TE TUPU NGĀTAHI
SUPPORTING GROWTH

Pukekohe Transport Network Assessment of Effects on the Environment

September 2023

Version 1.0

WAKA KOTAHI
NZ TRANSPORT AGENCY

New Zealand Government

Document Status

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Revision Status

Version	Date	Reason for Issue
1.0	13/09/2023	Final for lodgement

Document Volumes and Structure

The Assessment of Effects on the Environment report (this 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; and • Attachment C: Conditions of Designation
2	Assessment of Effects on the Environment	• Appendix A: Assessment of Alternatives
3	Concept Design Drawings / General Arrangement Layout Plans	
4	Supporting Technical Reports	• Appendix A: Assessment of Transport Effects • Appendix B: Assessment of Construction Noise and Vibration Effects • Appendix C: Assessment of Operational Noise Effects • Appendix D: Assessment of Flooding Hazard Effects • Appendix E: Assessment of Ecological Effects • Appendix F: Assessment of Landscape, Natural Character and Visual Effects • Appendix G: Assessment of Historic Heritage Effects • Appendix H: Assessment of Arboricultural Effects • Appendix I: Urban Design Evaluation

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Acronyms and Terms Definitions

Acronym/Term	Description
AEE	Assessment of Effects on the Environment (this report)
AGRD	Austroads Guide to Road Design
AMP	Avifauna Management Plan
ARI	Average Recurrence Interval
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
AUP:OP	Auckland Unitary Plan: Operative in Part
BMP	Bat Management Plan
CCRA	Climate Change Response Act 2022
CEMP	Construction Environment Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DBC	Detailed Business Case
EMP	Ecological Management Plan
FDS	Future Development Strategy (Draft)
FULSS	Future Urban Land Supply Strategy (2017)
FUZ	Future Urban Zone
GPS	Government Policy Statement
HHMP	Historic Heritage Management Plan
HNZPTA	Heritage New Zealand Pouhere Taonga Act 2014
IBC	Indicative Business Case
Indicative Strategic Transport Network for Pukekohe	The indicative strategic transport network identified for Pukekohe in the Pukekohe Indicative Business Case
LGA	Local Government (Auckland Council) Act 2009
LMP	Lizard Management Plan
NES	National Environmental Standard
NOR	Notice of Requirement

Acronym/Term	Description
NPS-FM	National Policy Statement for Freshwater 2020
NPS-HPL	National Policy Statement on Highly Productive Land 2022
NPS-UD	National Policy Statement on Urban Development 2020
NUMP	Network Utilities Management Plan
PC	Plan Change
PPF	Protected Premises and Facilities
PWA	Public Works Act 1981
Pukekohe Preferred Transport Network	The preferred transport network identified for Pukekohe in the Pukekohe Detailed Business Case
Pukekohe Transport Network	Comprising the following new or upgraded transport corridors: • NoR 1: Drury West Arterial • NoR 2: Drury – Pukekohe Link • NoR 3: Paerata Connections • NoR 4: Pukekohe North- East Arterial • NoR 5: Pukekohe South-East Arterial • NoR 6: Pukekohe South- West Upgrade • NoR 7: Pukekohe North-West Arterial • NoR 8 (AC) and (WDC): Pukekohe East Road and Mill Road Upgrade
RLTP	Regional Land Transport Plan
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
SEA	Significant Ecological Area
SCEMP	Stakeholder Communications and Engagement Management Plan
SH	State Highway
SSTMP	Site-Specific Traffic Management Plan
TDM	Transport Design Manual
Te Tupu Ngātahi	Te Tupu Ngātahi Supporting Growth Alliance
TfUG	Transport for Future Urban Growth
ULDMP	Urban and Landscape Design Management Plan
Waka Kotahi	Waka Kotahi NZ Transport Agency

1 Introduction

1.1 Overview

This Assessment of Effects on the Environment (AEE) supports the Pukekohe Transport Network Notices of Requirement (NoRs) for Waka Kotahi NZ Transport Agency (Waka Kotahi) and Auckland Transport (AT) as requiring authorities under the Resource Management Act 1991 (RMA). The notices are to designate land for future strategic transport corridors to provide for the future construction, operation, maintenance and improvement of transport infrastructure in the Pukekohe, Paerata and Drury areas of Auckland and Waikato (for one NoR).The projects in the Pukekohe transport Network are described in Table 1.1 and shown in Figure 1-1.

The Pukekohe Transport Network encompasses eight transport projects (and nine NoRs) for the Pukekohe, Paerata and Drury West areas. Auckland Transport has lodged six Notices of Requirement with Auckland Council and Waka Kotahi has lodged two Notices of Requirement with Auckland Council and one with Waikato District Council. The Pukekohe Transport Network includes provision for improved walking and cycling, public transport, and general traffic connections.

For the purposes of this assessment, Mill Road and Pukekohe East Road Upgrade (that includes works within Auckland Council and Waikato District Council) is referred to as one transport project, despite being submitted as two separate NoRS. The matters relevant to each jurisdictional area are addressed through this assessment.

Table 1-1 Pukekohe Transport Network Projects

NoR	Project	Requiring Authority	Council	Description
NoR 1	Drury West Arterial	AT	Auckland Council	A new transport corridor with active mode facilities in Drury West extending south from the intersection of SH22 and Jesmond Road to the the edge of the Future Urban Zone near Runciman Road, Drury. .
NoR 2	Drury-Pukekohe Link	Waka Kotahi	Auckland Council	A new state highway including a shared path. It includes sections of new and upgrades of existing transport corridors from Great South Road, Drury in the north-east, connecting to State Highway 22 in the west, and the area in the vicinity of Sim Road/Cape Hill Road, Pukekohe in the south.
NoR 3	Paerata Connections	AT	Auckland Council	Two new transport corridors including active mode facilities: One new connection between the existing Sim Road (south) and the Paerata Rail Station. The second new connection between the two extents of Sim Road across the NIMT.
NoR 4	Pukekohe North-East Arterial	AT	Auckland Council	A new transport corridor including active modes from SH22, Paerata in the north-west to Pukekohe East Road, Pukekohe in the south-east.
NoR 5	Pukekohe South-East Arterial	AT	Auckland Council	A new and upgraded transport corridor in Pukekohe including active mode facilities. It upgrades part of Pukekohe East Road and Golding Road and a new

NoR	Project	Requiring Authority	Council	Description
				connection between Golding Road (north of Royal Doulton Drive) and to Svendsen Road across Station Road and the NIMT.
NoR 6	Pukekohe South-West Upgrade	AT	Auckland Council	The upgrade of specific intersections and the regrade of specific driveways on Nelson Street, Ward Street, West Street and Helvetia Road for active mode facilities.
NoR 7	Pukekohe North-West Arterial	AT	Auckland Council	The upgrade of Helvetia Road, Pukekohe in the south-west and a new corridor from Helvetia Road to SH22 Paerata in the north-east including active mode facilities.
NoR 8 (AC) NoR 8 (WDC)	Mill Road and Pukekohe East Road Upgrade	Waka Kotahi	Auckland Council Waikato District Council	An upgrade of Mill Road (Bombay) in the east for additional vehicles lanes and a shared path and Pukekohe East Road, Pukekohe in the west for a shared path.

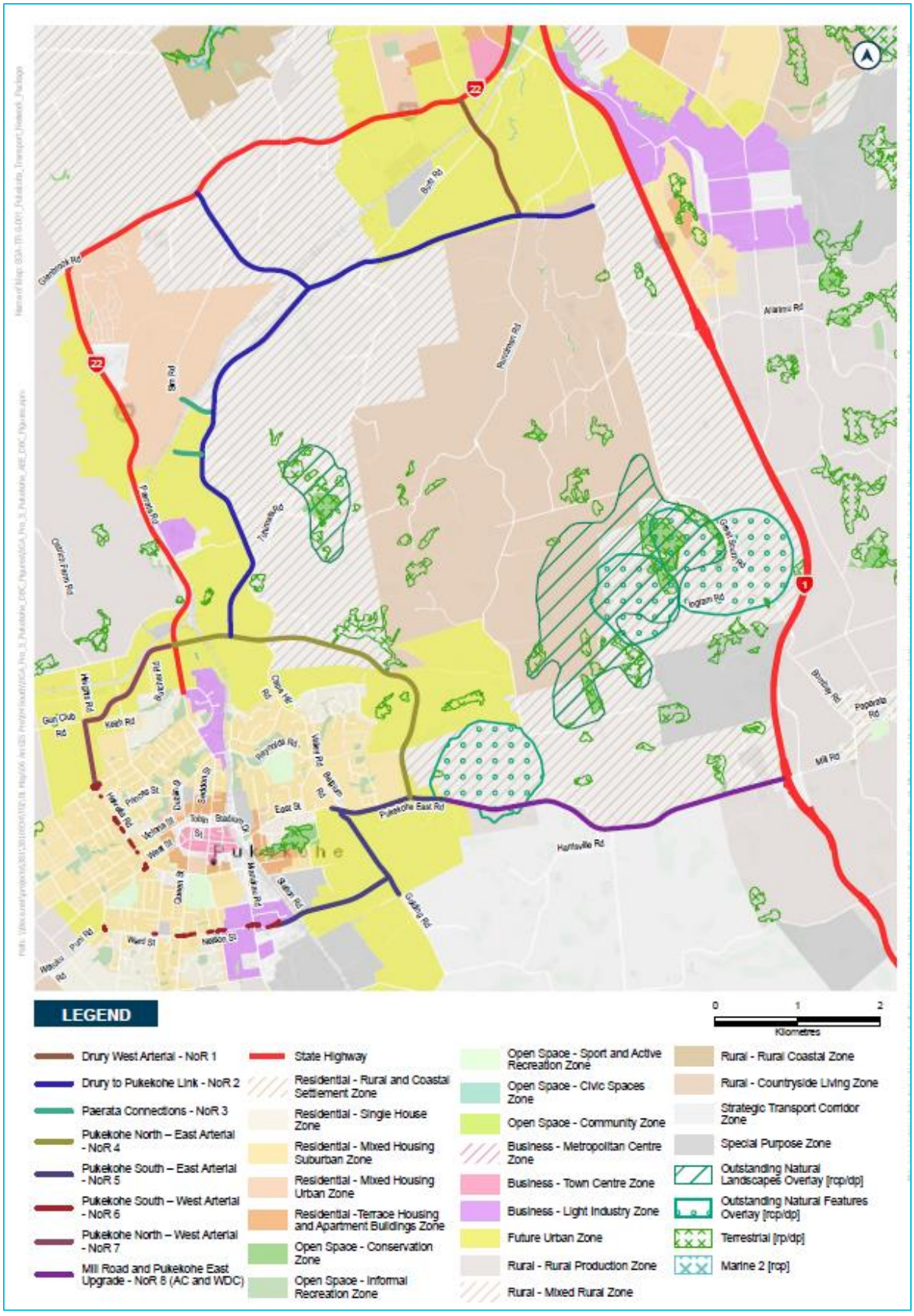

Figure 1-1: Pukekohe Transport Network NoRs

1.2 Te Tupu Ngātahi Supporting Growth

Te Tupu Ngātahi Supporting Growth (Te Tupu Ngātahi) is a collaboration between AT and Waka Kotahi NZ Transport Agency (Waka Kotahi) to plan transport investment in Auckland's future urban zoned areas over the next 10 to 30 years.

AT and Waka Kotahi have partnered with Auckland Council, Manawhenua and KiwiRail Holdings Limited (KiwiRail) and are working closely with stakeholders and the community to develop the strategic transport network to support Auckland's growth areas, which are shown in Figure 2.

The key objective of Te Tupu Ngātahi is to protect land for future implementation of the required strategic transport corridors/infrastructure. As a form of route protection, designations will identify and appropriately protect the land necessary to enable the future construction, operation and maintenance of these required transport corridors/infrastructure. A designation is important as it provides certainty for the Requiring Authority that it can implement the work. It also provides property owners, businesses and the community with increased certainty regarding future infrastructure, so they can make informed decisions. It can also significantly reduce long-term costs for local and central government and enable more effective land use and transport outcomes.

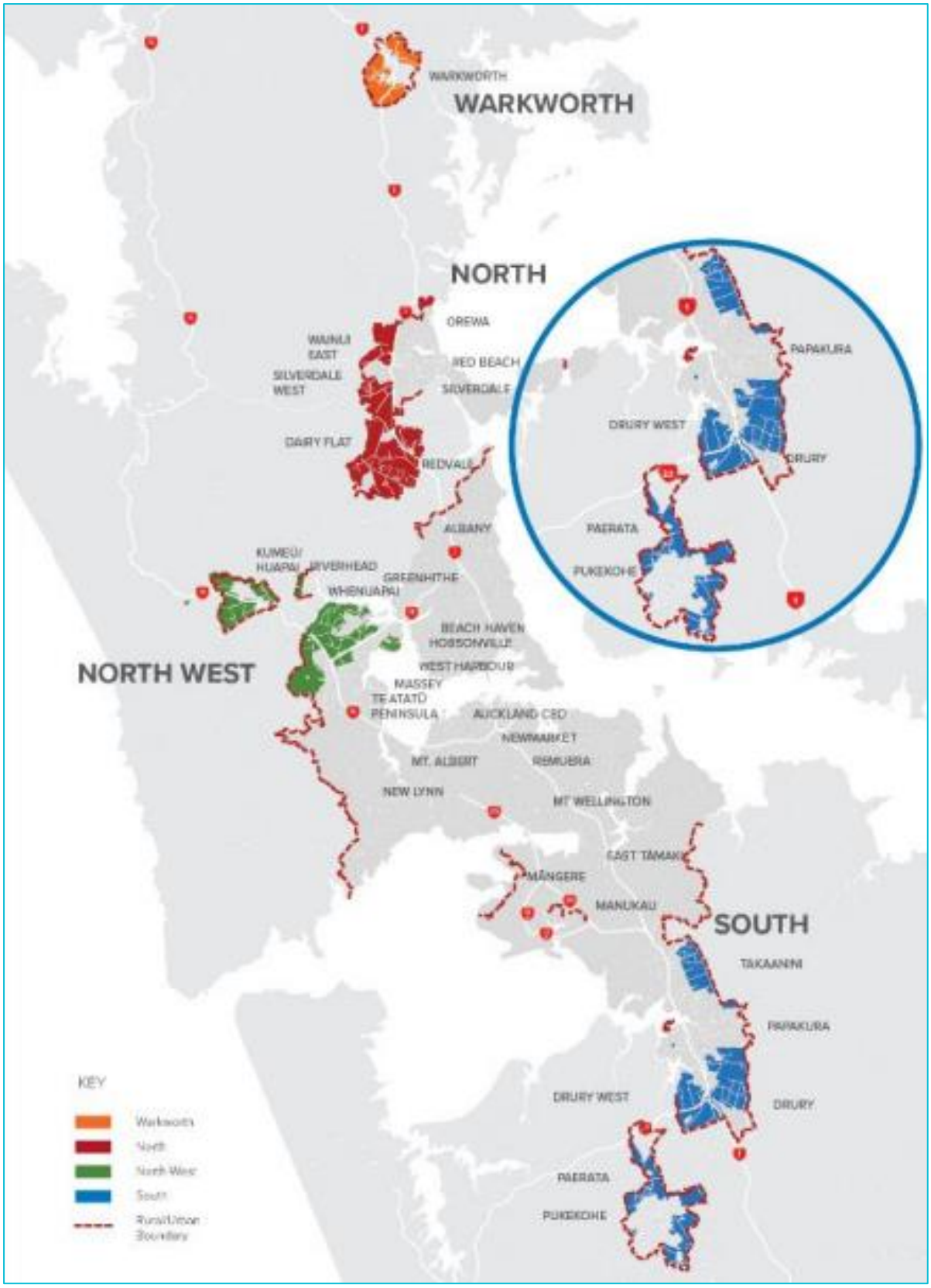

Figure 1-2: Future Urban Areas of Auckland, highlighting the Southern Growth Area.

1.3 Requiring Authorities

1.3.1 Auckland Transport

AT is financially responsible for Auckland's transport network 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 performing the statutory functions and exercising the statutory powers set out in section 46 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 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 (other than an activity described in paragraph (a)) in relation to the Auckland transport system for which it or the Auckland Council has financial responsibility". Subsequently, AT may designate land to construct, operate and maintain roads and any other activities in relation to the Auckland transport system that Council has financial responsibility for.

1.3.2 Waka Kotahi

The Land Transport Management Act 2003 (LTMA) provides the statutory framework for New Zealand's land transport system and is the statute under which the Waka Kotahi operates (in conjunction with the Government Roading Powers Act 1989 (GRPA) and the Land Transport Act 1998 (LTA)).

Waka Kotahi principal objective under section 94 of the LTMA is "to undertake its functions in a way that contributes to an effective, efficient, and safe land transport system in the public interest". Waka Kotahi functions are set out in section 95(1) and the principles under which it must operate are affirmed in section 96 of the LTMA.

Section 61 of the GRPA sets out the powers and duties of Waka Kotahi in relation to state highways. Waka Kotahi has the sole powers of control for all purposes, including construction and maintenance, of all state highways under this Act. Further, section 88 states that Waka Kotahi is able to declare a state highway, or part of a state highway, a limited access road.

Waka Kotahi was approved under section 167 of the RMA as a Requiring Authority by two gazette notices in 1994 and 2015.

Pursuant to the 1994 notice, Waka Kotahi may designate land, water, subsoil or airspace for the "construction and operation (including the maintenance, improvement, enhancement, expansion, realignment and alteration) of any State highway or motorway pursuant to the GRPA". It may also designate land, water, subsoil or airspace for "the purpose of constructing or operating (or proposing to construct or operate) and maintaining cycleways and shared paths in New Zealand pursuant to the GRPA and the LTMA.

1.4 Auckland Council and Waikato District Council

NoR 1 – 7 are entirely within the Auckland Council jurisdictional area.

NoR 8 (Waka Kotahi) upgrades the existing Mill Road (Bombay) and Pukekohe East Road and is partly within the Auckland Council and partly within the Waikato District Council jurisdictional area. While this report describes NoR 8 as one project, a separate NoR has been submitted for each of the jurisdictional areas and has been considered under both the Auckland Unitary Plan and the Waikato District Plan in this AEE. This is shown through Figure 1-3

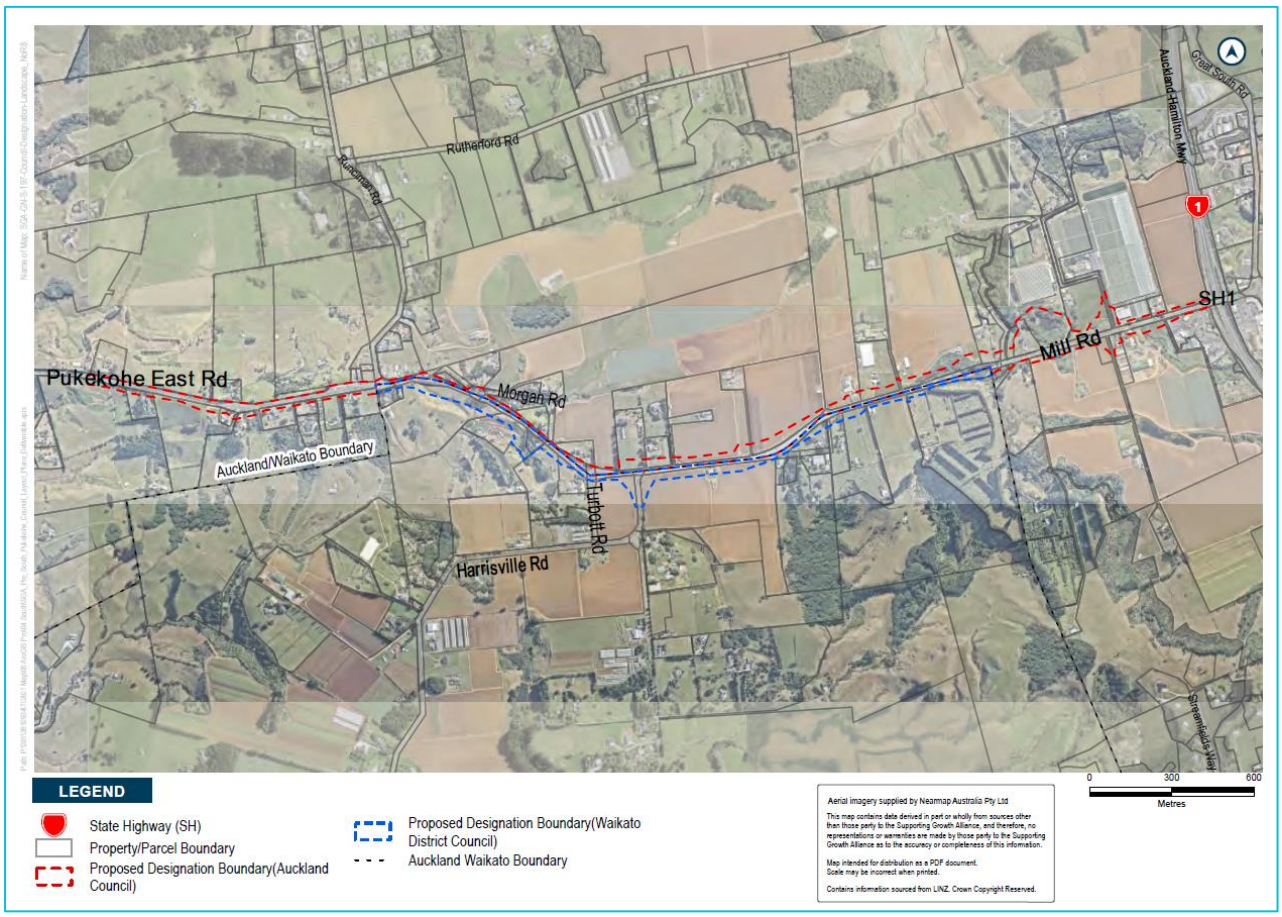

Figure 1-3: Mill Road (Bombay) and Pukekohe East Road Upgrade split by jurisdictional area (Auckland Council and Waikato District Council).

