated into this duct if required and will be determined at the detailed design stage. The Project works will have minimal impact on the substation with only a small section of land within the berm of the site required for the Project.
- Some of the existing communications infrastructure will need to be relocated and/or protected as part of the works. New communication ducts will be installed to incorporate all relevant utilities if existing ducts are removed.

4 Overview of NoR and Resource Consents

Auckland Transport are seeking a designation corridor and relevant resource consents for the proposed road corridor and associated works.

A designation provides for activities relating to Section 9(3) of the RMA (refer section 4.1 below). Table 2 below provides an overview of the NORs sought. Other activities are necessary for the construction, operation and maintenance of the Project that cannot be provided for by a designation. As such, AT is seeking regional resource consents under the AUP:OIP and resource consent under the NES: Soil and NES: FW for the activities in Table 3 below.

4.1 Auckland Transport

AT is responsible for Auckland's transport projects and services (excluding state highways), including roads, footpaths, cycling, parking and public transport services such as rail. AT is a Council Controlled Organisation under the Local Government (Auckland Council) Act 2009 (**LGA**), which states that AT's purpose is to "contribute to an effective, efficient and safe Auckland land transport system in the public interest".

AT's functions are identified in section 45 of the LGA and include managing and controlling the AT system in accordance with the LGA, including by performing the statutory functions and exercising the statutory powers set out in section 46 of the LGA as if AT were a local authority or other statutory body, and acting as a requiring authority under section 167 of the RMA.

Under section 47(1) of the LGA, AT is deemed to be approved as a requiring authority, as a network utility operator, under section 167 of the RMA. This is for the purpose of "constructing or operating or proposing to construct or operate roads in relation to the Auckland transport system" and "the carrying out of an activity or a proposed activity ... in relation to the Auckland transport system for which it or the Auckland Council has financial responsibility". Subsequently, AT may designate land under the RMA to construct, operate and maintain roads and to carry out activities which relate to the transport system.

4.2 NoR Summary

The NoR, if confirmed and subject to any conditions, will designate land in the AUP:OIP for the purpose of the construction, operation and maintenance of the Project. The designation authorises the works to be undertaken within the footprint, without further consents under the district plan provisions of the AUP:OIP. Table 2 provides an overview of the key details associated with the NoR.

Table 2: NoR Overview

NoR Overview	
Project Name	Trig Road Corridor Upgrade
Purpose	Construction, operation and maintenance of a transport corridor
Project Objectives	• **Project Objective 1**: Provide an urban arterial transport corridor between State Highway 18 and Hobsonville Road to support and integrate with the planned urban residential growth of Whenuapai.

	• **Project Objective 2**: Provide arterial transport corridors that are safe for all transport users. • **Project Objective 3**: Contribute to mode shift by providing a choice of transport options including walking, cycling and public transport.
Extent	The NoR submitted proposes a designation footprint that comprises: • Approximately 0.8 km of Trig Road generally between Hobsonville Road and SH18, providing for a 24m wide cross section; • Approximately 0.5 km of Hobsonville Road generally between Cyril Crescent and Luckens Road, providing for a 30m wide cross-section; and • Additional land for ancillary works including construction, mitigation and ongoing operations and maintenance.
Lapse Period	15 years
Overview of Properties	66 properties are directly affected by the Project.

4.3 Lapse period for NOR

In accordance with section 184 of the RMA, a designation lapses five years after it is included in the district plan unless:

a. It has been given effect to; or
b. Upon application within three months of the designation lapsing, the territorial authority determines that substantial progress or effort has been and continues to be made towards giving effect to the designation and fixes a longer lapse period; or
c. The designation specifies a different lapse period.

A key objective of the Te Tupu Ngātahi Supporting Growth Programme is to identify and protect land now for future transport networks. We consider that an extended lapse period of 15 years is a method that is reasonably necessary to achieve this key objective as it provides statutory protection of the future transport corridors in a manner that enables a flexible and efficient infrastructure response to land use.

As enabled by section 184(c) of the RMA, a lapse period of 15 years is required for the NoR.

4.4 Notification – NOR

Auckland Transport requests that the NOR associated with the Project is publicly notified.

4.5 Reasons for Resource Consent

A designation provides for activities relating to Section 9(3) of the RMA. However, other activities are necessary for the construction, operation and maintenance of the Project that cannot be provided for by a designation. As such, AT is seeking regional resource consents under the AUP:OIP and resource consent under the NES: Soil and NES: FW for the activities in Table 3 below.

A full description of the permitted activities that form part of the proposal is provided in Appendix C, in accordance with Clause 3(a) of Schedule 4 of the RMA. The relevant AUP:OIP standards, matters of

discretion and assessment criteria are provided in Appendix D. For the avoidance of doubt, AT seeks all necessary resource consents for the Project.

Table 3: Project Resource Consent Triggers

Consent	Rule	Activity	Status	Assessment Matters
AUP:OIP Regional Resource Consents				
Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing of any substance, diversion of water and incidental temporary damming of water– Sections 13 and 14 RMA	E3.4.1 (A26)	The Project involves batterslope and culvert extension within the wetland resulting in a loss of approximately 0.078ha (780m2) of natural wetland. As the total length of the extended culvert exceeds 30m, this does not comply with the permitted activity standard (E3.6.1.12).	**Discretionary**	N/A
New structures and the associated bed disturbance or depositing of any substance, reclamation, diversion of water and incidental temporary damming of water – Sections 13 and 14 RMA	E3.4.1 (A44)	TR-W1 – The Project involves earthworks and batterslopes within the wetland resulting in a loss of approximately 0.1ha (1000m2) of natural wetland. TR-W4 – The Project involves batterslope and culvert extension within the wetland resulting in a loss of approximately 0.078ha (780m2) of natural wetland.	**Discretionary**	N/A
Land use (vegetation removal) – Section 9(2) RMA	E26.3.3.1 (A77)	Trees which are greater than 6 m in height and located within the riparian yard setback of Trig Stream (wetland) require removal.	**Restricted Discretionary**	E26.3.7.1. Matters of discretion E26.3.7.2. Assessment Criteria
Land use (earthworks) – Section 9(2) RMA	E26.5.3.2 (A107)	The total earthworks area is estimated to be 61,000m^2, resulting in greater than 2,500m^2 within the Sediment Control Protection Area.	**Restricted Discretionary**	E26.5.7.1. Matters of discretion
Discharge of contaminants (contaminated land) – Section 15 RMA	E30.4.1(A7)	Soil materials scheduled for land disturbance as part of the Project may have been impacted by contaminants. As a precautionary measure it is assumed that these soils are contaminated. A Detailed Site Investigation (**DSI**) has not yet been undertaken for the Project (to be completed as part of detailed design).	**Discretionary**	N/A
NES: Soil				

Disturbing the soil of a piece of land – Section 5(4) and 11 NES: Soil	11	Soil materials scheduled for land disturbance as part of the Project may have been impacted by contaminants. As a precautionary measure it is assumed that the works may encounter soils that are contaminated. A DSI has not yet been undertaken for the Project (to be completed as part of detailed design) and provided as a condition of consent.	**Discretionary**	N/A
NES: FW				
Regulation 45 Construction of specified infrastructure	45	The Project will result in earthworks, vegetation clearance and land disturbance for specified infrastructure, within and within 100m of natural wetlands (as defined by NES:FW).	**Discretionary**	N/A
Regulation 57 Reclamation	57	The Project involves the partial reclamation of two watercourses connected to wetlands.	**Discretionary**	N/A
Regulation 71 **Culvert/Piping Wetland and associated disturbance**	71	The Project involves extension of culverts and associated structures and disturbance, within two wetlands.	**Discretionary**	N/A

Overall, resource consent is sought from the Council as a **discretionary** activity. Therefore, in accordance with section 104B of the RMA, the Council is not restricted in its discretion when assessing the actual or potential effects associated with the Project.

4.6 Lapse period for Regional Consents

In accordance with section 125 of the Resource Management Act, a resource consent lapses on the date specified in the consent or, if no date is specified, —

a. 5 years after the date of commencement of the consent, if the consent does not authorise aquaculture activities to be undertaken in the coastal marine area; or
b. 3 years after the date of commencement if the consent does authorise aquaculture activities to be undertaken in the coastal marine area.

As noted above, a key objective of the Te Tupu Ngātahi Supporting Growth Programme is to identify and protect land now for future transport networks. We consider that an extended lapse period of 15 years is required to achieve this key objective for the regional resource consents. A 15 year lapse period provides sufficient time to undertake detailed design of the works, procure the necessary properties, undertake the investigations required to complete the necessary management plans, and seek Council certification on the regional consent management plans. It also enables the regional consents to tie in with the 15 year lapse period for the proposed designation.

4.7 Expiry dates for Regional Consents

Auckland Transport is seeking a 10 year expiry date for regional consents for earthworks, streamworks and discharge of contaminants to land in accordance with the RMA. This is in reflection of the size of the overall project, and the need to provide flexibility in staging.

For the reclamation consent, an unlimited consent duration is sought, in accordance with the RMA.

4.8 Notification – Regional Resource Consents

Auckland Transport is requesting full notification of the regional consent applications, in accordance with section 95A(3)(a) of the RMA.

5 Existing and Likely Future Environment

5.1 Existing Environment

This section provides an overview of the existing natural, built and social environment in which the Project will be located.

5.1.1 Site and Context Overview

The Project is located in Whenuapai, approximately 13km north-west of the Auckland CBD. Whenuapai is a transitional landscape on the periphery of the existing built urban environment of North West Auckland. Reflecting this position, the area is generally characterised by a range of rural and urban land uses, including large areas of developing or recently developed urban land use.

The Project is located along parts of the existing alignments of Trig Road and Hobsonville Road in Whenuapai, Auckland (Figure 11). The extent of the Project area along Trig Road is from just north of the SH18 over-bridge and Hobsonville Road in the south. For Hobsonville Road the Project extends between Cyril Crescent in the west and just east of Luckens Road to the east.

Key features within and surrounding the Project area include:

- SH18 is located in the northern extent of the Project area and was opened in 2007. SH18 provides a connection to the North Shore in the east and to State Highway 16 (SH16), approximately 1km west of the Project area.
- Westgate metropolitan centre is approximately 1km west of the Project area providing a range of commercial and retail land uses as well as community facilities and open space.
- Hobsonville Point is approximately 3km north-east of the Project area and consists of medium-high density residential land uses and the Hobsonville town centre, providing commercial and retail land uses, largely servicing the local area.
- West Harbour is immediately south of the Project area and is characterised by suburban residential land use in the form of single detached housing.
- Whenuapai Airbase (Royal New Zealand Air Force Base Auckland) is approximately 1.2km north of the Project area. Established in the 1930s and 1940s, Whenuapai Airbase is operated by Royal New Zealand Air Force and is the largest Royal New Zealand Air Force Base in New Zealand operating a range of defence aircraft.

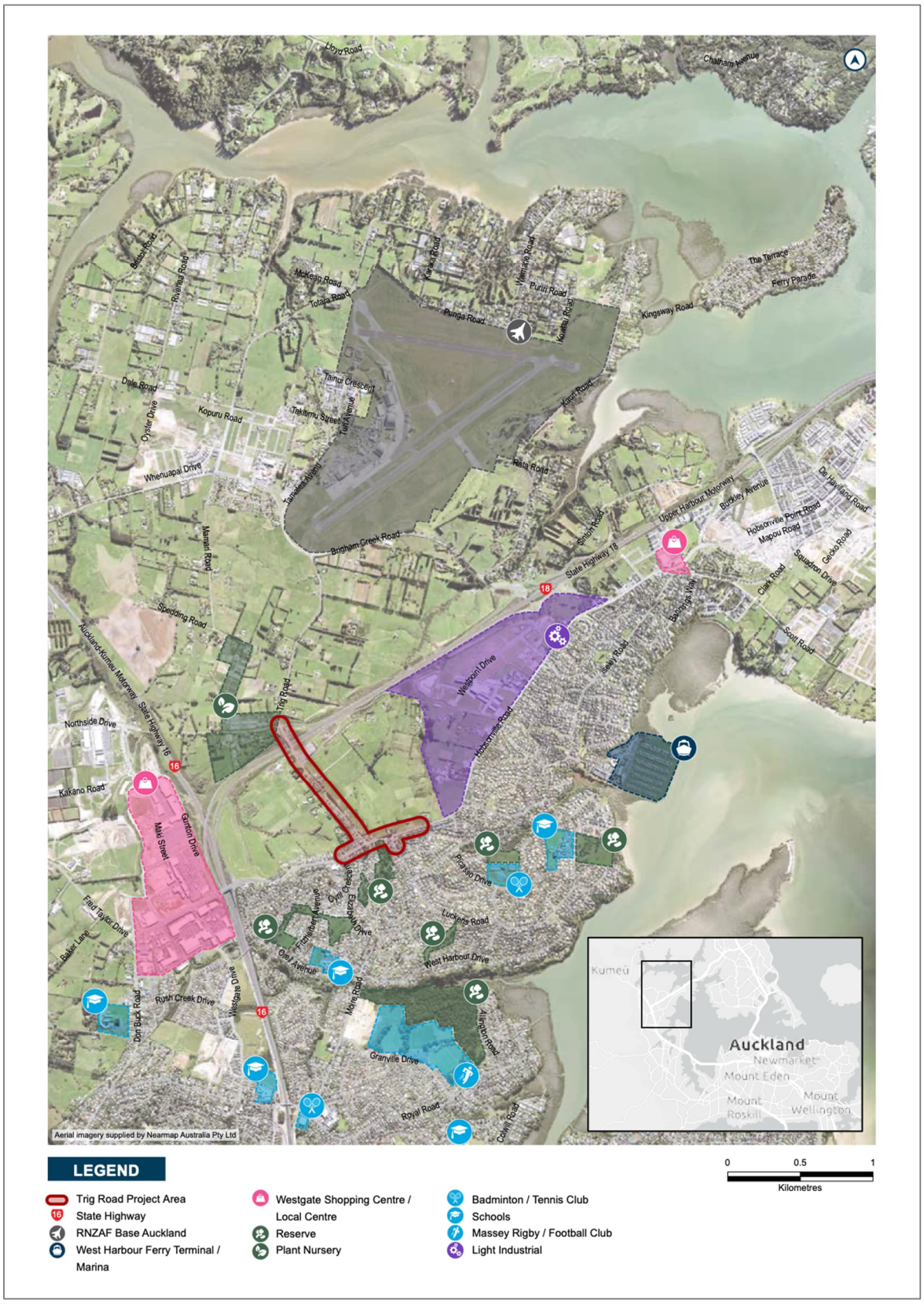

Figure 11: Trig Road Arterial Corridor Upgrade Surrounding Context

The land use immediately surrounding the Project area is characterised by a combination of residential, lifestyle block and rural properties with agricultural activities and groupings of plant nurseries.

The south-western section of Trig Road is currently residential with predominantly single detached housing on larger (quarter acre) sections. Land use along most of the remainder of Trig Road is rural with a range of pastoral and horticultural land uses – including three plant nurseries around the northern extent of the Project area. The property at 15 Trig Road is designated for Primary School and Early Childhood Education Centre. It is understood that the first stage of the Primary School is intended to open in 2023.

Land use along Hobsonville Road is generally more urban, characterised by predominantly single detached housing development along the southern side of Hobsonville Road and northern side of Hobsonville Road west of Trig Road. There are also pockets of commercial and retail development along Hobsonville Road, including a vet clinic, day care, dental clinic, cattery, and real-estate companies adjacent to or within the Project area. The northern side of Hobsonville Road west of Trig Road is largely rural and characterised by pastoral grazing and lifestyle blocks.

5.1.2 Topography and Hydrology

Both Hobsonville Road and Trig Road are generally aligned along natural ridgelines forming the highpoints of the surrounding landscape. The landform within the surrounding area is gently undulating, with higher terrain in the west and slopes down in a north-east and south-west direction. Hobsonville Road follows a primary east-west orientated ridge, with the residential land to the south moderately sloped and falling away to the south.

Figure 12 indicates the nearby hydrology and topography. Figure 12: Project Topography and HydrologyThe Project corridor interacts with three watercourses. The Auckland Council Geomaps ‘catchments and hydrology’ layer shows the location of three streams (two tributaries of Trig Stream and a tributary of Waiarohia Stream) within the Project area. The Project ecologist has undertaken Field surveys of the Project area and determined that no streams are directly impacted by the Project. In the Project Area, streams are associated with wetland complexes (and the hydrology is mainly wetland) (further detail provided in Section 5.1.3). Groundwater seepage has also been identified just off the eastern side of Trig Road at the upper branch of Trig Stream.

There is generally a low risk for flooding within Trig Road and surrounding catchments at a 1% Annual Exceedance Probability (**AEP**) (1 in 100-year) extreme rainfall event. There are two flood prone areas at the localised low points along Trig Road. The Whenuapai 3 Precinct Stormwater Management Plan prepared by Auckland Council Healthy Waters has identified the streams and coastal waters within the Project area are of poor quality, degraded and sensitive to change in land use (and therefore stormwater flow as urbanisation occurs).

Figure 12: Project Topography and Hydrology

The Project area is underlain by two main geological units (Figure 13): the Puketoka Formation of the Tauranga Group, comprised of "pumiceous mud, sand and gravel"; and overlying Waitemata Group (East Coast Bays Formation) material comprised of "alternating sandstone and mudstone". Indicative groundwater levels in the Project area have been measured at two boreholes at 3.0m and 2.5m below ground level.

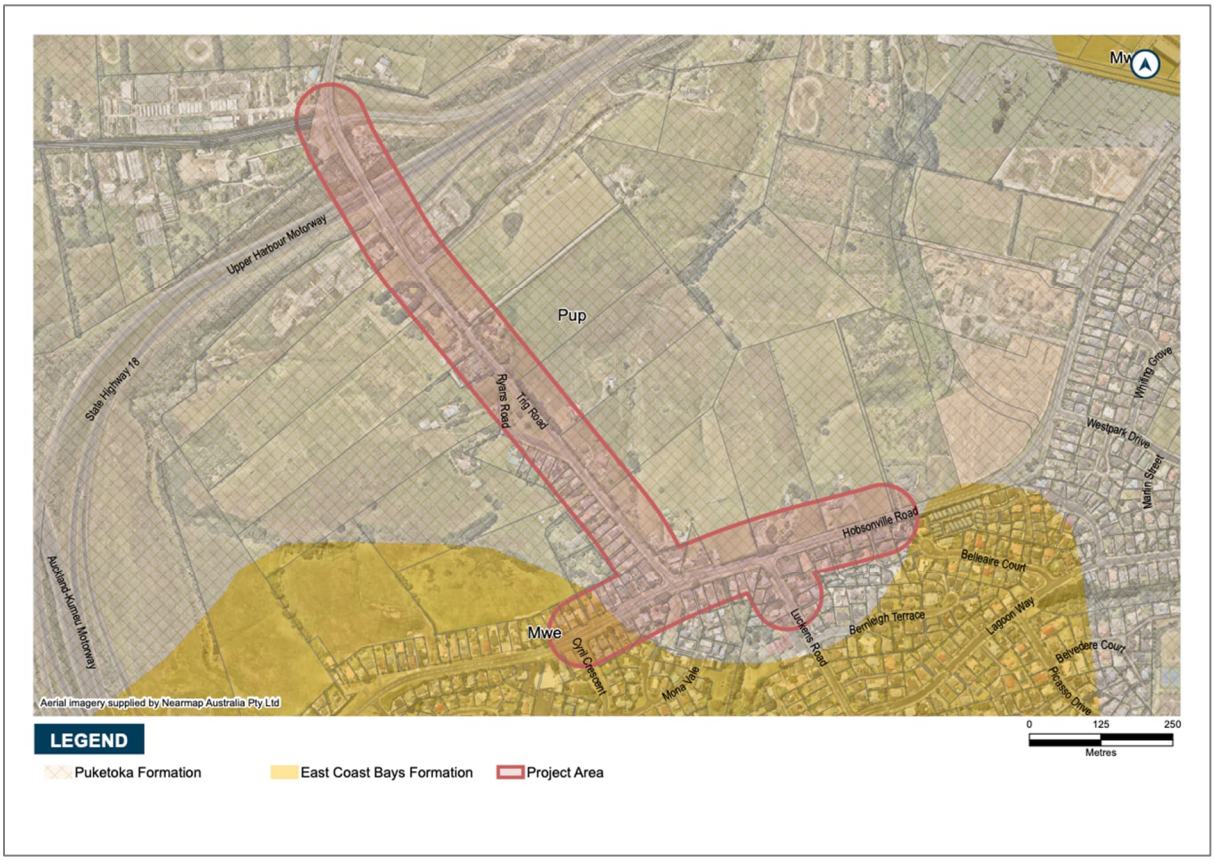

Figure 13: Project Geology (QMaps, 2019)

5.1.3 Ecological Environment

The Project lies within the Tamaki Ecological District, which has a warm humid climate and is characterised by volcanic cones, isthmus, harbours and volcanic terrain (McEwen, 1987). Historically, the Project area would have been forested; including pūriri (*Vitex lucens*), tōtara (*Podocarpus totara*), mataī (*Prumnopitys taxifolia*), kahikatea (*Dacrycarpus dacrydioides*) and tītoki (*Alectryon excelsus* subsp. *excelsus*), kōwhai (*Sophora* sp.) and taraire (Auckland Council, 2017).

The Project area is currently dominated by hard stand (existing roads and footpaths), grazed exotic grasses, planted native and exotic trees consisting of mostly mature pines (*Pinus radiata*) and exotic garden species.

There are no Significant Ecological Areas within the Project area, however there are three within 2 km of the Project area:

- SEA_T_2040, which is 1 km southwest of the Project area.
- SEA_T_4661, which is 0.98 km south of the Project area.

- SEA_T_4733, which is located within the wider stream catchment, approximately 2 km northeast of the Project area, adjacent to the Waiarohia Stream. Tributaries to the Waiarohia Stream flow through from the Project area.

Project ecologists initially undertook a desktop investigation to identify all potential wetlands within 100m of the Project designation. All wetlands potentially affected by the project activities were then investigated and delineated in the field. Seven wetlands potentially affected by the project have been identified, five within the project area (TR-W1, TR-W2, TR-W3, TR-W4, and TR-W5) and two directly adjacent (TR-W6 and TR-W7) to the Project Area. All the wetland areas have a dominance of exotic plant species, but are classified as natural wetlands because they do not meet the exclusions of the NPS:FM. The wetland habitats are all largely modified, and dominated by exotic plant species, artificial drainage, and grazing and pugging from livestock.

5.1.4 Transport Environment

The existing transport environment includes two key arterial corridors (Waka Kotahi One Network Road Classification); Hobsonville Road that travels east-west, and Trig Road that travels north-south towards Whenuapai. These corridors both provide direct connections to SH16 and SH18.

Trig Road is currently two lanes wide, with a footpath on one side. The posted speed limit on Trig Road from Hobsonville Road to Ryans Road is 50kph, increasing to 80kph beyond Ryans Road. There are currently no cycle facilities provided and the corridor can be characterised as generally rural in standard. The intersection with Hobsonville Road is a priority-controlled intersection with acceleration and deceleration lanes provided for vehicles turning left into and out of Trig Road.

Hobsonville Road in the Project area is currently two lanes wide, with footpaths on both sides. There are no cycle facilities on either side of the road. Luckens Road intersects with Hobsonville Road with a priority-controlled intersection. This intersection provides acceleration and deceleration lanes for left turning vehicles on to and from Luckens Road.

Other than bus stops, there are no dedicated public transport facilities on Trig Road or Hobsonville Road. Bus services currently run on both Hobsonville Road and Trig Road.

Existing traffic volumes on Trig Road and Hobsonville Road have been counted by AT in December 2020, December 2021 and February 2022. The results of these surveys are shown in Table 4 below.

Table 4: Existing Traffic Volumes on Trig Road and Hobsonville Road

Location of Count	Survey Date	5 Day ADT*	7-day ADT	AM Peak Volumes	PM Peak Volumes
Trig Road between Spedding Road and Brigham Creek Road	December 2020	4,160	4,180	430	490
Trig Road between Ryan's Road and Motorway Overbridge	December 2021	6,890	6,460	590	690
Hobsonville Road between Luckens Road and Westpark Drive	February 2022	14,170	13,300	1,220	1,380
Hobsonville Road between Fitzherbert Avenue and Cyril Crescent	November 2020	18,720	17,830	1,400	1,760

* Average Daily Traffic

5.1.5 Cultural and Heritage Environment

There are no archaeological sites recorded within or in close proximity to the Project area, and the nearest known sites (mainly shell midden relating to Māori occupation) are over 1.5km to the west along the coast and approximately 1km to the south along the Manutewhau inlet and stream. Similarly, there are no identified Sites of Significance to Manawhenua identified under the AUP:OIP within or in close proximity to the Project area.