1.5 Notification

Auckland Transport requests that NoRs 1, 3 – 7 are publicly notified, and Waka Kotahi requests that NoR 2 and NoR 8 (AC and WDC) are publicly notified.

2 Background and context

2.1 Future Urban Growth

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 areas (greenfields) as identified in the Auckland Unitary Plan: Operative in Part (AUP:OP).

The Future Urban Land Supply Strategy 2017 (FULSS) identifies the Future Urban Zone (FUZ) areas of Pukekohe-Paerata amounting to 1,704ha of former (primarily) rural land rezoned for future business and residential growth. This growth over the next 25 years towards 2048 is anticipated to result in a total of over 14,000 new dwellings. The subsequent Pukekohe-Paerata Structure Plan 2019 provides indicative statistics of 1,262ha developable land area (529ha net available for building) anticipated to result in 12,520 additional dwellings for an additional population of 33,809 people and 5,020 jobs once fully developed by 2050. With the addition of Drury West, growth across the area amounts to 21,000 additional households, 9,000 additional jobs and 55,000 more people at full build out post-2048.

The ratio of people to jobs indicates many people living in the area will need to travel elsewhere for employment, consolidating an existing pattern of transport demand out of the Pukekohe area for employment trips, typically made in morning and evening peak periods.

In 2019, Council prepared and endorsed two structure plans within the Pukekohe-Paerata and Drury Ōpāheke areas. The Structure Plans set out the pattern of land uses and supporting infrastructure network for the future growth of Pukekohe-Paerata, therefore, informing the options assessment for this project. The AUP:OP had placed the land intended for urban growth into a transitional FUZ zoning prior to this in 2016 with the establishment of the operative plan. The staging for live zoning of the identified FUZ land will be led by the FULSS 2017 timeframes.

The significant growth anticipated will pose a number of future transport challenges for the region. Many people living in the area will need to travel elsewhere for employment, consolidating an existing pattern of transport demand out of the Pukekohe-Paerata area for employment trips, typically made in morning and evening peak periods.

Given the scale and duration of the growth proposed, the early route protection of critical transport corridors provides the required certainty for the requiring authorities, stakeholders and the community.

The Waikato District is also experiencing significant growth and the pressure of development. As discussed within the Waikato District Growth Strategy, the Waikato District population is expected to double by 2061 with a consequent increase in the demand for land, infrastructure, services and amenities. Of importance to the Pukekohe Transport Network is Tuakau and Pōkeno, which are located approximately 10km and 8km from Pukekohe East and Mill Road respectively. Specifically,

[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

Mill Road and Pukekohe East Road are key transport routes for those travelling between Pukekohe and North Waikato. Mill Road (Bombay) and Pukekohe East Road provide an important connection between Auckland and Waikato.

2.2 Previous programme phases

In 2015, AT, Waka Kotahi and Auckland Council formed the Transport for Future Urban Growth (TfUG) Programme to investigate, plan and deliver the transport networks needed to connect the urban growth areas across North, North-West and South Auckland over the next 30 years. AT, Waka Kotahi and the Council prepared a Strategic Business Case, which confirmed the scale and urgency of the issue and a need to progress a transport response to the growth.

In 2016, AT, Waka Kotahi and the Council worked in partnership to develop a TfUG Programme Business Case. The Programme Business Case informed the TfUG Programme and the indicative network prepared at that time. It also identified route protection of key transport corridors as the priority focus area for the next steps of the programme. The TfUG Programme is now known as the Te Tupu Ngātahi Supporting Growth Programme.

In May 2019, AT and Waka Kotahi Boards approved Indicative Business Cases (IBC) for each growth area (Warkworth, North, North-West and South) to further test and develop the recommendations of the Programme Business Case. The IBC's identified an indicative strategic transport network, which includes indicative locations for new or upgraded public transport connections, walking and cycling links and roads or state highways.

The South IBC recommended the Indicative Strategic Transport Network for Drury, Paerata and Pukekohe is shown in Figure 2-1. This network was endorsed by the AT Board in February 2019 and Waka Kotahi Board in May 2019.

After endorsement of the Indicative Strategic Transport Network, the Strategic South Detailed Business Case (DBC) commenced which included the "strategic" components of the Pukekohe area: the Pukekohe Expressway and connections including the North-east section of the "ring route" in Pukekohe. The Strategic South DBC undertook options assessment on these components and recommended preferred options that were presented in public engagement in 2020.

Later in 2020, the New Zealand Upgrade Programme (NZUP) announced funding for implementation of the Mill Road components of the Strategic South DBC. The Strategic South DBC projects were reallocated to the Pukekohe Local DBC within the Supporting Growth Programme.

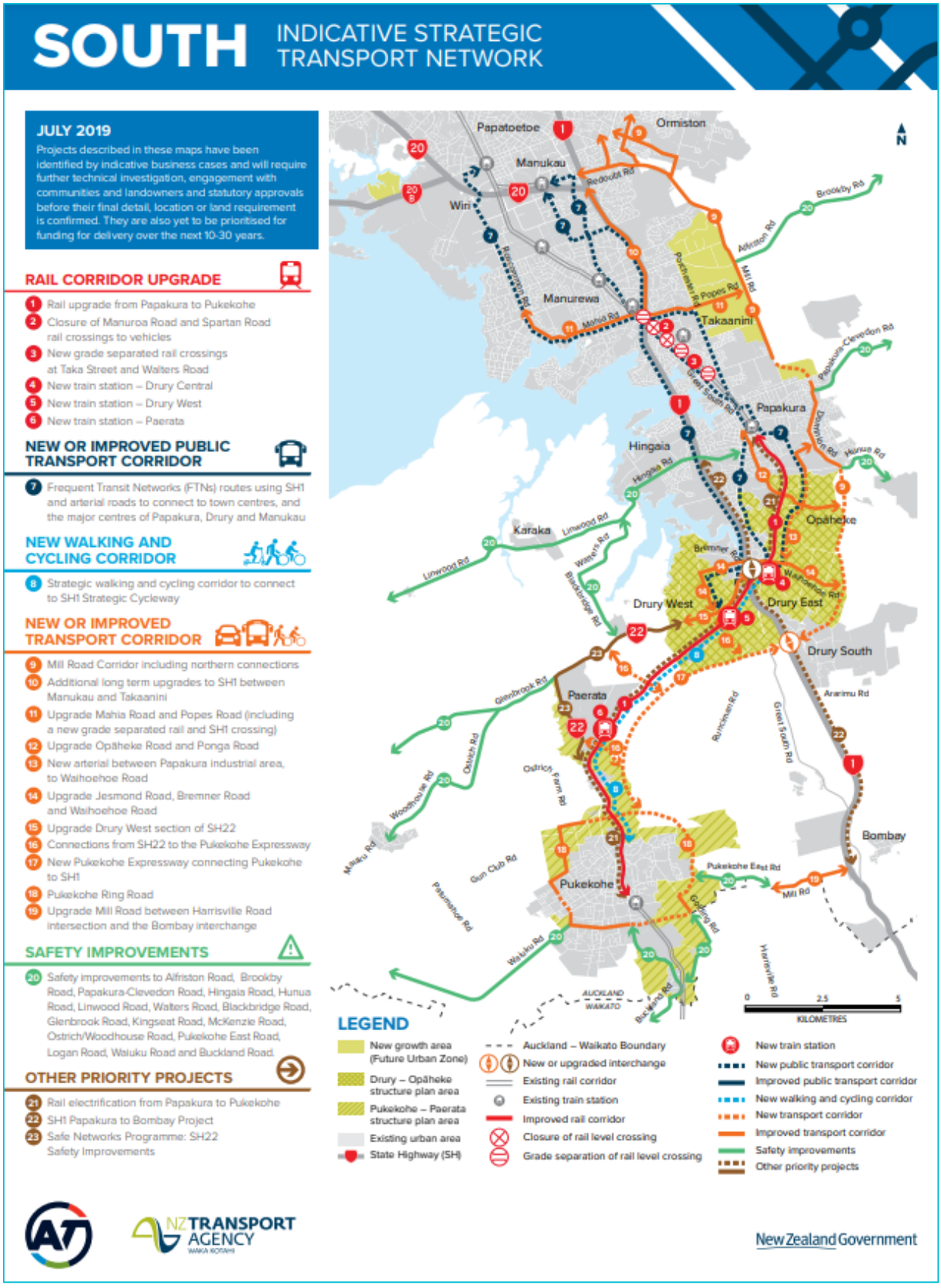

Figure 2-1: South IBC Indicative Strategic Transport Network

3 The Pukekohe Transport Network

3.1 Purpose of the Network

The current transport network is already under pressure and future transport demands will exacerbate existing issues, limiting Pukekohe, Paerata and Drury West's (collectively referred to as Pukekohe in this report) growth potential. The current form of the transport network in these areas is not capable of supporting the significant growth anticipated.

The key reasons why the Pukekohe Transport Network is required is set out in Table 3.1 below:

Table 3-1: Key issues if the Pukekohe Transport Network is not implemented

Issue	Key issues if the Pukekohe Transport Network is not implemented
Safety	• Significant road safety risks including conflicts with active modes and increased risks on rural roads from high speeds and rat running by vehicles seeking to avoid congestion
Integration	• Poorly integrated land use which will result in reduced access to social and economic opportunities, compromised liveability, reduced opportunities to maximise transport catchments to increase mode share for public transport, walking and cycling
Access	• Reduced access between destinations through a range of modes, resulting in heightened localised congestion and impacts on residential streets, impacting amenity, liveability and safety as well as limiting people's ability to meet daily needs
Reliability / resilience	• Reduced resilience as a result of limited availability of alternative modes and routes
Travel choice	• Limited transport choice which will undermine efforts to reduce VKT and the carbon emissions profile of the land transport system in line with local and national emission reduction imperatives

The Pukekohe Transport Network encompasses eight projects which together form a cohesive transport response for Pukekohe to respond to planned future growth. The Pukekohe Transport Network includes provision for improved walking and cycling, public transport, and general traffic connections. Overall, the Pukekohe Transport Network seeks to improve connectivity and resilience providing high quality, safe and attractive transport environments.

The Pukekohe DBC was approved by the AT Board in August 2023 and the Waka Kotahi Board in September 2023.

3.2 Overview of Notices of Requirement

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
NoR 1	AT	Drury West Arterial	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for a new transport corridor in Drury West that: 1. Improves connectivity 2. Is safe 3. Provides resilience in the transport network 4. Integrates with and supports planned urban growth 5. Integrates with and supports the existing and future transport network 6. Improves travel choice and contributes to mode shift	• A 1.6 km long proposed designation between SH22 and Jesmond Road to the proposed Drury to Pukekohe Link (NoR 2) at the edge of the FUZ in south Drury.	20 years	• 16 properties directly affected, including: ◦ Privately owned land: 15 properties totalling approximately 183,858m^2 ◦ Rail: 1 property totalling approximately 3,039m^2 • Land use includes working agriculture and horticulture, rural-residential
NoR 2	Waka Kotahi	Drury – Pukekohe Link	Auckland Council	Construction, operation, maintenance and improvement of a State highway cycleway and / or shared path, and associated infrastructure.	Provide for a new and upgraded transport corridor between Drury and Pukekohe that: a) Improves connectivity	• A 10.6km long proposed designation between Drury and Pukekohe.	20 years	• 61 properties directly affected, including: ◦ Privately owned land: 56 properties, totalling approximately 1,563,652m^2

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
					b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift			• Hydro: 4 properties, totalling approximately 5,363m^2 • Rail: 1 property, totalling approximately 7,323m^2 • Land use includes pastoral, working agricultural, rural-residential
NoR 3	AT	Paerata Connections	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for new transport corridors in Paerata that: a) Improve connectivity b) Are safe c) Provide resilience in the transport network d) Integrate with and supports planned urban growth e) Integrate with and supports the existing and future transport network f) Improve travel choice and	• A 285 m long proposed designation between the two extents of Sim Road over the NIMT. • A 300m proposed designation between the Paerata Rail Station (KiwiRail designation 6311 currently under	20 years	• 13 properties directly affected, including: • Privately owned land: 8 properties, totalling approximately 102,591m^2 • Rail: 5 properties, totalling approximately 6,808m^2 • Land use is pastoral

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
					contributes to mode shift	construction) and Sim Road (south).		
NoR 4	AT	Pukekohe North-East Arterial	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for a new transport corridor between SH22 and Pukekohe East Road that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	• A 4km long proposed designation between SH22 and Pukekohe East Road.	20 years	• 32 properties directly affected, including: • Privately owned land: 29 properties, totalling approximately 501,981m^2 • Rail: 3 properties, totalling approximately 3,515m^2 • Land use includes pastoral and rural-residential
NoR 5	AT	Pukekohe South-East Arterial	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for a new and upgraded transport corridor between Pukekohe East Road and Svendsen Road that: a) Improves connectivity b) Is safe	• A 1km long proposed designation between Pukekohe East and Golding Road	20 years	• 52 properties directly affected, including: • Privately owned land: 50 properties, totalling approximately 205,695m^2

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
					c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	to Svendsen Road.		• Council owned land: 1 property, totalling approximately 8,205m^2 • Rail: 1 property, totalling approximately 2,188m^2 • Land use includes agriculture-pastoral, rural-residential, light industrial and residential
NoR 6	AT	Pukekohe South-West Upgrade	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for an upgraded transport corridor between Svendsen Road and Helvetia Rd that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network	• Proposed designation at six intersections and 18 driveways for regrading.	20 years	• 38 properties directly affected, including: • Privately owned land: 38 properties, totalling approximately 4,140m^2 • Council owned land: 1 property, totalling approximately 514m^2 • Land use includes light industrial and residential

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
					f) Improves travel choice and contributes to mode shift			
NoR 7	AT	Pukekohe North-West Arterial	Auckland Council	Construction, operation and maintenance of a transport corridor.	Provide for a new transport corridor between SH22 and Helvetia Road that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	• A 2.4km long proposed designation between Helvetia Road and SH22.	20 years	• 27 properties directly affected, including: ◦ Privately owned land: 27 properties, totalling approximately 131,906m^2 • Land use includes arable land, commercial and agricultural
NoR 8 (AC) and NoR 8 (WDC)	Waka Kotahi	Mill Road and Pukekohe East Road Upgrade	Auckland Council Waikato District Council	Construction, operation, maintenance and improvement of a State highway cycleway and / or shared path, and associated infrastructure. .	Provide for an upgrade transport corridor from SH1 (Bombay Interchange) to Pukekohe that: a) Improves connectivity b) Is safe	• A 5.5km (total) long upgrade (two proposed designations – one in Auckland one in the Waikato District) between SH1 at	20 years	• 68 properties directly affected, including: ◦ Privately owned land: 65 properties, totalling approximately 168,814m^2

Notice	Requiring Authority	Project	Council	Purpose	Objectives	Extent	Lapse period	Overview of properties
					c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	Mill Road (Bombay) to Pukekohe South-East Arterial (NoR 5)		• Council owned land: 2 Auckland Council properties, totalling approximately 1,636m^2 • Hydro: 1 property, totalling approximately 131m^2 • Land use includes agriculture-pastoral, rural-residential

A full map of the NoRs is provided in Figure 1-1

3.3 Land use and transport staging

The required transport networks and infrastructure proposed by the Pukekohe Transport Network will play a vital role in the success of new neighbourhoods by providing safe, accessible and sustainable travel choices that connect communities and provide public transport and active transport.

The growth in the relevant Structure Plan areas (specifically Pukekohe-Paerata, and more broadly Drury-Opāheke) is occurring in the context of strong growth in adjacent areas including existing urban areas to the north, and the Waikato to the south. This means that transport demands (and therefore, staging considerations) are also influenced by regional and inter-regional growth for the strategic networks, not just growth in the Structure Plan areas.

The staging of transport networks within the Southern growth areas is highly influenced by the proposed release of FUZ areas by Council through Plan Changes. The Council's proposed sequencing of land release is identified in the FULSS.

There are known growth pressures from landowners and developers for accelerated growth in some areas which may result in a different timing and sequencing of land release than is indicated in the FULSS. The implementation of the strategic transport network required to support the growth will be staged over the next 30 years.

At the time of preparing this document, Auckland Council are developing an updated Future Development Strategy which is currently under consultation. While there is no material change on the full build out within the Project Area, the document proposes a new timeframe of land development, which sequences land development later than originally proposed in the FULSS. If the land development pattern follows the Future Development Strategy or later, it is likely that projects will be deferred until urbanisation occurs. Conversely, if land development accelerates earlier than anticipated in FULSS the projects will be needed earlier. The Future Development Strategy is expected to be finalised and adopted by Auckland Council in late 2023.

The staging has been based on when the FULSS anticipates that Pukekohe will be development ready. This has been tested in the Pukekohe DBC transport modelling to confirm the anticipated build out of the network. The DBC staging is specific to the Pukekohe area and has accounted for:

a) Transport demand using the regional transport model (the Macro Strategic Model (MSM)), as well as the Strategic Active Modes Model used for the assessment of the active modes demands and SATURN based traffic models (using MSM outputs) I11v6 Population Growth Forecasts setting out residents and employments forecasts, with a 2048+ forecast year.
b) Other network projects being developed separately in Pukekohe that are complementary to the Pukekohe Transport Network, including:
    a. New rail stations at Drury Central, Drury West and Paerata and associated park and ride facilities
    b. Additional rail capacity between Pukekohe and Papakura (4-tracking, electrification, and associated grade separations at road/rail crossings)
    c. SH1 Papakura to Bombay (P2B) project includes an upgrade to the existing Drury interchange, constructing a new interchange in Drury South and adding additional general traffic lane capacity in each direction.
    d. Upgrades on SH22 between SH1 and Oira Road funded by NZUP. These upgrades are proposed to improve safety, amenity and capacity along the route to enable urbanisation.

e. Drury Strategic Transport Network including Jesmond to Waihoehoe West FTN and upgrades to Ponga, Opāheke and Waihoehoe Road East
f. The future collector roads indicated in the Structure Plan are expected to develop through developer contributions as areas get urbanised.

The DBC modelling shows that overall, the land use staging is generally consistent with work completed as part of the FULSS. However, in practice, the development rate will be influenced by market attractiveness, the owner/developer willingness to develop and underlying regional growth trends meaning it could be many years before each of the areas is fully developed.

These timeframes have informed the project lapse dates discussed in Section 7.

3.4 Need for Route Protection

The need for route protection of the transport network in Pukekohe is driven by the rate and scale of committed developments, including the planned release of land by Auckland Council and pressure from developers proposing to accelerate urban growth.

There is also further evidence of ongoing development pressure in Pukekohe with various significant land developments occurring or planned to occur throughout the future urban area in Pukekohe. An overview of the strategic context is provided in section 9.1 of this Report. This includes:

- Structure Plans (discussed in section 9.1.1)
- Developer Interest (discussed in section 9.1.2)
- Private Plan changes (discussed in section 9.1.2)
- Resource Consents and Other Projects (discussed in section 9.1.2)

If the transport corridors and infrastructure are not protected ahead of development, this may result in:

- Uncertainty for private development investment
- Significant disruption to future communities (e.g., if the corridor is built into prior to delivery)
- Reduced ability to influence good urban form and land use integration
- Compromised ability to deliver a comprehensive transport network which supports public transport and active modes.

As such, it is critical that the future transport network in Pukekohe is route protected to ensure the required transport corridors and infrastructure can be provided when required.

4 Section 171 of the Resource Management Act 1991

Section 171 of the RMA sets out the matters that a territorial authority must (subject to Part 2), have particular regard to when considering the effects of the environment of allowing a Requirement. These matters are set out in Table 4.1 below:

Table 4-1: Outline of where Section 171 of the RMA has been addressed in AEE.

Matter to consider	Section of the AEE where the matter is primarily addressed
Whether particular regard has been had of any relevant provision of: a) A national policy statement; b) A New Zealand coastal policy statement; c) A regional policy statement or proposed regional policy statement; d) A plan or proposed plan	Refer to section 12 for assessment against relevant policy documents.
Whether adequate consideration has been given to alternative sites, routes or methods of undertaking the work if[2]: a) The requiring authority does not have an interest in the land sufficient for undertaking the work; or b) It is likely that the work will have a significant adverse effect on the environment.	Refer to section 5 and Appendix A: Assessment of Alternatives for discussion on alternative sites, routes and methods. Refer to section 10 for the assessment of effects on the environment.
Whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought[3]	Refer to section 6.
Any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement[4]	Refer to 12.2.

[2] Section 171(1)(b) of the RMA
[3] Section 171(1)(c) of the RMA
[4] Section 171 (1)(d) of the RMA

5 Assessment of Alternatives

5.1 Statutory requirement to consider alternatives

Section 171(1)(b) of the RMA requires that when making a recommendation on a NoR, a territorial authority shall consider whether adequate regard has been given to alternative sites, routes or methods of undertaking the work in circumstances where:

c) the requiring authority does not have an interest in the land sufficient for undertaking the work; or
d) it is likely that the work will have significant adverse effect on the environment.

There are several principles and key considerations for a requiring authority to apply and adhere to when undertaking an assessment of alternatives and identifying a preferred option. Of note are the following:

- the process should be adequately transparent and robust, and clearly recorded so that it can be understood by others;
- an appropriate range of alternatives should be considered; and
- the extent of options considered, and the assessment of these options, should be proportional to the potential effects of the options being considered.

Auckland Transport and Waka Kotahi do not have sufficient interest in the land required for the Project and as such are required to give adequate consideration to alternatives.

Auckland Transport and Waka Kotahi have considered an appropriately broad range of possible alternative routes and other methods for undertaking the Project. A summary of the assessment process and options considered is set out below. Appendix A of this report sets out the assessment in detail.

A summary of the assessment of alternatives for each NoR, including an overview of the options considered, key decisions made during the assessment of options and design refinement is also outlined in the sections to follow.