5.1.6 Community and Recreational Facilities

Community and recreational facilities within or in proximity to the Project area include:

- Hobsonville Kindergarten (34 Trig Road) adjacent to Ryans Road Reserve servicing the small residential and rural-residential catchment;
- Cool Kids Castle Early Learning (5 Luckens Road) south of Luckens Road/Hobsonville Road intersection providing early childcare facilities;
- Westgate Baptist Church (67 Hobsonville Road) providing religious facilities and early childcare facilities;
- Te Piringatahi O Te Maungaarongo Marae (Luckens Road) affiliated with Ngapuhi; and
- Hilda Griffin Reserve (opposite the intersection of Trig Road and Hobsonville Road) providing a largely vegetated open space with pedestrian thoroughfare to surrounding residential streets and to Louise Place Reserve.

5.1.7 Utilities

The existing utilities within the Project area are summarised in Table 5 below.

Table 5: Existing utilities in the Project area

Utility Type	Details
Watercare Services Limited Watermains	• Trig Road: Local watermains on both sides – size and type vary • Hobsonville Road contains watermains including trunk watermain, local watermains on both sides of the road and local watermain connections to dwellings. Watercare also owns 74 Hobsonville Road that contains a large pump station with cross connections to the trunk watermains • Luckens Road contains a trunk watermain and local watermains
Power Network	• Trig Road, Hobsonville Road and Luckens Road all contain Vector overhead power infrastructure • Vector operates a substation at 1 Trig Road (corner of Trig Road and Hobsonville Road)
Communications	• All existing road corridors will contain communication ducts, chambers and cables (copper and fibre)
Stormwater	• Existing stormwater infrastructure is illustrated in Figure 14 and further discussed in the Trig Road Corridor Upgrade: Assessment of Stormwater Effects (Volume 4).

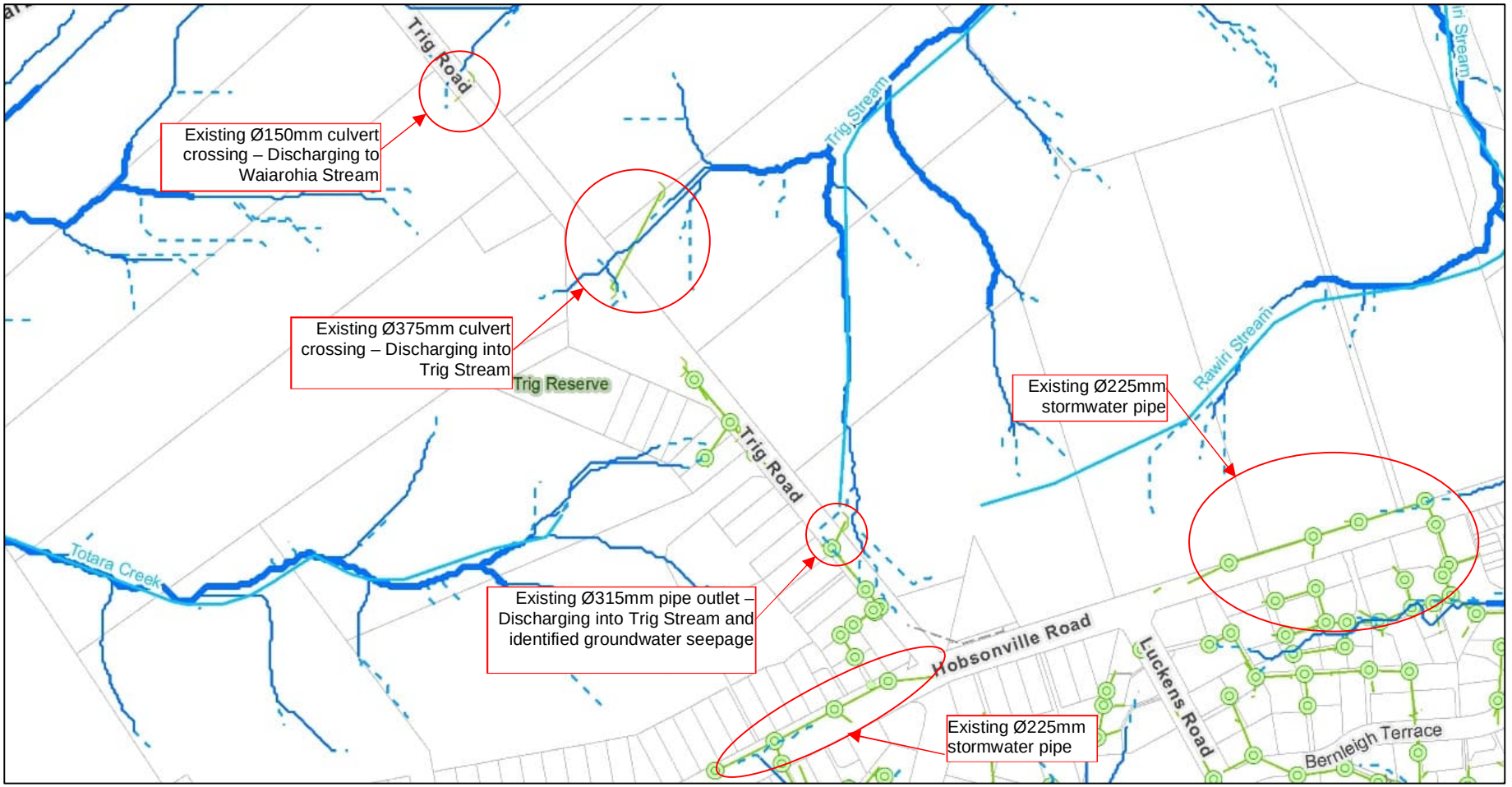

Figure 14: Existing Trig Road Corridor/Hobsonville Road Stormwater Infrastructure (AC-GEOMAPS)

5.2 Planning Context

Table 6 details the relevant planning context as specified by the AUP:OIP and Auckland Council GeoMaps, with the current AUP:OIP land use zoning shown in Figure 15. The key elements of the planning context for the Project are as follows:

- The existing corridor for Trig Road is generally 20m wide and zoned 'Road' under the AUP:OIP.
- Residential properties adjacent to the existing road corridor are zoned 'Future Urban Zone' (FUZ) and 'Residential – Mixed Housing Urban' (MHU) under the AUP:OIP.
- AT is the requiring authority for an existing designation which provides for the existing Hobsonville Road Corridor including the intersection with Trig Road (Des. Ref: 1437).
- Waka Kotahi is the requiring authority for an existing designation (Des. Ref: 6741) which provides for the existing SH18 Corridor including the Trig Road motorway on/off ramps, SH18 laydown area and surrounding land. The land use zoning for this area (including part of Trig Road) is a 'Strategic Transport Corridor' Zone.
- Vector is the requiring authority for an existing designation (Des. Ref: 8856) which provides for a substation at the corner of Trig Road and Hobsonville Road (1 Trig Road).
- Watercare is the requiring authority for an existing designation (Des. Ref: 9377) which provides for the Northern Interceptor Shared Corridor which bisects Trig Road, adjacent to the SH18 corridor.
- Minister of Education is the requiring authority for an existing designation (Des. Ref: 4667) which provides for a School and Early Childhood Education facility at 13-15 Trig Road.
- Three notable trees as identified in the AUP:OIP (ID 1974) are located within the front yard of the property at 8 Luckens Road, West Harbour. The trees are not located within the proposed designation boundary.

Written approval will be sought from these requiring authorities with existing designations in the Project area prior to construction in accordance with section 177 of the RMA.

Table 6: AUP:OIP Planning Context

AUP:OIP Planning Context: Trig Road Corridor Upgrade	
Zones	Road Zone Strategic Transport Corridor Zone Future Urban Zone Residential – Mixed Housing Urban Zone
Precincts	N/A
Overlays	High-Use Aquifer Management Areas Overlay [rp] – Kumeu Waitemata Aquifer
Controls	Arterial Roads Vehicle Access Restriction Control – Motorway Interchange Control Macroinvertebrate Community Index – Rural Macroinvertebrate Community Index – Urban Stormwater Management Area Control – MASSEY, Flow 2
Transport Designations	1437, Road – Hobsonville Road Transport Corridor, AT

	6741, State Highway 16 and 18 – Westgate to Whenuapai and Hobsonville, Waka Kotahi
Other Designations	4311, Air Space Restriction Designation, Defence purposes – protection of approach and departure paths (Whenuapai Air Base), Minister of Defence 8856, Electricity supply purposes – substation, Vector 9377, Northern Interceptor Shared Corridor, Watercare 4667, Educational Purposes - Primary School (Years 0-8) and Early Childhood Education (Pre-School) - Whenuapai, Minister of Education
Non-Statutory Features	Trig Stream (River Number: 78970) Overland Flow Paths Flood Prone Areas Flood Plains

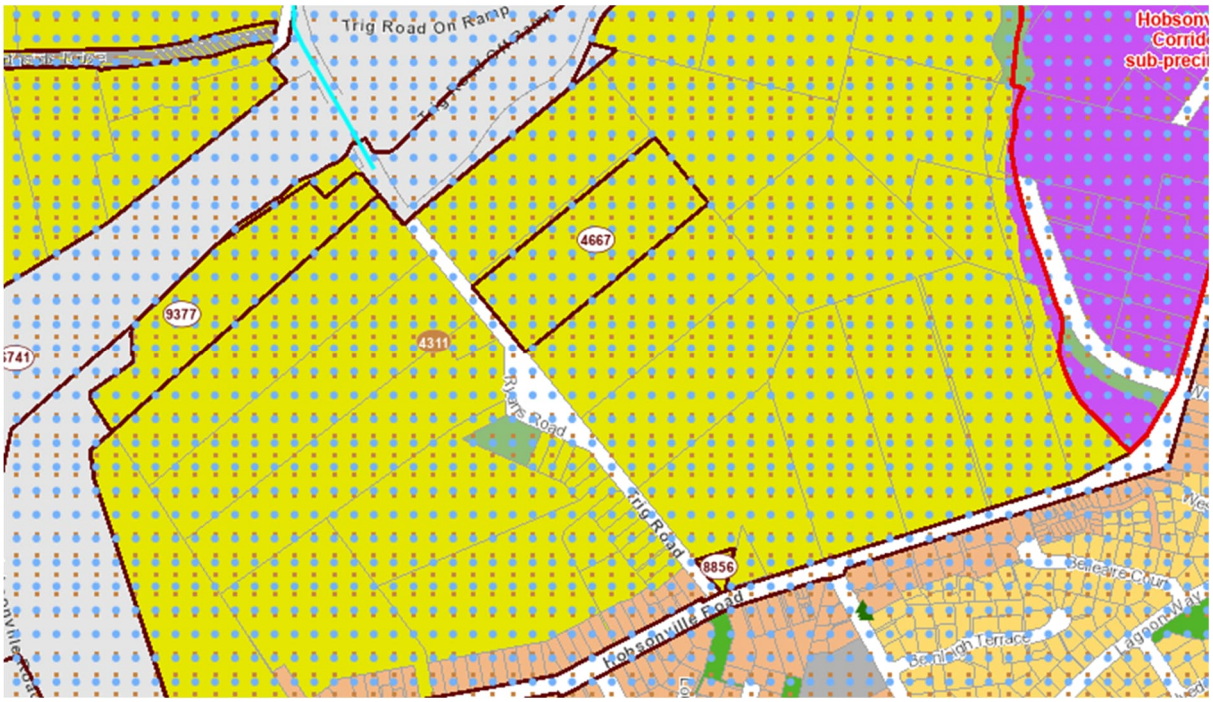

Figure 15: AUP:OIP Zoning

5.2.1 Whenuapai Structure Plan

The Whenuapai Structure Plan was completed in 2016 by the Council and sets out the framework for transforming Whenuapai from a semi-rural environment to an urbanised community over the next 10 to 20 years. The structure plan will be implemented through a statutory plan change process to the AUP:OIP to rezone land within the area from FUZ to different urban zones (the structure plan outcome is shown in Figure 16).

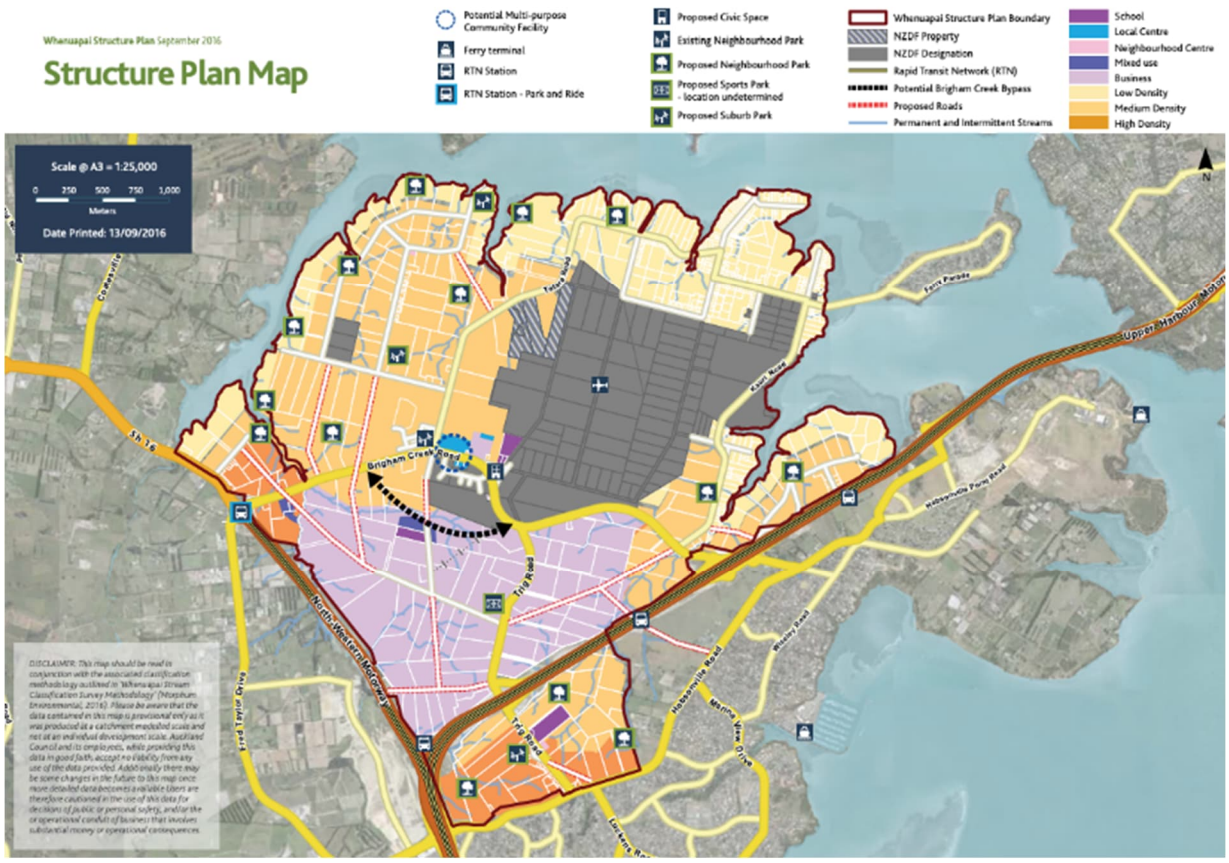

Figure 16: Whenuapai Structure Plan 2016 (AC)

5.2.2 PPC5: Whenuapai Plan Change

Proposed Plan Change 5 (**PPC5**) was a Council led proposed plan change to the AUP:OIP, notified on 21 September 2017, with the intent of rezoning the Whenuapai Structure Plan Stage 1 area adjacent to Trig Road. PPC5 was withdrawn on 16 June 2022, however given the proximity to the existing urban area along Hobsonville Road this area of FUZ land is expected to be subject to private development initiatives in the near future.

5.2.3 Proposed Plan Change 78

Proposed Plan Change 78 (Intensification) is in response to the NPS-UD and requirements of the RMA to enable more intensive development in and around neighbourhood, local, town and city centres and rapid transit stops and incorporate Medium Density Residential Standards into the AUP:OIP.

A handful of properties within the Project area, along Hobsonville Road and Luckens Road, are proposed to be up-zoned from Mixed Housing Suburban to Mixed Housing Urban Zoned, and Mixed Housing Urban Zone to Terrace Housing and Apartment Building Zone.

5.3 Likely Future Environment

The largely existing rural character of the Project area and current FUZ land under the AUP:OIP, coupled with development pressure, indicate a high likelihood of land use change in the Project area. It is anticipated that the Project will be constructed within a transitional environment (where increased urban activities start to occur) and will be operated within an urban or rapidly urbanising environment. Accordingly, when considering the environmental context of the Project, it is important to consider the likely future environment as well as the existing environment. The following sub-sections outline the key land use features that will comprise the likely future environment (as guided by the Structure Plan).

5.3.1 Approach to Likely Future Environment

Within the AUP:OIP, the Project area contains a range of existing and future urban zones which influence the existing and likely future land use patterns for assessment purposes (refer Figure 18). Areas with existing urban zoning or rural zoning that are not identified for future urban growth are not likely to materially change in the future. Conversely, those areas that are currently rural in character, but are zoned future urban are highly likely to experience material change.

Table 7 sets out our understanding of the current land use zoning, its likelihood of change and its potential future environment.

Table 7: Existing and Future Environment Likelihood of Change

Project area	Environment today	Current Zoning	Likelihood of Change	Likely Future Environment
Context A	Rural	Future Urban	High	Urban
Context B	Urban – Low Density	Future Urban	High	Urban
Context C	Urban – Medium Density	Urban	Moderate	Urban
Context D	Urban	Urban	Moderate	Urban

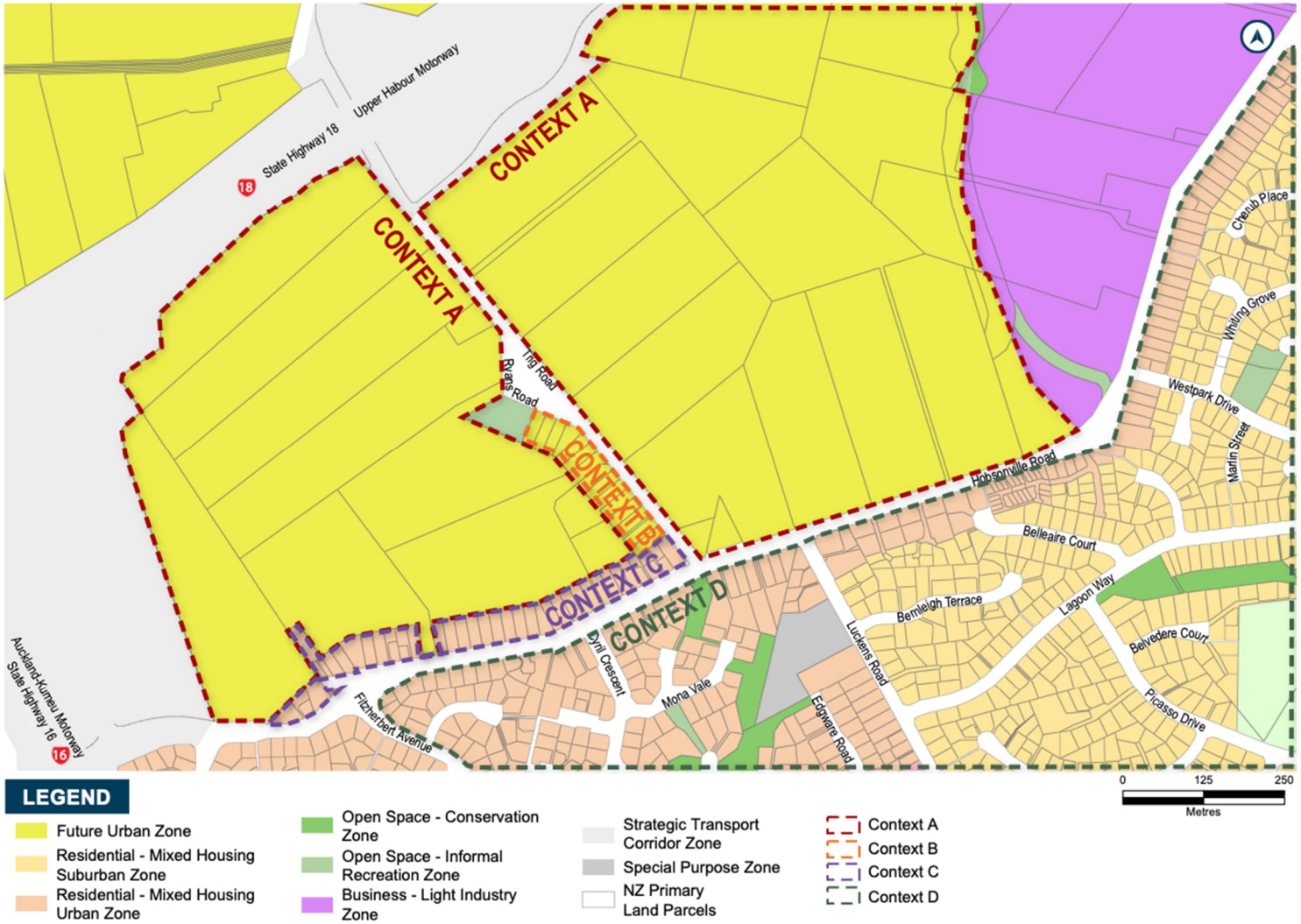

Figure 17: Existing Zoning / Likely Future Environment

The Project seeks to provide for an urban standard transport corridor that will support urbanisation of the surrounding land. As such, assessing the effects on the environment solely as it exists today (i.e. at the time of this assessment) will not provide an accurate reflection of the environment in which the effects of the construction and/or operation of the transport corridor will be experienced. Whilst it is likely that construction of the Project will take place in the existing (mostly rural) environment, it will be when the area is transitioning into an urban environment.

Accordingly, when considering the environment within which the effects of the operation of the transport corridor are likely to occur, this assessment considers the likely future environment as well as the existing environment.

5.3.2 Future Residential and Business Zoned Areas

Most of the current FUZ area surrounding the Project area is likely to be rezoned for medium and high density residential use, with some provision for business land use (as indicated by the Whenuapai Structure Plan). The land use outcomes based on the signalled AUP:OIP zoning are summarised in Table 8.

Table 8: AUP:OIP Zoning Potential Urban Form

Zone	Anticipated Outcomes
Mixed Housing Suburban	Development is typically two storey detached and attached housing in a variety of types and sizes.
Mixed Housing Urban	Development typically up to three storeys in a variety of sizes and forms, including detached dwellings, terrace housing and low-rise apartments.
Terraced Housing and Apartment Building	Provides for urban residential living in the form of terrace housing and apartments. Buildings are enabled up to five, six or seven storeys.
Business – Neighbourhood Centre	Provides for buildings up to three storeys high with mixed use residential on upper floors. Development generally in keeping with nearby residential character. This land use is generally characterised by single corner stores and small shopping strips.

5.3.3 Existing Residential Zoned Areas

The existing residential area adjacent to the Project area, along both sides of Hobsonville Road, is currently zoned MHU under the AUP:OIP.

The current residential form can be largely characterised as low-density, single detached dwellings. There is evidence of some subdivision and subsequent infill housing; however, the majority of these dwellings are still single or double storey and largely detached.

The MHU zone allows greater intensity for the residential area along Hobsonville Road, enabling development of detached, terraced and low-rise apartment housing up to three storeys (refer Table 8 above).

5.3.4 Future Transport Network

The transport corridors within Whenuapai and the surrounding area will be delivered as part of the wider urbanisation that is scheduled to occur in the North West of Auckland.

To understand the future transport network an indicative transport network for the North West has been developed to support Auckland Council's planned urban growth. Refer to Figure 2: North West Preferred Transport Network – North West Growth Area.

Through the AC DBC and SG DBC it was established that Trig Road will continue to facilitate key movements, including providing access to SH18 and will be an important north-south connection as Whenuapai urbanises. There are future urban areas immediately adjacent to Trig Road, and future developments will be able to connect to this key corridor via future developer delivered collector roads.