5.1.1 Consideration of alternative routes

This section provides an overview of the assessment of alternatives methodology used to develop and assess route options for the Pukekohe Transport Network and ultimately determine the preferred option(s). This methodology was generally applied to both the IBC and the DBC processes. In some instances, where specific circumstances required, deviation from the process set out below occurred. Where the process was deviated from, this was identified and described in the relevant sections of the Assessment of Alternatives Report (refer to Appendix A of this AEE).

An overview of the alternatives assessment process undertaken across the IBC and DBC is illustrated in Figure 5.1 below:

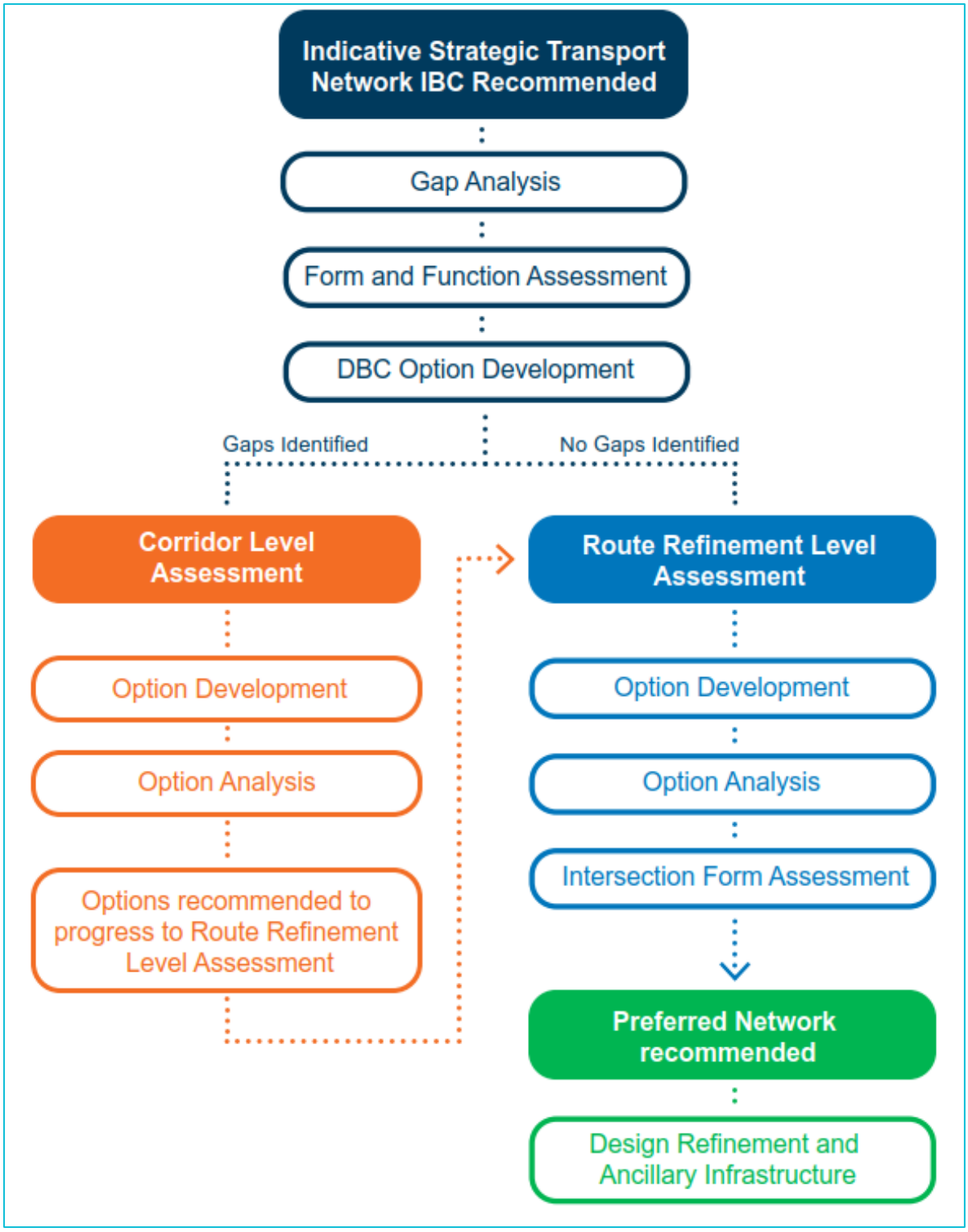

Figure 5-1: Alternatives assessment process

Options for the Pukekohe Transport Network were considered using a Multi-Criteria Analysis (MCA) and expert judgement. The assessment process was iterative with inputs from partners, stakeholders and the public.

The options assessment for the South IBC followed a long list – short list – recommended option process, which assessed 151 options at a network level to form an indicative strategic transport

network in the southern growth areas of Auckland. Within the Pukekohe-Paerata and Drury West area, options identified for further investigation included:

- Pukekohe Ring Road;
- New road connecting Pukekohe with Paerata, Drury West and SH1;
- SH22 Connections; and
- Other safety and/or walking and cycling improvements.
- The draft Strategic South DBC included the “strategic” components of the Pukekohe area: the Pukekohe Expressway and the Pukekohe Urban Arterial (north-east section of the “ring route”). The Strategic South DBC undertook alternatives assessment on these components and recommended preferred options that were presented in public engagement in 2020.

Later in 2020, the NZUP announced funding for implementation of the Mill Road components of the Strategic South DBC. The remaining Strategic South DBC projects were reallocated to the Pukekohe Local DBC within the Supporting Growth Programme. These projects form the basis of this alternatives assessment to determine the recommended Pukekohe Transport Network.

Between the South IBC, the draft Strategic South DBC (for the Pukekohe Expressway and Pukekohe NE Arterial) and the Pukekohe DBC, a gap analysis was undertaken to test whether the alternative options considered were proportional to the scale of potential effects, and whether new information had emerged since the completion of the IBC that would alter the Pukekohe Transport Network.

Following the recommendations of the gap analysis, an assessment of alternatives was undertaken for the DBC phase at a ‘macro’ corridor level (considering various network and corridor options) taking into consideration the assessments undertaken during the IBC phase and draft Strategic South DBC.

At the corridor level, alternatives were assessed in four groups:

- Drury West Local – local connectivity in the FUZ to the station and strategic corridors;
- Paerata Local – local connectivity in the FUZ to the station and strategic corridors;
- North-South – strategic connections between Drury, Paerata and Pukekohe; and
- Pukekohe Local – local connections around Pukekohe as alternatives to the current main connection through the Pukekohe centre.

Once preferred corridors were identified for the Pukekohe Transport Network, route refinement assessments were undertaken at a ‘micro’ level to further develop the corridor options. Additional assessments were undertaken during route refinement to determine appropriate tie-ins, side of road widening and walking and cycling facility placement.

The completion of this process ultimately informed the recommended Pukekohe Transport Network to progress to the NoR stage. As set out in Appendix A of this AEE, adequate consideration has been given to alternative sites, routes and methods in a manner that is transparent, robust and replicable.

5.1.2 Consideration of alternative methods

As part of the consideration of alternatives, an evaluation of alternative methods was undertaken during the DBC. This focused on methods that enabled route protection and future implementation of projects and were considered in light of a number of contextual elements including project importance, urgency, and complexity.

Following the assessment of a range of methods including:

- Designations;
- Resource consents;
- Landowner/developer negotiations;
- Plan changes (initiated or submitted on);
- Structure plans; and
- Traditional property acquisition.

Of the identified methods short term designations, legislation/statutory document changes and resource consents were not considered appropriate methods for the Projects from the outset because they would not offer the appropriate long term protection of land required to implement the Projects.

Designations were identified as the preferred method in the context of the Project as these were considered to be the most logical and effective method to protect a corridor in an evolving environment for the following reasons:

- A designation provides certainty to all parties including the community and affected landowners;
- It is a well-recognised and understood tool for route protection which also enables land acquisition processes through the link to the Public Works Act 1981 (PWA);
- Maximises flexibility for future implementation;
- Negates the need for additional land use consents to implement works authorised under the district plan (s 9(3) of the RMA); and
- Will continually provide for future operation and maintenance requirements.

The other methods considered were discounted for the following reasons:

- Resource consents could grant approval under the RMA for the projects but would not enable protection of the land from buildout and would not enable the corridors to be shown publicly in the AUP:OP.
- Plan changes and structure planning were considered, however the Pukekohe Transport Network area has two structure plans which have already been prepared. Structure Plans are not considered an appropriate mechanism to rely upon for route protection as they do not provide enough certainty in protection of privately-owned land and they have no formal statutory weighting. A new plan change is not considered an appropriate mechanism to implement the network because the land surrounding portions of the network are already zoned for future development, are precincts or have established development.
- Landowner and developer negotiations were considered, however where numerous owners are present and any route protection afforded by negotiations can be piecemeal if agreement cannot be reached with all parties. It is not compulsory for landowners or developers to enter into agreements and it is likely to require significant time and resources to reach agreement, if this is possible at all.

Traditional property acquisition is not appropriate for the Pukekohe Transport Network because property is typically purchased closer to construction when detailed design is available. Purchasing land ahead of detailed design may result in too much or too little land being acquired which would need to be corrected at construction, or otherwise the design may have to be compromised. Traditional acquisition would also not protect temporary construction areas or provide route protection until following acquisition, leaving routes with multiple owners vulnerable to buildout in the interim.

6 Whether the work and designation are reasonably necessary for achieving the objectives

Section 171(1)(c) of the RMA requires a territorial authority to have particular regard to whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought. Table 6.1 provides an assessment of whether the work and designation are reasonably necessary for achieving the project objectives:

Table 6-1: Reasonable necessity of to achieving the Project objectives

Notice	Project Objectives	Project achieves objectives by
NoR 1 - Drury West Arterial	Provide for a new transport corridor in Drury West that: e) Improves connectivity f) Is safe g) Provides resilience in the transport network h) Integrates with and supports planned urban growth i) Integrates with and supports the existing and future transport network j) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Provides connectivity in Drury West. • Supports Vision Zero and road safety outcomes • Supports resilience by providing an additional strategic transport corridor. • Supports planned urban growth and the existing and future transport network by providing a spine for the future collector road network and an additional connection to the existing strategic network.) • Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes, a key connection to public transport (planned Drury West Station and FTN network) and additional capacity for further public transport services. • The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration.

Notice	Project Objectives	Project achieves objectives by
NoR 2 - Drury - Pukekohe Link	Provide for a new and upgraded transport corridor between Drury and Pukekohe that: k) Improves connectivity l) Is safe m) Provides resilience in the transport network n) Integrates with and supports planned urban growth o) Integrates with and supports the existing and future transport network p) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves connectivity between and within Drury and Pukekohe. • Supports Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing an additional strategic transport corridor to SH1 and SH22. • Supports planned urban growth and the future collector network by providing a new corridor for strategic movements between future urban areas. • Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes and connections to the future strategic Active Mode Corridor. • The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration.
NoR 3 - Paerata Connections	Provide for new transport corridors in Paerata that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves connectivity within Paerata • Support Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing new transport connections. • Supports planned urban growth and the future transport network by providing new connections within new future urban communities.

Notice	Project Objectives	Project achieves objectives by
		• Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes and a key connection to the Paerata Rail Station. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration.
NoR 4 - Pukekohe North-East Arterial	Provide for a new transport corridor between SH22 and Pukekohe East Road that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves connectivity in Pukekohe • Support Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing a new transport connection. • Supports planned urban growth and the future transport network by providing new connections within new future urban communities. • Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes and capacity for new public transport services. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration.
NoR 5 - Pukekohe South-East Arterial	Provide for a new and upgraded transport corridor between Pukekohe East Road and Svendsen Road that: a) Improves connectivity	The work is reasonably necessary to achieve the objectives because it:

Notice	Project Objectives	Project achieves objectives by
	b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	• Improves connectivity in Pukekohe. • Supports resilience and the existing transport network by providing new transport connections. • Supports planned urban growth and the future transport network by providing new connections within new future urban communities. • Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration
NoR 6 - Pukekohe South-West Upgrade	Provide for an upgraded transport corridor between Svendsen Road and Helvetia Rd that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves active mode connectivity in Pukekohe. • Support Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing new active mode connections. • Supports planned urban growth and the future transport network by providing new active mode connections between new future urban communities. • Supports travel choice by providing for active modes on existing roads. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and

Notice	Project Objectives	Project achieves objectives by
		protection of the land required for the Project for an extended duration.
NoR 7 - Pukekohe North-West Arterial	Provide for a new and upgraded transport corridor between SH22 and Helvetia Road that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves connectivity in Pukekohe • Supports Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing new transport connections. • Supports planned urban growth and the future transport network by providing new connections within new future urban communities. • Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes and capacity for new public transport services. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration
NoR 8 - Mill Road and Pukekohe East Road Upgrade	Provide for an upgrade transport corridor from SH1 (Bombay Interchange) to Pukekohe that: a) Improves connectivity b) Is safe c) Provides resilience in the transport network d) Integrates with and supports planned urban growth e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift	The work is reasonably necessary to achieve the objectives because it: • Improves connectivity in Pukekohe. • Support Vision Zero and road safety outcomes • Supports resilience and the existing transport network by providing an upgraded transport connection including adding additional capacity to Mill Road. • Supports planned urban growth and the future transport network by upgrading an existing strategic connection for new future urban communities.

Notice	Project Objectives	Project achieves objectives by
		• Supports travel choice by providing for all modes of transport. • Contributes to mode shift and the transition to a low carbon transport network by providing for active modes. The method of designation is reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the Project for an extended duration.

7 Lapse period sought and rationale

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

- It has been given effect to; or
  - 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, or
  - 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 to support the planned urban growth. We consider that an extended lapse period of 20 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 landuse. As enabled by section 184(1)(c) of the RMA, a lapse period of 20 years is required for the Pukekohe Transport Network.

Table 7-1 Recommended Lapse Dates

Notice	Lapse period
NoR 1 - Drury West Arterial	20 years
NoR 2 - Drury - Pukekohe Link	20 years
NoR 3 - Paerata Connections	20 years
NoR 4 - Pukekohe North-East Arterial	20 years
NoR 5 - Pukekohe South-East Arterial	20 years
NoR 6 - Pukekohe South-West Upgrade	20 years
NoR 7 - Pukekohe North-West Arterial	20 years
NoR 8 - Mill Road and Pukekohe East Road Upgrade	20 years

7.1 Need for extended lapse date

The above lapse dates account for uncertainty of urbanisation and funding timeframes.

At the time of preparing this document, Auckland Council is developing an updated Future Development Strategy which is currently draft and under consultation. While there is no material change on the full build out within the Project Area, the document proposes a new timeframe of land development, which sequences land development later than originally proposed in the FULSS. At the time of lodgement, Council has made no decisions on the updated Future Development Strategy.

In the context of the projects within the Pukekohe Transport Network, extended lapse periods are considered necessary for the following reasons:

- It provides statutory protection of the land required for transport infrastructure to support future growth in a manner that recognises the uncertainty associated with the timing of that growth.
- It supports efficient land use and transport integration by enabling the efficient delivery of transport infrastructure at a time and in a way that is integrated with future urbanisation.
- It provides the Requiring Authorities sufficient time to:
  - Obtain funding;
  - Undertake tendering / procurement;
  - Undertake property and access negotiations and other processes associated with construction of the projects;
  - Undertake the detailed design of the projects; and
  - Obtain the necessary resource consents and other statutory approvals.
- It provides property owners, businesses and the community certainty on where transport routes will be located (i.e., within the designation boundaries) .

We also note that:

- An extended lapse period does not mean that the designation will not be given effect to until the end of the lapse period sought. A lapse period is a limit and not a target. If urbanisation was confirmed within the lapse period sought it is likely that the designation will be implemented to enable appropriate integration with development.
- It is not uncommon for infrastructure projects to have a longer lapse period and this has been confirmed on recent projects such as the Drury Arterial Network (part of the Supporting Growth Programme), Southern Links (Waka Kotahi), the Northern Interceptor Wastewater Pipeline (Watercare) and the Hamilton Ring Road (Waikato District Council, Hamilton City Council).
- Setting a shorter lapse period would not be a significant factor in facilitating earlier availability of funding than is planned at the time the NoR is sought.
- Setting an unrealistically short lapse period will likely result in an inadequate suite of conditions to manage any uncertainty if the requiring authority is likely to seek to extend the lapse period through the application of section 184 of the RMA.

It is acknowledged that when considering an extended lapse period, it is appropriate to balance the need for that lapse period against the potential "blighting" effects on landowners. In the absence of a specific construction commencement date, and other precise information regarding construction duration within any specific area, the method for managing any outstanding uncertainty associated with the lapse period being sought is ongoing communication with affected landowners. Providing s176(1)(b) approvals for works within the designation where this does not prevent or hinder the future work will also mitigate the “planning blight” effects on landowners. This is particularly relevant for development of the FUZ adjacent to the proposed designations.

When considering effects associated with an extended lapse period, it is important to note that the majority of the Pukekohe Transport Network is within the FUZ. The FUZ is a landuse zoning that is applied to greenfield land that has been identified as suitable for urbanisation. It is located entirely within the boundaries of the Rural Urban Boundary (RUB) so is acknowledged as being potentially suitable for urban development.

The FUZ enables the land to continue to be used for rural purposes until such a time as the zoning is changed to an urban zoning. The AUP:OP identifies the FUZ as being a transitional zone wherein land can be used for a range of general rural activities but cannot be used for urban activities until the

site is rezoned for urban purposes; and while the FUZ anticipates urbanisation, it does not require it, nor does it set a timeframe for when the urbanisation will occur. In this regard, it is considered:

- People who currently live within the FUZ experiencing a rural lifestyle are unlikely to remain within that area as urbanisation of the FUZ is confirmed and implemented. As such, there is likely to be some uncertainty for existing residents about when urbanisation is likely to occur. People who live within the FUZ are likely already experiencing the effects of uncertainty irrespective of the proposed extended lapse date.
- The network is unlikely to be implemented until urbanisation is (at least) confirmed. If urbanisation does not occur, it is likely that the network will not be constructed. Confirmation of urbanisation is therefore considered to be critical to providing certainty on the likely construction of the network.
- Future communities, i.e. people who move into the area as the FUZ urbanises, will do so with knowledge of where the network will be.

8 Design and Assessment Approach

As discussed above, it is anticipated that the Pukekohe Transport Network will not be constructed for an estimated 20 years. As such the Te Tupu Ngātahi approach to design and assessment of effects has been developed in a manner that reflects the long-term implementation of the transport networks within environments that are likely to change significantly.

8.1 Approach to design

The design of the future strategic transport network has focused on developing an indicative design of the Network that is sufficient to inform the proposed designation footprint and to assess an envelope of effects whilst recognising the need for flexibility required due to the uncertainty of the future urban environment.

The proposed Network alignments are included in the drawing set in Volume 1, Attachment A. These have informed the proposed designation footprint and include ancillary components, such as construction areas and stormwater requirements. The detailed design will be undertaken before construction and an Outline Plan or Plans (as the Outline Plans may be staged to reflect Project phases or construction sequencing) will be submitted to Council as set out in s176A of the RMA. Resource consents will also need to be applied for in the future.

It is understood that the final design of the Network (including the design and location of associated works including bridges, culverts, stormwater management systems, soil disposal sites, signage, lighting at interchanges, landscaping, realignment of access points to local roads, and maintenance facilities), will be refined and confirmed at the detailed design stage.

8.2 Construction methodology

An indicative construction methodology has been developed for the Pukekohe Transport Network and has been used to inform the proposed designation footprints, assess potential effects on the environment, and to identify measures to avoid, remedy or mitigate those effects, as appropriate and relevant to the NoRs. The construction methodology includes:

- Sequencing of the main construction activities;
- Identification of indicative land required for construction works; and
- Approximate duration of activities.

This section is structured to address these inputs as they apply across the whole of the Pukekohe Transport Network.

The construction methodology has been developed based on the design of the projects and current land use / landform in which the projects are located. However, the actual construction detail will be confirmed at detailed design, and will consider, measures required to mitigate effects, the designation and any resource consents conditions. Importantly, timing of implementation of the projects will dictate what land development is present along the corridors and will inform the final methodology. As such, the requiring authorities seek flexibility in each of the NoR's construction methods to accommodate these factors and retain opportunities to reduce the impact and duration of adverse construction effects at delivery.

A condition requiring a Construction Environmental Management Plan is therefore proposed for each NoR.

8.2.1 Sequencing of main construction activities

The programme assumes a generally staged construction process, with exact staging to be determined at detailed design. The construction sequence for a typical project within the Pukekohe Transport Network areas are outlined below:

- Enabling works, including site investigation and service relocation;
- Site establishments for main contractor;
- Establish traffic management to enable access and establish construction areas;
- Earthworks, establishment of environmental controls, topsoil stripping and cut to fill activities;
- Structures work, including bridges, retaining walls and culverts;
- Network drainage;
- Pavement construction; and
- Finishing works, including linemarking, landscaping and disestablishment.

8.2.2 Identification of land required for construction works

Typical areas required for construction have been identified and applied to the Pukekohe Transport Network. These have informed the extents of the projects and the designation boundaries. Refer to drawings in Volume 1, Attachment A for the location and application of construction elements.

Table 8-1: Typical construction areas

Construction element	Description of typical construction areas
Construction of batter slopes	For larger earthworks projects, the construction areas will differ significantly to account for the larger plant and equipment likely to be used, construction methodology and temporary works such as haul roads and sediment retention ponds. Between 2m and 20m is required for construction access and environmental controls.
Bridge construction: • Abutments • Piers • Deck	Generally, the design has provided either a bridge or culvert to be constructed, with the form to be determined at detailed design and regional consent stage, unless identified in the AEE as necessary to address effects on the environment. For construction, 20m is required either side of the bridge, and a minimum 40m behind each abutment ends for construction access.
Retaining wall construction: • Minor retaining walls (e.g., timber or blockworks) • Large retaining walls (e.g., secant pile or sheet pile)	Retaining structures are generally located near the project boundary to overcome overspill of earthworks batters or at the bridge abutments. Typically, retaining walls are constructed of MSE walls to contain fill embankments and piled retaining walls and soil nails to retain cut batters. The working area required to construct the retaining walls will largely depend on the design and size of the wall.
Stormwater treatment construction:	Stormwater treatment may consist of stormwater drains discharging to stormwater wetlands.