Once the area around Trig Road is urbanised, the road will need to serve a variety of movement needs, including:

- Access to and from the east facing motorway ramps to SH18
- Facilitating north-south non-motorway movement between business and residential land in Whenuapai, and the existing residential areas around West Harbour and Hobsonville
- Provide opportunities for future developments to deliver connections for collector road access to the surrounding residential land
- Provide access from Whenuapai to wider destinations such as the Westgate Shopping Mall and the ferry terminals at West Harbour and Hobsonville.

Trig Road will therefore serve a range of local and strategic uses across a range of modes and consequently needs to provide the appropriate facilities associated with an urban arterial.

Hobsonville Road will play an increasingly important public transport role and will facilitate local east-west movements between Westgate and Hobsonville.

5.3.4.1 Future Walking and Cycling Network

The Whenuapai Structure Plan indicates that Trig Road and Hobsonville Road will form part of the cycling network for Whenuapai and notes that this would include the provision of dedicated cycle facilities.

5.3.4.2 Future Local Public Transport

In the longer term, there will be changes to the supporting local network to deliver an integrated public transport network. These changes have been identified through discussions with AT public transport network developers and reflect the outcomes sought by the Whenuapai Structure Plan.

The changes include:

- Local services on Trig Road connecting to Hobsonville Road, Moire Road and Wisely Road
- Local services along Hobsonville will become a frequent route, which is defined as having a service at least every 10 minutes from 7am to 7pm, 7 days per week.

The longer term future public transport network has been developed on the basis of significant public sector investment including a rapid transit network on SH18 with associated interchanges, an additional road crossing of SH18 between Brigham Creek and Trig Road, a Northside Drive connection over SH16 to Westgate and connections between SH16 and SH18 to facilitate movements from Westgate to Whenuapai.

In the interim period between these investments and the investment of rapid transit to the North West, Trig Road and Hobsonville Road will play a critical part in the delivery of a public transport network to support the developing more intensive urban form in Whenuapai.

The Regional Public Transport Plan (RPTP) provides a 10-year indication of public transport provisions. In terms of the two existing services on Trig Road and Hobsonville Road, Table 9 summarises the proposed changes to these services over the next 10 years.

Table 9: Bus Services as proposed in RPTP 2018/2028

	2018	2021	2028
Route 114	30 minute services in weekday peak, 60 minute in interpeak, no evening service	30 minute services in weekday peak, 60 minute in interpeak, no evening service	20 minute services weekday peak, 20 minute interpeak, 30 minute evening service
Route 120	30 minute services in weekday peak, 30 minute in interpeak, 60 minute evening service	15 minute services in weekday peak, 20 minute in interpeak, 20 minute evening service	10 minute services weekday peak, 15 minute interpeak, 15 minute evening service

5.3.4.3 Traffic Growth

Considerable growth in traffic volumes is forecast between now and 2038. The current and forecast traffic volumes for Trig Road and Hobsonville Road are shown in Table 10.

Table 10: Trig Road and Hobsonville Road – Traffic Volumes to 2048+

	Current	2028	2038	2048+
Trig Road (forecast)	7,500	11,100	15,700	17,700
% growth on previous decade	-	**48%**	**41%**	**12%**
Hobsonville Road (forecast)	10,700	14,400	18,400	20,400
% growth on previous year	-	**35%**	**28%**	**11%**

5.3.5 Open Space and Waterways

As identified in the Whenuapai Structure Plan, a network of public open space, esplanade reserves and walking and cycling connections are proposed to be protected and enhanced as development proceeds. Within the environment surrounding the Project, it is anticipated that there will be a suburban park between 3-5 hectares in size on the current location of the properties at 38 and 40 Trig Road, and a neighbourhood park of 0.3-0.5 hectares in size on the current location of 17, 19 and 21 Trig Road. There is also an 'Open Space – Informal Recreation' Zone at 34A Trig Road that is anticipated to remain. Furthermore, an esplanade reserve is indicated along Trig Stream to the east of Trig Road. This esplanade reserve, in conjunction with other permanent and intermittent watercourses and wetlands may contain native riparian planting along the edge of streams for a width of 10m when development consents are obtained and implemented.

[2] Based on the SATURN modelling based year, calibrated against 2015 surveyed traffic volumes.

6 Approach to Design

As noted, the proposed designation for the Project, if confirmed, will identify and protect the Project corridor in the AUP:OIP and provide approval for the construction, operation and maintenance of the Project. The design information is indicative for the Project and has been prepared to a level sufficient to inform the proposed designation footprint and to assess an envelope of effects that includes operational and maintenance requirements, potential construction areas, and areas required to mitigate any adverse effects.

The key transport elements which will be provided by the Project are described in Section 3. The final design details for the Project will be refined and confirmed before construction as part of the Outline Plan (or Plans if the Outline Plans are staged to reflect Project phases or construction sequencing) which will be submitted to Council as set out in section 176A of the RMA.

The drawing set for the Project is contained in Volume 3 of this suite of documents and includes the following:

- Indicative alignment general arrangement layout plan, including the proposed designation footprint
- Indicative stormwater design.

6.1 Design Philosophy and Standards

The following section outlines the design philosophy and key design standards that have been adopted for the Project.

The Project will upgrade the existing Trig Road corridor and part of Hobsonville Road to provide for its intended function as part of a wider regional arterial network. As specified in the Project Objectives (Section 2.2) there is a need for the Project to provide for safe and efficient connections between key destinations (or other components of the wider network), integrate with the new or planned communities at Whenuapai and improved access to transport modes and provide choice in mobility.

Overall, the key design outcomes sought are:

- Compatibility with planned urbanisation of adjacent land in the AUP:OIP;
- Separated/dedicated off road cycle paths;
- Separated footpaths;
- Bus priority at intersections;
- Improved urban design and amenity outcomes; and
- Improved safety for all road users.

6.2 Arterial Corridor Design

The Project has been investigated, designed and assessed in accordance with the Auckland Transport Design Manual (**TDM**) design guidelines and relevant national standards. The design standards are as follows:

A design speed of 60km/h has been adopted for Trig Road and Hobsonville Road with a posted speed of 50km/h for all the future and interconnecting roading network.

A maximum vertical gradient of 8.0% has been adopted for the alignment. Vertical gradients have been set as low as practically possible to mitigate potential problems arising from:

- Engineering costs related to working on steep gradients, providing an economic balance between cut and fill quantities, and long-term road maintenance costs
- Vehicle speeds and other road safety concerns attributed to steep gradients
- Consideration for active modes using the road corridor.

A generic arterial cross-section has been developed for the transport corridors within the Project (Trig Road and Hobsonville Road), and generally incorporates the following elements:

- Berm
- Footpath
- Cycleway
- Traffic lanes
- Solid or flush median
- Communications duct for utilities
- Street lighting on both sides of the transport corridor, providing for cyclist and pedestrian path lighting in accordance with TDM and national lighting standards
- Appropriate delineation with standard road pavement markings and advance guidance/warning signage in accordance with relevant national standards
- All batter slopes designed to 3H:1V in accordance with TDM minimum design standards.

Final cross-sections will be produced at the detailed design stage and will be submitted as part of the Outline Plan(s).

Active mode mobility is a key desired design outcome, therefore walking and cycling have been prioritised in the Project design and will be provided in all arterial corridors.

Flexibility to enable future public transport by providing sufficient berm space where possible to allow bus stop facilities at a nominal spacing of approximately 400m.

The standard arterial road pavement design, and in particular the surfacing details, will be refined during future design phases.

The future collector road network adjacent to Trig Road has not been designed. Therefore the standards outlined above provide enough flexibility in relation to the location of where collector roads can connect in to Trig Road.

6.3 Stormwater Design and Management

Designs for stormwater management have been developed with consideration of existing stormwater infrastructure and existing stormwater management requirements, stormwater discharge and diversion, stormwater runoff quality, and natural flooding hazards. The AUP:OIP and other standards, regulations and guidelines have been utilised and adopted, including specific consideration of Water Sensitive Design requirements under the AUP:OIP. Key design requirements include:

- Flood modelling has been undertaken to identify and quantify the existing overland flow paths, focusing on the 10-year and 100-year average recurrence interval.

- All new roads will be kerbed to contain and convey the 10% AEP rainfall event, discharged into standard TDM approved stormwater catch pits with filtration and litter traps, and collected via a primary stormwater network for subsequent on-site water quality volume treatment and discharge into on-site attenuation ponds catering for up to the 1% AEP rainfall event.
- All existing overland flow paths will be maintained via upgrades to existing culvert crossings to enhance existing drainage conditions and prevent disturbance to the natural watercourses.
- Stormwater ponds will be located at the optimal engineering low point where possible within the Project corridor. These will also be as close as practicable to both a suitable outlet location and the road corridor.

6.4 Geotechnical

Desktop assessments have been carried out based on published geological and geomorphological conditions to enable the generalised topography and geology of the areas to be identified. Based on the desktop assessment, further geotechnical investigations in the form of boreholes, test-pits and hand augers were conducted to inform the preliminary design of the Project. These reports are contained withing Volume 4. The investigations informed the indicative design elements, as follows:

- The key geotechnical risks for the Project include property boundary constraints, ground conditions, cut-fill material balance and the presence of existing services.
- As discussed in Section 4.1.1.1 above, 3H:1V cut and fill slopes have been used in all arterial designs, and for determining earthworks quantities and potential impacts on existing features and property boundaries. No additional geotechnical or engineering strengthening has been assumed for the cut and/or fill batters, and this will be investigated during the later design stages.
- The site subsoil has been determined as having low susceptibility to liquefaction.

6.5 Urban Design Input

6.5.1 Overview

Land use and transport integration, through the placement and interrelationship of movement networks and the areas they pass through, has the potential to contribute to high quality liveable places. The Programme has the potential to have a meaningful, and positive impact on the liveability and quality of future urban areas, including Whenuapai.

In recognition of this, the *Te Tupu Ngātahi Design Framework* (the **Design Framework**) was established for the Programme. The Design Framework provides measurable guidance for outcomes-based decisions throughout each phase of the Programme delivery. The design principles that make up the Design Framework ensure that transport networks contribute positively to new or planned communities, the environments and the social and economic vitality of Auckland. The design principles are:

- Environment
- Support and enhance ecological corridors and biodiversity
- Support water conservation and enhance water quality in a watershed

- Minimise land disturbance, conserve resources and materials
- Adapt to a changing climate and respond to the microclimatic factors of each area
- Social
- Identity and place
- Respect culturally significant sites and landscapes
- Adaptive corridors
- Social cohesion
- Safe corridors
- Built form
- Align corridors with density
- Corridor scaled to the surrounding context and urban structure
- Facilitate an appropriate interface between place and movement
- Movement
- Connect nodes
- Connect modes
- Support access to employment and industry
- Prioritise active modes and public transport
- Support inter-regional connections and strategic infrastructure
- Support legible corridor function
- Land use
- Public transport directed and integrated into centres
- Strategic corridors as urban edges

The Design Framework sits within the context of a range of established strategic plans, policies and design guidance at the Auckland level (Auckland Plan 2050, ATAP, Auckland Roads and Streets Framework, AUP:OIP), national level (Government Policy Statement on Land Transport, Waka Kotahi Bridging the Gap) and at a global level (UN 17 Sustainability Goals). These documents have informed the Design Framework content and are referenced in general terms as they relate to healthy, connected and sustainable communities.

6.5.2 Trig Road Corridor Context

The Trig Road corridor follows a gently undulating alignment that generally rises from north to south, it has few distinguishing urban form characteristics in its current semi-rural setting. Natural drainage lines and ecological features will all be subject to changes in relation to future development activity with no noted or significant existing vegetation.

The Trig Road corridor is physically constrained by the SH18 corridor to the north-west, limiting future built form continuity and connectivity with other future growth areas within Whenuapai. The corridor demonstrates a closer urban form relationship and integration with established mixed urban and suburban mixed housing in West Harbour and Hobsonville.

Changes signalled by the Whenuapai Structure Plan will likely result in the land adjacent to Trig Road containing new medium density housing, and higher density terraced and apartment housing to the west and southern half of Trig Road. A small Business – Neighbourhood Centre zone is proposed on the Eastern side of Trig Road.

The indicative cross section for Trig Road inherently supports the Environment principles by providing opportunities for integrated ecological and stormwater outcomes based on enhancement of the wetland and use of raingardens. From a social perspective, the Project will contribute positively to the sense of belonging and participation of the new urban residents, as well as community resilience by supporting access to the proposed local centre on Hobsonville Road and connecting (via signalised intersections) to the open space network of West Harbour e.g. Midgley Park.

The Project is aligned to service planned higher density residential development, as well as business and employment opportunities in north and west Whenuapai. The corridor cross section provides clear and flexible allocation of street space between competing uses by allowing for separated modes. Vehicular access is not generally accommodated however a pedestrian permeable interface or active frontage interface is supported, especially where adjacent to higher density housing.

In relation to Movement, the Project provides tangible and direct connectivity for all modes between complementary destinations, for example the local urban centre at Hobsonville Road and open space networks within West Harbour.

At detailed design stage, the Project's design should provide:

- Re-integration of any residual land required for the Project;
- Integration with the character of adjacent development;
- Connections between open space areas;
- Integration with the commercial activities along Hobsonville Road;
- Logical pedestrian and cycle crossing points;
- Safe movement, orientation and way-finding; and
- Integration of any bus stops.

7 Construction Works

7.1 General Approach

While it is anticipated that construction may not occur for some time (and therefore the construction techniques may change), an indicative construction methodology has been developed based on the level of design undertaken to date and the current land use / land form in which the corridor is located and with the knowledge that a contractor is yet to be confirmed. As such, there is a preference to retain some flexibility in construction methodologies, and the construction will be guided through the management plan process. The conditions for the proposed designation and resource consents will be in place to manage the effects of the construction activities.

Should the contractors wish to undertake construction activities in a manner which is not within the scope of the proposed designations, or resource consents, additional authorisations will need to be obtained at that time.

Management Plans form an integral part of the construction methodology for the Project setting out how specific matters will be managed. A suite of Management Plans is proposed for the Project. These include the following:

- Construction Environmental Management Plan (CEMP);
- Stakeholder and Communication Engagement Management Plan (SCEMP);
- Cultural Management Plan (CMP);
- Construction Traffic Management Plan (CTMP);
- Construction Noise and Vibration Management Plan (CNVMP);
- Tree Management Plan (TMP).

The Management Plans required for the proposed designations and resource consents, and future Outline Plan will be submitted to Auckland Council prior to the commencement of construction.

Following the Completion of Construction, the designation boundary will be reviewed and any land that is not required for the permanent work or for the on-going operation, maintenance or mitigation of the Project will be reinstated in coordination with directly affected landowners or occupiers.

Typical offsets for construction areas of various construction work have been adopted to inform the proposed designation boundaries. These offsets and typical construction areas have been based on similar transport infrastructure projects of this size and nature.

An indicative construction methodology has been developed for the Project to allow an assessment of the likely construction effects. This methodology has been developed based on an indicative concept design only. It is expected that as the design develops, further information will be required to inform the final construction method.

The key components of this construction methodology are outlined in the following sub-sections.

7.2 Indicative Construction Zones and Programme

The total construction phase of the Project is expected to take approximately 18 to 24 months. It is anticipated that the works will be broken down into separate construction zones based on the type of works required and the nature of the work environment. These anticipated zones are:

- Zone 1: Trig Road North of the SH18 bridge
- Zone 2: Trig Road South including the SH18 bridge

- Zone 3: Hobsonville Road.

Figure 18 provides an illustration of the indicative construction zones and Table 11 outlines the typical construction activities and construction durations associated with each zone.

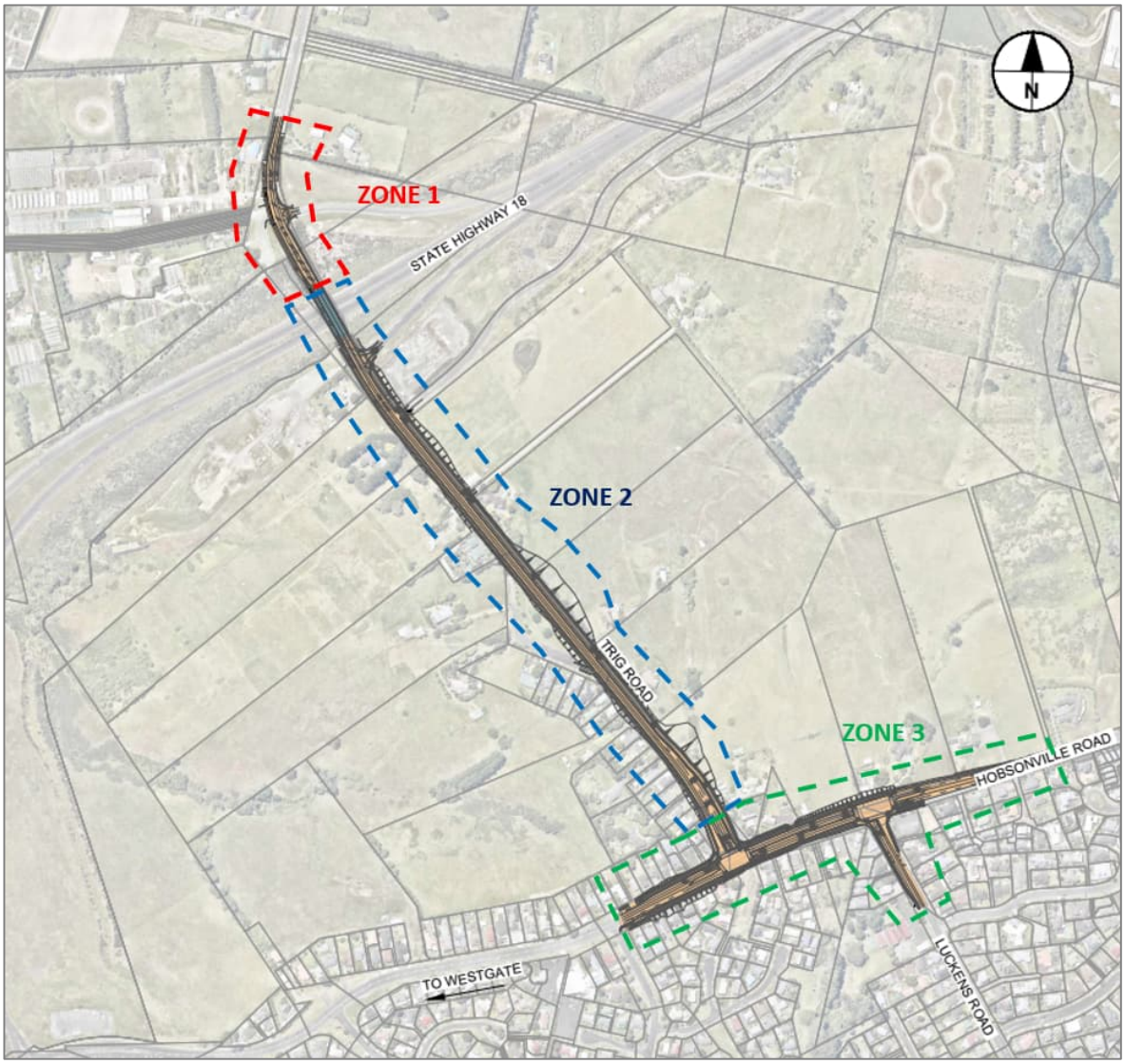

Figure 18: Indicative Construction Zones

Table 11: Trig Road Corridor Upgrade Indicative Construction Works Summary

Zone	Works Overview	Construction Activity	Estimated Duration
1	Construction of indicative cycle path and footpath and remarking of the existing road and bridge.	• Remarking of existing road and bridge deck • New cycleway and footpath construction on west side (As discussed the location is indicative) • Minor earthworks to enable construction of the new cycleway and footpath	Approximately 3 months.

	Note: All works in Zone 1 are within the existing road corridor.		
2	The main construction activities consist of bulk earthworks, stormwater drainage and pond, and corridor construction. Most of the works are on the east side of Trig Road and involve fill to provide for corridor widening.	• Site clearance • Divert existing services • Approx. 28,500m^3 of earthworks cut/fill • Construct three new drainage culverts • Construct new stormwater dry pond • Construct new rain gardens • Construct new retaining wall to the front of properties on the west of Trig Road • Construct new traffic lanes, berm, footpath and cycleway • New road surface and line marking • Lighting and road furniture • Driveway regrading	Approximately 14-16 months.
3	The main construction activities on Hobsonville Road involve road widening to accommodate the intersection layouts and cycleway, with most of the widening achieved by gaining area on the north side of Hobsonville Road.	• Site clearance • Divert existing services • Approx. 6,000m^3 of earthworks cut/fill • Construct new raingardens • Construct new traffic lanes, berm, footpath and cycleway • New road surface and median • Lighting and road furniture • Driveway regrading	Approximately 11-13 months.

7.3 Construction Laydowns and Work Areas

A number of indicative construction laydown areas have been provided for within the proposed designation footprint. The location of the indicative laydown areas is provided in Volume 3

7.4 Construction Activities

7.4.1 Site Establishment and Clearance

A draft Erosion and Sediment Control Plan (**ESCP**) (Volume 4) has been prepared for the Project in accordance with the Council's Guidance for Erosion & Sediment Control (**GD05**). All environmental management controls are to be set up prior to construction works occurring. General controls to be applied across the Project area include clean water diversion, silt fences/silt socks, and site stabilisation. Specific erosion and sediment control measures related to particular construction activities are identified as appropriate in the following sub-sections.

In preparation for the works, the Project area will need to be cleared of all impediments to construction such as buildings, structures and vegetation. Where possible, impacts on private property from site clearance works will be minimised or avoided. However, where existing structures cannot be avoided these will either require removal or relocation outside the Project area. This includes potential removal/relocation of fences, dwellings, garages, and farm structures.

The existing vegetation within the Project area will require removal. This is mostly comprised of planted wind breaks along Trig Road and the northern side of Hobsonville Road. The three notable trees located at 8 Luckens Road, West Harbour (refer section 5.2 above) will not be affected by tie-in works to be undertaken within the adjacent road corridor, as they will comprise line marking only.

Vegeation to be removed also includes a limited area of riparian vegetation around Trig Stream (wetland). The draft ESCP includes specific watercourse protection measures. All environmental/management controls related to watercourses will be set up prior to the removal of any riparian vegetation.

7.4.2 Earthworks

The Project includes bulk earthworks to provide for widening of the corridor, regrading of the road alignment and construction of stormwater management devices.

Prior to commencing bulk earthworks, all soft and/or unsuitable soils will be removed from the site before placing any fill material or construction of structures.

The largest volume of earthworks activity will be the filling of the eastern side of Trig Road and excavation of the stormwater dry pond. Approximately 35,000m^3 of fill is required, which is likely to be sourced from material cut from the western side of Trig Road and imported fill.

Table 12: Project Earthworks Summary

	Approx. Cut	Approx. Fill	Approx. Area
Site Clearance	17,000m^3	17,000m^3	61,000m^2
Corridor Earthworks	3,000m^3	35,000m^3	45,000m^2

In addition, the bulk earthworks will be undertaken in a staged approach to minimise the area of disturbed earth, stockpiling and potential for sediment laden runoff at any given time.

Road widening will be achieved by excavating the northern verge along Hobsonville Road, with some cut required to construct the road base, reshape the verge and construct new retaining walls. Works along the southern side of Hobsonville Road will generally occur within the existing road corridor.

Driveway tie-in requirements will potentially require local reshaping on private driveways and may require additional localised relocation of services. This may also include additional drainage, resurfacing, and localised retaining structures within private property. These retaining walls will likely be constructed using conventional plant.

To mitigate the very limited potential for unidentified archaeological remains to be exposed during construction, the conditions include an advice note referring to the AUP:OIP Accidental Discovery Rule (ADR) (E12.6.1). Likewise, contamination protocol has been established, in the event that contaminated soils are encountered. Refer to Section 9.11.

7.4.3 Drainage and Stormwater

Works to install the stormwater network will involve typical shallow drain laying, involving excavation and trench shields, with existing services likely to drive the depth of the stormwater pipes.

These will likely be constructed upon completion of the bulk earthworks, with the western side of Trig Road constructed first. These works are anticipated to be in shallow excavations with simple batters or trench shields to provide ground support. Where road crossings are required, construction will be through excavation in stages with single lane closure traffic management.

The three culverts will be constructed in a similar method to the connection pipework.

7.4.4 Watercourses

Construction works within Zone 2 consist of activities directly within the upper gullies leading to the existing watercourses (catchment 1 – Waiarohia Stream, catchment 2 – Trig Stream (wetland), catchment 3 – Trig Stream (wetland) upper branch) with potential to cause adverse effects to the ecological health of the watercourses.

All three stormwater pipe crossing upgrades/extensions under Trig Road can be completed offline therefore typical control measures such as bunds/silt/sand logs should be used to prevent loose soil runoff into the adjacent watercourse.

Outlets will be constructed in approximately similar positions downstream as the existing structures. Some water diversion from existing outlets may be required with the use of sandbags to allow for a dry working space while the existing outlets remain functional. Silt fences will be used around the downstream perimeter of outlet construction areas. Water diversion and sediment control measures are to be used progressively as required and adapted to suit changes to conditions on-site.

Earthworks operations in the vicinity of streams will be handled with controls as described above. Vegetation removal will be required on the Trig Stream upper branch to accommodate the embankment fill.

Measures will be taken to minimise disturbance to surrounding vegetation and soils, followed by compaction and temporary stabilisation of the area to cater for the period prior to continuance of earthworks.

A desktop review was undertaken on the potential of the habitats within the Project Area to support native fish. The review identified six native fish species potentially within 2km of the project area.

7.4.5 Utilities

Several services along Hobsonville Road will require relocation as described earlier in Section 3.1.5, including the overhead lines crossing Hobsonville Road and the associated power pole, numerous streetlights and underground water services coming from the pump station on the corner of Hobsonville and Trig Road. Further service identification and location will be required prior to works commencing.

The overhead lines along the western edge of Trig Road may be reinstalled as overheads (if sufficient room is available in the construction corridor) or installed as underground services through the utility ducts provided within the Project corridor cross-section. The exact form and location of the existing overhead utilities will be determined at the later detailed design stage.

7.4.6 Pavement and Surfacing

Pavement and surfacing will commence once earthworks and drainage works are complete. This will be likely be staged in two halves to maintain traffic flow in the adjacent lane, with the intersections requiring further staging.

Resealing will need to be carried out in stages and night works will likely be required to complete marking and tie-ins to the motorway on-ramp.

New street lighting will be installed once the bulk earthworks and drainage are complete.

7.4.7 Construction Remediation

Construction of the Project will require temporary impacts to private properties along the Project corridor. This includes temporary changes to property access, impacts on private outdoor space (including fences, gardens and vegetation and lawns) and in localised instances impacts to dwellings and other private structures.

Reinstatement is to be addressed on a case-by-case basis through discussion with individual landowners and will follow the provisions under the Public Works Act 1981, which is a process separate from the requirements of the RMA.

7.4.8 Typical Plant and Equipment

A list of typical plant and equipment which may be required for construction has been developed (Table 13).

Table 13: Typical Plant and Equipment Summary

Construction Type	Typical Plant
Typical across all works	• Main site compound • Satellite site compounds • Light vehicles • Hiab truck • Small tools and plant
Clearing	• 20T excavator • Mulcher
Overhead line relocation	• Line crew • Elevated work platform or cherry picker • Directional drilling equipment
Earthworks	• Excavator (>20T) • Excavator (<15T) • Compactor/sheepsfoot roller • Water cart • Articulated Dump Trucks (ADT) • Road tip trucks (6 wh or tandem tipper)
Drainage	• Excavator • Trench shields • Tandem tipper • Loader • Plate compactor

Pavement construction	• Grader • Smooth drum roller • Tandem tippers • Kerbing machine • Plate compactor • Paver

8 Assessment of Alternatives

When considering a NoR by a requiring authority, a territorial authority is required under section 171(1)(b) of the RMA to have particular regard to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if either:

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

In this instance, AT does not currently have an interest in all of the land through which the Project will be constructed and operated.

The development of alternatives for the Project was completed through a sequential options development process in the Supporting Growth Programme Business Case 2016 (**PBC**), AC DBC, SG DBC and development of this NoR application and the Project as described in Section 3.

Figure 19 provides a summary of the options development process in relation to each of the steps. Once problems, issues and objectives had been established, a list of corridor options were developed to achieve the outcomes. These were refined into a range of alignment options with the preferred options further refined to develop the Project as it is described in Section 3.

A comprehensive assessment of alternatives was undertaken and is provided in Appendix A. This includes the key decisions made during the assessment of corridor options, alignment options, design refinement and statutory methods. It also outlines the further review of AC DBC and SG DBC options that was subsequently undertaken due to the introduction of the National Policy Statement for Freshwater Management 2020 (NPS:FM), which affords additional protection to natural wetlands. Please refer to Appendix A for these assessments.

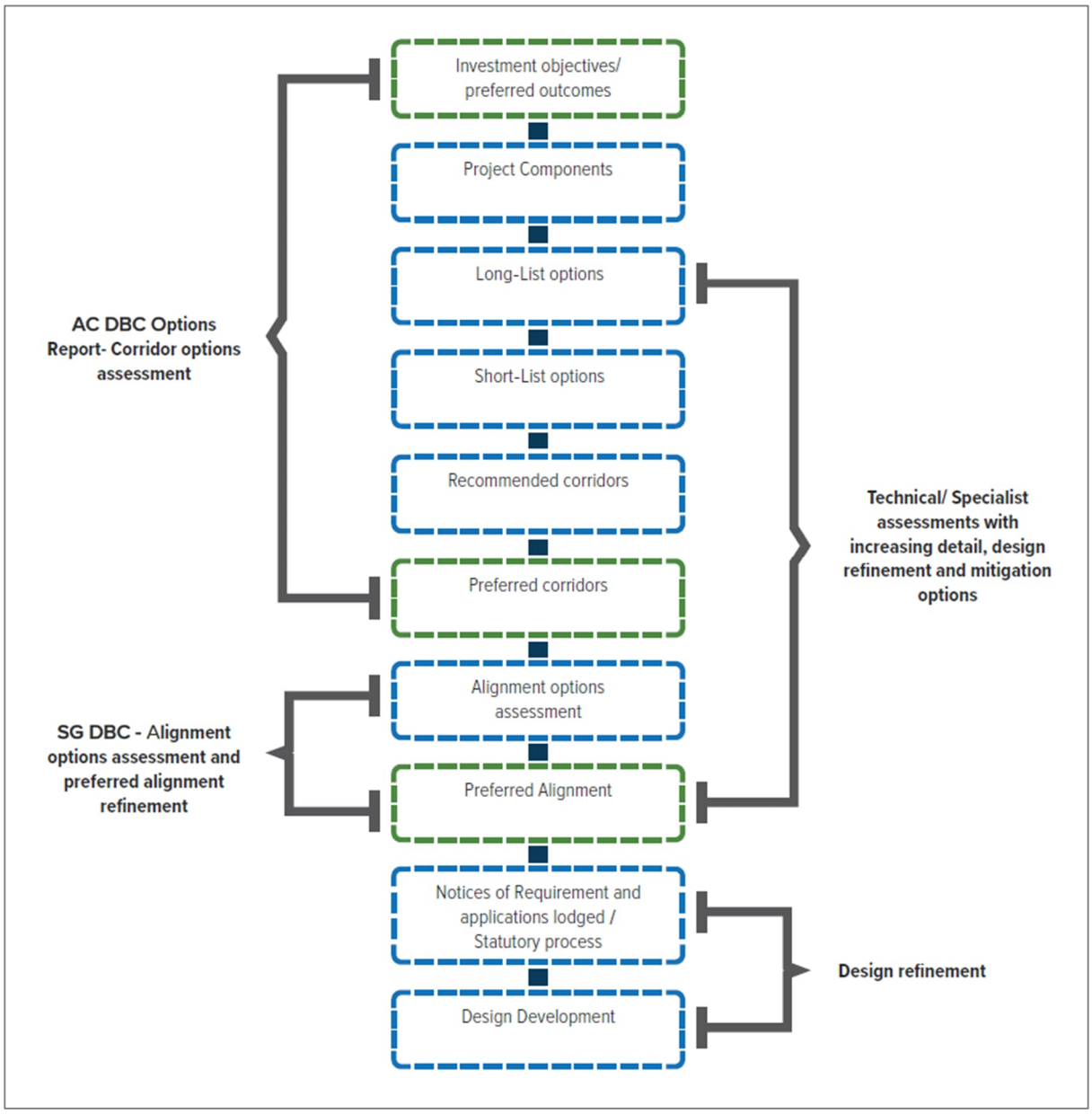

Figure 19: Summary of Options Development Process

8.1 Summary of Alternatives Assessment

A wide range of alternatives have been investigated for addressing the transport needs for the Project area. A key driver for the assessment of alternatives was to avoid adverse effects where practicable. That evaluation confirmed that the upgrade of Trig Road and Hobsonville Road (between the intersections at Trig Road and Luckens Road) would provide a balance of strong transport and urban outcomes while minimising potential adverse effects.

A further review of AC DBC and SG DBC options was undertaken in response to introduction of the National Policy Statement for Freshwater Management 2020 (NPS-FM). It confirmed that all options considered during the business case process would result in wetland impacts, and that the rationale for discarding the other options remained valid. The alignment being progressed in this NoR remained the preferred option.

The Project supports the future development of land in Whenuapai. Its location and design represent the most appropriate approach to the changing local environment, providing a high-quality urban corridor for the urbanisation and development of the surrounding area and connecting to the future and existing transport network.

An assessment of the various alternative methods for achieving the Project was undertaken, and it was concluded that a designation is considered the most appropriate mechanism to provide for the Project.

The conclusion reached in the assessment of alternatives has been based on a comprehensive and replicable optioneering process. As such it is concluded that adequate consideration has been given to alternative sites, routes, or methods for undertaking the work, satisfying the requirements of section 171(1)(b) of the RMA.

9 Assessment of Effects on the Environment

Section 171 of the RMA requires that when considering a NoR, a territorial authority must consider the effects on the environment of allowing the requirement. Furthermore, in accordance with Schedule 4 of the RMA, an application for resource consent must include an assessment of the actual or potential effects on the environment of the activity.

This section provides a summary of the actual and potential effects of the construction, operation and maintenance of the Project, including whether these effects are positive or adverse and the scale, duration and locality of effects.

As set out in Section 8, the avoidance of adverse effects has been a key driver for the assessment of alternatives, identification of the proposed designation corridor and the subsequent refinement of the corridor. Where effects cannot be avoided, measures to remedy or mitigate significant adverse effects have been proposed. Details of these are included in section 10 and are reflected in the proposed designation and resource consent conditions.

Positive effects are summarised in Section 9.1, and adverse effects on the environment are described in Sections 9.2 to 9.11.

9.1 Positive Effects

The Project Objectives (Section 2.2) have been developed to address the key problems and issues identified in Section 2.2. In achieving these objectives, the Project will deliver a range of positive effects for the Whenuapai area.

Significant growth is anticipated in Whenuapai (as set out in the FULSS) which will require a range of infrastructure, including transport infrastructure, to achieve the growth figures sought under the Auckland Plan. The Project supports the ongoing urbanisation of the area, by providing improved accessibility to the FUZ surrounding the Project area through an upgraded urban transport corridor and greater connectivity between SH18 and Hobsonville Road.

The current layout of Trig Road provides limited or no pedestrian, cycle and public transport facilities. The Project will provide pedestrian, cycle and public transport facilities along Trig Road, which will enable greater choice of mode and provide improved safety outcomes for transport users.

Currently the potentially affected wetlands in the project area, are dominated by exotic plant species, with effects of grazing and pugging from livestock. The proposal includes planting and fencing and protection of two wetlands in perpetuity.

Overall, the Project will provide significant benefits to the local community and wider North West area, supporting the Council's growth strategy. In providing an urban transport corridor that responds to the growth demand in the area, the Project will improve transport network functions and contribute to a high-quality urban environment for local residents, businesses and road users.

9.1.1 Walking and Cycling

There are currently no dedicated cycle facilities on Hobsonville Road or Trig Road and limited pedestrian facilities. The current road environment, including the intersections of Trig Road and

Luckens Road, support higher vehicle speeds, which further results in reduced attractiveness for walking and cycling.

The proposed walking and cycling facilities for Hobsonville Road and Trig Road (described in Section 3) have been designed to indicatively provide separated protected walking and cycling facilities and all intersections within the Project have been provided with signalised pedestrian/cycle crossing facilities. This provides a significant improvement to the existing walking and cycling network and is a positive effect of the Project.

Dedicated walking and cycling facilities have been provided on both sides of Hobsonville Road. This reflects the higher strategic importance of Hobsonville Road within the primary cycle network.

Trig Road is close to several key trip attractors, including Westgate shopping centre and public transport interchange (1km west of Trig Road), and business land planned in Whenuapai (1 to 3km north and east of Trig Road). West Harbour ferry terminal is 2.6km east of Trig Road on the current road network. The proposed separated cycle lane and footpaths will provide safe alternative transport options and encourage a mode shift for these local movements.

Overall, the Project will create an improved and safer walking and cycling network that encourages and promotes alternative modes of transport. The proposed walking and cycling improvements will integrate with existing networks and the likely future environment.

9.1.2 Public Transport Network

As described in Section 3, the Project involves the replacement of existing bus stops and provides sufficient corridor width to locate new bus stops in the berm along the corridors as they may be needed to respond to the future public transport network.

The upgrades to the road network will improve bus travel time and reliability by providing for bus only through movements along Hobsonville Road at Luckens Road and Trig Road intersections, a dedicated bus lane on Hobsonville Road between Luckens Road and Trig Road and a right turn bus advance lane on Trig Road. These upgrades will allow buses travelling on Hobsonville Road to avoid potential queuing delays at intersections and improve travel time reliability thereby increasing the efficiency and attractiveness of public transport travel.

Overall, the Project will enable an efficient public transport network which will support the existing and the likely future environment in the Project area and wider Whenuapai.

9.1.3 Road Safety

The design of the Project has been undertaken to reflect AT's commitment to Vision Zero, which aims for no deaths or serious injuries on Auckland's transport system by 2050. The Project supports this approach by:

- Providing for protected walking and cycling facilities on all corridors, where necessary, supporting facilities for vulnerable road users
- Safe intersection design based on AT standards and provision of crossing facilities for vulnerable users, where necessary.
- Vehicle lane widths and corridor widths minimised, as much as practicable, to support a lower speed environment.

The current intersection forms at Trig Road and Luckens Road with Hobsonville Road were designed for a low-volume rural environment. While these intersections may have been appropriate in the past, these will be less appropriate as urbanisation occurs. A speed environment of 50kph is more appropriate in an urban context and consequently there is a need to reform these intersections in a way that supports walking and cycling and encourages a slower speed environment. The Project will achieve this by providing a slower speed environment and improved intersections with dedicated cycling and pedestrian facilities.

Overall, the Project is well aligned with the principles of AT's Vision Zero and will improve the existing transport corridor to provide high levels of road safety in the Project area. Detailed design investigations will be completed to further support safety outcomes.

9.2 Transportation Effects

This section provides an assessment of the actual and potential adverse transportation effects that will result from the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade: Assessment of Transport Effects* (**ATE**) contained within Volume 4.

9.2.1 Construction Transport Effects

The assessment of expected construction traffic has been developed based on the indicative construction methodology (outlined in Section 7).

Given the construction timing and staging of the package has yet to be determined, there is a degree of uncertainty associated with any predicted construction methodology and associated traffic routes. This means:

- The routes that will be used by construction vehicles will depend on the location of quarries and disposal sites which are not yet certain
- The exact location and extent of compound sites/lay down areas has yet to be determined
- The timing of construction of other projects could impact on likely construction vehicle routes

Notwithstanding this, it is considered that with available connectivity to the strategic network and available capacity in the network, construction traffic will be able to be readily accommodated.

Overall, the ATE does not identify any significant adverse impacts on the wider transport network as a result of the construction traffic; however, it does identify the potential for localised changes to traffic movement and property access. Measures to mitigate these potential effects will be secured through a designation condition requiring preparation and implementation of a CTMP, such that the adverse effects are no more than minor. These measures are summarised below.

9.2.1.1 Construction Traffic Management

As discussed above, the potential adverse effects of construction traffic will be managed through a CTMP. The purpose of the CTMP is to ensure the construction of each Project is managed in such a way that enables safe and efficient movement of local traffic throughout the construction period and to minimise disruption to road users, particularly the adjacent residential properties and local activities.

Localised transport effects will be managed through appropriate construction management protocols, including:

- Measures to provide for the safety of all road users is maintained throughout construction; for instance, temporary speed limits.
- Identification of detour routes and other methods to provide for the safe management and maintenance of traffic flows, including pedestrians and cyclists, on existing roads;
- Methods to provide ongoing vehicle and pedestrian access to private and adjacent properties; and
- Methods for communicating and timing construction activities to minimise the effects of temporary traffic and access restrictions.

9.2.2 Operational Transport Effects

The assessment of operational effects provided in the transport assessment was completed using a mix of quantitative transport modelling and qualitative assessment measures relating to the following transport functions:

- Walking and cycling
- Public transport
- Road user safety
- Property access
- General traffic.

The positive transport effects as a result of the Project are described in Section 9.1 of this report. The following sub-sections provide a summary of the adverse operational effects with respect to each of these transport functions.

9.2.2.1 Walking and Cycling

The proposed walking and cycling facilities are described in Section 3. While cycling facilities would typically be provided on both sides of the corridor, a two-way cycle facility on the eastern side of Trig Road has been proposed due to the high number of existing vehicle crossings on the western side of the corridor. Once the land is urbanised on the north eastern and western side, it is expected that these properties will be accessed via future collector roads from Trig Road, rather than driveways directly on to Trig Road. Locating the cycleway on the eastern side of Trig Road means that cycle facility users will not have to cross multiple vehicle crossings, reducing the potential for conflict and accidents.

It is noted however, that should the urban context or environment along Trig Road change, there may be a desire to implement typical one way cycle facilities on each side of the corridor. The proposed corridor width would be capable of achieving these reconfigured cycle facilities in the future if required.

The cycle facility will also connect into future intentions for a strategic shared path on the southern side of SH18 and the proposed cycle provisions along Hobsonville Road.

For pedestrians, the proposed corridor provides for a significant increase in the level of service provided to pedestrians crossing Hobsonville Road, compared to the existing environment.

Overall, the Project will create an improved and safer walking and cycling network that encourages and promotes alternative modes of transport. The proposed walking and cycling improvements will integrate with existing networks and the likely future environment.

9.2.2.2 Access

9.2.2.2.1 Driveways

Hobsonville Road is classified as an 'Arterial' corridor under the AUP:OIP and Trig Road is proposed to also have an arterial function although it is not identified as an arterial in the AUP:OIP. Arterial roads classification in the AUP:OIP means that new direct property access is limited by the AUP:OIP.

In terms of existing properties, the overarching design philosophy for the Project has been to maintain driveway access where practicable and minimise impacting land other than where necessary to re-instate driveways.

There are several existing properties where it has been identified that a replacement driveway will not be possible to implement with the Project in place, primarily due to changes to road levels and incursion of the corridor into the front of properties. These properties have been included within the proposed designation boundary.

9.2.2.2.2 Access Movements

As part of the design of the signalised intersections, a raised island has been proposed to separate traffic at the intersection approaches. The provision of the raised island has been provided as a safety measure to prevent crashes between vehicles at the intersection. The implication of the raised islands is that several existing property accesses will no longer be able to turn right and will in effect be a left-in left-out access. This directly impacts the existing property accesses between 72 to 78 Hobsonville Road and 87 to 111 Hobsonville Road.

The ATE provides an evaluation of this change and how the restriction to right-turn movements is likely to affect vehicle access to these properties. This evaluation has concluded that there are sufficient alternative routes within the local transport network to mitigate the restriction on right-turn movements on these properties. The local transport network provides a range of alternative route options (regardless of destination or direction of approach) which work for left-in left-out movements. Accordingly, any additional travel time to complete these manoeuvres are considered to be minimal.

9.2.2.3 General Traffic

9.2.2.3.1 Network Performance

The Project will change the local transport environment, which has the potential to impact network performance through greater travel times.

There is expected to be a minor increase to travel time along Trig Road as a result of a speed reduction from 80km/h to 50km/h resulting from the Project. However, this speed reduction is required to provide an urban arterial transport corridor and safe walking and cycling facilities. Overall, a reduced speed limit over approximately 600 m of corridor may result in an increased travel time of some 10 seconds.

The provision of these signalised intersections along Hobsonville Road will result in delay to vehicles travelling on Hobsonville Road in comparison to the existing intersection arrangements, which provide priority to through movements on Hobsonville Road. However, this delay is considered to be typical of travelling by vehicle in an urban environment and would, therefore, not be unexpected within the context of a rapidly urbanising surrounding area. Moreover, as discussed previously, public transport (i.e. bus services) will be less restricted due to the bus advance lanes, and the dedicated walking and cycling facility improvements will provide enhanced alternatives for travel.

Overall, whilst the signalisation of the intersections on Hobsonville Road may result in some minor delays for private vehicles, this is balanced by increased efficiency for public transport such that the effect on network performance is considered to be negligible.

9.2.2.3.2 Surrounding Network Connections

A collector road network is not provided for by the Project as the alignment and delivery of these will be the responsibility of developers at the time of urbanisation. The design does not preclude these intersections being provided by developers at a later time. Additional land that may be necessary to deliver the intersections for collector roads will be vested by developers at the time of development. The median will also facilitate the opportunity for future pedestrian/cycle crossing points along Trig Road, as urbanisation occurs on both sides of the corridor.

The location of these collector intersections will also need to be integrated with the bus stop locations and pedestrian crossing facilities. The Project does not preclude these facilities being provided at a future stage of design or after construction by other parties.

Overall, while the future collector and local transport network is yet to be determined, the Project design provides sufficient flexibility to enable these connections to be formed as the surrounding land is developed. As such, the Project will have no adverse effects on the future network connectivity.

9.2.3 Summary of Transport Effects

Considering both the positive transport effects in Section 9.1 and the actual and potential adverse transport effects described above, overall, the Project will provide an improved transport environment that includes:

- Improved walking and cycling facilities with increased safety that will provide for the urbanisation of the local walking and cycle catchment.
- Improved public transport efficiency and reliability through the provision of bus priority and sufficient space to accommodate the development of future public transport network.
- Improved road safety through transport design which is better suited for an urban environment.
- Improved network performance through upgraded intersection design and traffic signalling.

To provide these benefits, the construction of the Project will require some temporary and localised disruption to traffic movements and property access. These construction effects can be appropriately managed through the implementation of a CTMP.

Additionally, a small number of properties will require changes to their existing vehicle access. A detailed access assessment will be completed by a suitably qualified traffic engineer and/or transport

planner as part of the Outline Plan of Works to identify appropriate means to mitigate these effects in consultation with the landowners.

Overall, the Project will have positive effects for the local and wider transport network. Any adverse effects will be temporary and localised, such that they will be no more than minor.

9.3 Noise and Vibration Effects

This section identifies and assesses the actual and potential effects of noise and vibration associated with the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade: Assessment of Construction Noise and Vibration* (**ACNV**) and the *Trig Road Corridor Upgrade: Assessment of Traffic Noise and Vibration* (**ATNV**) contained within Volume 4, respectively.

9.3.1 Construction Noise and Vibration Effects

The indicative construction methodology (Section 7) has been assessed for construction noise and vibration against the relevant standards. The proposed designation boundary has been assumed as the construction boundary, and noise predictions were based on reasonable worst-case assumptions which included:

- The majority of noisy works will be carried out between 7am-6pm on weekdays with limited night-time and weekend works for the pavement and surfacing stage when required.
- Equipment and construction activity sound power levels for dominant noise sources were identified.
- Minimum set back distances from receivers were calculated to comply with day-time noise criterion of 70 decibels equivalent continuous sound level (dB LAeq) without mitigation.

The vibration effects associated with construction have been assessed in relation to potential building damage. The effect of vibration on amenity has not been assessed and has only been discussed to the extent that it is relevant to mitigation.

Indicative vibration emission radii distances have been predicted for the most vibratory equipment. Actual vibration levels are highly dependent on local conditions and the selection of machinery, which is currently unknown. To account for inaccuracies, the likely worst-case vibration has been calculated based on the equipment and hard ground geology to provide offset distances.