Construction element	Description of typical construction areas
• Wetlands • Diversion drains / Overland Flow Path • Culvert headwalls and scour protection	The size of the working area will vary depending on the size of culvert being installed, the topography of the area, and volume of water being diverted. Works on the new culvert construction may require flow diversion or over pumping. Further investigations will be required to confirm the flow volumes and ecological requirements for the diversions. Regional consents (including for earthworks and stream works) will be sought in the future before construction commences.
Temporary works: • Sediment retention ponds • Haul roads and construction access roads	Surface water running through the earthwork sites will need to be treated prior to discharge. The typical method for doing this is to contain the water from the earthworks areas and channel it into temporary sediment retention ponds. Locating the ponds at the low point of the zones and outside of the permanent works area is ideal so it can be operational and maintained throughout the construction works. Where possible temporary and permanent ponds have been co-located, so that at the end of construction the pond can be reinstated as a permanent device. Haul roads are typically required for large earthworks projects for the movement of people, plant and materials along the proposed alignment. These haul roads provide access and connectivity to critical work sites such as the culverts, bridge sites, and main cut and fill sites. These are best constructed outside the earthwork's extent to avoid clashes with the permanent works.
Site facilities: • Main site compound (project office) • Additional / satellite site compound • Construction yards for laydown / stockpile • Construction yards for intersection works	Site compounds and laydown areas are required to support construction along the proposed corridor alignments. The proposed compound site locations identified for each NoR enable easy access to key construction zones and arterial routes. The use of these compounds will only be required during the construction period and will be reinstated upon completion of the works. The space required is dependent on the scale of the project and the nature of the intersection (e.g. rural vs urban).
Reconnecting property access • Service lanes • Access roads / driveways	Vehicle access will be provided to private properties during construction and reinstated after works where required. However, there may be temporary disruptions to access. Where this is proposed, it will be discussed in advance with the affected user/owner. As required, accesses are designated to enable reintegration to the permanent corridor. Where it has been determined that legal safe access cannot be reinstated after construction (e.g., due to gradient, angle, proximity), the property in its entirety is included in the proposed designation. 4 – 6m is required to provide for reconnecting property access.

8.2.3 Approximate activities duration and construction programme

Table 8.3 sets out the expected duration of each project within the Pukekohe Transport Network. The projects are expected to be constructed in a generally staged method along the corridor, however the exact approach will be confirmed at detailed design and Outline Plan stage.

Table 8-2: Transport corridor construction expected duration of programme

Notice	Project	Approximate duration of construction
NoR 1	Drury West Arterial	3 to 4 years
NoR 2	Drury – Pukekohe Link • South Drury Connection • SH22 Connection • Drury-Paerata Link • Paerata Arterial	3 to 4 years
NoR 3	Paerata Connections	1 to 2 years
NoR 4	Pukekohe North-East Arterial	3 to 4 years
NoR 5	Pukekohe South-East Arterial	3 to 4 years
NoR 6	Pukekohe South-West Upgrade (including works in the existing road reserve)	2 to 3 years
NoR 7	Pukekohe North-West Arterial	3 to 4 years
NoR 8	Mill Road and Pukekohe East Upgrade	3 to 4 years

8.3 Approach to the assessment of effects

Section 171(1) of the RMA sets out the matters that must be considered by a territorial authority in making a recommendation on a NoR for a new designation.

When assessing the actual or potential effects on the environment under section 171 of the RMA, the assessment of effects on the environment for the Project has been limited to matters that trigger a district plan consent requirement under the AUP:OP or WDP as these are the only activities authorised by the proposed designations. Where NES or regional plan consenting requirements are triggered, these will not be authorised by the proposed designations and will require resource consents in the future. Notwithstanding this, relevant national and regional resource consent matters have been considered to inform the Project's design, the alternatives assessment process and the proposed designation footprint.

In the future prior to construction, the Project will require NES and regional resource consents for a number of activities to enable the proposed works.

These resource consents are not sought at this time, but will be sought when detailed design for the Project is completed so as to confirm consent requirements, understand the actual or potential effects of activities that require consent and define the measures proposed to manage any adverse effects.

8.4 Approach to assessing the likely receiving environment

The Pukekohe Transport Network is located in the south of Auckland and includes Pukekohe, Paerata and Drury West.

As set out above, a key purpose of these NoRs is to protect the necessary transport network that will support the future urbanisation of Pukekohe, Paerata and Drury. Accordingly, it is anticipated that the network will not be constructed and operational until urbanisation of the Pukekohe, Paerata and Drury West growth area has at least been confirmed or is under development.

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 operation of the transport corridor will be experienced.

Within the Pukekohe Transport Network area there are a range of existing and future urban zoning patterns, which influence the likely future environment for assessment purposes. Project areas with existing urban zoning or rural zoning that is not identified for future urban growth are not likely to materially change in the future. Those Project areas that are currently rural or urban zoned but have recently been live zoned or up-zoned for urban development or have a FUZ are likely to experience material change because of the urbanisation contemplated by the operative planning provisions. The following table sets our understanding of the current land use zoning, its likelihood of change and its potential future zoning.

Table 8-3: Land use likelihood of change based on current and potential future zoning

Land use today	Zoning type	Likelihood of change for the environment	Likely future environment
Residential	Residential	Low	Urban
Business	Business	Low	Urban
Open Space	Open Space	Low	Open Space
Special Purpose	Special Purpose	Low	Special Purpose
Rural	Countryside Living	Low	Rural
	Mixed Rural Use	Low	Rural
Greenfield / Rural	FUZ	High	Urban
Greenfield / Rural	Residential or Business	High	Urban

Where transport infrastructure is within FUZ, it is likely the construction of the infrastructure will occur ahead of, or in parallel to, the urbanisation of these areas. Accordingly, when considering the environment within which the effects of the construction and operation of the transport infrastructure is likely to occur, it is important to consider the likely future environment for specific NoR areas.

Where relevant, the urban land use patterns outlined in Auckland Council's Structure Plans for the Pukekohe and Drury growth areas have been considered together with proposed plan changes informed by how far advanced they are through the plan making process.

The likely future environment assessment has also been guided by overlays within the AUP:OP which identify features considered to be of high natural, cultural or heritage value with associated controls

that apply to development which may adversely affect those features. The overlays and protective rules provide useful guidance on areas that are likely to remain in the future urban environment.

Having regard to the above, Section 9 of this AEE sets out the receiving environment for each NoR within the Pukekohe Transport Network.

8.5 Approach to the interface between the Pukekohe Package and other projects

There are several projects being developed outside of the Pukekohe Transport Network that will integrate with or affect the proposed Pukekohe Transport Network, highlighted in Figure 8-1.

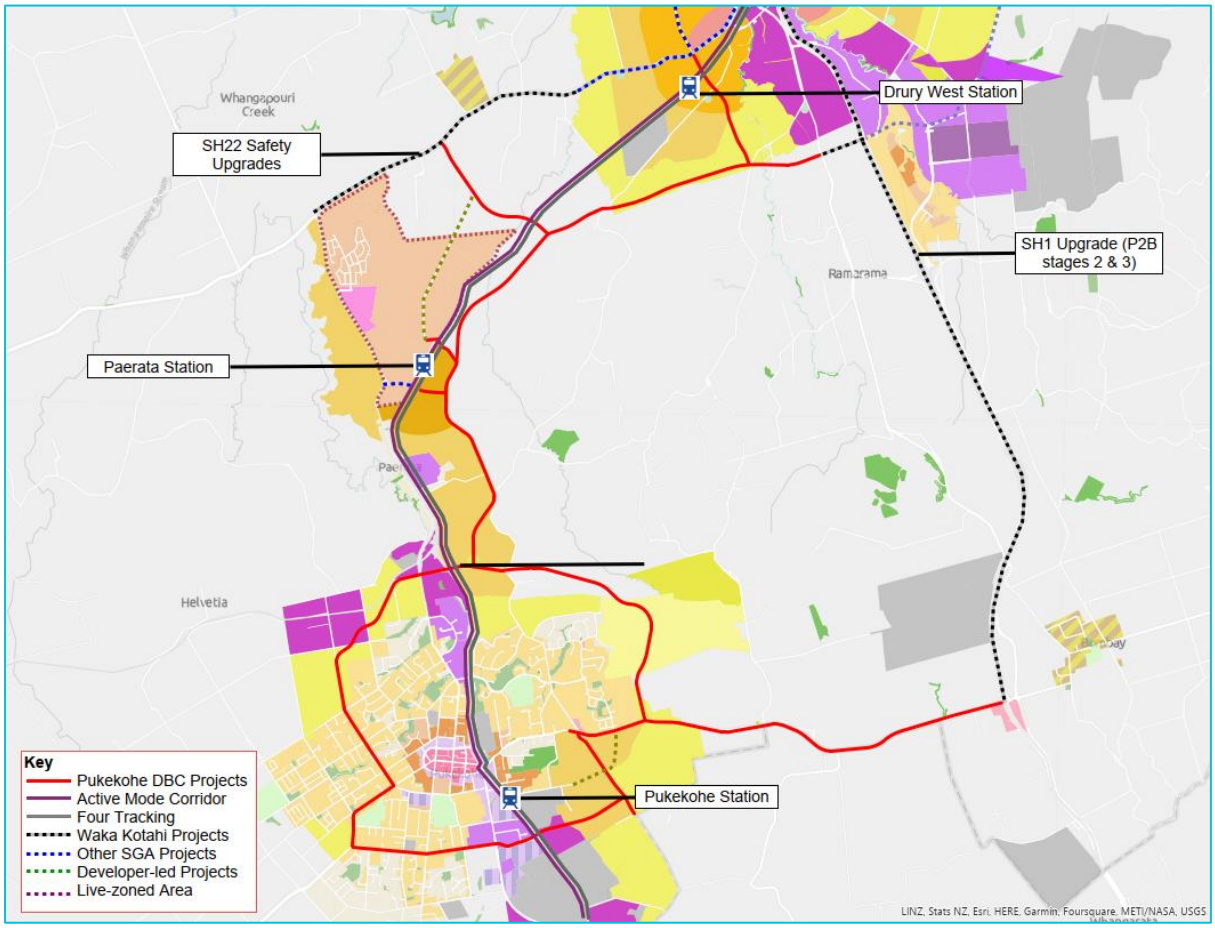

Figure 8-1: The Pukekohe Transport Network interface with other projects.

Given the long-term delivery of the projects within the Pukekohe Transport Network, the assessment of effects considers the operational impacts of the Pukekohe Transport Network in the context of full build out of all urban areas at 2048+. This therefore accounts for these wider infrastructure upgrades not being progressed by Te Tupu Ngātahi that are anticipated to be in place at the time the Pukekohe Transport Network is operational.

Table 8-4 summarises these other projects and demonstrates how their delivery (or not) will affect the Pukekohe Transport Network.

Table 8-4: Interface with other projects

Project	Interface with the Pukekohe Transport Network	Status
KiwiRail Drury West Rail Station Ngakoroa –	• The Drury West Arterial (NoR 1) extends south from the Drury West Ngakoroa Rail Station upgrading the proposed station access way to provide for bus priority lanes. The Drury West Arterial will connect the FUZ south of SH22 with the rail station.	Drury West Ngakoroa Rail Station notice of requirement and resource consents lodged in 2021, publicly notified in 2022; direct referral to Environment Court in late 2023, funding through NZUP; construction timeframe proposed in 2024/2025.
Waka Kotahi SH22 Drury upgrade	• The Drury West Arterial (NoR 1) extends south of SH22/Jesmond Road and Drury West Station access.	Alteration to designation confirmed in 2022. Project funded through NZUP. Construction due to commence in 2024.
KiwiRail Paerata Station	• Paerata Connections (NoR 3) provides a connection to the Paerata Rail Station from Sim Road (south) proposed to be upgraded by Drury to Pukekohe Link (NoR 2)	Paerata Rail Station designation confirmed; funding secured; construction is underway.
KiwiRail / Auckland Transport NIMT four tracking and Active Modes Corridor (AMC)	• Drury West Arterial (NoR 1), Drury to Pukekohe Link (NoR 2), Paerata Connections (NoR 3) cross the NIMT where future four tracking and AMC are proposed. Pukekohe NE Arterial crosses the NIMT where four tracking is proposed. Space allocation was taken into consideration when designing structures over the NIMT	KiwiRail and AT Programme Business Case is underway.
Paerata Rise – Grafton Downs development	• Interface with Paerata Connections (NoR 3). The Paerata Connections provide new connections to the east of the NIMT and connect into the Paerata Rise development.	Residential development is underway and will be developed in stages.
Waka Kotahi SH1 Papakura to Bombay Motorway Project	• Interfaces at the SH1 proposed Drury South Interchange at SH1 / Great South Road with Drury to Pukekohe Link (NoR 2). • An interface at SH1 Bombay interchange improvements with Mill Road – Pukekohe East Road Upgrade (NoR 8) at Mill Road.	Waka Kotahi is likely to lodge Notices of Requirement for route protection in late 2023.

9 Description of the Pukekohe Transport Network and the Receiving Environment

9.1 Overview of the strategic context

This section provides an overview of the strategic context across the Pukekohe (and surrounding) area. Each NoR in the Pukekohe Transport Network is specifically discussed in Sections 9.2 to 9.13. including a description of the existing environment and likely future environment for each project. For detailed discussion of specialist topics, refer to Volume 4: Supporting Technical Reports.

The growth proposed in Pukekohe and the wider area requires appropriate infrastructure to support this growth, which is described in more detail in Section 2.1 of this AEE.

9.1.1 Council Structure Plans

The strategic land use patterns described within all four relevant structure plans are outlined below:

9.1.2 Drury-Opāheke Structure Plan

The Drury- Opāheke Structure Plan was adopted by Auckland Council in 2019 and sets out the pattern of land uses and the supporting infrastructure network for the future growth areas of Drury-Opāheke. The land use is being progressively ‘live zoned’ through private plan changes. Figure 9-1 shows the indicative land uses as set out in the Structure Plan.

9.1.3 Pukekohe-Paerata Structure Plan 2019

The Pukekohe-Paerata Structure Plan was adopted by Auckland Council in 2019 and sets out the pattern of land uses and the supporting infrastructure network for the future growth areas of Pukekohe and Paerata area in the Auckland Plan 2050. The land use is being progressively ‘live zoned’ through private plan changes. Figure 9-2 shows the indicative land uses as set out in the Structure Plan.

9.1.4 Waikato District Council Structure Plans

The Pukekohe Transport Network has inter-regional benefits on relevant towns in the North of the Waikato, especially the Mill Road Pukekohe East Upgrade (NoR 8). Tuakau is located approximately 9km and Pōkeno is located about 10km from NoR 8.

The Tuakau Structure Plan provides a strategic and spatial framework for future land uses, open space, transport and utility networks in Tuakau over the next 30 years and the Pōkeno Public Realm Concept Plan builds a sequential plan that will take the Waikato District Council, Manawhenua and Pokeno community on a journey to develop a distinct and compact centre, reconnecting the existing residential community with its built and natural environments.

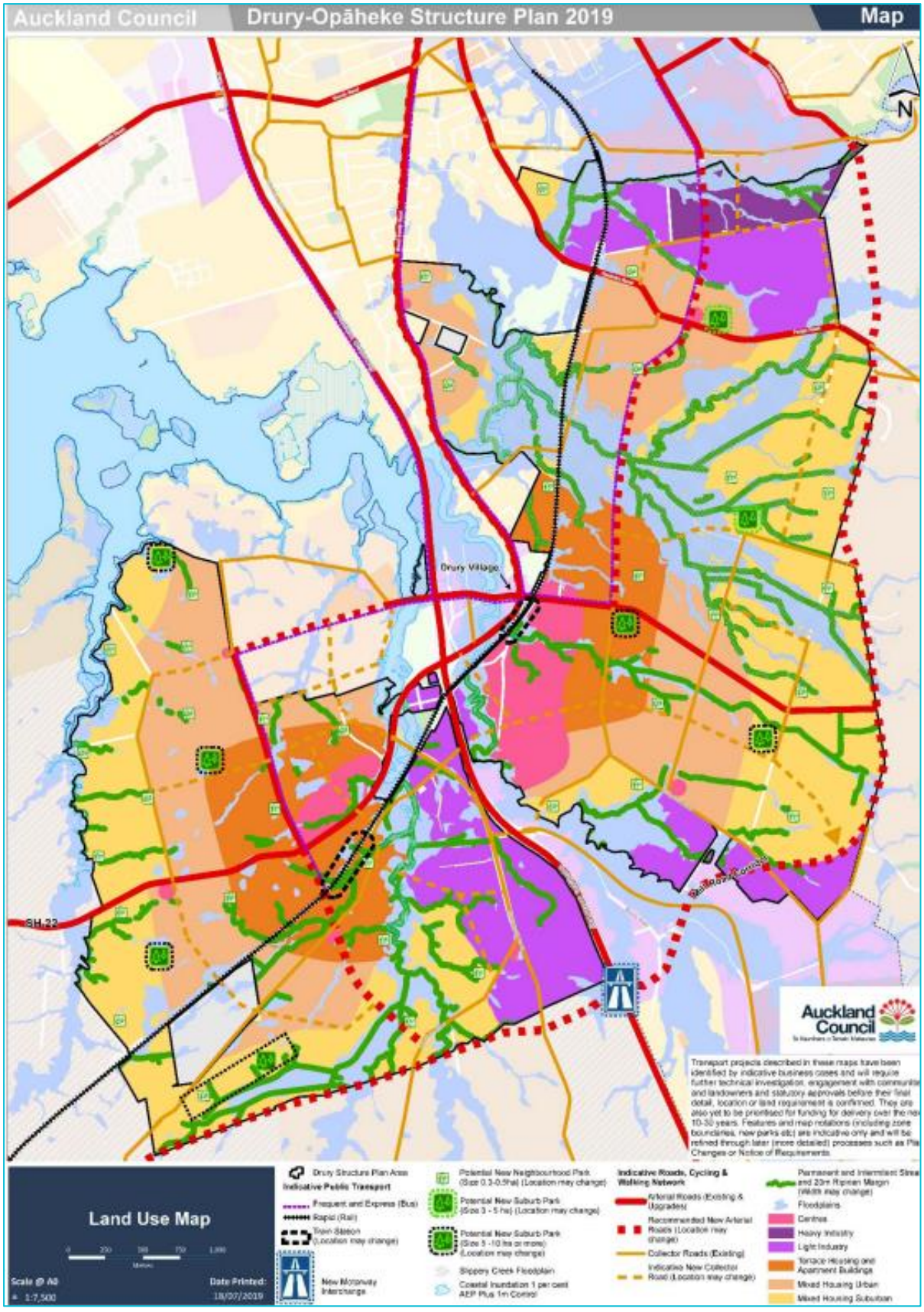

Figure 9-1: The Drury – Opāheke Structure Plan 2019 land use map 2019

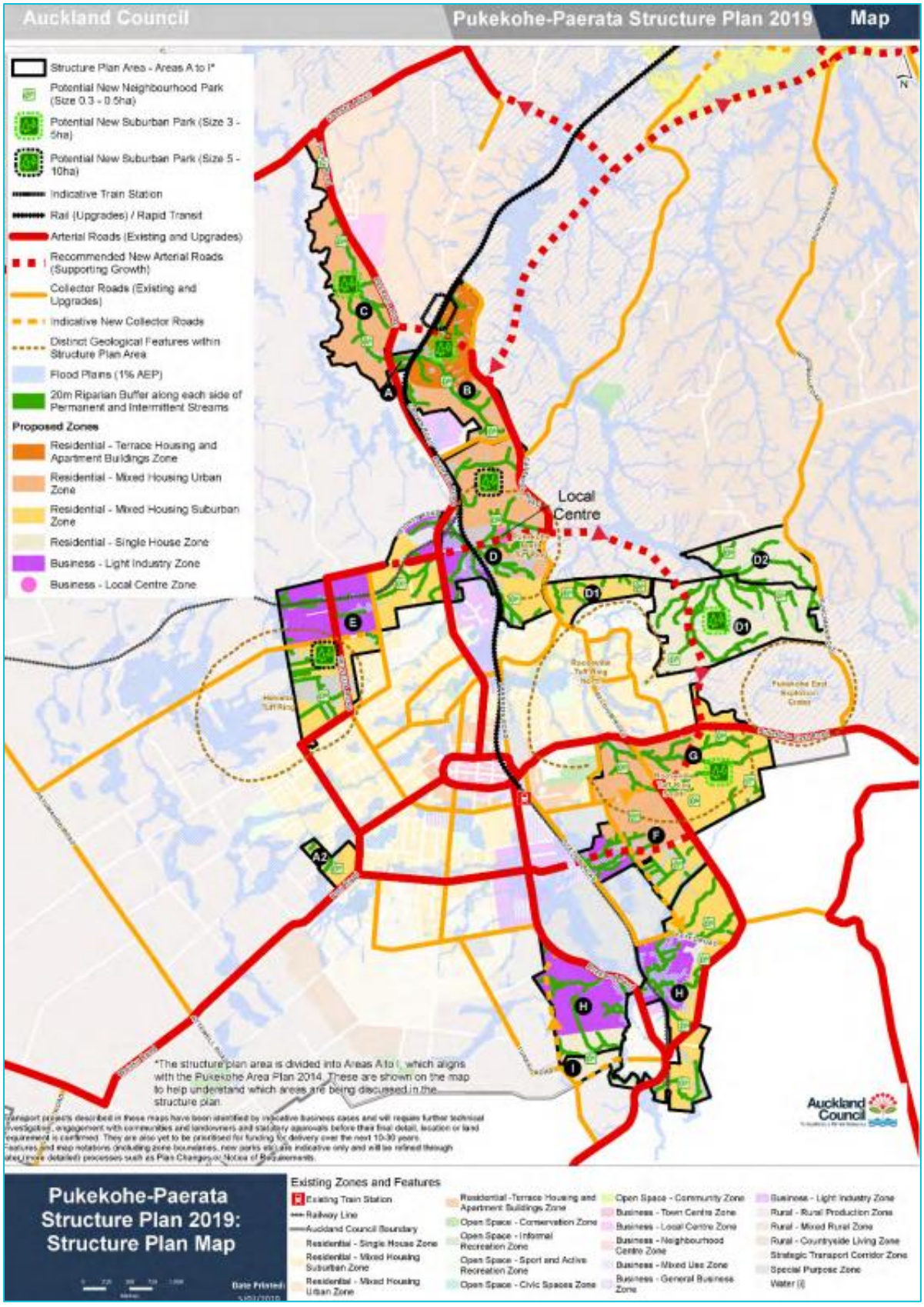

Figure 9-2: Pukekohe-Paerata Structure Plan 2019: Structure Plan Map

9.1.5 Council initiated plan changes

Within current residential zones and land adjacent to rapid transit stops, greater intensification is anticipated in line recent policy changes including the introduction of the National Policy Statement for Urban Development (NPS-UD) and Medium Density Residential Standards (MDRS). The intention of the MDRS is to enable housing choice in main urban areas. These standards support the development of three homes up to three storeys on each site without the need for resource consent. To enable this, the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 requires Tier 1 territorial authorities in greater Auckland, Hamilton, Tauranga, Wellington and Christchurch to incorporate the MDRS into every relevant residential zone in their district plan. Auckland Council has actioned this through Plan Change 78 (PC78) which was notified on 18 August 2022. Further submissions on PC78 closed on 17 March 2023.