The predicted results were then assessed against the relevant criteria to determine if there would be any potential construction noise and vibration exceedances for any of the existing receivers along the Project.

9.3.1.1 Construction Noise Effects

The ACNV identifies that the closest properties outside the designation boundary and adjacent to the Project area could experience worst-case noise levels up to 90 decibels equivalent continuous sound level (**dB LA_{eq}**,) with mitigation, which does not comply with the AUP:OIP day-time noise criterion. This has the potential to result in noise disturbance effects (e.g. loss of concentration, annoyance, a reduction in speech intelligibility and reduced productivity) without appropriate mitigation.

Operation of construction equipment will be intermittent in nature. Construction will be linear so as the equipment moves away from the receiver noise levels will reduce. The worst-case situations, where mitigated noise levels could reach 90 dB LAeq at the closest receivers, are not expected to be frequent, due to the setback distances to the majority of the proposed works and the use of equipment with lower source noise levels for large portions of the works. Mitigated noise levels are expected to comply with the 70 dB LAeq daytime noise criterion for most of the construction works.

The ACNV sets out a hierarchy of mitigation measures which will be adopted through a Construction Noise and Vibration Management Plan (CNVMP) and any Schedules produced for the works (refer to section 9.3.1.3 for details). The preparation and implementation of CNVMP and Schedules will be secured through a designation condition.

The ACNV concludes that by following this hierarchy the Best Practicable Option (BPO) for mitigation will be implemented, whilst avoiding undue disruption to the community.

Overall, construction noise will be temporary and construction noise levels can be significantly reduced through the implementation of the hierarchy of mitigation measures. Accordingly, by providing appropriate mitigation and construction management the potential construction noise effects will be no more than minor.

9.3.1.2 Construction Vibration Effects

The ACNV identifies that, in worst case circumstances (without mitigation), 36 existing residential dwellings adjacent to the Project area may experience vibration levels of 5 mm/s or above, exceeding the criteria for residential properties. 5mm/s is the threshold above which cosmetic building damage may occur, such as cracking.

The vibration amenity criteria (vibration levels of 0.3mm/s for night time and 2 mm/s during the day) could be exceeded in existing or future buildings if they are occupied during the works and within 21m of the roller compactor (high vibratory equipment) or within the emission radii identified for the other vibration generating equipment (refer to Volume 4 for details).

In addition to cosmetic building damage, the potential adverse effects associated with excessive vibration may range from annoyance to loss of amenity or inability to carry out work. It is noted the structural damage is not expected. These vibration effects will reduce with distance from the source and the level of vibration transmission into a building will depend on a number of factors, such as the foundation type and building construction. Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration and where there is effective prior engagement.

The ACNV sets out a hierarchy of mitigation measures which will be adopted through a Construction Noise and Vibration Management Plan (CNVMP) and any Schedules produced for the works (refer to section 9.3.1.3 for details). The preparation and implementation of CNVMP and Schedules will be secured through a designation condition.

Additionally, to manage the potential for cosmetic damage to buildings, a building condition survey will be offered to be carried out before and after construction works at properties where predictions indicate the relevant building damage criteria may be exceeded, to determine if any damage has been caused. Any damage confirmed to be caused by the Project will then be repaired.

Overall, construction vibration will be temporary and through the implementation of the hierarchy of mitigation measures, the risk of significant adverse effects associated with excessive construction vibration levels can be avoided. Accordingly, by providing appropriate mitigation and construction management, the potential construction vibration effects will be no more than minor.

9.3.1.3 Construction Noise and Vibration Management Plan

A Construction Noise and Vibration Management Plan (**CNVMP**) is proposed as the most effective way to control noise and vibration impacts. The objective of the CNVMP will be to provide a framework for the development and implementation of best practicable options for the management of construction noise and vibration effects.

The CNVMP will include a comprehensive suite of measures, which are set out in detail in the ACNV in Volume 4 and the proposed designation conditions in Volume 4.

Where noise and/or vibration limits are predicted to be exceeded for a more sustained period or by a large margin, a Site Specific or Activity Specific Construction Noise and Vibration Management Schedules ("Schedule") will be produced. Any Schedule will include details such as:

- Construction activity location, start and finish dates;
- The nearest neighbours to the construction activity;
- The predicted noise and/or vibration level for all receivers where the levels are predicted or measured to exceed the applicable standards and predicted duration of the exceedance;
- The proposed mitigation options that have been selected, and the options that have been discounted as being impracticable and the reasons why;
- The consultation undertaken with owners and occupiers of sites subject to the Schedule, and how consultation has and has not been taken into account; and proposed communications with neighbours.
- Location, times and types of monitoring.

Where measured or predicted vibration from construction exceeds Category A, then there is also a requirement to undertake building condition surveys.

Night works may potentially be required during pavement construction stages. Where there is no practicable alternative, night works can be managed through increasing the frequency of communication with stakeholders, carrying out regular monitoring to ensure criteria are being met and, as a last resort, offering alternative accommodation.

As set out above, where necessary, pre-condition surveys by a suitably qualified engineer will be offered to be undertaken at all buildings where the Project building damage criteria is identified as likely be exceeded. A post-construction condition survey of the same buildings will be conducted when construction is completed, and any damage shown to have been caused by the Project construction rectified by Auckland Transport.

9.3.2 Traffic Noise and Vibration Effects

This section identifies and assesses the actual and potential effects of traffic noise and vibration associated with the Project.

The Assessment of Traffic Noise and Vibration Effects report for Trig Road, in Volume 4, contains predictions of road traffic noise carried out using the method recommended in NZS 6806: Acoustics – Road traffic noise – New and altered roads (NZS 6806) in accordance with the AUP:OIP.

The assessment of effects undertaken in the report is two-fold: in accordance with NZS 6806 and in relation to the predicted noise level changes comparing the future traffic noise levels with and without the extended and / or upgraded transport corridors. The summary below should be read in conjunction with this report.

9.3.2.1 Assessment Methodology

As required by NZS 6806, the assessment methodology included the prediction of existing and future traffic noise levels, both without (Existing and Do Nothing scenarios) and with the proposed transport corridors (Do Minimum scenario). The scenarios are explained below:

- The Existing scenario represents the current road network with current traffic volumes, i.e. the existing environment as it is experienced now
- The Do Nothing scenario represents the current road network with future traffic volumes, assuming a full build out of the area
- The Do Minimum scenario represents the proposed future road network, incorporating the proposed or upgraded transport corridors and other planned transport projects in the area. This scenario assumes a full build out of the area, and the transport infrastructure to enable the development. This is a realistic scenario at a point in time when all proposed designations are operational.

Noise effects of road traffic on existing noise sensitive locations, referred to as Protected Premises and Facilities (PPFs) within NZS 6806, have been assessed. PPFs within a 100m radius of the urban transport corridors have been included.

Where transport corridors are considered ‘Altered Roads’, these have been assessed by comparing the predicted noise levels in the design year without the projects (Do Nothing) with the predicted noise levels in the design year with the projects (Do Minimum).

Transport corridors considered to be ‘New Roads’ have been assessed by comparing the predicted existing noise levels with the Do Minimum predictions.

9.3.2.2 Potential Adverse Traffic Noise and Vibration Effects

Adverse noise effects as a result of high levels of traffic noise may include sleep disturbance, loss of concentration, annoyance, a reduction in speech intelligibility and reduced productivity. The effects are not restricted to PPFs but also future residential and other noise-sensitive developments. The effects on future residential and other noise-sensitive developments are not included in the NZS 6806 definition of PPF. Where new noise sensitive developments are established in the vicinity of a road, their design should take account of the potential noise effects and care should be taken to avoid or minimise the effects.

The magnitude of effects will largely depend on noise levels received in noise-sensitive spaces within buildings, although there are also potential annoyance effects associated with a loss of amenity when high noise levels are received in outdoor living or recreation spaces.

Traffic from new or upgraded roading projects is not generally expected to create any vibration issues. The smooth and even surface typical of new urban roads would likely generate no more than negligible traffic vibration impacts. Therefore, traffic vibration has not been assessed for the transport corridors.

9.3.2.3 Assessment of Adverse Traffic Noise Effects

As identified in the Traffic Noise and Vibration report, the use of a low noise road surface was found to provide the best practicable solution in terms of traffic noise reduction and is the mitigation option recommended. Following implementation of the recommended mitigation measures outlined in Section 9.3.2.4, the Category A criteria will be achieved at 104 out of 106 PPFs, with the remaining two PPFs achieving the Category B criteria. There are no PPFs which are predicted to receive noise levels in Category C.

For 2 PFFs, noise levels are predicted to increase by a perceptible amount (3-4dB). This is as a result of the known demolition of dwellings which would otherwise provide screening from the road, resulting in a slight adverse effect. Noise barriers were investigated but not considered practical due to the gap that would be required to maintain access to the properties, compromising the performance of the barriers.

All predictions are based on traffic flow along 'Altered Roads' at the design year (2048). These traffic volumes are predicated based on the anticipated urbanisation of the area and implementation of surrounding infrastructure projects. Development of the surrounding areas will likely increase activity and associated noise levels. Therefore, any changes predicted for the traffic noise effects related to these projects are not likely to represent such a significant change at the time of construction due to the change in environment.

The results of the noise assessment will be confirmed at detailed design stage including confirmation of the road traffic noise at current PPFs. The review, confirmation and refinement of the BPO shall aim to achieve the same noise criteria categories as determined with the current BPO.

Nevertheless, the predictions show that most PPFs (with the exception of two Category B PPFs) will receive levels within the Category A criterion, which is the most stringent Category and represents the lowest design noise levels. Therefore, resulting noise levels will be reasonable in a residential context at the majority of PPFs assessed and no further noise mitigation is deemed necessary at this stage.

9.3.2.4 Recommended measures to avoid, remedy or mitigate potential adverse effects

There are broadly three mitigation options that can be applied to manage road traffic noise, and are discussed in NZS6806:

- The choice of road surface material, a mitigation option that reduces noise at the source. Road surface material has the largest influence on the generation of road traffic noise.
- The installation of noise barriers either on the roadside or on the property boundary.
- Building Modification measures (e.g., mechanical ventilation to enable windows and doors to remain closed, or upgrade or replacement of windows, wall linings, floors and ceiling linings.

NZS 6806 states:

> *The noise criteria are intended to address the adverse effects of road-traffic noise on people. Land-use planning is the preferred method of avoiding these effects. Where this is impracticable, the Standard sets out procedures and methods of the prediction, measurement and assessment, and guidelines for mitigation of road-traffic noise in accordance with the duty to adopt the best practicable option.*[8]

This indicates that NZS6806 deals with the residual noise effects after land-use planning has been implemented (or where it has been omitted in the planning stage).

Generally, mitigation is implemented from source to receiver. This means that the road surface is the first choice of mitigation measure as it protects the largest extent of receivers. Second are barriers placed either on the road edge or the property boundary. Barriers protect the area behind them, so are not suitable to shield upper floors of multi storey buildings, however, they are suitable to protect ground floors and outdoor living areas where these are facing a road. Barriers may also not be appropriate in suburban and urban environments for urban design reasons – this would be considered when the BPO is confirmed. Lastly, building modification can be implemented to existing PPFs where these are not sufficiently designed to reduce internal noise levels. Building modification is the last choice as it only protects individual living areas and has no benefit to the wider community.

Where future developments are not yet implemented, the road controlling authorities and developers have a shared responsibility to implement reasonable and appropriate mitigation.

Application of AC-14 or equivalent low noise road surface has been recommended for the entire length of the project. No additional mitigation measures are required.

9.3.2.5 Summary of Traffic Noise and Vibration Effects

With implemented mitigation measures, predicted traffic noise levels during operation of the Project are generally expected to meet the most stringent noise criteria (with two exceptions).

Two PPFs are predicted to experience perceptible noise level increase due to the known demolition of several dwellings which would otherwise provide acoustic shieldings. However, ambient noise levels in the area will likely increase as the area urbanises and therefore the change in noise level due to the Project will likely not be as noticeable at the time. Noise barriers were investigated but not considered practical due to the gap that would be required to maintain access to the properties compromising the performance of the barriers.

9.4 Archaeology and Heritage Effects

This section provides an assessment of the actual and potential effects on archaeology and heritage that will result from the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade: Assessment of Historic Heritage Effects* (**AHHE**) contained within Volume 4.

It is noted that the AHHE was finalised in 2020 prior to the NOR and Regional consents being placed on hold. The general premise of this assessment is still correct, with only very minor changes made to the alignment since 2020 (notably the stormwater pond has been relocated due to the presence of a wetland). We do not consider this has any significant effect based on the findings of the AHHE.

The AHHE has been prepared based on review of the following sources to determine whether any archaeological or other historic heritage sites have been recorded on or in the immediate vicinity of the Project area:

- The New Zealand Archaeological Association's site record database;
- Auckland Council's Cultural Heritage Inventory;
- AUP:OIP schedules;
- Heritage New Zealand Pouhere Taonga New Zealand Heritage List/Rārangi Kōrero; and
- Literature and archaeological reports relevant to the area.

This was supplemented with a visual inspection of the Project area.

The AHHE concludes that there are no archaeological sites or historic heritage sites recorded within or in close proximity to the Project area, and the nearest sites (mainly shell midden relating to Māori occupation) are over 1.5km to the west along the coast and approximately 1km to the south along the Manutewhau inlet and stream. As such, the construction and operation of the Project will have no effects on any known archaeological or other historic heritage values.

In any area where archaeological sites have been recorded in the general vicinity, it is possible that unrecorded subsurface remains may be exposed during development. However, it is considered unlikely in this situation, as the Project area is located some distance from both the coast and navigable waterways where Māori and early European archaeological sites tend to be concentrated. The Project also follows existing road alignments, and most of the Project area has been modified by roading and urban development.

To mitigate the very limited potential for unidentified archaeological remains to be exposed during construction, an ADR advice note has been included with the designation conditions for the Project.

Overall the Project is unlikely to have effects on any known archaeological or other historic heritage values.

9.5 Cultural Effects

Manawhenua have been partners throughout the development of the Programme, with Ngāti Whātua o Kaipara and Te Kawerau ā Maki the predominant iwi groups with an interest in the area.

Manawhenua involvement in the Programme has included options assessment, design refinement and effects assessment for the Project. Engagement with these iwi groups has included site walkovers to identify and address any culturally significant effects. Further detail on the engagement and consultation with Manawhenua is provided in Section 11.2.3.

While the Project area is not subject to any identified Sites of Significance to Manawhenua under the AUP:OIP, Ngāti Whātua o Kaipara and Te Kawerau ā Maki have produced Cultural Impact Assessments (**CIA**) for the Project.

9.5.1 Ngāti Whātua o Kaipara

In the CIA, Ngāti Whātua o Kaipara raised matters including:

- Road design
- Vegetation removal

- Potential to enhance ecology and environment
- Effects of site works
- Potential to uncover archaeological or heritage items
- The proposed design and conditions of the designation includes appropriate measures to control the effects of site works, appropriate road design, avoidance of vegetation remove where possible, and ongoing consultation with manawhenua.

9.5.2 Te Kawerau ā Maki

Te Kawerau ā Maki are associated with the area within which the North West Preferred Transport Network (refer Figure 2) is located. The CIA prepared by Te Kawerau ā Maki addresses the entirety of the North West Preferred Transport Network. This includes the Trig Road Corridor Upgrade Project.

The following is a summary of the key matters raised by Te Kawerau ā Maki, in respect to the Project:

The future transport network

- Te Kawerau ā Maki do not oppose the Project.
- The CIA notes the potential positive operational benefits of the Project through walking and cycling provision and opportunity for cultural design and place making.

Impacts on streams and ecology

- The CIA identifies impacts on Te Waiarohia ō Ngariki (Waiarohia Stream), including effects arising from earthworks in proximity to the awa, works within the awa to install new culverts, permanent fill batter slopes adjacent to the awa and an increase in impervious surface.
- Impacts on Wai Māori (fresh water) are identified, including effects arising from earthworks within proximity to watercourses and vegetation clearance along watercourse embankments.
- Te Kawerau ā Maki identified in the CIA that the stormwater management approach proposed as having minor beneficial effect.

Impacts on whenua (soils)

- The CIA raises the impact of bulk earthworks associated with the Project.

9.5.3 Recommended measures to avoid, remedy or mitigate potential adverse effects

A suite of measures is proposed to avoid, remedy and mitigate cultural effects arising from the Project, and will be secured through consent and designation conditions. These are summarised below.

General

- Te Tupu Ngātahi will continue to engage with manawhenua to further understand the cultural effects that may result from the construction and operation of the Project.
- Manawhenua will be invited to prepare a Cultural Advisory Report in advance of the detailed design. The purpose of the report is to assist in understanding and identifying treasures affected by the project and inform their management and protection.

Cultural design and expression

- Manawhenua will be invited to participate in the development of the ULDMP to input into relevant cultural landscape and design matters on each corridor. This includes the management of potential effects on cultural sites, landscapes and values.

Risk of archaeological discovery

- A Cultural Monitoring Plan will be prepared prior to the start of construction works or enabling works. These plans will be prepared in collaboration with manawhenua to ensure that effects are managed appropriately, including features discovered by accident.
- Accidental discovery protocols set out under the AUP:OIP Accidental Discovery Rule (E12.6.1) will be adhered to. An advice note is proposed to this effect.

Earthworks, erosion and sediment deposition

- A CEMP will be prepared, setting out the overarching management procedures and construction methods to be undertaken to, avoid, remedy or mitigate any adverse effects associated with construction works.
- A finalised Erosion and Sediment Control Plan will be prepared and implemented to ensure appropriate construction methodologies and staging is used, land disturbance and vegetation removal is minimised, watercourses are protected, potential pollutants and debris/construction materials are controlled, outfalls are located to minimise erosion and scour, earthworked areas are stabilsed and retention devices are used to allow settlement of suspended solids/sediment laden runoff.

Wetland enhancement

- Wetland enhancement/planting is proposed to offset the wetland reclamation required to upgrade the road corridor, and will achieve a slight net gain in wetland value and extent. A Wetland Restoration and Enhancement Plan (**WREP**) will be finalised and implemented, requiring enhancement planting, protection in perpetuity and a maintenance plan ensuring ongoing pest control for five years.

9.5.4 Summary of Cultural Effects

Manawhenua have been partners through the development of the Project and their values have been reflected through the decision-making process and implementation of key mitigation protocols. While the Project will not affect any identified Sites of Significance to Manawhenua under the AUP:OIP, there is the potential for impacts on cultural values to the natural environment and cultural landscape context, identified through direct engagement with manawhenua.

Provision for cultural input and engagement will be enabled through the ULDMP and monitoring plans to manage adverse effects on cultural heritage and the potential for new archaeological discovery. The ULDMP will also consider how corridor features integrate with the corridor as a whole, including any proposed mitigation, and how the transport corridors can contribute to or reduce effects on the relevant cultural landscape.

9.6 Landscape and Visual Effects

This section provides an assessment of the actual and potential landscape and visual effects that will result from the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade – Assessment of Landscape and Visual Effects* (**ALVE**) contained within Volume 4.

It is noted that the ALVE was finalised in 2020 prior to the NOR and Regional consents being placed on hold. The general premise of this assessment is still correct, with only very minor changes made to the alignment since 2020 (notably the stormwater pond has been relocated due to the presence of a wetland). It is recognised that the receiving environment of the ALVE is based on PPC5, which has subsequently been withdrawn. We do not consider this has any significant effect based on the findings of the ALVE as it is still representative of the aspirations of the Whenuapai Structure Plan, and intensification is provided for in the current zonings of the AUP:OIP and PC78.

9.6.1 Construction Landscape and Visual Effects

As outlined in Section 5.3.1, whilst it is likely that construction of the Project will take place in the existing (mostly rural) environment, it will be when the area is transitioning into an urban environment. Within this context, the following changes need to be considered when considering construction related landscape and visual effects:

- Physical changes to the landscape during construction as a result of construction activities, such as earthworks, vegetation removal, and site clearance; and
- Temporary changes to visual amenity as a result of construction activities, such as construction laydown areas and machinery.

These changes to the landscape environment have the potential to result in temporary adverse landscape and visual effects during construction, particularly when viewed from properties that are immediately adjacent to the Project. However, through the implementation of appropriate mitigation and design considerations, the potential adverse effects can be minimised, and the level of effect will diminish over time following completion of the Project. These mitigation and design considerations include:

- Cut and fill slopes are proposed to be shaped to a natural slope to integrate with the surrounding landform and reinstated with appropriate landscaping.
- Localised planting is proposed to mitigate physical landscape effects and to assist with integrating the larger fill slopes further into adjacent landscape and ecological mitigation measures along Trig Road.
- Existing fences and garden plantings (removed through the Project works) are proposed to be reinstated.
- Integrate of any retaining walls or noise mitigation walls with private boundary fencing (i.e., to avoid double layering of noise walls and boundary fences). It is also proposed that retaining walls and/or noise walls incorporate any reinstatement planting required to replace vegetation that may be lost through the Project works.
- Reinstatement of the Project area following the completion of construction, including the removal of residual fill and gravel from construction laydown areas and reinstatement with grass and landscaping.

Overall, there may be minor adverse effects on visual amenity during construction. However, these effects will be temporary and largely confined to the period of construction. These temporary effects are typical for a corridor upgrade project and when considered within the context of a landscape which is likely to be changing at the time of the construction of the Project, are further mitigated.

9.6.2 Operational Landscape and Visual Effects

As outlined in Section 5.3.1, operation of the Project is likely to take place in an urban landscape. As such, operational related landscape and visual effects need to be considered within this context.

The Project will result in longer-term changes to the landscape context of the Project area, which have the potential to result in adverse effects to the landscape character, natural character and visual amenity of the area. These changes include:

- Re-profiling of the existing road surface and adjacent land resulting in changes to surface levels;
- Clearance and/or disturbance of vegetation and landscaping along the corridor and adjacent land; and
- Removal and/or modification of existing structures along parts of the Project area and introduction of new structures such as noise mitigation walls and retaining walls.

The Project area is considered to have low sensitivity to the type and extent of landscape and visual change proposed through the Project, as:

- The Project utilises existing infrastructure and there is no significant change in land use;
- Existing land cover is of low botanical value;
- The AUP:OIP indicates future urban development adjacent to the Project area; and
- There are no regionally or nationally significant landscapes identified with the AUP:OIP within or proximate to the Project area.

The localised effects on the landscape values of the Project area can be managed through the proposed mitigation measures:

- All cut and fill slopes will be shaped to a natural profile to integrate into the surrounding natural landform and reinstate with grass, where practicable.
- Stormwater features will be configured to a natural appearance with appropriate vegetation and integrated into the surrounding urban landscape context, so that any physical landscape effects are ameliorated.
- Retaining walls and noise mitigation walls will be designed to integrate with private boundary fencing and where practicable incorporate existing and reinstatement planting.
- Residual land parcels acquired through the Project should be grassed and maintained within the road corridor.
- Street tree planting will be provided along Trig Road and Hobsonville Road, which along with indigenous planting within the stormwater features will assist with moderating the shift from rural to urban landscape character.

FUZ development areas on adjacent land will, over time, substantially change the scale and character of the adjacent landscape as experienced from within the road and absorb the landscape and visual changes proposed within the Project area. As such, the Project will contribute to an improvement of the landscape values for the future urban context of the area.

9.6.3 Summary of Landscape and Visual Effects

The Project will result in some temporary adverse effects to landscape and visual amenity in the Project area. However, these effects will be localised, of a relatively short period and can be appropriately managed.

The existing landscape character and amenity values of the Project area are currently low and are likely to be enhanced over time as a result of the Project. Overall, when considered within the context of a landscape which is likely to undergo substantial changes as the area transitions into an urban environment, the Project will result in a net improvement to the existing landscape environment which is better suited to the future urban context of the area.

9.7 Ecological Effects

This section provides an assessment of the actual and potential ecological effects that will result from the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade – Assessment of Ecological Effects* (**AEcE**) contained within Volume 4.

9.7.1 Ecological Baseline

The AEcE included a range of ecological surveys to identify habitat value and ecological features within the Project area. A summary of these findings is provided in Table 14.