For the Pukekohe Town Centre, much of the residential zoned land will change from Mixed Housing – Suburban zone to Mixed Housing – Urban zone, with residential sites located closest to the Pukekohe Train Station being changed from Mixed Housing – Urban and Mixed Housing – Suburban to Terrace Housing and Apartment Building zone. The proposed changes as per PC 78 are shown below in Figure 9-3. The areas north of Pukekohe are primarily zoned rural or FUZ and are therefore excluded from PC78. The Franklin 2 Precinct area is a Special Housing Area and is therefore also excluded from PC78. Auckland Council are also proposing additional plan changes to the regional policy statement, for transportation, and for the scheduling of historic heritage and notable trees (Plan Changes 79, 80, 81, 82 and 83). Assessment of the relevant objectives and policies including the proposed changes as a result of PC78, 79, and 80 is provided in Section 12.

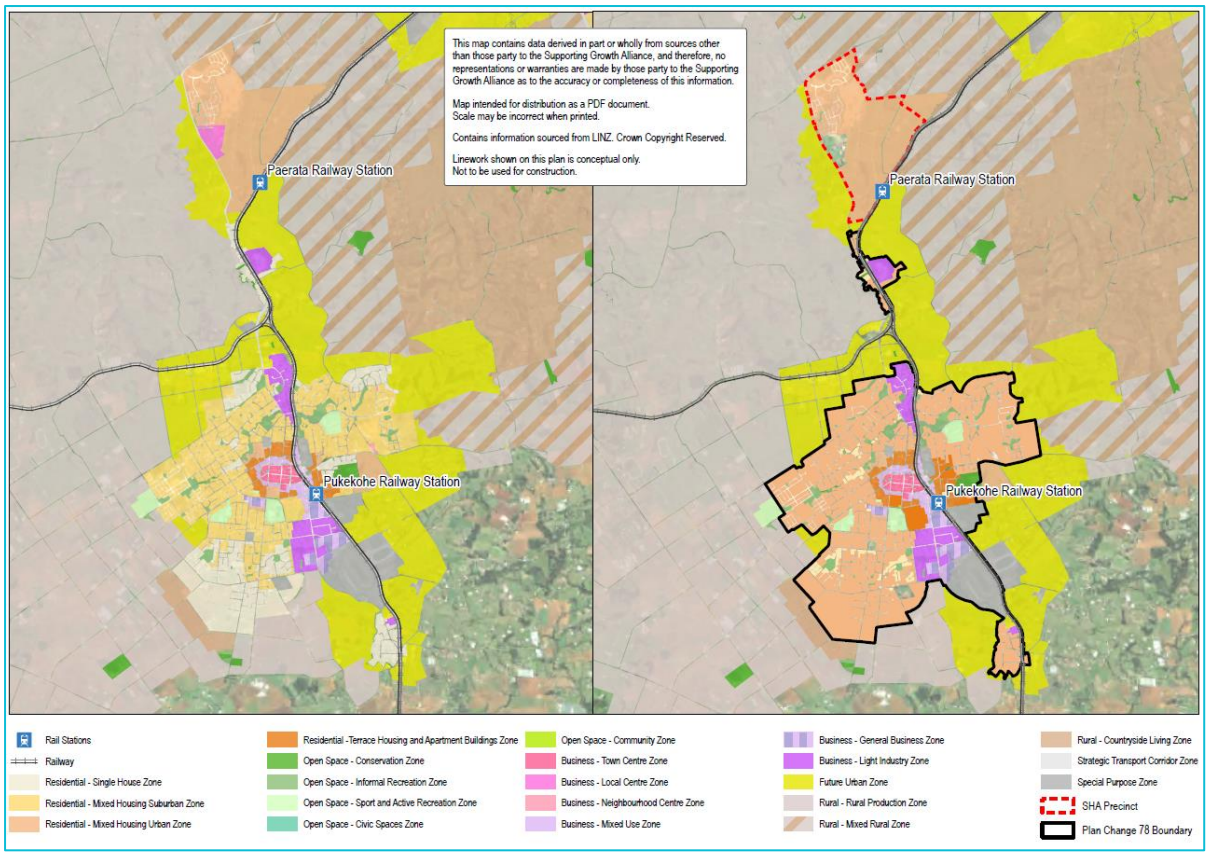

Figure 9-3: PC 78 - Changes to zoning

9.1.6 Developer Interest

There are a number of developer-led plan changes, resource consents and developer interest in Pukekohe in proximity to the Pukekohe Transport Network. These are summarised in the following tables. Notably, these are the relevant plan changes and resource consents that are known to the project team , and we cannot explicitly state there are no other relevant developments within proximity to the Pukekohe Transport Network There are also a number of proposed plan changes being prepared that interface with the Pukekohe Transport Network. The project team have been engaging with these developers.

Table 9-1: Summary of Plan Changes proximate to the Pukekohe Transport Network

Plan Change	Proposal and Interaction with Designation
Plan change 74 Golding Meadows154 – 158 and 162 Golding Road (currently an appeal to the Environment Court)	The proposal is to rezone approximately 82.66 Ha of land in South-East Pukekohe from Future Urban Zone and Special Purpose Zone - Major Recreation Facility to: • 19.77 Ha of Light Industry Zone. • 62.56 Ha of Residential - Mixed Housing Urban Zone. • 0.33 Ha of Business - Neighbourhood Centre Zone. The Pukekohe Transport Network does not interact directly with the plan change. However, NoR 5 Pukekohe South-East Arterial is located in proximity on Golding Road to the north.
Plan Change 76 Kohe 47 Golding Road and 50 Pukekohe East Road (Approved mid 2023)	PC76 rezones approximately 30.61 hectares of land in eastern Pukekohe, bounded by East Street to the north, Golding Road to the east, Ngahere Road to the west and Birch Road and rural/ residential blocks to the south. The plan change rezones land from Future Urban Zone to Residential – Mixed Housing Urban Zone. NoR 5 Pukekohe South-East Arterial has a direct interface with the plan change area on Golding Road.
Plan Change 87 301-303 Buckland Road (Further submissions closed 24 February 2023)	This private plan change seeks to rezone 7.8 hectares of land at 301 and 303 Buckland Road, Pukekohe from the Future Urban Zone to the Business – General Business Zone. The Pukekohe Transport Network does not interact with this proposal.

Table 9-2: Summary of Other Projects and relevant Resource Consents

Project	Proposal and Interaction with Designation
Paerata Rise, Grafton Downs	Active development is occurring in the Paerata Rise development which is being progressed in stages. NoR 3 Paerata Connections – the Sim to Sim Connection is located partly within the development.
10 Stockmans Lane and 13 Nanjing Road	Active development is occurring at the Nanjing Road development. NoR 5 Pukekohe South-East Arterial interfaces with Pukekohe East Road frontage of the development.
105 Beatty Road, Pukekohe	A resource consent application was lodged in April 2022 for a 63 Lot Subdivision. NoR 7 Pukekohe North-East Arterial is located in proximity to the development but does not interact with it.

Project	Proposal and Interaction with Designation
1199 Paerata Road	Resource consent was approved dated 3 December 2020 for the establishment of a storage facility at the northern area of the site. NoR 4 Pukekohe North-East Arterial interacts with this property.
43 – 45 Puni Road and 44 McNally Road – Franklin Village	A retirement village has recently been consented on the site. NoR 5 Pukekohe South-West Upgrade is located in close proximity on Puni Road.
10 Butcher Road – Roger Gill Agricultural	A consent has recently been grated for an agricultural machinery business on the site. NoR 1 Pukekohe North-West Arterial interacts with the frontage of the property.

9.2 NoR 1: Drury West Arterial

9.2.1 Project Overview

The Drury West Arterial is a 1.6km new transport corridor extending south from the intersection of SH22 and Jesmond Road to the proposed Drury to Pukekohe Link (NoR 2) shown in Figure 9-5. It connects with the proposed Drury West Town Centre and the proposed KiwiRail Drury West Rail Station and provides access to the strategic transport network including SH1 and SH22. It connects with Burtt Road and to Runciman Road in the south as this new transport corridor improves local connectivity in Drury West and the wider area to centres, employment and rail stations.

Key features of the Drury West Arterial are:

- A four-lane arterial for bus priority lanes between SH22 and Burtt Road with an indicative 30m wide cross-section and a two-lane arterial with an indicative 24m wide cross-section south of Burtt Road with active transport facilities on both sides of the transport corridor. The cross sections are shown in Figure 9-4
- Three new bridges are proposed over existing NIMT rail line, and two tributaries of the Ngakoroa Stream.
- Three new stormwater wetlands are proposed and new culverts and swales.

Figure 9-4 Indicative generic Four-Lane Arterial - 30m cross section with 2 lanes for general traffic, PT and active transport facilities either side. Proposed SH22 to Burtt Road (not to scale)

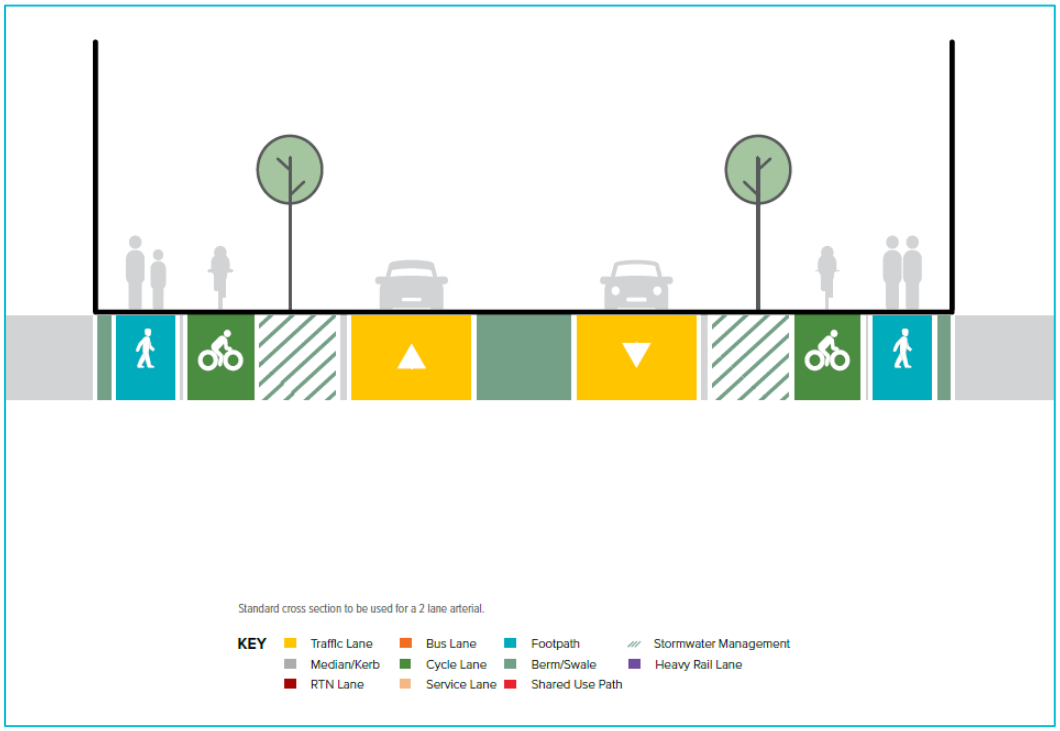

Figure 9-5: Indicative generic Two-Lane Arterial - 24m cross section with 2 lanes for general traffic and active transport facilities either side. Proposed south of Burtt Road (not to scale)

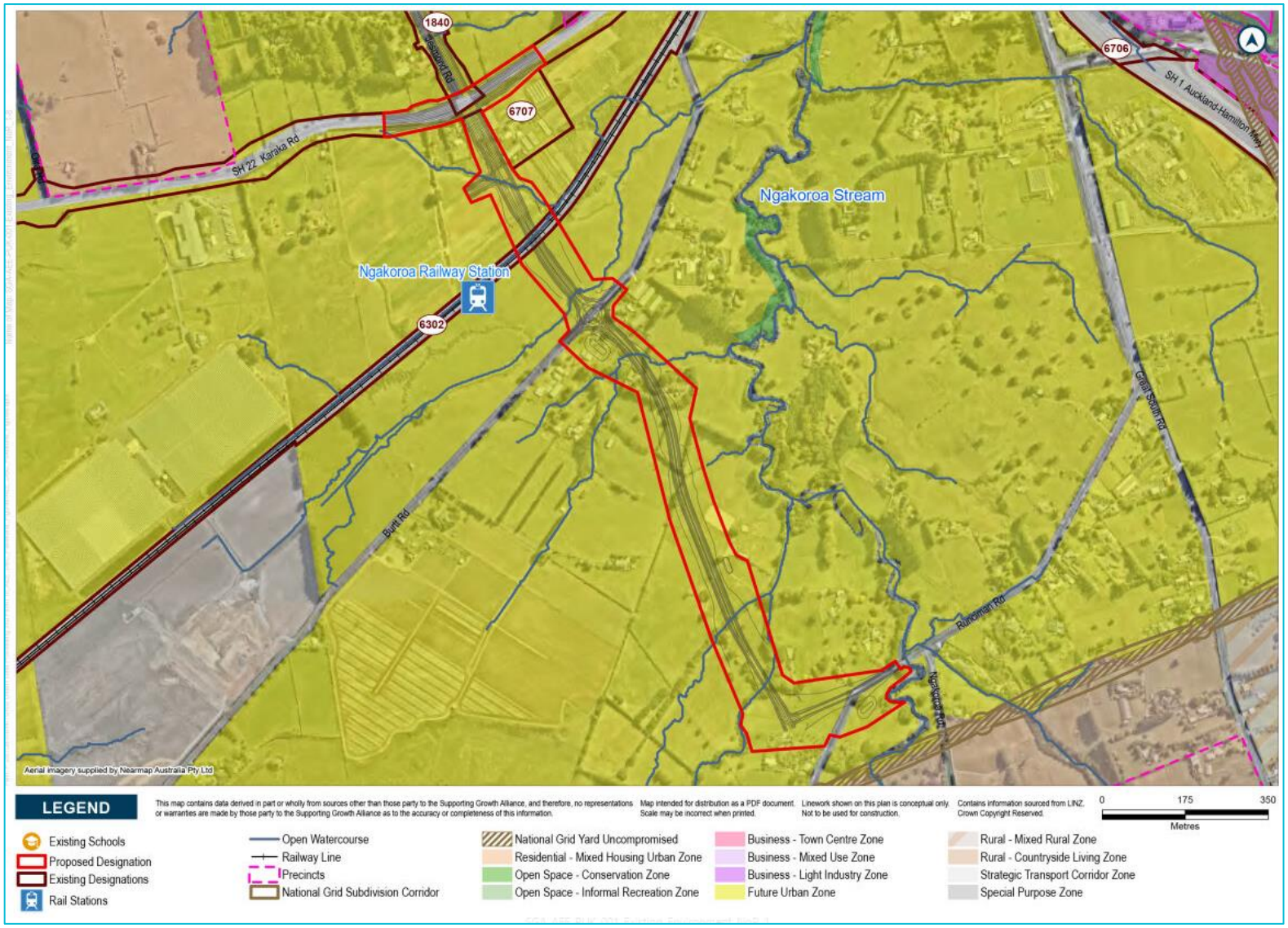

Figure 9-6: NoR 1 – Drury West Arterial – Existing Environment

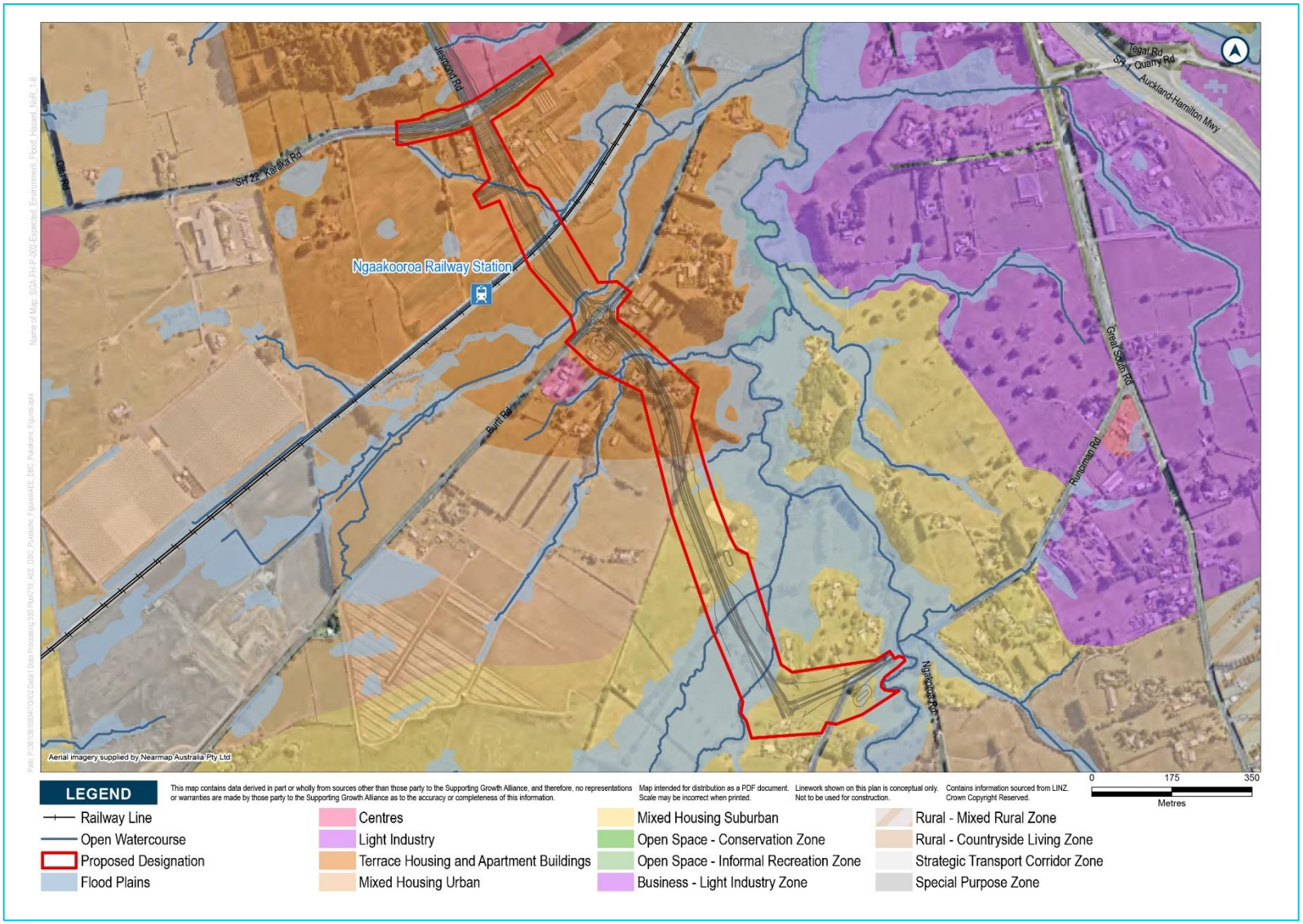

Figure 9-7: NoR 1 – Drury West Arterial – Likely, Planned Future Environment

9.2.2 Receiving Environment for NoR 1 Drury West Arterial

Features	Description
Current zoning	• FUZ
Likely future zoning	• Drury – Opāheke Structure Plan provides direction for future land use in the area. Live zoning through private plan changes in Drury West have generally followed the structure plan. Although, further increase in housing density is likely through future plan changes. The Drury – Opāheke Structure Plan indicates THAB, MHU, MHU.
Planning Overlays, Controls and Precincts	• Flood Plains and Overland Flow Paths • Two natural resource overlays (high-use stream and aquifer management areas overlay). • Macroinvertebrate Community Index (control in the AUP:OP)
Existing designations	• The project intersects with the existing Waka Kotahi SH22 designation (Designation 6707) at the northern extent. This designation has recently been altered to provide for widening (through the Supporting Growth programme) and funding has recently been allocated for part of this upgrade through NZUP (including where the project intersects). • The project intersects with the existing KiwiRail designation for North Island Main Trunk Railway Line (Designation 6302) and Notice of Requirement lodged for Drury West Station (KiwiRail).
Current land use	• The existing land use is characterised by working agricultural and horticultural land uses, interspersed with rural residential development, farmsteads, shelterbelts and vegetation blocks. • Recent plan changes to rezone FUZ to urban zoning to the immediate north of the project area (north of SH22) show the transitioning environment with urban development underway or planned.
Community and recreational facilities	• Runciman Equestrian Park (partially within the proposed designation boundary).
Watercourses	• The project crosses the Ngakoroa Stream and tributaries
Ecology	• Bat habitat: The closest record was approximately 2km from the NoR (details within the Bat Survey – Appended to the Assessment of Ecological Effects). • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, and South Island pied oystercatcher (al at risk). A full list of species identified in the desktop review is included in Appendix 7 of the Assessment of Ecological Effects (Volume 4, Appendix E). • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in NoR 1.