Table 14: Value of Ecological Features within the Project Area

Ecological feature – habitat or species	Ecological value	Justification
Terrestrial habitats	Low	Mainly exotic habitats. However, there is planted native vegetation including 'Threatened; and 'At-Risk' Myrtaceae species. These threatened species are planted, immature/semi-mature and are currently widespread in the Ecological District; therefore, their presence has not elevated the value of the habitats.
Wetlands	Low to Moderate	All the wetlands potentially affected are largely modified, with low to moderate ecological value and probably reflect a moderate representation of similar wetland features within the Waiarohia catchment. Likely, residual functions associated with wetlands in and adjacent to the Project area include erosion control and water purification.
Bats	Low	Bat surveys did not identify the presence of bats. Linkages to habitats where bats are known to be present are limited and the habitat in the Project area for bats is considered suboptimal (limited foraging and roosting habitat).
Birds	Low	Habitat dominated by exotic plant species. It is considered that only non-threatened native bird species would regularly use the habitats on or adjacent to the Project area.
Lizards	Low	Exotic scrub and long grass areas of habitat that are potentially suitable for 'Not Threatened' copper skink; although these species were not observed during site inspections.

Fish	Low	There is a low potential for indigenous eel species to be present given low water levels within wetlands 1 and 2 which would affect the presence of fish.

9.7.2 Construction Effects

9.7.2.1 Aquatic Ecology (Streams and Wetlands)

The location of the Project has been determined by balancing a number of factors, including environmental features (including wetland), road operational requirements, other existing and proposed infrastructure, etc. This is further described in Appendix A: Alternatives Assessment and Section 13.2.5 of this AEE which demonstrate a functional need for locating in this area. Despite efforts to avoid streams and wetlands, seven wetlands are potentially affected by the Project - five within the Project Area (TR-W1, TR-W2, TR-W3, TR-W4, and TR-W5) and two directly adjacent (TR-W6 and TR-W7). All seven wetland areas have been classified as NPS:FM natural wetlands because they do not meet the NPS:FM exclusions.

As identified in the ecological baseline, all the wetlands identified are dominated by exotic species, are subject to grazing and pugging and have largely modified conditions.

Table 7.18 of the AEcE, identifies the magnitude of effects on each of the streams and wetlands. In summary, the Project will result in direct effects of:

- Permanent loss of approximately 0.1ha (1000m2) of a 0.37ha (3700m2) hydrogeomorphic unit of a natural wetland (TR-W1)
- Permanent loss of approximately 0.078ha (780m2) of a 0.28ha (2800m2) hydrogeomorphic unit of a natural wetland (TR-W4)

The potential level of effect (without impact management) is considered to be low to moderate.

The loss of wetland habitat at TR-W1 and TR-W4 cannot be mitigated at the point of impact, therefore offset is required. The proposed location for this offset is within the downslope areas of the remaining portions of wetland habitat associated with both wetlands (TR-W1 and TR-W4). The area of wetland enhancement/planting has been calculated to ensure no net loss in ecological value is achieved. A Wetland Offset/Compensation Restoration Plan has been prepared, with initial calculations showing that restoration of 2,700 m^2 (TR-W1) and 1,000 m^2 (TR-W4) is required to provide a no net loss. The proposed designation provides sufficient room for this offset to be finalised at the detailed design stage.

A Wetland Restoration and Enhancement Plan (**WREP**) will be finalised prior to construction (as per draft resource consent conditions in Appendix F). The WREP will include confirmation of offset mitigation, protection in perpetuity and a maintenance plan ensuring ongoing pest control for five years. The proposed wetland offset will achieve a slight net gain in wetland value and extent – meeting the requirements of the NES:FW and AUP:OIP.

9.7.2.2 Terrestrial Ecology

The terrestrial vegetation within the Project site is Negligible to Low ecological value. There are no construction effects for terrestrial ecology where the level of effect was assessed to be Moderate or higher, however habitat is provided to native fauna including:

- Long-tailed bats (Very High ecological value)
- Non-TAR native birds (Low ecological value)
- North Island fernbird (High ecological value)
- Copper skink (High ecological value)

In accordance with the Environment Institute of Australia and New Zealand (EIANZ) guidelines, impact management measures (i.e., mitigation) are only proposed for those effects that have been assessed as moderate and above, therefore no mitigation is required for construction effects on terrestrial ecology.

9.7.3 Operational Effects

With consideration of the ecological baseline (Table 14), the operation of the Project has the potential to result in direct and indirect impacts on ecological features present in the Project area.

Direct adverse impacts from operational effects of the Project may include:

Vegetation removal creating a loss of connectivity.

Indirect adverse operational effects of the Project may include:

- 'Edge effects', creating increased alien and invasive plants within planted areas adjacent to the road that have been subject to vegetation removal.
- An increase in noise, light and vibration from operation of the upgraded road – resulting in disturbance and displacement of indigenous fauna.
- Modification of hydrological flow paths required for the maintenance of downslope wetland habitat for Wetland 1 and 2.
- Reduction in water quality via stormwater discharges from the release of contaminants (i.e., heavy metal and fine sediments) through the operation of the road.

When considering the Project within the context of the future urban receiving environment, the AEcE concludes that the potential operational effects on ecology are "low".

The operation of the road is not considered to present any noticeable change to the existing environment in regard to disturbance/displacement of native fauna. Overall, the magnitude of operational disturbance effects on resident fauna populations were assessed in the AEcE to be low due to the current presence of the road. In accordance with the EIANZ guidelines, no mitigation is proposed.

Through the construction of appropriate stormwater management devices to remove fine sediment and other contaminants (outlined in Section 9.9), operational effects on stream quality can be appropriately avoided.

Overall the operational effects on ecology are considered to be less than minor.

9.8 Property, Land Use and Business Effects

The Project design philosophy has been to avoid and minimise potential adverse effects on private properties and businesses through alignment and project design, where this is practicable. This has included specific consideration of the potential property and business impacts in the assessment of alternatives as discussed in Section 8 and detailed in Appendix A.

Where impacts on property, land use and businesses cannot be avoided, the potential effects are categorised into two broad groups:

- Directly affected properties/landowners; and
- Properties and businesses affected by proximity to the Project.

An assessment of these potential property, land use and business disruption effects is provided in the following sub-sections.

9.8.1 Directly Affected Properties

The proposed designation requires land to provide a sufficient footprint to enable the construction and operation of the Project (Designation Drawings are provided in Volume 3). Based on the proposed designation footprint, 66 private properties will be directly affected.

A description of existing land uses of the properties directly affected by the proposed designation is provided in Section 5.1. In summary:

- The land use immediately surrounding the Project area is characterised by a combination of residential, lifestyle block and rural properties.
- The south-western section of Trig Road is currently residential with predominantly single detached housing on larger (quarter acre) sections.
- Land use along Hobsonville Road is generally more urban, characterised by predominantly single detached housing development along the southern side of Hobsonville Road and northern side of Hobsonville Road west of Trig Road. There are also pockets of commercial and retail development along Hobsonville Road.

The potential pre-construction, construction and post construction effects on directly affected properties is discussed in the following sub-sections.

9.8.2 Pre-Construction

The proposed designation has a lapse duration of 15 years which is the standard lapse period for a designation under section 184 of the RMA. The proposed designation will not preclude the continued (unchanged) use of any directly affected properties prior to construction. However, in accordance with section 176 of the RMA, written consent would be required from AT for any works that would “prevent or hinder” the Project, including:

- Undertaking any use of the land;
- Subdividing the land; and
- Changing the character, intensity, or scale of the use of the land.

The purpose of the Project is to support for planned urban residential growth in Whenuapai. As outlined in Section 5.2, the Project area is largely rural in character and current FUZ zoning under the AUP:OIP indicates a high likelihood of change in the Project area from rural to urban land use. As outlined in Section 5.3, the Project is likely to be constructed within a transitional environment and will be operated within an urban or rapidly urbanising environment. As such, the Project is unlikely to affect the current land use of the Project area until such a time that the area starts to develop which would be concurrent with the construction of the Project. At this point potential land development issues would be addressed through the construction and operation of the Project (further discussed in Sections 9.8.3 and 9.8.4).

The areas of the Project along the south-western area of Trig Road and Hobsonville Road are expected to have a lesser scale of development change as this area is an existing residential environment - albeit that the area is generally zoned MHU under the AUP:OIP which allows for higher density development than that existing. As discussed, development is not precluded within the designation area, however any development within the designation area will require approval pursuant to section 176 of the RMA. As outlined in Section 11, AT has actively sought to engage with developers through the Project development process to address development plans and adapt where practicable to enable development in and around the Project corridor. AT will continue this process once the designation is confirmed, using section 176 of the RMA as the mechanism for approval with particular regard to the compatibility and viability of construction, flexibility of the Project design and where possible avoiding effects on reasonable future changes to land use which do not prevent or hinder the Project.

Considering these effects, the pre-construction of the Project will have no more than minor effects on property, land use and business.

9.8.3 Construction

During construction the Project will temporarily require land to enable construction activities (detailed in Section 7). The Project area adjacent to Trig Road is identified as a combination of residential, rural, pastoral and agricultural land uses, while along the south-western portion of Trig Road and Hobsonville Road the land is predominantly residential. Potential effects from temporary land requirements include temporary loss of grazing pasture, fencing, disruption to access, changes to driveway gradient, loss of vegetation and temporarily affected amenity.

It is proposed that the designation will be drawn back to the operational boundary once construction is complete. Effects from temporary land requirement can be mitigated through site specific arrangements which will be developed with the individual landowners through the Public Works Act processes.

Potential adverse effects from construction activities are addressed throughout Section 9 with appropriate mitigation identified to avoid or minimise effects on properties in proximity to the works. Particular mitigation measures for residential property and business disruption during construction include:

- Implementation of a CTMP to manage construction traffic and disruption to the local transport network (Section 9.2.1), including methods to:
    - Maintain vehicle access to property and/or private roads where practicable, or to provide alternative access arrangements when it will not be; and
    - Communicate traffic management measures to affected parties.
- Implementation of a CNVMS and CNVMP to manage construction noise and vibration effects on sensitive receivers (Section 9.3.1.3), including methods to:
    - Communicate and engage with nearby residents and stakeholders; and
    - Minimise construction disruption for affected properties during construction.
- Implementation of a Stakeholder and Communication and Engagement Management Plan to identify how the public and stakeholders will be communicated with throughout construction, including methods to:

- Determine adequate notice periods for the commencement of construction activities and works that affect access to properties;
- Inform parties of the expected timing, duration and staging of works and regular updating of progress; and
- Provide feedback, inquires and complaints during the construction process.

These measures will appropriately minimise disruption to affected properties and allow the continued use of properties where possible. Potential effects will be temporary and therefore it is considered that they will be less than minor.

9.8.4 Post Construction

The Project will permanently require land which is required for the finished Project (permanent transport corridor). The individual land requirements will vary between properties. The primary effect is loss of productive and residential land which will be mitigated through the Public Works Act process.

Any residual land (land not permanently required) will be reinstated in coordination with landowners through the temporary land acquisition process. The finished form of the corridor and viability of land adjacent to the road corridor will be evaluated based on the principles of the ULDMP. The purpose of this document is to:

> *"Enable integration of the Project's permanent works into the surrounding landscape and urban context; and*
>
> *Ensure that the completed Project mitigates potential adverse landscape and visual effects as far as practicable and contributes to a quality urban environment."*

The ULDMP requires the consideration of the future land use context as this relates to the Project corridor and seeks to ensure a suitable urban outcome for the area. Key considerations include:

Design to integrate with the adjacent urban (or proposed urban) landscape context, including the surrounding existing or proposed topography, urban environment and landscape character.

Integration of batters and cut/fill slopes in the landscape, measures may include:

- Grading cut and fill slopes to integrate with the surrounding landform.
- Minimising encroachment into water bodies and indigenous vegetation.
- Planting batters that coincide with wetland and stream courses.

The ULDMP is anticipated to be further developed in coordination with adjacent development where this is practical. In this way the ULDMP will ensure that the Project appropriately integrates with future land uses which are directly adjacent to the corridor and avoids, where possible, the potential to create residual land as a result of the Project. It is therefore considered that the effects of land requirement will be no more than minor on these landowners.

9.8.5 Properties Impacted by Proximity

Aside from the properties which will be directly affected by the designation, there is the potential that other properties outside the designation footprint could be affected by the Project as a result of their proximity to the construction activities.

Potential adverse effects from construction activities are addressed throughout Section 9 with appropriate mitigation identified to avoid or minimise effects on properties in proximity to the works. The particular mitigation measures for directly affected properties during construction, which are described in Section 9.8.3, are also applicable to properties impacted by proximity.

The potential adverse effects to properties and businesses in proximity to the Project area would be temporary and through the implementation of appropriate construction management, can be avoided or minimised, such that they are no more than minor.

9.9 Stormwater and Flooding Effects

This section provides an assessment of the actual and potential stormwater and flooding effects that will result from the operation and maintenance of the Project. The assessment is informed by the ASE contained within Volume 4. The assessment of construction effects on stormwater are provided in Section 9.10. As outlined in section 4.5, all necessary regional consents are sought for the operation of the Project. Discussions with Auckland Council's Healthy Waters Unit indicate that the proposed stormwater discharge can be authorised under the Regionwide Network Discharge Consent (NDC). However, for completeness, the ASE addresses all potential resource consent requirement in the event that discharge under the Regionwide NDC is not possible.

9.9.1 Flooding Risk

Potential flooding effects will be appropriately managed and are expected to result in negligible up to minor effects subject to the following recommended design outcomes, which will be secured by a designation condition:

- No increase in flood levels for existing authorised habitable floors that are already subject to flooding
- No more than a 10% reduction in freeboard for existing authorised habitable floors
- No increase of more than 50mm in flood level on land zoned for urban or future urban development where there is no existing habitable dwelling
- No new flood prone areas
- No more than a 10% average increase of flood hazard (defined as flow depth times velocity) for main access to authorised habitable dwellings existing at the time the Outline Plan is submitted.

9.9.2 Stormwater

The proposed stormwater dry pond will be utilised to provide on-site attenuation to control peak flows and discharge of runoff in the post-development receiving environment to a maximum that matches pre-development runoff.

Damage to properties and other infrastructure will be avoided by the collection and conveyance of runoff within the road and via underground pipe systems, and by allowing sufficient capacity in pipe crossings for effectively draining upstream catchments for future 'maximum probable development'.

The on-site attenuation ponds and proposed outfall structures provide for stream protection from increased stormwater flow, stream protection by energy dissipation at outfall to minimise scouring and erosion, and controlled discharge into the stream during large storm events to prevent downstream flooding.

The stormwater design approach, elements/infrastructure and concept network layout have been developed to satisfy the regulatory standards. While subject to refinement in detailed design stage the indicative design demonstrates the stormwater needs of the Project can be met, whilst catering to both current land use and for the expected future development upstream and downstream of the Project area.

The total redeveloped site area equates to 31,245m², with the percent of imperviousness increase from 47% in pre-development condition to 73% in post-development condition. The 22,680m² post-development impervious area equates to >50% of the total catchment area and dictates the method for runoff volume calculations as per the GD01.

Due to new impervious areas, this has the potential to result in adverse water quality effects in the mobilisation of contaminants within the runoff that accumulates in impervious areas, particularly with an increase in hydrocarbons, heavy metals, exhaust particles generated by vehicle use within the new transport corridor.

The following mitigation and management measures have been provided for in the indicative stormwater design:

- Water treatment has been designed and selected with consideration of GD01
- Raingardens were selected for “at source” treatment within the berms along the carriageway as well as “end of pipe” treatment in larger raingardens, and meet equivalent treatment requirements as per GD01
- The Project’s stormwater design has been developed with consideration of GD01.

The proposed measures will effectively deal with water quality volumes from the high contaminant generating roads, removing contaminants from runoff prior to their discharge into the environment. This is also consistent with BPO for water sensitive design.

The stormwater design approach, elements/infrastructure and concept network layout have been developed to satisfy the requirements of GD01 and water sensitive design approach. While subject to refinement in detailed design stage the indicative design demonstrates that the adverse effects of the Project on stormwater quality will be less than minor.

9.10 Earthworks, Erosion and Sediment Deposition

This section provides an assessment of the actual and potential earthworks, erosion and sediment deposition effects that will result from the construction and operation of the Project. The assessment is informed by the draft ESCP contained within Volume 4. As identified in Section 4, the proposed earthworks are a matter for both NOR and Resource consent consideration.

As described in Section 7.4.2, a significant volume of earthworks is anticipated to enable the widening of Trig Road and construction of permanent stormwater devices. Section 7.4.2 details the

approximate area and volume of earthworks required. The final amounts of earthworks will be confirmed at detailed design phase.

Erosion and the associated effects of sediment deposition have the potential to cause both physical and ecological disturbance within a watercourse/stream, and control measures (both during construction and within the design of permanent structures) need to be considered.

The key objectives of erosion and sediment control for the project are:

- Construction methodology and staging of work
  Selection and implementation of appropriate construction methods to facilitate staged construction works. This allows for more manageable ESC measures by confining works to smaller sections, making it easier to monitor and maintain, particularly when multiple measures are in place. Staging also means that the areas of exposed soils during earthworks is minimised or limited to only the specific area where works are taking place, minimising erosion of loose soils by wind and runoff, and facilitating dust management. Staging earthworks allows for progressive stabilisation during the construction period.
- Minimising disturbance
  Minimising disturbance by keeping earthworks and area of works to a minimum during operations, ensuring stability of surrounding slopes and structural integrity of nearby infrastructure is maintained. This is applicable to both vegetation removal, earthworks required to carry out cut/fill operations and works within existing watercourses during stormwater crossing upgrades.
- Protection of existing watercourses
  Diversion of clean water away from areas of disturbance and diversion of sediment laden runoff from disturbed areas/exposed soils during earthworks to prevent sediment laden runoff discharging into watercourses and adversely affecting downstream stream health (both ecological and physical).
- Pollutants and debris/construction materials should also be carefully controlled so that these are not deposited within the bed, with the potential to be conveyed downstream along with sediment.
- Minimising earthworks and vegetation removal around and within watercourses to reduce the exposure of soils, and consequential erosion potential from scouring or wind during stormwater crossing upgrades.
- Protection of receiving streams is also applicable for the permanent structures. Outfalls will be designed to ensure stormwater discharges have minimal erosion and scouring impacts.
- Protection and stabilisation of embankments
  Protection of steep embankments by means of clean water diversion, contour channels along embankments, and progressive rapid stabilisation with the application of temporary straw mulch, geotextiles or similar, and hydro-seeding/grassing for permanent measure.
- Protection of existing watercourse embankments by limiting vegetation removal and earthworks during stormwater crossing upgrades.
- Retention devices to allow for settlement of suspended solids/sediment laden runoff
  Allow for sediment laden runoff to be detained and treated to facilitate the settlement of solids prior to discharging back into downstream watercourses.
- Monitoring and maintenance
  ESC measures should be monitored and maintain throughout the construction works so that they remain operational and fit for purpose and modified accordingly to suit changes on site.

The draft ESCP indicates the measures that can be used to achieve these objectives. It includes an indicative Erosion and Sediment Control Plan Layout, providing measures for each construction zone. All measures will comply with GD05 and will be confirmed in a final ESCP once detailed design has been completed.

The topography is mostly flat to rolling landscapes, with localised areas of steepness, and can be appropriately treated by the measures. Specific measures are proposed to ensure discharges are treated prior to entering watercourses. As identified in the AEcE, all works within the wetlands and watercourses can be done offline.

The proposed earthworks are of a scale that is typical for a transport corridor upgrade in a greenfield area and can be appropriately managed by the measures outlined above and detailed in the draft ESCP. As such, the Project is expected to generate less than minor effects from earthworks.

9.11 Contamination

This section provides an assessment of the actual and potential contamination effects that will result from the construction, operation and maintenance of the Project. The assessment is informed by the *Trig Road Corridor Upgrade: Preliminary Site Investigation* (**PSI**) contained within Volume 4. As identified in Section 4.5, resource consent is being sought in accordance with the NES: Soil.

The PSI identified numerous activities classified in the Hazardous Industries and Activities List (**HAIL**) that have historically occurred or are currently being undertaken on properties adjacent to the Project area. It states that while the human and environmental risk profile associated with soil contamination of properties in the Project area is likely to be limited, soil materials scheduled for disturbance as part of the Project may have been impacted by a range of contaminants of concern associated with the storage or use of hazardous materials or disposal of hazardous wastes at the adjacent properties.

The activities that are particularly relevant to the assessment of effects include:

- Commercial nurseries and glass houses;
- Potential horticultural activities (such as orchards, glass houses and market gardens);
- Transformers outside of properties and adjacent to road corridor; and
- A Vector substation.

The presence of these activities, means that soil materials scheduled for disturbance as part of this Project may have been impacted by a range of contaminants of concern, including:

- Heavy metals;
- Acid herbicides;
- Organophosphates;
- Organochlorine pesticides;
- Polychlorinated biphenyls;
- Hydrocarbons; and
- Asbestos containing materials.

The PSI recommends that a DSI be prepared to quantify the nature and extent of actual soil contaminant conditions within the Project area. This should be completed in accordance with Ministry for the Environment Contaminated Land Management Guideline No 5, Site Investigation and Analysis of Soils. A recommended condition of consent has been included to address this matter.

Given the above, the potential risks associated with the disturbance of contaminated material will be appropriately managed throughout the works and any potential adverse effects resulting from land disturbance are considered to be less than minor.

10 Summary of Key Proposed Mitigation

The table below sets out the proposed designation conditions by matter to manage the actual and potential effects on the environment as a result of the Project.

The concept design for Trig Road proposed designation and regional consents (as reflected in this AEE and supporting drawings and assessments) has sought to avoid or mitigate adverse effects through the route selection process and the concept design of the Project elements. Where it has not been practicable to avoid adverse effects, through route selection or design, measures are proposed to remedy or mitigate any residual adverse effects.

This will be achieved through the development and implementation of a suite of measures covering detailed design, construction and operation management plans and monitoring. These measures are included in the NOR conditions, and proposed Regional consent conditions (refer Appendix E and Appendix F) and are summarised in Table 15 below.

Table 15: Summary of key proposed mitigation measures

Matter	Measure
Transportation	• Construction Traffic Management Plan (**CTMP**)
Traffic Noise and Vibration	• Traffic noise mitigation measures as set out in designation conditions
Construction Noise and vibration	• Construction Noise and Vibration Management Plan (**CNVMP**)
Archaeology and Heritage	• Accidental Discovery Rule under the AUP:OIP
Cultural	• Mana whenua partnership • Cultural Advisory Report • Urban Landscape and Design Management Plan (**ULDMP**) • Stakeholder and Communication Engagement Management Plan (**SCEMP**); • Cultural Monitoring Plan • Contaminated Land Management Plan (**CLMP**) • Accidental Discovery Rule under the AUP:OIP • Wetland Restoration and Enhancement Plan (**WREP**).
Urban design	Urban Landscape Design Management Plan (**ULDMP**).
Landscape	
Ecology	• Tree Management Plan (**TMP**); and • Wetland Restoration and Enhancement Plan (**WREP**)
Property, Land Use and Business	• Stakeholder and Communications and Engagement Management Plan • Complaints register • Construction Noise and Vibration Management Plan (**CNVMP**) • Construction Traffic Management Plan (**CTMP**)
Stormwater and Flooding	• Construction Environmental Management Plan (**CEMP**); and • Flood Hazard Risk Outcome condition
Earthworks	• Construction Environmental Management Plan **(CEMP)**; • Erosion and Sediment Control Plan (**ESCP),** • Chemical Treatment Plan **(CTP)**

Contamination	• Contaminated Land Management Plan (**CLMP**)

11 Engagement

This section provides a summary of engagement that has been undertaken to date and which is ongoing for the Project. It summarises the approach during each phase, focusing on key themes and common issues raised across the Project and the North West Network more generally.

Prior to detailed design and construction, further engagement will be undertaken by the requiring authority, as needed to manage impacts of the Project. This is set out in detail in the AEE and the proposed conditions.

11.1 Overview of Engagement

Engagement with partners, stakeholders, potentially affected parties and the wider community has been ongoing. Table 16 provides a brief summary of the key Project development stages and engagement undertaken.