Features	Description
Vegetation and Landscape	• There are no known landscape related overlays in the AUP:OP within the proposed designation or setting of NoR 1. • There are no trees protected under relevant District Plan provisions of the AUP; OP. Vegetation patterns include shelterbelts and lot boundary planting.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within NoR 1.
Areas of cultural value	• The Ngakoroa Stream is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.3 NoR 2: Drury – Pukekohe Link

The Drury – Pukekohe Link provides a North south strategic corridor with two general traffic lanes proposed and active transport facilities on one side of the corridor. The total length of the NoR is 10.6km. NoR 2 is split into four segments and this will be reflected in the project description, as shown in Figure 9-8.

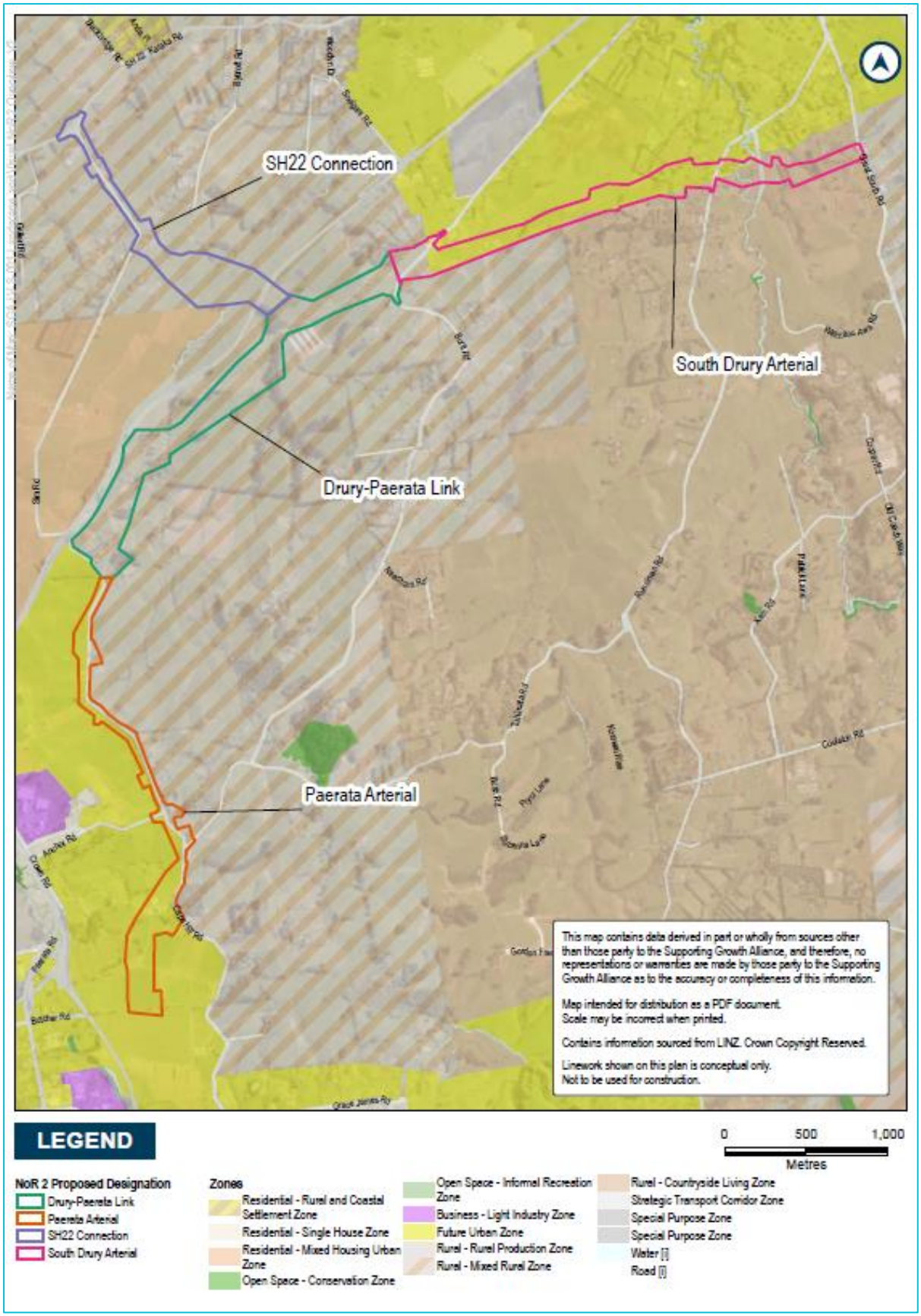

Figure 9-8: Drury to Pukekohe Link (NoR 2) four segments.

9.4 NoR 2: South Drury Connection Segment

9.4.1 Project Overview

South Drury Connection segment, shown in Figure 9-10, provides a new connection extending from Great South Road in the east at the proposed SH1 Drury South Interchange (a proposed Waka Kotahi SH1 project). The alignment is along the edge of the FUZ to Burtt Road in the west. It provides a strategic connection improving local access in Drury West, provides resilience in the transport network supporting SH22 and SH1, provides direct connectivity to the proposed Drury South Interchange and supports the proposed strategic active modes corridor.

Key features include:

- An indicative 28m wide cross section with two lanes for general traffic, with active transport facilities on one side of the corridor, shown in Figure 9-9.
- Three new bridges over tributaries of the Ngakoroa Stream.
- Three stormwater wetlands and new culverts and swales.

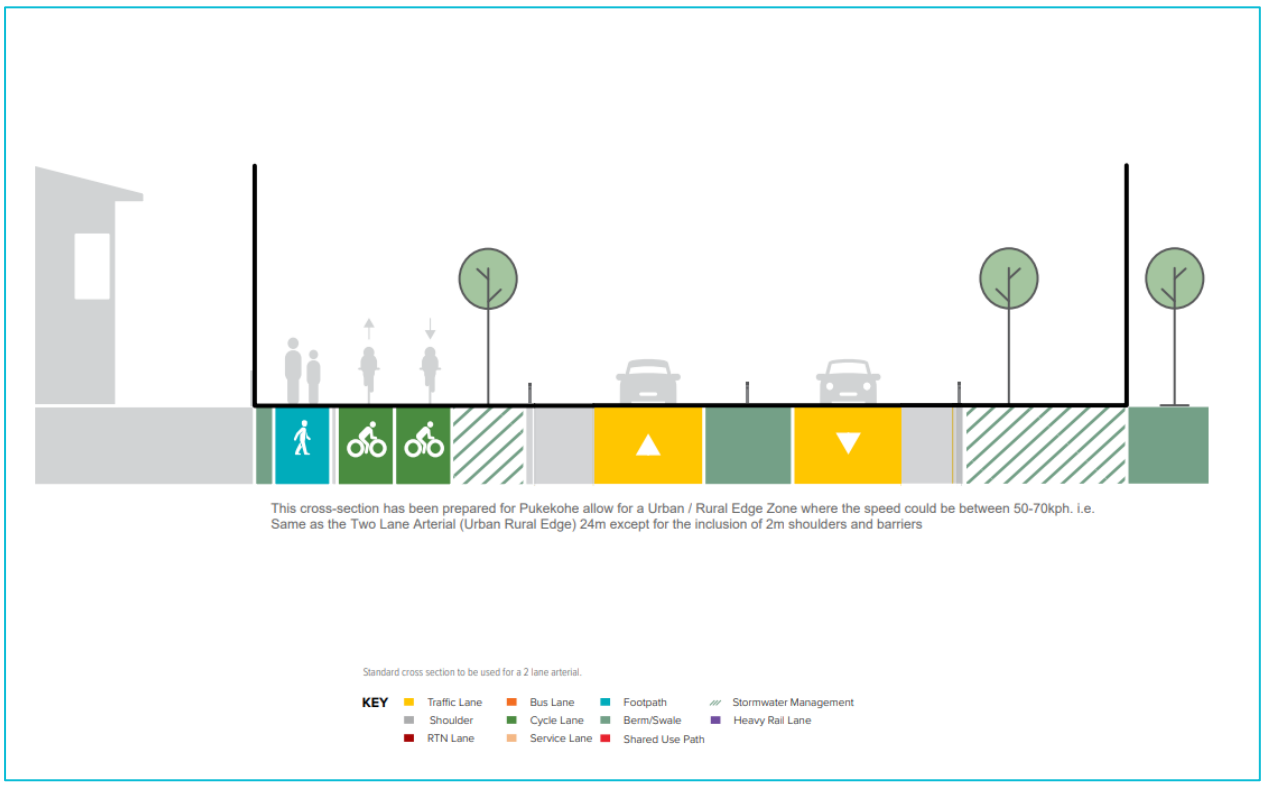

Figure 9-9: Indicative generic 24m wide cross section with two lanes for general traffic, with active transport facilities on one side of the corridor

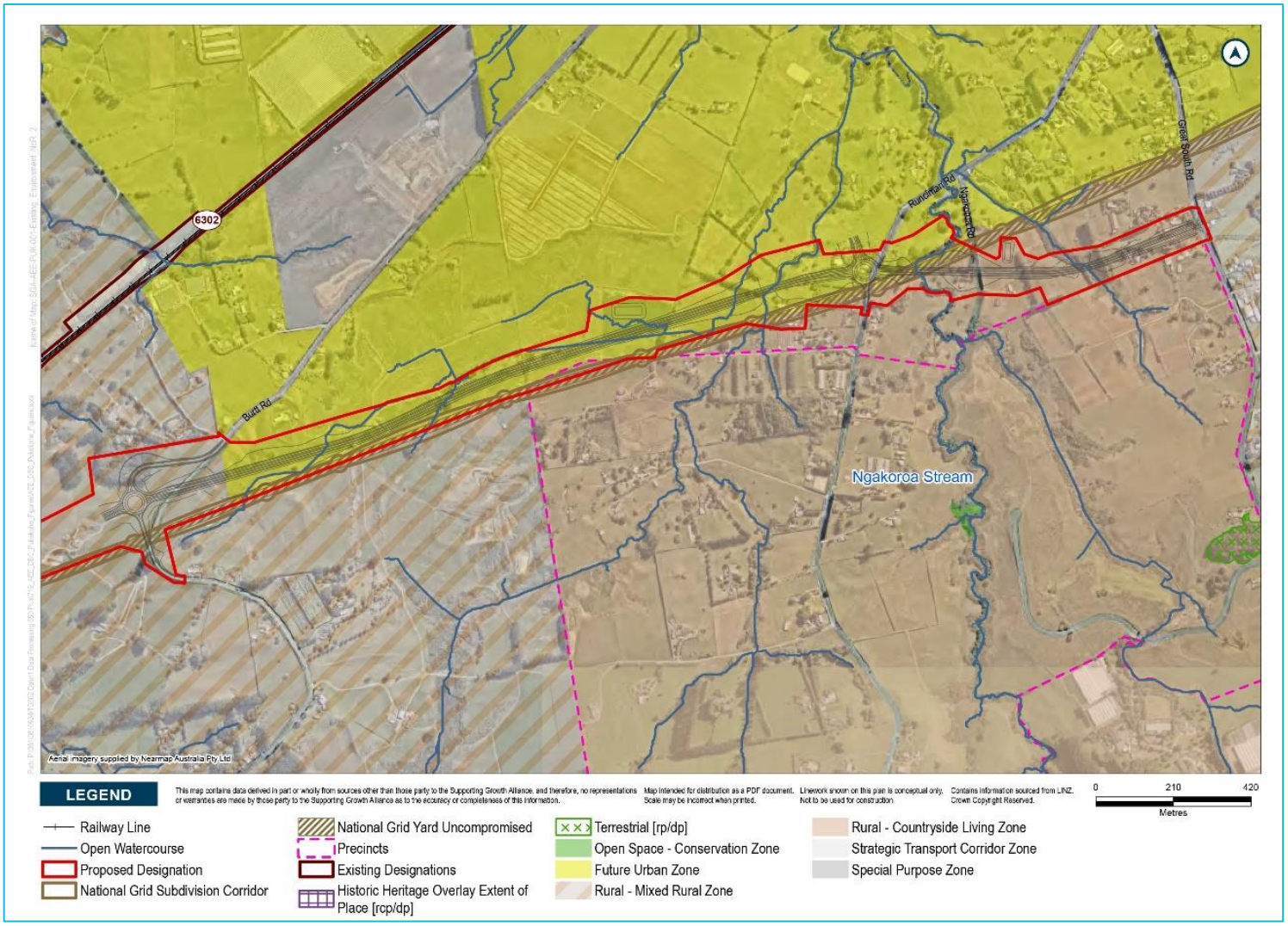

Figure 9-10: NoR 2 – South Drury Connection Segment – Existing Environment

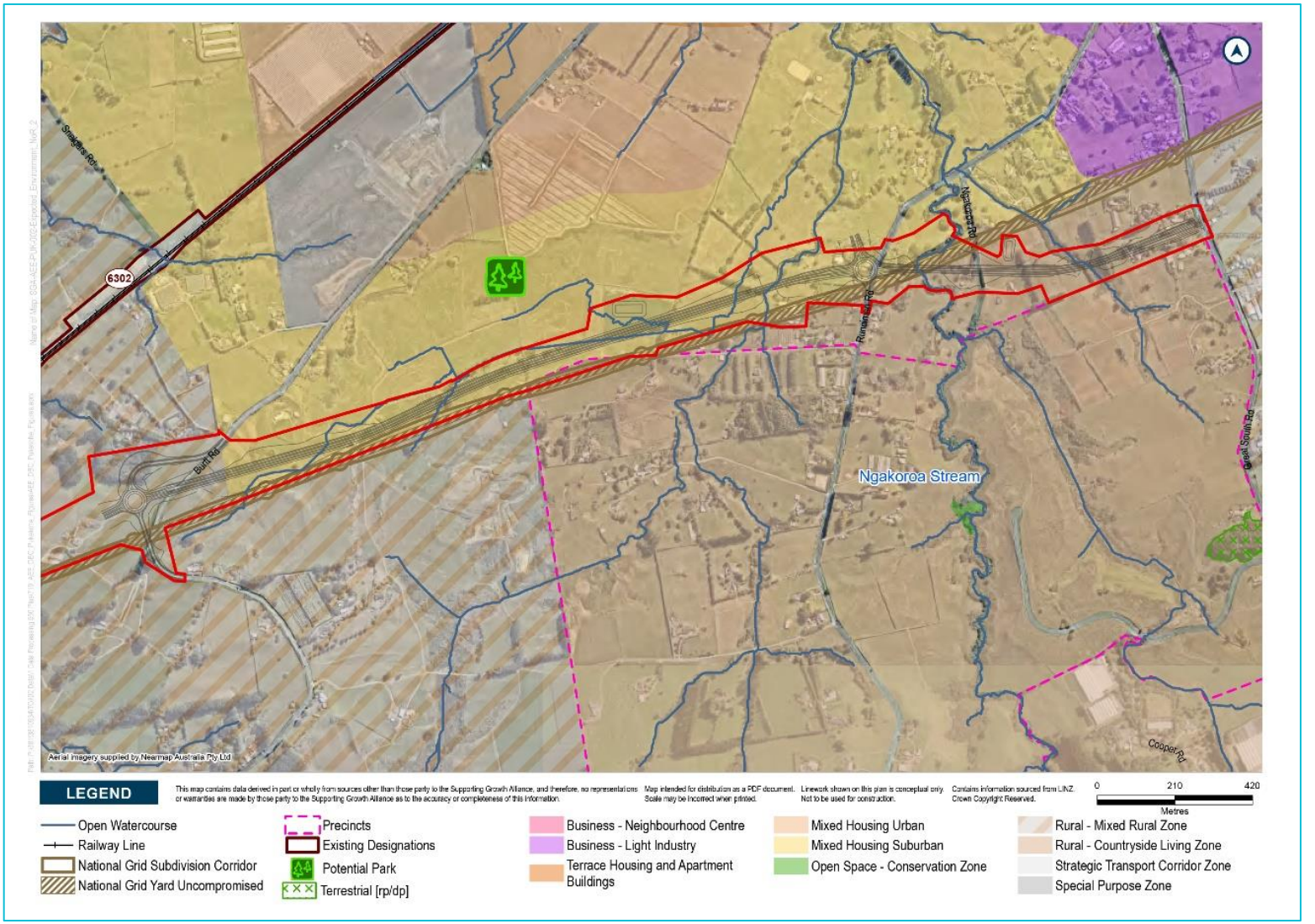

Figure 9-11: NoR 2 – South Drury Connection Segment – Likely, Planned Future Environment

9.4.2 Receiving Environment for NoR 2 – South Drury Connection Segment

Features	Description
Current zoning	• Rural – Mixed Rural Zone • Rural - Countryside Living Zone • FUZ
Likely future zoning	• The Drury – Opāheke Structure Plan provides direction on the future land use for the FUZ. Live zoning through private plan changes in Drury West have generally followed the structure plan. Although, further increase in housing density is likely through future plan changes. The Drury – Opāheke Structure Plan indicates MHU. • The rural zone is very likely to retain the same zoning.
Planning Overlays, Controls and Precincts	• Two natural resource overlays (high-use stream and aquifer management areas). • Flood Plains and Overland Flow Paths • Runciman Sub – Precinct A • The National Grid Overlay, in relation to the Pukekohe Transport Network, follows SH1 and aligns with the South Drury Connection, then heads further west, and has no further interface with the Pukekohe Transport Network.
Existing designations	• n/a
Current land use	• Pastoral land use, interspersed with rural residential properties and areas of arable land.
Community and recreational facilities	• n/a
Watercourses	• The project crosses the Ngakoroa Stream
Ecology	• Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, Fernbird and South Island pied oystercatcher (all at risk). A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network.
Vegetation and Landscape	• Vegetation cover in the area includes shelterbelts, lot boundary planting and densely vegetated gullies / catchments and streams (namely, the Ngakoroa Stream).

Features	Description
	• To the west of Runciman Road, vegetation cover is generally sparse with scatterings of mature trees and block tree planting amongst the rural residential development. • There are no known landscape related overlays within the designation alignment or setting of this segment of NoR 2. • There are no trees in NoR 2 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within NoR 2.
Areas of cultural value	• The Ngakoroa Stream is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.5 NoR 2: SH22 Connection Segment

9.5.1 Project Overview

Alongside the South Drury Connection Segment and Drury – Paerata Link Segment, this connection provides a strategic connection improving local access between State Highway 1 and State Highway 22. It improves access between Drury West and Paerata, provides resilience in the transport network supporting SH22 and SH1, provides direct connectivity to the proposed Drury South Interchange and supports the proposed strategic active modes corridor. It includes new transport corridor and a partial upgrade of Sim Road (north). The SH22 Connection is shown in Figure 9-13.

Key features include:

- An indicative 24m wide cross section with two lanes for general traffic and active transport facilities on one side of the corridor, as shown in Figure 9-12.
- Two bridges over tributaries of the Oira Creek and NIMT.
- Two stormwater wetlands and new culverts and swales.

Figure 9-12: Indicative generic 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on one side of the corridor.

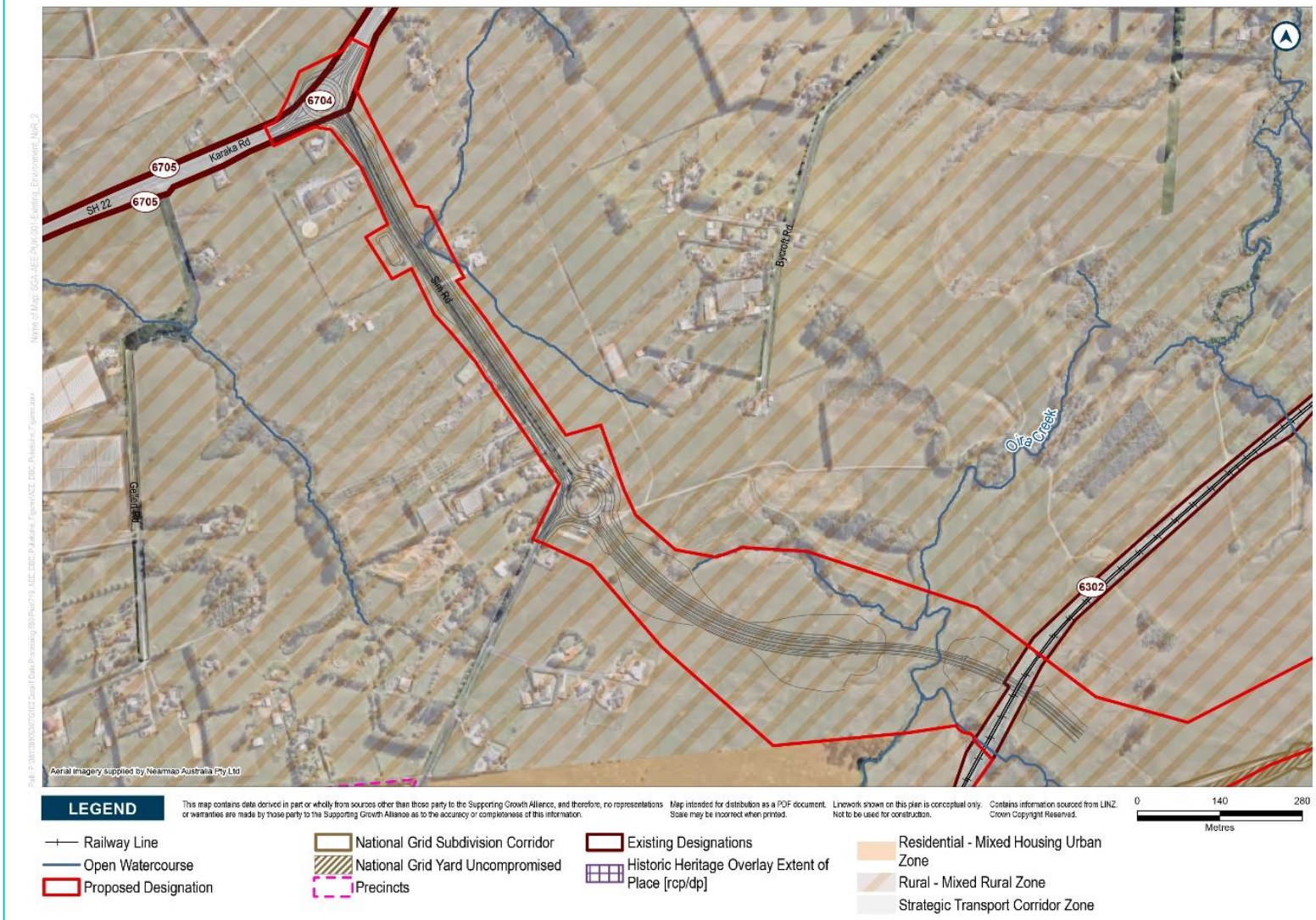

Figure 9-13: NoR 2 – SH22 Connection Segment – Existing Environment and Likely, Planned Future Environment

9.5.2 Receiving Environment for NoR 2 - SH22 Connection Segment

Features	Description
Current zoning	• Rural – Mixed Rural Zone • Future Urban Zone • Residential – Mixed Housing Urban Zone
Likely future zoning	• The likely future environment is anticipated to remain consistent with the existing rural land use and setting.
Planning Overlays, Controls and Precincts	• Flood Plains, Flood Prone Areas, and Overland Flow Paths • High use aquifer management area overlay.
Existing designations	• The project intersects with the existing Waka Kotahi SH22 designations (Designation 6704 and 6705) at the northern extent. • The SH22 Connection crosses over the KiwiRail North Island Main Trunk Railway designation (Designation 6302).
Current land use	• The land use is characterised by pastoral with clusters of rural residential development (including an equine veterinary). The area is identified as highly productive land under the NPS HPL.
Community and recreational facilities	• n/a
Watercourses	• The project crosses the Oira Creek and unnamed tributary.
Ecology (terrestrial and riparian)	• Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, Fernbird and South Island pied oystercatcher (all at risk). A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network:
Vegetation and Landscape	• Vegetation cover is sparse, generally limited to occasional planted catchments and vegetation along residential lot boundaries. • There are no known landscape related overlays within the designation alignment or setting of this segment of NoR 2. • There are no trees in NoR 2 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within the designation of NoR 3.
Areas of cultural value	• The Oira Creek is of cultural significance to Manawhenua.

Features	Description
	• There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.6 NoR 2: Drury – Paerata Link Segment

9.6.1 Project Overview

The Drury-Paerata Link, shown in Figure 9-15, is a new east west corridor connecting the segments of South Drury Connection, SH22 Connection and Paerata Arterials. This segment extends from an intersection with Burtt Road in the north, to the Paerata Arterial segment in the south. It provides connectivity between Drury and Paerata providing a strategic connection between two areas of future urban development

Key features include:

- An indicative 24m wide cross section with two lanes for general traffic and active transport facilities on one side of the corridor, shown in Figure 9-15.
- Two bridges over tributaries of the Oira Creek.
- Three stormwater wetlands and new culverts and swales.

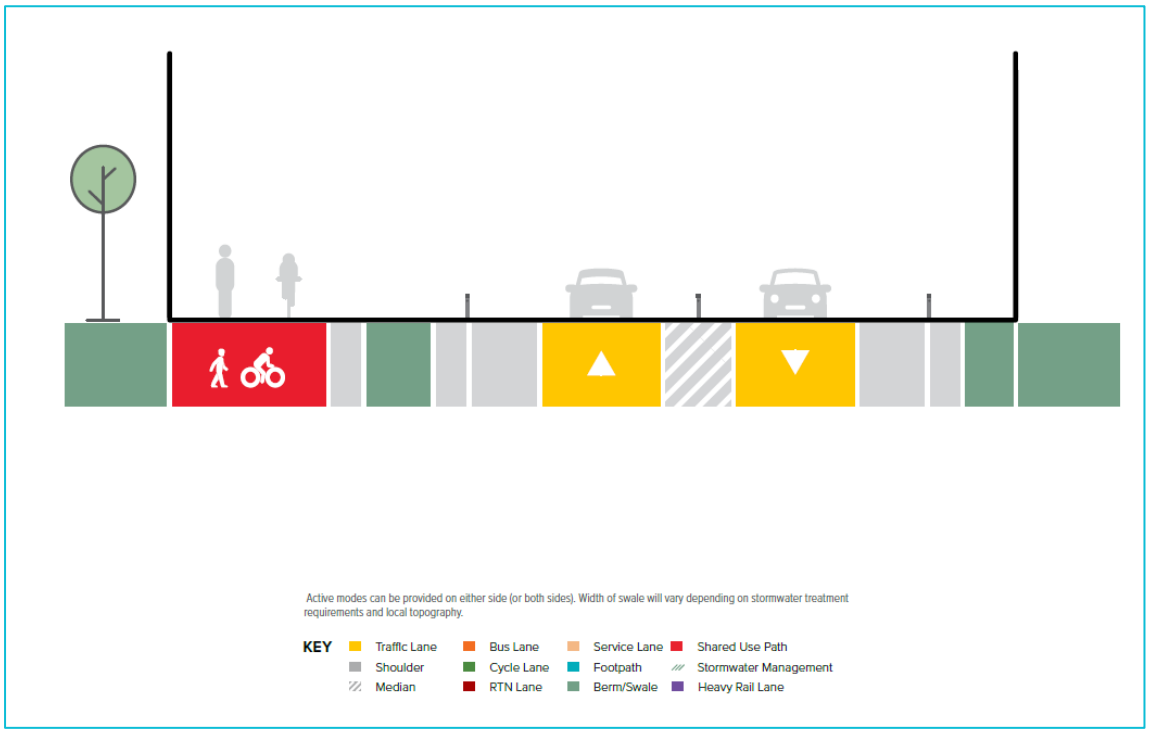

Figure 9-14: Indicative generic 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on one side of the corridor.

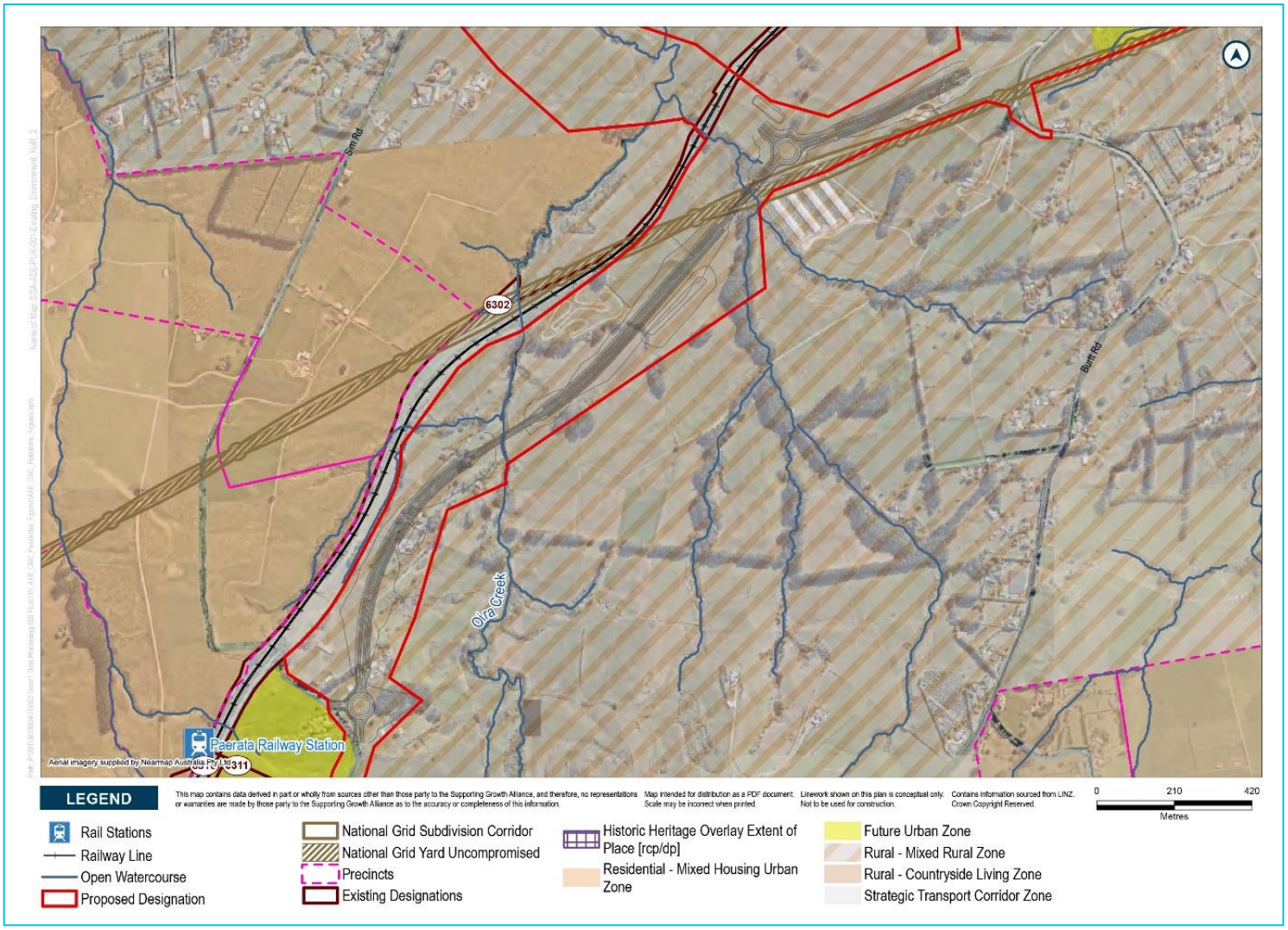

Figure 9-15: NoR 2 - Drury – Paerata Link Segment – Existing Environment

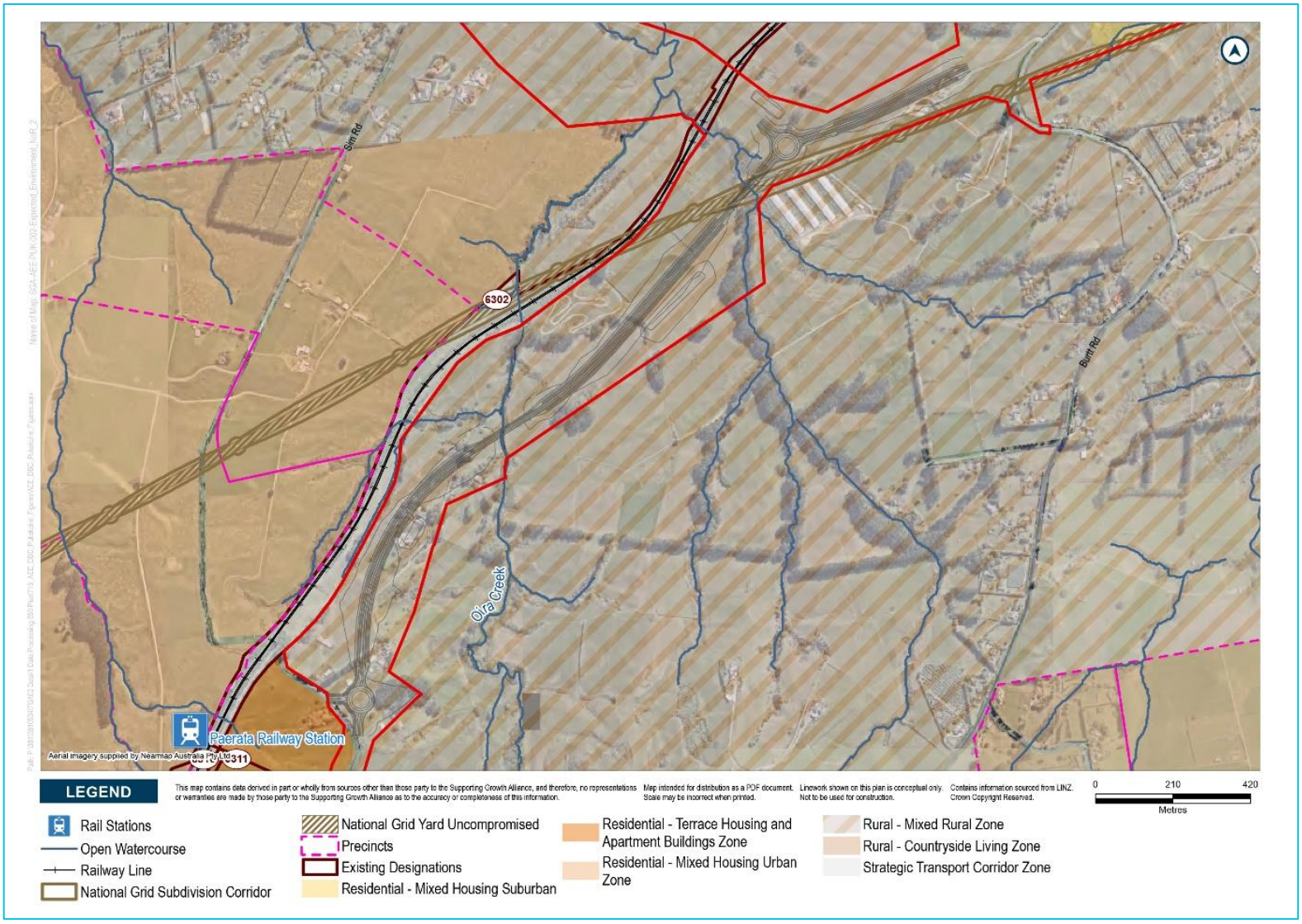

Figure 9-16: NoR 2 - Drury – Paerata Link Segment – Likely, Planned Future Environment

9.6.2 Receiving Environment for NoR 2 Drury – Paerata Link Segment

Features	Description
Current zoning	• The Drury – Paerata Link is all within the Rural – Mixed Rural Zone • Adjacent zoning is Future Urban Zone (to the north and south)
Likely future zoning	• This segment is within the rural zone and is highly likely to remain as rural zoning.
Planning Control, Overlays and Precincts	• A high use aquifer management area overlay. • Flood Plains, Flood Prone Areas, and Overland Flow Paths • Franklin 2 Precinct (Paerata Rise) is adjacent to this segment on the west of the NIMT. • National grid overlay: Extends west adjacent to the proposed NoR 2 – South Drury Segment. It is adjacent to the most northern part of the Drury Paerata Segment.
Existing designations	• The Drury-Paerata Link is adjacent to the KiwiRail North Island Main Trunk Railway designation (Designation 6302), the KiwiRail Paerata Interchange and Accessway (Designation 6311). And Waka Kotahi SH22 designations (6704 and 6705).
Current land use	• The land use is predominantly characterised by working agricultural land, with occasional rural residential properties and farmsteads (including a poultry farm with large sheds).
Community and recreational facilities	• Paerata Primary School is located approximately 1.5km away.
Watercourses	• The project crosses the Oira Creek
Ecology (terrestrial and riparian)	• Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, Fernbird and South Island pied oystercatcher (all at risk) . A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network:
Vegetation and Landscape	• The vegetation pattern is sparse, largely limited to groupings / blocks of vegetation and a scattering of trees • There are no known landscape related overlays within the designation alignment or setting of this segment of NoR 2. • There are no trees in NoR 2 that are protected under relevant District Plan provisions of the AUP: OP.

Features	Description
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within the designation of NoR 2.
Areas of cultural value	• The Oira Creek is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.7 NoR 2: Paerata Arterial Segment

9.7.1 Project Overview

The Paerata Arterial, shown in Figure 9-18, is located along the eastern edge of Paerata FUZ. It connects with the Paerata Connections NoR 3 at the northern extent and to the proposed Pukekohe North East Arterial NoR 4 at its southern extent. It includes an upgrade of part of Sim Road (south), Tuhimata Road and a new section of transport corridor. It increases connectivity to Paerata FUZ, Paerata Rail Station and Pukekohe Town Centre.

Key features of the designation include:

- An indicative 24m wide cross section with two lanes for general traffic and active transport facilities on one or both sides of the corridor, shown in Figure 9-18.
- No bridges are proposed.
- Six stormwater wetlands (one shared with NoR 4 and one shared with NoR 3) and new culverts.

Figure 9-17: Indicative generic 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on one side of the corridor.

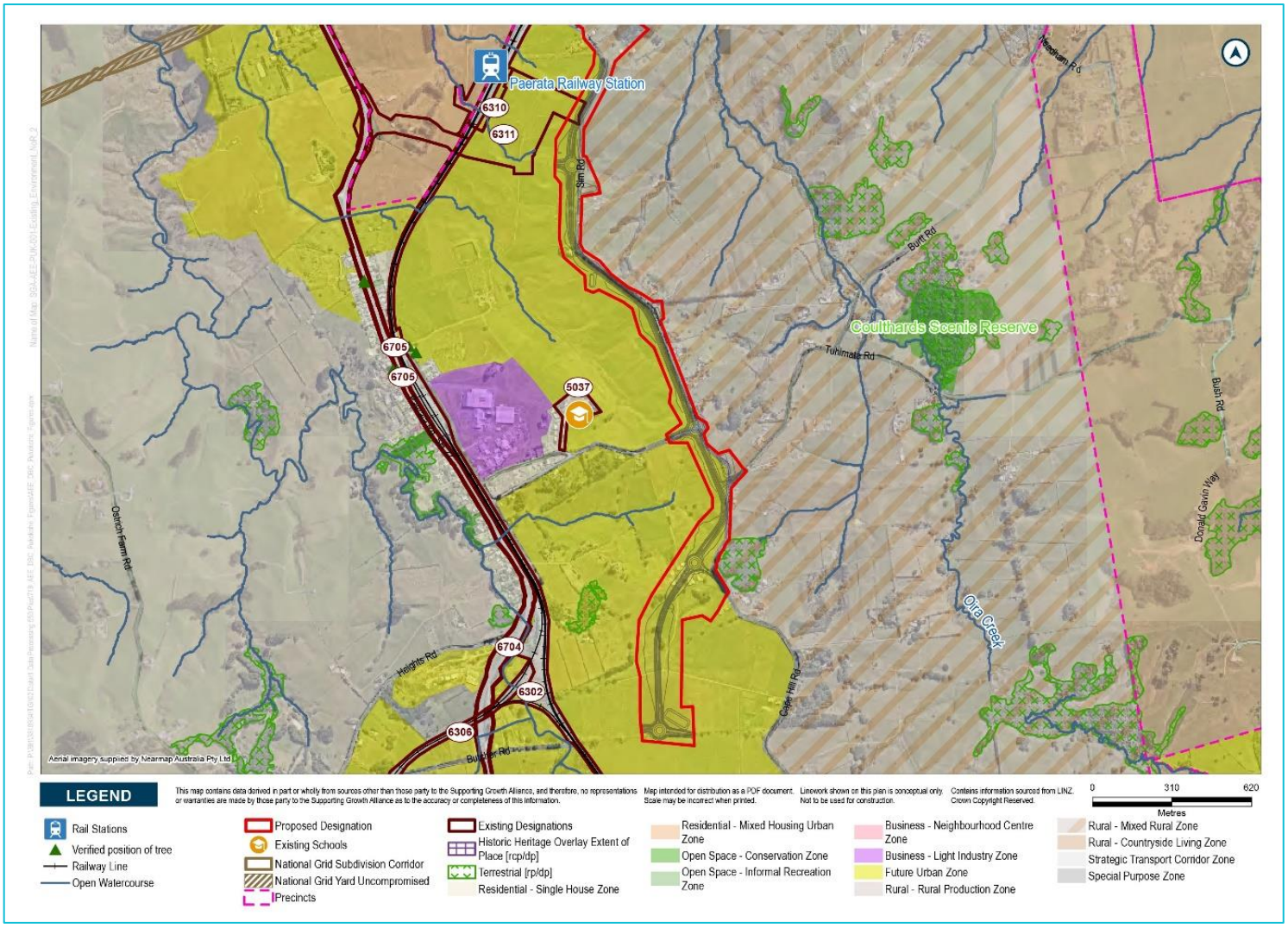

Figure 9-18: NoR 2 – Paerata Arterial Segment – Existing Environment

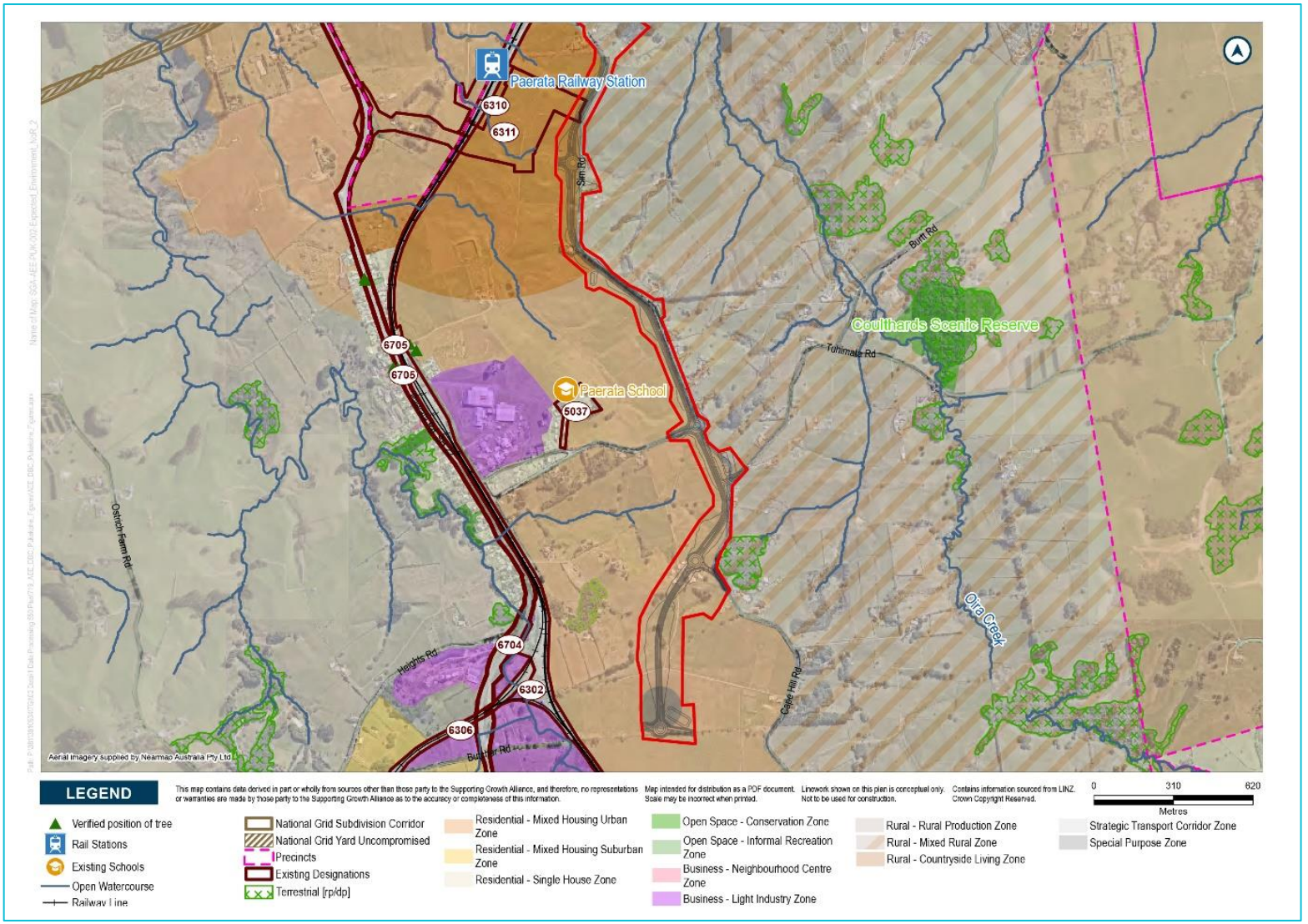

Figure 9-19: NoR 2 – Paerata Arterial Segment – Likely, Planned Future Environment