Table 16: Project Stage Engagement Summary

Project Stage	Timing	Description

Programme Business Case (PBC) – Auckland wide	2015 – 2016	**Engagement undertaken:**
		• Workshops, meetings and events with Manawhenua, Local Boards, communities and a wide range of stakeholders, to understand the issues, opportunities and community aspirations in each growth area (Auckland-wide).
		• Manawhenua were engaged to:
		  • Seek feedback on the draft preferred transport networks;
		  • To develop a set of Manawhenua values that could be considered and further developed at the next stage of the Project; and
		  • To provide cultural, historical and social knowledge and information that will help to inform the Project.
		• Two stages of consultation undertaken ('Long-list' options phase and preferred programme stage) – both stages involved a series of public based community open day events, feedback sessions, online forms and a business owner/operator survey.
		Outcome
		• A process-led refinement of the long list into preferred options leading to the completion and publication of the Preferred Transport Network Plans in 2016.
		• These high-level maps showed a range of indicative transport connections required to support the growth in each growth area of Auckland.

Indicative Business Case (IBC) – North West area wide	2018/19	**Engagement undertaken:** • Engagement sought to build on the PBC and receive feedback and input from partners, stakeholders and the general public on the short-listed options being considered for the four Supporting Growth business case areas, including the North West. • Engagement was undertaken via information days, workshops and meetings to develop an IBC for the entire North West growth area. **Outcome**

Project Stage	Timing	Description
		• The Project options were subsequently modified and refined as the process progressed. • As a result, the Indicative Strategic Transport Network was identified in Redhills and Whenuapai to support growth. The Indicative Network maps were published in mid-2019.
Detailed Business Case – North West HIF	2019	**Engagement undertaken** • Engagement with stakeholders, developers, and landowners was undertaken to prepare a DBC and understand the issues and opportunities of the Indicative Strategic Transport Network developed during the IBC phase. • Focus was on meetings with landowners and developers affected by the Project and informing the wider community on the Indicative Strategic Transport Network. **Outcome** • Designs were subsequently modified and refined. • As part of this, the Indicative Strategic Transport Network was further developed in this phase to create preferred routes (including for this Project).
Notices of Requirement - North West HIF	2019/20 and 2022	**Engagement undertaken** • Engagement with stakeholders, developers, and landowners has been undertaken to prepare NoRs for the new and upgraded arterials in Redhills and Whenuapai to support growth (including this Project). This has included briefings and presentations to local boards and elected representatives, Community Drop-in sessions held at Te Manawa in Westgate, letters and plans sent to identified affected landowners, and emails, phone calls and meetings with landowners. • Engagement was undertaken during 2019 and 2020 when the NoRs were first prepared. Due to funding constraints, the Project was not lodged with Council until 2022. Further engagement was undertaken during 2022 prior to lodgement. The purpose of engagement in 2022 was to refresh the project purpose with Local Boards as well as key stakeholders, with the focus being directed to landowner engagement. **Outcome** The preferred routes were further refined as part of this phase to create indicative alignments including for this Project.

11.2 Engagement with Programme Partners, Stakeholders and Landowners/Developers

The Programme partners and stakeholders have continued to be involved throughout the various Project development stages. This has included engagement with key stakeholder groups and developers on a Programme-wide basis to gain an understanding of proposed work programmes, land holdings, projects, timing, integration opportunities and to establish enduring relationships. Where possible, engagement with landowners has been undertaken on a one-to-one basis to understand how they use their land (including any further development plans to the property) and how they would be affected by the Project.

As illustrated in Figure 21 below, the feedback from these stakeholder groups, including landowners and developers, has been used to build knowledge, to understand risk, and to refine the design of the Project where practicable and appropriate.

Figure 20: Engagement Feedback Loop

11.2.1 Waka Kotahi

Waka Kotahi are investors and partners to the Programme and engagement has been undertaken with Waka Kotahi through the development of the Project. Engagement with Waka Kotahi has been facilitated via the Owner Interface Managers within the Programme, and through regular forums leading up to business case milestones and attendance at business case workshops. Other projects and business cases are also being progressed within the North West area to provide for predicted growth and safety improvements. The Programme has sought to integrate across these other projects and has been involved in updates and workshops, with information shared between the projects to align key messaging.

11.2.2 Auckland Council

There is close alignment between the Programme and the Council that supports the Programme's desired outcome of integration of land use and transport. Programme-wide, a regular Integration Forum between the Programme and Council has been facilitated to enable these commitments, and to actively identify and manage risks and opportunities inherent to the Programme.

Engagement with the Council regarding the Project has been closely aligned with the structure planning process that has already been completed. Notably in Whenuapai, where the Project is located, the Auckland Council Whenuapai Structure Plan was adopted in 2016.

Additional engagement undertaken with the Council through the North West business case stages included attendance at business case workshops, stakeholder workshops, Council attendance at North West Public Information Days and various meetings with the Council Resource Consents, Policy Planning and Parks teams.

11.2.3 Manawhenua

Manawhenua are recognised as Treaty Partners by AT and Waka Kotahi, and as such the Programme recognises their responsibilities and commitments in regard to engagement with Manawhenua.

Across the Programme, Manawhenua have been involved in the development of the indicative strategic transport networks.

The Programme recognises the Crown Settlement Area of Interest and Statutory Acknowledgement instruments in place for Te Kawerau ā Maki and Ngāti Whātua o Kaipara. Both iwi have been actively involved throughout the business case process.

Ngāti Whātua o Orākei, Te Runanga o Ngāti Whātua, Ngāti Te Ata Waiohua, and Te Ākitai Waiohua have noted their interest in the area with the Council and council-controlled organisations and were involved in the development of the Project since November 2017.

Te Tupu Ngātahi maintains a Manawhenua Forum (for operational and kaitiaki level interaction that focuses on Programme-wide delivery and consistency) with specific discussion on the Project. This has involved presenting to manawhenua on a regular basis, seeking input on the corridor development and potential effects on cultural values. This has informed the corridor alignment and the mitigation measures proposed. Iwi invited to the Northern Te Tupu Ngātahi hui includes Ngai Tai Ki Tamaki; Ngati Maru; Ngati Whanaunga; Ngati Whātua o Kaipara; Te Ākitai Waiohua; Ngati Paoa Trust Board; Te Kawerau ā Maki; Ngati Tamatera, Te Runanga o Ngati Whatua and Ngati Manuhiri.

Further opportunities for governance level relationships are provided via the Tamaki Transport Table and the existing connections with governance through the owner participants (AT and Waka Kotahi).

Manawhenua contributed to the development of criteria and values to be integrated into the MCA framework. Ngāti Whātua o Kaipara and Te Kawerau ā Maki have both prepared CIAs for the Project. These are summarised in Section 9.5 of this AEE.

The Programme involved Manawhenua as partners in decision making and considered their views when identifying priorities for investment options. This included seeking feedback on the draft preferred transport networks, developing a set of Manawhenua values to be considered and further developed, and attending the option evaluation and recommendation making processes.

Throughout this, key Manawhenua issues and opportunities were identified, as summarised in Table 17.

Table 17: North West Specific Manawhenua Issues and Opportunities

Key issues	Opportunities
• Impacts on riparian planting • Property development impacting waterway health • Impacts on wetlands, including reclamation • Protection/consideration of growing areas and history	• Restoration of streams and waterways • Mitigation planting and art work • Wetland restoration and enhancement • Improvement of forest and native vegetation areas through the Crown Settlement Area of Interest & Statutory Acknowledgement of Te Kawerau ā Maki & Ngāti Whātua o Kaipara

The Programme has also held various hui with Manawhenua to feed into the development of the Project, with these Hui both informing and enabling Manawhenua to influence the preferred network options. Manawhenua also participated in the site walkover in November 2019 with the wider Project team and Council specialists.

11.2.4 Engagement with Stakeholders

Engagement with stakeholders has been undertaken primarily at a Programme-wide level, through a series of Stakeholder Reference Group presentations and one-to-one meetings. Engagement methods and communication techniques have been tailored to each stakeholder, largely with the purpose to discuss issues/opportunities in relation to specific projects. Table 18 provides an overview of the key stakeholders and the purpose of engagement with each.

Table 18: Key Stakeholders for the Project

Key Stakeholders	Purpose of Engagement
Auckland Council Councillors	• Discuss issues/opportunities in relation to the Project
Auckland Council Local Boards	• Discuss issues/opportunities in relation to the Project
Auckland Council Parks and Reserves	• Discuss issues/opportunities in relation to the Project and the Council's long-term plans for future parks in the Whenuapai Structure Plan process
Watercare	• Watercare is a landowner in the Project area • Preliminary discussions to align Watercare planned infrastructure in both Whenuapai and Redhills
The Ministry of Education	• The Ministry of Education is a landowner in the Project area • Discuss issues/opportunities in relation to the Project • Discuss new potential school locations
The New Zealand Defence Force	• The New Zealand Defence Force is a landowner adjacent to the Project area • Discuss future plans and integration with Auckland Council plan changes
Vector	• Vector are a landowner within the Trig Road Project area and have infrastructure across all urban areas

Engagement with these stakeholders was largely through one-on-one meetings or email updates to explain both the study areas and plans for further refining the network, and to explore opportunities to work together to minimise impacts and enable positive outcomes.

Local Boards were provided with project update presentations and memorandums in July and August 2022, and briefings were held with elected representatives.

A Utility Infrastructure Alignment Forum lead by Watercare is held regularly and provides an opportunity for integration between infrastructure and utilities projects. The North West Infrastructure Forum includes representation from:

- Watercare
- Vector
- Chorus
- AT
- Waka Kotahi

The Programme delivered numerous presentations to introduce the Programme as a whole, discuss public feedback periods and the timeline of the Programme. It was also an opportunity to receive updates from infrastructure providers on plans for the North West.

11.2.5 Engagement with Landowners

During the DBC and NoR phases of the Project, one-to-one meetings were arranged with potentially and directly affected landowners within the Project area to discuss impacts and opportunities. Initial engagement took the form of informing landowners that they are located within the investigation area, via a letter. Landowners were then met with individually, including both residential (owner-occupied and tenanted) and business owners, at various stages of the Project development to gain an understanding of local knowledge of the area, how they use their land, to talk through the indicative strategic transport networks and to understand any arising constraints, issues and opportunities.

Driveway surveys of some properties were undertaken at the end of 2019 to better understand the impact on access to these properties. The alignment design was further developed and refined during early 2020 which resulted in minor to significant changes to property impacts and designation boundaries. In June 2020 those landowners were contacted by letter where there had been a change in impact or a new impact. A plan was attached to the letter showing their property and the new road alignment and face to face meetings were offered. These included 13 landowners in the Project area that had not been engaged with yet.

The purpose of the engagement was to:

- Engage with newly impacted landowners the Programme hadn't met with yet.
- Re-engage with landowners and communicate the post-design changes and impact to their property.
- Understand from those landowners whose properties were now fully designated their sentiments and appetite for undertaking topographical driveway surveys to see if there is a suitable access solution.

When the Project recommenced in 2022, further landowner engagement was undertaken, commencing with letters and project overview maps being sent to all property owners identified as potentially affected by the proposed designation. Once the proposed designation boundaries were confirmed, a plan of each property was produced and a further letter and copy of the plan were sent to each property owner. This encouraged landowners to get in touch with Te Tupu Ngātahi should

they have any further questions or require a meeting. 18 phone calls and emails were received in relation to the Project.

Meetings with landowners were held at local community venues or online via Microsoft Teams. These meetings were attended by two members of the Project Team and, in some cases, a property specialist from AT. These meetings allowed landowners to ask questions and understand the route protection process and timing. To date, 12 meetings have taken place with landowners in relation to the Project. In summary, four key periods of landowner engagement for the Project (in conjunction with engagement for the Redhills project, which is a separate project as part of the Programme) were undertaken:

- For the 2019 North West DBC landowner engagement period, the Programme sent letters to 112 landowners. A total of 75**3** landowner meetings were undertaken over a five-week period.
- For the 2019 North West NoR landowner engagement period the Programme sent letters to 112 landowners. A total of 55**4** landowner meetings were undertaken over a five-week period.
- For the 2020 North West NoR landowner engagement period the Programme sent letters to 83 landowners where there was substantial change in impact to their property. Approximately 59**5** landowner meetings were undertaken over a four-week period. This included 13 landowners newly impacted by the further design work that was undertaken.
- For the 2022 North West NoR landowner engagement period, 12 landowner meetings were undertaken for the Project.

The predominant themes of feedback received across the four engagement periods for the Project were:

- **Site boundary**: Concerns with loss of land and acquisition, queries if boundaries would stay the same, and concerns with the repercussions of the road coming closer to their house.
- **Access**: Questioning how this is impacted, and how it will be restored. Access, in particular right turn movements to/from some Hobsonville Road properties was a key theme during the 2020 engagement period.
- **Property acquisition**: Most landowners mentioned this, questioning what the process is, how compensation is determined, and whether it would be full or partial acquisition. During the 2020 engagement period an AT Property Specialist attended most of the landowner meetings to provide information on the property acquisition process including compensation and timeframes.
- **Property - Loss of Value**: Loss of property value was a main theme during the 2020 engagement period.
- **Re-development potential**: Landowners concerned with the loss of land and the impacts this has on their ability to subdivide or develop land.
- **Alignment concerns**: Landowners generally expressed interest in wanting more detail on alignments – there was an ongoing trend that the lack of detail is frustrating and causes a lack of certainty. More detail was provided during the 2020 engagement period.

[3] 75 being the number of landowners who responded to requests from the Project team for a landowner meeting

[4] 55 being the number of landowners who responded to requests from the Project team for a landowner meeting

[5] 59 being the number of landowners who responded to requests from the Project team for a landowner meeting

- **Timing**: Landowners enquired about timeframes for NoR lodgement and the construction period. Landowners raised during the 2022 engagement period that they were surprised the Project was still occurring as they had thought it had been cancelled rather than put on hold. As a result, generally, landowners expressed that due to the delay and uncertainty around the timing of the Project they wanted to move forward with property acquisition. In summary, the Project Team has undertaken ongoing engagement with affected landowners throughout the development of the Project. This has both informed affected landowners of the Project and potential impacts, and identified the key themes of concerns to landowners, with further information provided and surveys undertaken (where appropriate) to close out concerns. As such, the landowner engagement provided and detailed in this section is considered sufficient.

11.2.6 Engagement with Developers

To facilitate effective developer engagement across the Programme, a Land Development Co-ordination Team was initiated that included appropriate representatives from within the Programme (including AT and Council personnel) that meets and coordinates discussions with developers.

The Programme has undertaken a direct approach to engagement with developers, predominantly through one-to-one meetings. The purpose of these meetings was to ensure the Project Team had a greater understanding of their landholdings and to establish relationships for ongoing engagement and discuss how their land is potentially impacted by the proposed alignments. Additionally, engagement has also been undertaken with developers with interests in the Project area, in conjunction with those developers with property impacted by the other North West projects being progressed by the Programme.

During the 2022 engagement period, developers, commercial landowners and local businesses were contacted and draft designation plans were shared with these stakeholders via online and in person meetings.

The predominant themes from engagement with developers can be summarised as follows:

- Developers with development plans that are ready to develop need to align timing and sequencing with the Programme.
- Developers interested in developing are seeking a better understanding of transport networks in relation to their land.
- Existing developments may be impacted by transport networks and upgrades.
- Developers in the general vicinity are interested in the way the areas may develop and how transport networks may influence growth.
- Developers are interested in projects in the wider business case areas and other growth-related infrastructure that is to be implemented by others.
- Questions surrounding funding of transport networks and cost of development.
- Expectations for greater level of detail at the NoR stage, with specific requests such as the engineering approach, access changes, timing of works, acquisition processes and opportunities for design compromise to reflect developer plans.

Developers have generally been supportive of the Programme, recognising the need to improve transport infrastructure to enable the release of developable land in these areas. The delivery timing

of transport infrastructure is of significant interest for developers, in order to establish certainty for their own development plans.

11.3 Community Engagement

Engagement with the community for the Project has been undertaken as part of the wider engagement for the North West.

This engagement was largely through Public Information Days and survey questions, and included written responses, completed online and hardcopy surveys, and webpage views. Furthermore, to reflect the future 'communities' of these future growth areas (given the largely route protection focus of the Programme), engagement with youth and young professionals was undertaken across three workshops.

The North West Project Team also attended a community drop-in session in October 2022 at Te Manawa Library in Westgate. This was organised by the Waka Kotahi State Highway 16 Brigham Creek to Waimauku Safety Improvements project which has crossover with the North West projects. Approximately 40 people visited the Te Tupu Ngātahi stand to talk to the team and pick up information handouts. Attendees included both landowners affected by the Project and local community leaders.

The Te Tupu Ngātahi website was also updated to provide information about the Project, including an updated project overview map and information sheets about how the proposed designation may be used in the future.

The summary of community feedback relevant to the Project is presented in Table 19 below.

Table 19: Summary of Key Public Feedback Themes

Key Theme	Feedback Summary
General Transport (some relate to wider North West area feedback)	
Walking and Cycling	• Lack of safe cyclists and pedestrian facilities and crossings, and strong support for increased facilities (including separation between vehicles and cyclists • Support for increased facilities between residential areas and town centres, increased linkages to regional cycle network • Need for cycle facilities at transport centres
Safety	• Key concern for all transport mode users • Rural roads not fit for urban growth • Existing road corridors too narrow • High engagement regarding speed limit review, with it commonly perceived too high
Public Transport	• Currently poor or non-existent service and desire for immediate improvement • Desire for provision of Park and Rides and local feeder buses to support public transport (largely regarding ferries) • Consistent themes of improving connections, level of service (frequency, speed, increased destinations) and connectivity, and integrating modes of transport
Local Bus Network	• Greater accessibility to bus services, including suggestions for more bus stops, park and rides and shuttle buses to major transport stations

	– specific areas that require bus stops/stations provided and destinations provided • Concerns with the current low frequency of bus services • Suggestions for bus lanes and express services
Rail (light and heavy)	• Strong support for utilising and extending the existing heavy rail infrastructure as a quick fix and cost-effective option • Suggestions to upgrade the heavy rail for passenger use with double tracking and electrification of the routes • Some thought light rail would be better and quicker than buses, providing more options for transport • Concerns with long-term nature of light rail amidst immediate pressure for rail • Concerns with possible changes in political priority
Key State Highway	• Intersections and roundabouts were noted to require safety upgrades • Half interchanges should be upgraded to full diamond interchanges • Congestion deemed a key issue, leading to strong support for the SH16/18 connection to bypass Whenuapai and dedicated bus and cycle lanes • Support for environmental consideration in designing alignments
Area Specific Feedback	
Whenuapai	• Safety consistently mentioned, such as pedestrians and cyclists, crossings, school design interface, widening roads, capacity/maintenance and need to accommodate rural vehicles and activities

11.4 Ongoing Consultation

Te Tupu Ngātahi continues to meet and engage with potentially impacted landowners as required. The Te Tupu Ngātahi website will continue to be updated with the key steps in the NoR process (i.e. public notification, hearing dates, decisions and appeals) and the Programme will continue to engage with submitters post lodgement during the hearings process.

12 Resource Management Amendment Act 2020

To date, the overlap between the RMA regime and climate change has been limited as sections 104E and 70A of the RMA have constrained the ability of local authorities to account for climate change considerations in exercising their roles and functions. However, the amendment to the RMA that came into effect on 30 November 2022 is intended to better align the RMA with the CCRA. The Resource Management Amendment Act 2020 repeals the restrictions under the RMA in relation to climate change with the following consequences:

- The repeal of section 104E means that effects on climate change of a discharge to air of greenhouse gases can in future be considered in the context of an application for a discharge permit or coastal permit to do something that would otherwise contravene section 15 or section 15B.
- The repeal of section 70A means that when making a rule to control the discharge into air of greenhouse gases a regional council may now have regard to the effects of such a discharge on climate change.
- An amendment to section 74(2)(c) means that when preparing or changing a district plan, a territorial authority must now have regard to any ERP or national adaptation plan made in accordance with the CCRA.

The above RMA amendments do not directly affect the Project as no resource consent is sought or required for the discharge of contaminants to air. AUP:OIP rule E14.4.1(A14) permits discharges to air from the engines of motor vehicles, and the general permitted activity standards do not apply.

13 Statutory Assessment

The following statutory assessment for the Project is provided in accordance with the relevant sections under the RMA.

13.1 Section 171 Recommendation by a Territorial Authority

Section 171(1) of the RMA sets out the matters which are to be taken into consideration by the Council when considering a NoR. Section 171(1B) of the RMA states the assessment of effects may include: "*any positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from the activity enabled by the designation, as long as those effects result from measures proposed or agreed to by the requiring authority.*"

These matters have been addressed throughout the AEE and associated technical assessments. In summary:

- Effects on the environment and Part 2 of the RMA are addressed in Sections 9 and 13.3 of this AEE respectively;
- Relevant provision of policy statements and plans have been addressed by Appendix B and in Section 13.3 of this AEE;
- Adequate consideration of alternative sites, routes and methods has been addressed in Section 8 and Appendix A of this AEE;
- The works and proposed designation are reasonably necessary to achieve the Project Objectives for the proposed designation because:
    - The proposed works will assist in the efficient operation of the local transport network.
    - The proposed works will provide additional transport network capacity for planned growth in the Whenuapai area, in particular it will enable the use and development of planned future urban land adjoining the Project in accordance with the AUP:OIP.
    - Sufficient space and facilities will be provided to ensure that the proposed transport corridors are safe for all transport users, including vehicles, public transport, walking and cycling.
    - The proposed works contribute to mode shift by providing a choice of transport options through the provision of separated and protected walking and cycling facilities, including signalised pedestrian/cycle crossing facilities, and public transport measures to improve bus travel time and reliability.
    - It will allow AT and/or its authorised agents to undertake the works for the construction, operation and maintenance of the Project comprising transport corridors and associated ancillary components/ activities.
    - It will enable works to be undertaken in a comprehensive and integrated manner.
    - It will add protection to the route from future incompatible development which may preclude or put at risk the construction and/or operation and maintenance of the corridor.
    - The designation will be included in the AUP:OIP providing certainty to the public as to the intended use of the land and nature of the activity authorised.

- Other matters that inform the territorial authority's consideration are addressed in Section 13.1.1 below.

Given the above, it is considered that the Council can confirm the requirement by AT.

13.1.1 Section 171(1)(d) Other Matters

Section 171(1)(d) requires the territorial authority to have particular regard to:

> *'Any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement'*

It is considered that there are no other matters under s171(1)(d) that are reasonably necessary to make a recommendation on the NOR.

13.2 Section 104 Assessment

Section 104 of the RMA relates to the consideration of resource consent applications by a consent authority. This assessment is therefore relevant to those matters for which resource consent is being sought.

13.2.1 Section 104(1)(a)

This section of the RMA requires that regard is given to any actual and potential effects on the environment of allowing the activity. An assessment of the actual and potential environmental effects on the environment as a result of implementing the proposed works is included in Section 9 of this report which concludes that effects can be adequately avoided, remedied or mitigated through the proposed mitigation and monitoring measures.

13.2.2 Section 104(1)(ab)

This section of the RMA requires that regard be had to any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity. As outlined in Section 9.7 of this report, the Project will result in adverse effects on the Trig Stream wetland as a result of corridor widening. As previously discussed, these effects will be offset by proposed wetland enhancement/planting, with the proposed designation providing sufficient room for this offset to be finalised at the detailed design stage.

13.2.3 Section 104(1)(b)(i)

This section of the RMA requires that regard is given to any relevant provisions of a national environmental standard.

The NES: Soil applies to activities that disturb the soil if the relevant piece of land is, or has previously been, a HAIL site.

The PSI has shown that there are numerous activities classified in the HAIL that have historically occurred or are currently being undertaken on properties adjacent to the Project area. While the human and environmental risk profile associated with soil contamination of properties in the Project area is likely to be limited, soil materials scheduled for disturbance as part of the Project may have

been impacted by a range of contaminants of concern associated with the storage or use of hazardous materials or disposal of hazardous wastes at the adjacent properties.

As previously discussed in Section 9.11 and Volume 4, a DSI is recommended to be prepared at the detailed design stage to quantify the nature and extent of actual soil contaminant conditions within the Project area. This will be completed in accordance with Ministry for the Environment Contaminated Land Management Guideline No 5, Site Investigation and Analysis of Soils (revised 2021) and be used to determine whether further site management is required.

A Contaminated Land Management Plan will also be prepared prior to the commencement of any land disturbance activities and will be prepared in accordance with the Ministry for the Environment Contaminated Land Management Guidelines No. 1, Reporting on Contaminated Sites in New Zealand (revised 2021).

The NES:FW applies to activities undertaken within or near natural wetlands. While the Project has sought to avoid wetlands and streams through optioneering and design, seven wetlands are potentially affected by the Project.

As set out in Section 9.7 of this AEE, to mitigate the effects of potential wetland loss, offsetting is proposed to be provided through a Wetland Offset/Compensation Restoration Plan. This will be finalised at construction and will confirm the offset mitigation required to ensure no net loss in ecological value is achieved, consistent with the requirements of the NES:FW. The proposed designation provides sufficient room for this offset to be finalised at the detailed design stage.

As such, the Project is considered to be consistent with section 104(1)(b)(i) of the RMA.

13.2.4 Section 104(1)(b)(ii)

This section of the RMA requires that regard is given to any relevant provisions of any other regulations.

The Hauraki Gulf Marine Park Act 2000 (**HGMPA**) is considered relevant to the Project given that the downstream receiving environment is the Hauraki Gulf.

It is considered that the proposed works are consistent with these the objectives of the HGMPA as the Project will employ an ESCP during construction to manage the effects from bulk earthworks, while the use of GD01 compliant stormwater management and treatment devices will minimise the long-term effects from the Project's surface runoff on the receiving environment.

13.2.5 Section 104(1)(b)(iii)

This section of the RMA requires that regard is given to any relevant provisions of a National Policy Statement (**NPS**).

National Policy Statement for Freshwater 2020 (NPS:FM)

The NPS:FM seeks to ensure that natural and physical resources are managed in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems followed by the health needs of people and then the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. In particular, the NPS:FM seeks to protect natural wetlands, rivers, outstanding waterbodies and habitats of indigenous freshwater species.

It is considered that the Project is consistent with the objectives of the NPS-FM.

There is a functional need for the Project to provide an urban standard transport corridor between the northern end of Trig Road (north of State Highway 18) and Hobsonville Road, in order to support urbanisation of the surrounding land. The Project has sought to avoid adverse effects on water bodies and freshwater ecosystems where possible, as demonstrated through the alternatives assessment and desig refinement process. The alternatives assessment process establishes that all potential road corridor alignments would have resulted in impacts on water bodies and freshwater ecosystems.

While the Project will result in adverse effects on two wetlands, these effects will be offset through wetland enhancement/planting calculated in an Indicative Wetland Offset/Compensation Restoration Plan and sufficient room for this offset to be finalised is provided for in the proposed designation boundary. AT will also employ measures during both the construction and operational phases of the Project to ensure that local water quality is protected. This will include the use an ESCP, stormwater treatment and wetland mitigation, all of which will address the environmental effects of the Project on local waterbodies, wetlands and their associated ecosystems. Given that there is limited existing stormwater management infrastructure in place within the Project area this is likely to result in an improvement to the overall quality of freshwater.

National Policy Statement on Urban Development (NPS-UD)

The NPS-UD seeks to ensure urban environments are well-functioning and enable all people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety. Within the NPS-UD Auckland is recognised as a Tier 1 urban environment and therefore is subject to a greater policy direction in terms of intensification and density of urban form. The NPS-UD directs that urban development is integrated with infrastructure planning and funding decisions and is strategic over the medium to long term. The Project gives effect to these objectives and policies by protecting a corridor to deliver an accessible, high quality, effective, efficient and safe transport system to positively contribute to, and support, quality, connected urban environments.

13.2.6 Section 104(1)(b)(iv)

This section of the RMA requires that regard is given to any relevant provisions of a New Zealand Coastal Policy Statement. As the Project is not located in the coastal environment, the New Zealand Coastal Policy Statement is not considered to be relevant.

13.2.7 Section 104(1)(b)(v)

This section of the RMA requires that regard is given to any relevant provisions of a regional policy statement or proposed regional policy statement. An analysis of the Project against the AUP:OIP Regional Policy Statement is provided in Appendix B and is not repeated here. However, in summary the Project is considered to be consistent with the AUP:OIP Regional Policy Statement as it will support the desired urban growth objectives of the AUP:OIP, assist in the development of a quality urban form, enable efficient movement of vehicles and people, provide resilient infrastructure and maintain and enhance environmental values. Furthermore, the Project has been designed with consideration to cultural and environmental values.

13.2.8 Section 104(1)(b)(vi)

This section of the RMA requires that regard is given to any relevant provisions of a plan or proposed plan. Appendix B provides an assessment of the Project against the relevant objectives and policies contained within the AUP:OIP. In summary, the Project is considered to be consistent with the provisions of the AUP:OIP. The Project has been designed to meet the local growth requirements of Whenuapai, where appropriate mitigation has been offered by AT and when combined with the management plans proposed, the Project will provide a positive contribution to the local community and environment.

13.2.9 Section 104(1)(c)

Section 104(1)(c) requires the consent authority to have particular regard to:

> *'any other matter the consent authority considers relevant and reasonably necessary to determine the application'*

It is considered that there are no other matters under s104(1)(c) that are reasonably necessary to determine the consent application.

13.3 Other Policy Considerations

Other legislation and policy that has informed development and will inform the implementation of the Project is set out in Table 20, Table 21 and Table 22.

Table 20: Assessment against potential other matters - National

National
Government Policy Statement on land transport (GPS) for 2021/22 – 2030/31
The Government Policy Statement on Land Transport 2021 continues the strategic direction of GPS 2018, but provides stronger guidance on what Government is seeking from land transport investments. The GPS outlines the Government's strategy to guide land transport investment over the next 10 years, influencing decisions on how money from the National Land Transport Fund will be invested across activity classes, such as state highways and public transport. The overall strategic priorities for GPS 2021, the national objectives for land transport and the themes and the results the Government wishes to achieve through the allocation of the Fund are summarised as follows: • Safety – a safe system, free of death and serious injury • Access – a system that provides increased access to economic and social opportunities • Climate change – a low carbon transport system that supports emissions reductions, while improving safety and inclusive access • Improving freight connections – improving freight connections for economic development. The Project provides a safe and reliable transport corridor that supports growth, enables sustainable travel choice, addresses safety concerns and improves access to employment and social amenities. The Project will provide transport infrastructure appropriate to the urban context; a slower speed environment and improved intersections with dedicated cycling and pedestrian facilities. The upgrades to the road network will improve bus travel time and reliability by providing for bus priority, and is designed with flexibility to respond to the future public transport network in the surrounding area. The GPS 2021 prioritises reduction of greenhouse gas emissions and a shift to active modes, public transport and low emission vehicles. This focus is well aligned to the upgraded transport corridor which provides an

National
increase in modal choice including active modes and public transport, thereby seeking to reduce reliance on single occupancy vehicles. Overall, the Project positively contributes towards the strategic priorities in the GPS.
The Thirty Year New Zealand Infrastructure Plan 2015
The Thirty Year New Zealand Infrastructure Plan makes changes to the current approach to planning and management and to encourage investment in New Zealand's infrastructure while recognising the challenges the country needs to navigate. The Plan envisages that by 2045 New Zealand's infrastructure will be resilient, co-ordinated and contribute to a strong economy and high living standards. The Plan notes that challenges exist around projected population growth with Auckland forecast to grow by another 716,000 people by 2045 meaning that over the next 25 years, the city will need to provide 400,000 more dwellings. The Project provides an integrated approach to land-use and infrastructure planning which is critical to deliver good urban outcomes. The plan envisages $18.7 billion being spent on infrastructure between 2015 and 2025. The Project forms part of this spending and falls within the scope of this Plan by enabling and providing for future urban growth in Whenuapai.
Road to Zero: New Zealand's Road Safety Strategy 2020-2030
Road to Zero outlines a strategy to guide improvements in safety on our roads, streets, footpaths, cycleways, bus lanes and state highways in New Zealand over the next 10 years. The vision of the strategy is a *New Zealand where no one is killed or seriously injured in road crashes.* The Strategy focuses on achieving this vision through system management, road user choices, vehicle safety, work-related road safety and infrastructure improvements and speed management. The Project plays a role in providing opportunity to plan and design system improvements that embed the Road to Zero strategy. The Project will reduce the risk of DSI's and improve road safety for all users. The Project will significantly improve all transport facilities for all modes, resulting in improved safety for those that travel by car, commercial vehicle, active mode and public transport.
Heritage New Zealand Pouhere Taonga Act 2014
Under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA) no person shall modify or destroy an archaeological site unless an authority is granted by Heritage New Zealand Pouhere Taonga (whether or not a site is a recorded archaeological site). An archaeological assessment has been provided (Volume 4) which states that no known archaeological sites are located within the Project area. As such there are no requirements to obtain authority under the HNZPTA.

Table 21: Assessment against other potential matters - Regional

Regional
Auckland Transport Alignment Project (ATAP)
The Auckland Transport Alignment Project ("ATAP") is a joint project involving Auckland Council, the Ministry of Transport, AT, Waka Kotahi, the Treasury and the State Services Commission. The final report (April 2018) sets out a clear direction for the development of Auckland's transport system over the next 10 years. The vision seeks transport investment decisions that deliver broad economic, social, environmental and cultural benefits to Auckland and New Zealand by providing safe, reliable and sustainable access to opportunities. Specifically, this includes easily connecting people, goods and services to where they need to go; providing high quality and affordable travel choices for people of all ages and abilities; seeking to eliminate harm to people and the environment; supporting and shaping Auckland's growth, and; creating a prosperous, vibrant and inclusive city.

Regional
The ATAP package highlights the need for significant investment in transport infrastructure to enable urban growth in greenfield FUZ areas, encourage the use of public transport and active modes, and to provide a reasonable level of service to future residents. ATAP specifically notes investment into three main areas including for arterial roads and footpaths (including bus and cycle lanes where required). The Project is consistent with ATAP as it will provide a safe and reliable transport corridor that integrates with land use planning, supports growth, enables sustainable travel choice for all transport users, addresses safety concerns and improve access to employment and social amenities.
Auckland Regional Land Transport Plan 2018-2028
The Regional Land Transport Plan (RLTP) sets out the funding programme for Auckland's transport services and activities over a 10-year period. Planned transport activities for the next three years are provided in detail while proposed activities for the following seven years are outlined. The RLTP is jointly delivered by AT, Waka Kotahi and KiwiRail, and forms part of the National Land Transport Programme. Te Tupu Ngātahi is identified as a committed, ongoing programme in the RLTP which it identifies will enable the sequence of land release specified in the FULSS, and improves access to places where people live and work.
Auckland Future Land Supply Strategy 2017
The FULSS was adopted by the Council in July 2017 and is a region wide strategic document detailing the location and timing for the release of new greenfield areas. It recognises the importance of aligning infrastructure planning with growth management and identifies Whenuapai as being development ready by the first half of Decade 1 (2018-2022). The Project is critical to delivering this greenfield capacity, given the improved accessibility it will provide to future collector roads and sites along its length. Without the Project, the opening up of these sites to greenfield development could be delayed and/or at lower development yields, thereby undermining the growth objectives of the FULSS and the wider sustainable urban development of Auckland.
Hauraki Gulf Marine Park Act 2000
The Hauraki Gulf Marine Park Act seeks to integrate the management of natural, historic and physical resources of the Hauraki Gulf, the islands and its catchment which includes the Whenuapai area within the Schedule 3 'catchment' indicating areas that drain to the Hauraki Gulf. The Act recognises the national significance of the Hauraki Gulf and life supporting capacity of the environment of the Gulf. The Project is designed with provision for stormwater treatment via raingardens within the berms along the carriageway as well as "end of pipe" treatment in larger raingardens. These meet the treatment requirements in accordance with Auckland Council Guidance Document GD01. These devices will treat the runoff from the corridor before discharge into the receiving environment of the Hauraki Gulf. The Project will also employ an ESCP during construction to manage the effects from bulk earthworks. This enables the protection of the Hauraki Gulf environments life supporting capacity.
Auckland Plan 2050
The purpose of the Auckland Plan is to contribute to Auckland's social, economic, environmental and cultural well-being through a 30 year vision for Auckland's growth. It sets a strategic direction for Auckland and its communities that integrates social, economic, environmental, and cultural objectives. The Auckland Plan's Development Strategy outlines the direction Auckland will take managing expansion in future urban areas noting the constraint that these areas are predominantly rural at present and have little or no infrastructure in place to cope with urban development. The Auckland Plan outlines the need to provide the required bulk infrastructure (water, wastewater, storm water and transport) to these areas in the right place at the right time. The Auckland Plan also seeks that Aucklanders will be able to get where they want to go more easily, safely and sustainably. The Project will provide a safe and reliable arterial corridor that integrates with land use planning, supports growth, enables sustainable travel choice for all transport users, addresses safety concerns and improve access to employment and social amenities. The development of the Project has been a direct response to the Auckland Plan. The Project will help facilitate the sustainable growth of the North West area enabling the bulk transport infrastructure required to unlock development potential.

Regional
Vision Zero for Tāmaki Makaurau: a transport safety strategy and action plan to 2030
Developed in 2019, Vision Zero extends the existing safe system approach, to place safety at the forefront of the future transport system for all modes by designing safe places for people. Vision Zero has a goal to eliminate transport deaths and serious injuries by 2050 (in line with the Auckland Plan 2050). The Project plays a key role in providing opportunity to plan and design system improvements that embed Vision Zero principles, and specifically contribute to the Vision Zero priorities. The Project is anticipated to reduce the risk of DSI's and improve road safety for all users. The Project will significantly improve all transport facilities for all modes, resulting in improved safety for those that travel by car, commercial vehicle, active mode and public transport.
Te Tāruke-ā-Tāwhiri: Auckland's Climate Action Framework and Plan
The purpose of Auckland's Climate Action Framework and Plan is to increase Auckland's resilience to the impact of climate change and reduce emissions that cause climate change, with one of the key moves identified to deliver clean, safe and equitable transport options. The Project has been designed having regard to and taking into account climate change and resilience to it. The Project will deliver better accessibility and mode choice (thus reducing the present reliance on low occupancy vehicles). This provides an important component to realising the regional emissions benefits of an integrated network. This shows alignment with, and a positive contribution towards the Climate Action Framework and Plan.
Auckland's Urban Ngahere (Forest) Strategy
The Auckland Urban Ngahere (Forest) strategy recognises the ecosystem services as well as economic and cultural benefits delivered by green infrastructure within the urban environment and sets out objectives of the strategy which include the need to grow and protect urban ngahere in existing and future urban areas. Although the Project seeks the removal of some street trees within the proposed designation footprint (protected by district plan rules), this will be mitigated by planting within the upgraded road corridor.. The long-term outcome of comprehensive street tree planting will be more trees in the public realm and increased amenity value within the road corridor, consistent with the Auckland Urban Ngahere (Forest) strategy.

Table 22: Assessment against other potential matters - Local

Local Board Plans
The Project is situated within two local board areas: Upper Harbour and Henderson-Massey. The Local Board Plans outline outcomes for the respective local board areas. The plans identify outcomes relating to an improved and well-connected transport system, including active modes, managing growth, economic prosperity and protection and care for the environment. The Project is consistent with the outcomes of the Local Board Plans. The upgrade will integrate well with proposed surrounding land uses and the wider transport network, to respond to the timing, scale and form of urban development triggers and staging of future infrastructure corridors. In doing so the Project manages any adverse effects on the environment. The Project will provide a multimodal, safe and reliable arterial corridor that supports growth, enables sustainable travel choice for all transport users, address safety concerns and improve access to employment and social amenities. The Project will also support the economic outcomes sought by supporting economic growth and increased productivity. The Project will help facilitate the sustainable growth of the Upper Harbour and Henderson-Massey areas.
Whenuapai Structure Plan (2016)
The Whenuapai Structure Plan is the strategic planning document for Whenuapai, supported by objectives with seven themes. These themes comprise of; sustainable urban development, a quality built urban environment, a well-connected Whenuapai, the national significance of the Whenuapai Airbase, the provision of infrastructure, an enhanced natural environment and protection of heritage, and the provision of quality open spaces.

Local Board Plans
The objectives around transport involve higher residential densities around Rapid Transit stations and park and ride facilities, as well as ensuring Whenuapai will have a well-connected cycling and pedestrian network. Specifically, the Structure Plan seeks to ensure that: • The transport network responds to anticipated growth and maximises connectivity for commuters and freight within Whenuapai and to surrounding areas. • Frequent, attractive public transport options are supported by greater density along key routes, and good local and regional connections exist. • Dedicated cycle and pedestrian footpaths provide safe, connected and high amenity linkages between areas of activity at a local scale. The Project provides for separated walking and cycling facilities, achieving safe, connected and high amenity linkages. The upgrades to the road network will improve bus travel time and reliability by providing for bus, and is designed with flexibility to respond to the future public transport network in the surrounding area.

13.4 Part 2 (Purposes and Principles)

With regard to the relevance of Part 2, it has been well established, that where a plan has been competently prepared under the RMA it may be that in many cases there will be no need to refer to Part 2. However, if there is doubt that a plan has been "competently prepared" under the RMA, then it will be appropriate and necessary to have regard to Part 2. That is the implication of the words "subject to Part 2" in sections 171(1) and 104(1) of the RMA.

In the context of these application's, the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA, they capture all relevant planning considerations and contain a coherent set of policies designed to achieve clear environmental outcomes. They also provide a clear framework for assessing all relevant potential effects, and there is no need to go beyond these provisions and look to Part 2 in making this decision. However, in the interests of caution, an assessment has been provided.

Sections 13.4.1 to 13.4.4 consider the Project against the purpose and principles of Part 2 of the RMA.

13.4.1 Section 6 Assessment

Section 6 of the RMA states that in achieving the purpose of the 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 matters of national importance. The specified matters of national importance of particular relevance to this Project are:

(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:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(h) the management of significant risks from natural hazards.

It is considered that the Project recognises and appropriately responds to these matters of national importance. With regard to natural character and indigenous ecology, the Project has sought to avoid the most significant vegetation and habitats.

The Project will result in unavoidable adverse effects on two wetlands. However, these effects will be offset through appropriate wetland restoration, as discussed at Section 9.7 of this AEE, and the proposed designation provides sufficient room for this offset to be finalised at the detailed design stage.

Manawhenua have been actively involved throughout development of the corridor, including through alternatives assessment and identification of the preferred options. The opportunity to provide CIA's was provided and the CIAs prepared by Te Kawerau ā Maki and Ngāti Whātua o Kaipara have been considered by the Project team.

The ongoing partnership with Manawhenua has provided an understanding and the incorporation of Manawhenua values and expression of kaitiakitanga throughout the development of the Project.

There are no sites of significance to Manawhenua, wāhi tapu, other taonga or Māori land identified under the AUP:OP within the transport corridor. The relationship of the respective iwi with the transport corridor, their ancestral lands, wāhi tapu and taonga will be recognised and provided for through the involvement of Manawhenua in developing and implementing various mitigation measures and management plans at the time of detailed design and construction.

The proposed stormwater management for the Project will provide sufficient attenuation to avoid the potential adverse effects of flood hazards, both upstream and downstream of the Project area.

Given these factors, the Project is considered to be consistent with section 6 of the RMA.

13.4.2 Section 7 Assessment

Section 7 of the RMA relates to other matters that all persons exercising functions and powers under the RMA shall have particular regard to, in relation to managing the use, development, and protection of natural and physical resources, including (as particularly relevant to the Project):

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(f) maintenance and enhancement of the quality of the environment:

(i) the effects of climate change:

The values of kaitiakitanga and the ethic of stewardship have been adopted to direct the option assessment and design development process for the Project. As previously discussed, the Project team has worked with, and is continuing to work with Manawhenua to ensure that appropriate measures are employed to protect the mauri of the local environment. This includes the use of an

ESCP during construction and GD01 compliant stormwater infrastructure within the completed transport corridor. The proposed design also avoids new stream crossings and minimises the required removal of vegetation and habitat, with any adverse effects adequately mitigated through wetland restoration and enhancement.

The Project also represents the efficient use and development of the Project corridor's natural and physical resources by utilising the existing transport corridor as much as possible, rather than constructing a new corridor.

The adjacent land to the existing Trig Road corridor is currently rural in character but is identified in the AUP:OIP and FULSS as future urban land. The Project will provide an urban transport corridor to reflect this intended future urban character of the surrounding area. The corridor has been developed to provide for walking and cycling facilities and sufficient space is provided for street planting and street furniture, contributing to the enhancement of amenity values associated with a high-quality urban environment.

The Project avoids any Significant Ecological Areas, and while wetland reclamation is required wetland restoration and enhancement will be undertaken to offset the adverse effects of the Project. In this way the Project recognises the intrinsic values of the local ecosystem.

The proposed stormwater infrastructure has been designed to accommodate predicted climate conditions, including ensuring that the proposed culverts can safely transport water without affecting the stability of the transport corridor. In addition, the Project supports a compact urban form within the existing urban boundaries by supporting the development proposed by the AUP:OIP, limiting the need for further urban expansion. It is also noted that the Project does not preclude the provision of future public transport services, and provides for active transport modes, assisting in seeking to achieve mode shift.

As such, the Project is considered to be consistent with section 7 of the RMA.

13.4.3 Section 8 Assessment

Section 8 of the RMA requires that the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) are taken into account, when managing the use, development, and protection of natural and physical resources.

AT has partnered with Manawhenua throughout the development of the Project. This has resulted in the selection of a corridor alignment which avoids and minimises adverse effects on cultural values where practicable. This has included treating stormwater to a high standard, minimising the disturbance of streams and ensuring that construction management plans will be in place to protect water quality and any unrecorded cultural heritage items encountered during construction.

Further engagement will be undertaken in the design and construction phases to ensure that the principles of the Treaty of Waitangi are taken into account. Given these factors, the Project is considered to be consistent with section 8 of the RMA.

13.4.4 Section 5 Assessment

The RMA has a single overarching purpose: to promote the sustainable management of natural and physical resources. Sustainable management is defined in Section 5 of the RMA as:

...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 wellbeing 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.

The effects of the Project are addressed in Section 9 of this AEE. The Project represents the sustainable use of natural and physical resources, by avoiding and minimising adverse effects on local ecology and water quality through both its design and the proposed mitigation. AT has sought to avoid new adverse effects on, and minimise disturbance of other, natural features during construction by upgrading the existing Trig Road corridor, and therefore utilising the efficient use of existing infrastructure, rather than providing a new transport corridor.

The finished Project corridor will feature stormwater infrastructure, which meets the Council's standards and avoids more than minor adverse effects on the receiving environment, while the design also addresses the natural hazards present in the Project area. AT has also proposed a number of management plans and offsetting for wetland loss to address the Project's effects, including those arising from construction traffic, works within watercourses, earthworks and noise and vibration generation (see Section 10 for specific management plans). This is a standard approach to projects of this scale and type, and similar measures have previously been used on other transport projects in the Auckland region. Following a management plan approach provides adequate flexibility to allow for minor design changes while ensuring that any adverse effects are addressed in a practical manner.

The Project will improve the existing transport network in Whenuapai and provide a vital transport connection for the Whenuapai area. This will ensure that the local transport network operates in an efficient manner as the area urbanises, thereby supporting the economic and social wellbeing of the community. The Project has also been designed to provide for multiple transport modes in a manner which protects the health and safety of all road users. The Project is needed to support the growth and development of the Whenuapai area and is an integral part of a wider programme to provide a comprehensive transport network in the North West area.

AT has also worked with Manawhenua to incorporate cultural protocols and mitigation where practicable and will continue working with iwi in this regard. Given these factors, the Project is considered to be consistent with section 5 of the RMA.

14 Conclusion

The Project represents an important transport investment in the future of Whenuapai. The Project will support the planned development of land identified under the AUP:OIP as appropriate for continued urbanisation.

While some adverse effects will be generated during construction, operation and maintenance, these can be adequately mitigated by the management plans and other measures proposed by AT.

In assessing these effects, it is also important to consider that the landscape and natural values associated with the Project corridor are in transition with the final receiving environment changing from the current rural land uses to an urban environment. Within this urban context, the Project will provide a high-quality transport corridor similar in character to other roads in metropolitan Auckland.

Overall, the Project is considered to be consistent with the relevant statutory planning documents and regulatory tests, thereby satisfying the requirements of the RMA for the Council to recommend that the NoR be confirmed by the requiring authority, and for the Council to approve the associated resource consent application.

Appendix A. Assessment of Alternatives Report

Appendix B. Statutory Assessment

Appendix C. Rules Assessment

Appendix D. Matters of Discretion and Assessment Criteria

Appendix E. Proposed NoR Conditions

Appendix F. Proposed Regional Consent Conditions