9.7.2 Receiving Environment for NoR 2 Paerata Arterial Segment

Features	Description
Current zoning	• Future Urban Zone to the west • Rural - Mixed Rural Zone to the east
Likely future zoning	• Pukekohe – Paerata Structure Plan provides direction for future land use in the area. Live zoning through private plan changes in Pukekohe and Paerata have generally followed the structure plan. Although, further increase in housing density is likely through future plan changes. The Pukekohe – Paerata Structure Plan indicates Mixed Housing Urban. • The adjacent Rural Zone to the east is very likely to remain a rural zone in the future.
Planning Controls, overlays and precincts	• A SEA (SEA_T_4380) is located to the east of project area on Cape Hill Road (note the project does not intersect with it; the SEA was avoided through the Alternatives Assessment, refer Appendix A of this AEE). • A high use aquifer management area overlay. • Flood Plains, Flood Prone Areas, and Overland Flow Paths • Franklin 2 Precinct (Paerata Rise) is adjacent to this segment on the west of the NIMT.
Existing designations	• Existing KiwiRail Paerata Interchange and Accessway Designation (6311) and KiwiRail North Island Main Trunk Railway designation (Designation 6302) at the Northern extent of the corridor.
Current land use	• Rural • The land use is agricultural land (predominantly pastoral) interspersed with clusters of rural residential development.
Community and recreational facilities	• n/a
Watercourses	• The project area is covered by a high use aquifer management area overlay. • Adjacent to Whangapouri Creek and unnamed tributary*
Ecology (terrestrial and riparian)	• A SEA (SEA_T_4380) is located to the east of project area on Cape Hill Road (note the project does not intersect with it; the SEA was avoided through the Alternatives Assessment, refer Appendix A of this AEE). • Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, Fernbird and South Island pied oystercatcher (all at risk). A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network.

Features	Description
Vegetation and Landscape	• There are no known landscape related overlays within the designation alignment or setting of this segment of NoR 2. • Vegetation cover is largely limited to planting around residential lots / curtilages and infrequent shelterbelt planting (notably along the South-Western part of Sim Road). • To the east of the segment across the adjacent catchment is the Te Māunu a Tūmatauenga pā. This pā sits upon a natural bluff and landform and is identified as an ONL within the AUP:OP. • There are no trees in NoR 2 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within the designation of NoR 2.
Areas of cultural value	• Whangapouri Creek is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.8 NoR 3: Paerata Connections

9.8.1 Project overview

The Paerata Connections, shown in Figure 9-21, provide two connections from the existing Sim Road (south) proposed to be upgraded by NoR 2 to the Paerata Rail Station and Paerata Rise development. The Sim Connection Segment provides a new connection of approximately 400m between the two extents of Sim Road over the railway (NIMT) and the Paerata Rail Station Connection segment provides a new transport corridor approximately 330m in length between the Paerata Rail Station (KiwiRail designation 6311 currently under construction) and NoR 2.

The connections provide the primary east-west connections for all modes in Paerata.

Key features of the designation are provided below:

- An indicative 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on both sides of the corridor, shown in Figure 9-21
- One bridge is proposed over the NIMT to connect the two extents of Sim Road for the Sim Connection segment.
- One new stormwater wetland is proposed that is shared with NoR 2 and a new culvert.

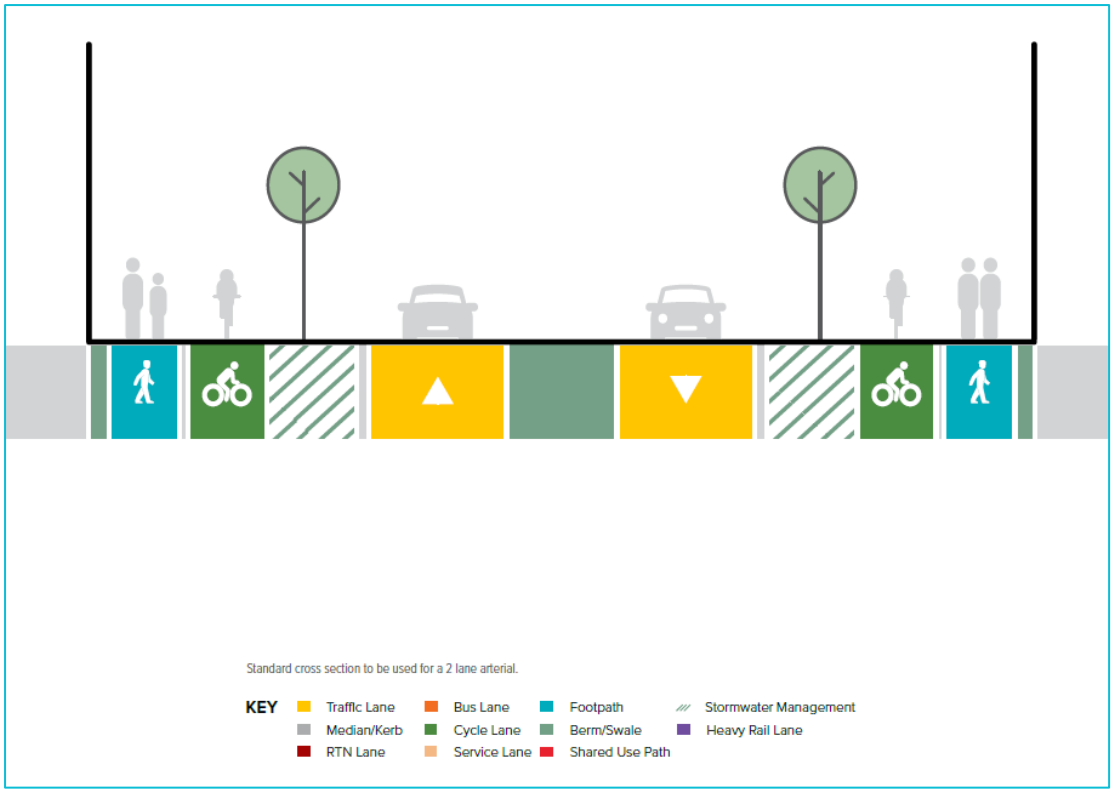

Figure 9-20: Indicative generic 24m wide cross section with two lanes for general traffic and active transport facilities on both sides of the corridor.

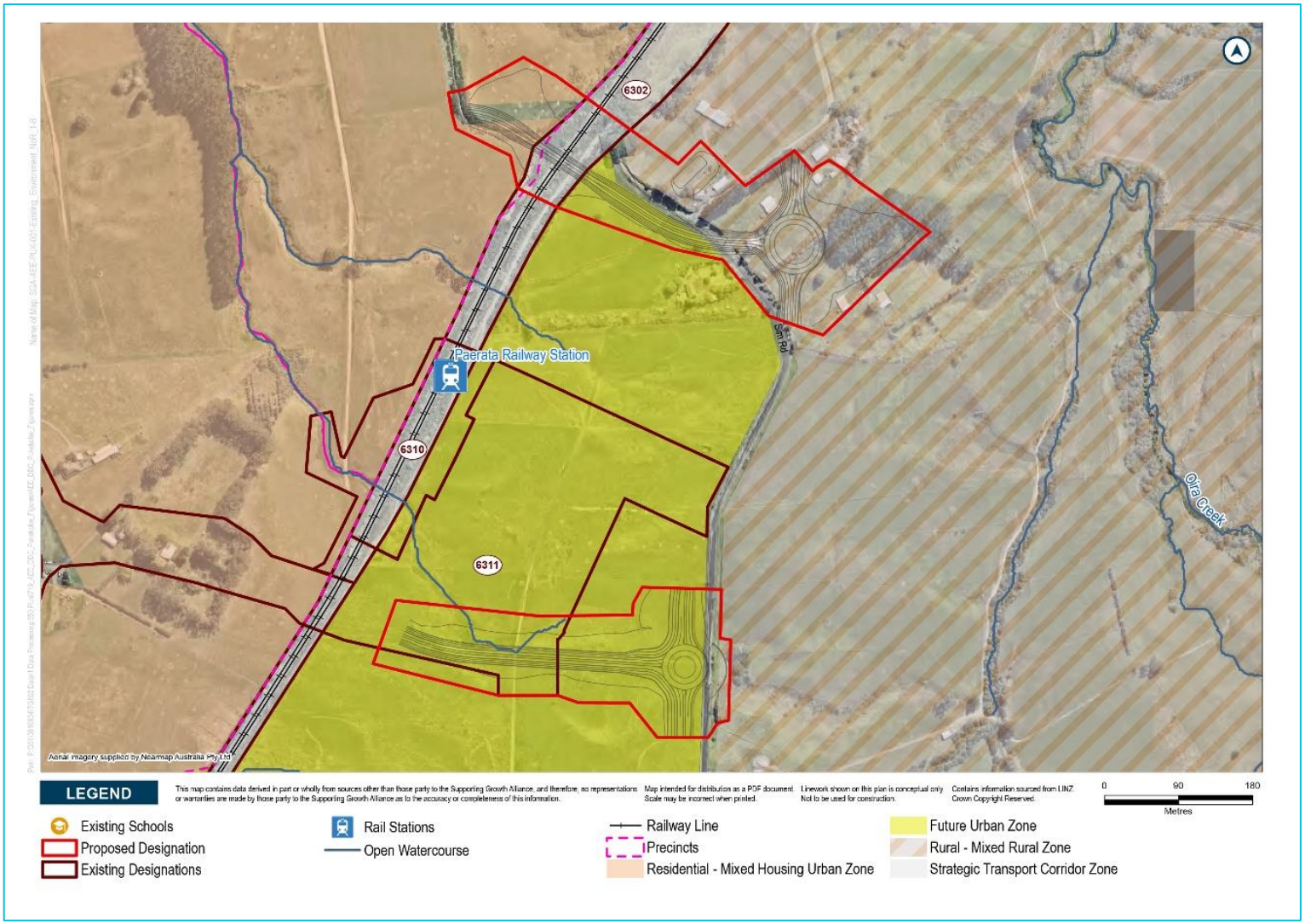

Figure 9-21: NoR 3 – Paerata Connections – Existing Environment

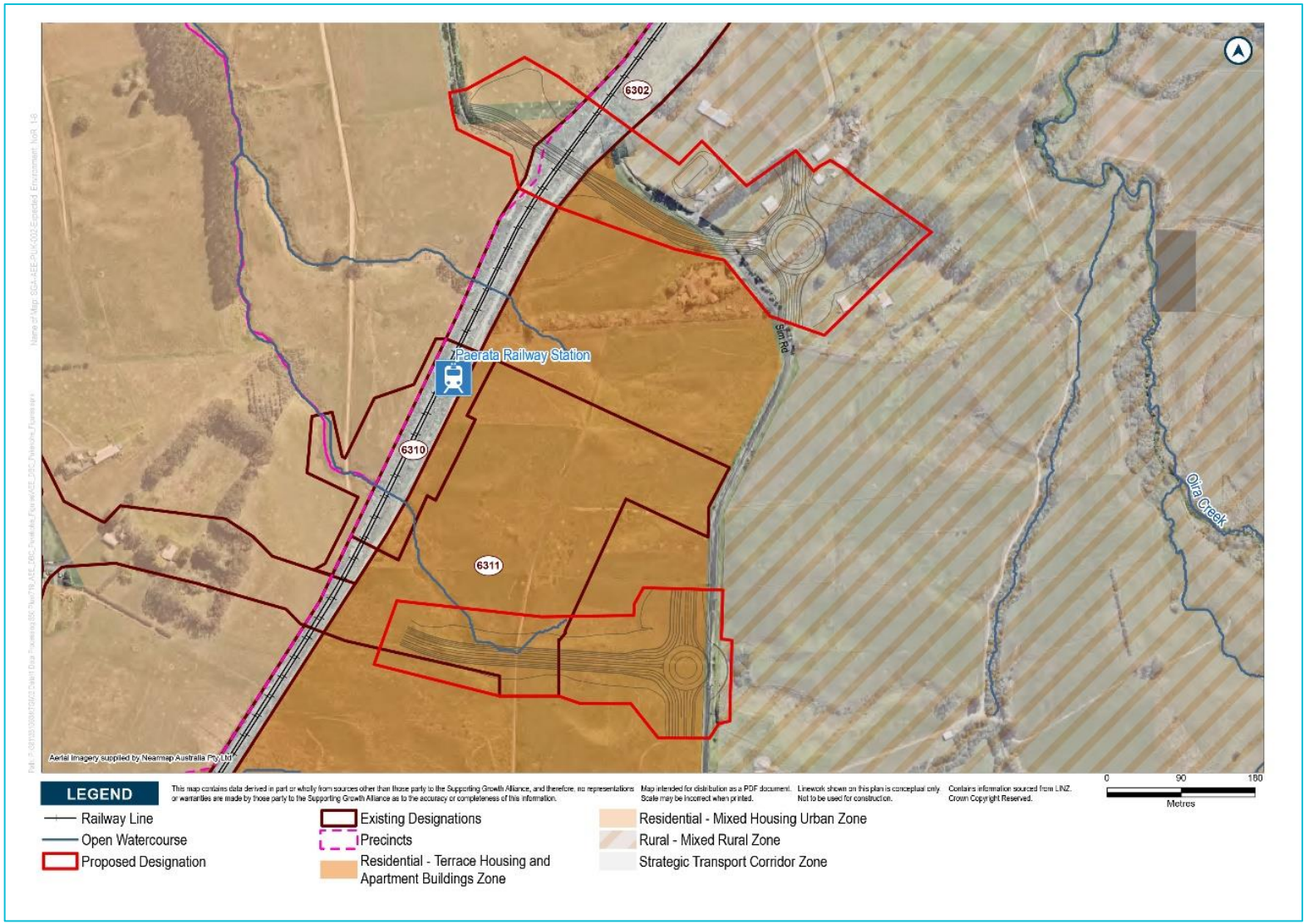

Figure 9-22: NoR 3 – Paerata Connections – Likely, Planned Future Environment

9.8.2 Receiving environment for NoR 3 Paerata Connections

Features	Description
Current zoning	• Rural – Mixed Rural Zone • Future Urban Zone • Residential – Mixed Urban Zone
Likely future zoning	• Pukekohe – Paerata Structure Plan provides direction for future land use in the area. Live zoning through private plan changes in Pukekohe and Paerata have generally followed the structure plan. Although, further increase in housing density is likely through future plan changes. The Pukekohe – Paerata Structure Plan indicates THAB. • For Rural Zone and live Residential Zone there is a low likelihood of change.
Planning Controls, Overlays and Precincts	• Flood Plains, Flood Prone Areas, and Overland Flow Paths • The project area is covered by a high use aquifer management area overlay. • Franklin 2 sub-precinct A and B
Existing designations	• KiwiRail Paerata Interchange and Accessway Designation (6311) and KiwiRail North Island Main Trunk Railway designation (Designation 6302) at the Northern extent of the corridor
Current land use	• Rural - pastoral land
Community and recreational facilities	• Paerata Rail Station
Watercourses	• Adjacent to Whangapouri Creek
Ecology (terrestrial and riparian)	• Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network
Vegetation and Landscape	• There are no known landscape related overlays within the designation alignment or setting of NoR 3. • Vegetation cover is consistent with the wider rural landscape, with only sporadic trees found along Sim Road and scrub vegetation along the railway alignment. • There are no trees in NoR 3 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within the designation of NoR 3.
Areas of cultural value	• Whangapouri Creek is of cultural significance to Manawhenua.

Features	Description
	• There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.9 NoR 4: Pukekohe North-East Arterial

9.9.1 Project Overview

The Pukekohe North-East Arterial is an approximately 4km new transport corridor from SH22 in the northwest connecting to Pukekohe East Road in the South-East, over the NIMT. It connects the strategic corridors at SH22 (at the Northern extent of the Pukekohe North-West Arterial NoR 7), the Drury to Pukekohe Link NoR 2 and Pukekohe East Road proposed to be upgraded by NoR 5 and NoR 8, shown in Figure 9-24. Its primary function is for general traffic, freight, an active mode links between future neighbourhoods and alleviating traffic on existing roads at Cape Hill Road and Valley Road.

The key features of the designation include:

- An indicative 24m wide cross section with two lanes for general traffic and active transport facilities proposed on both or one side of the corridor, shown in Figure 9-24.
- Seven bridges over the Whangapouri Creek, the NIMT, and other unnamed streams and tributaries.
- Six new stormwater wetlands and new culverts.

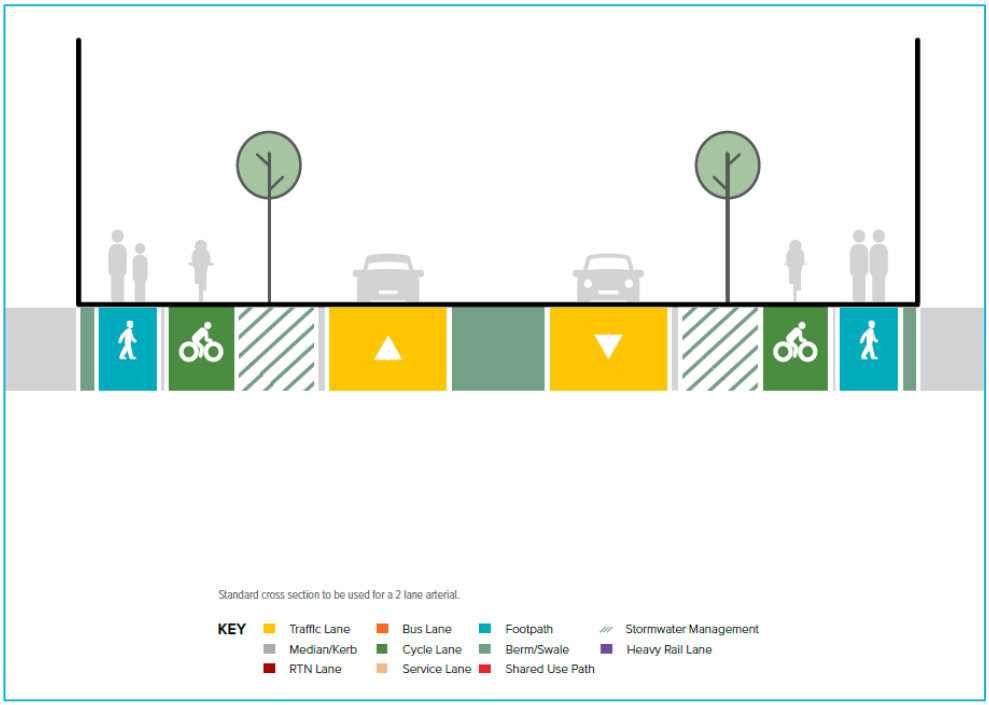

Figure 9-23: Indicative generic 24m wide cross section is proposed with 2 lanes for general traffic and active transport facilities proposed on both or one side of the corridor

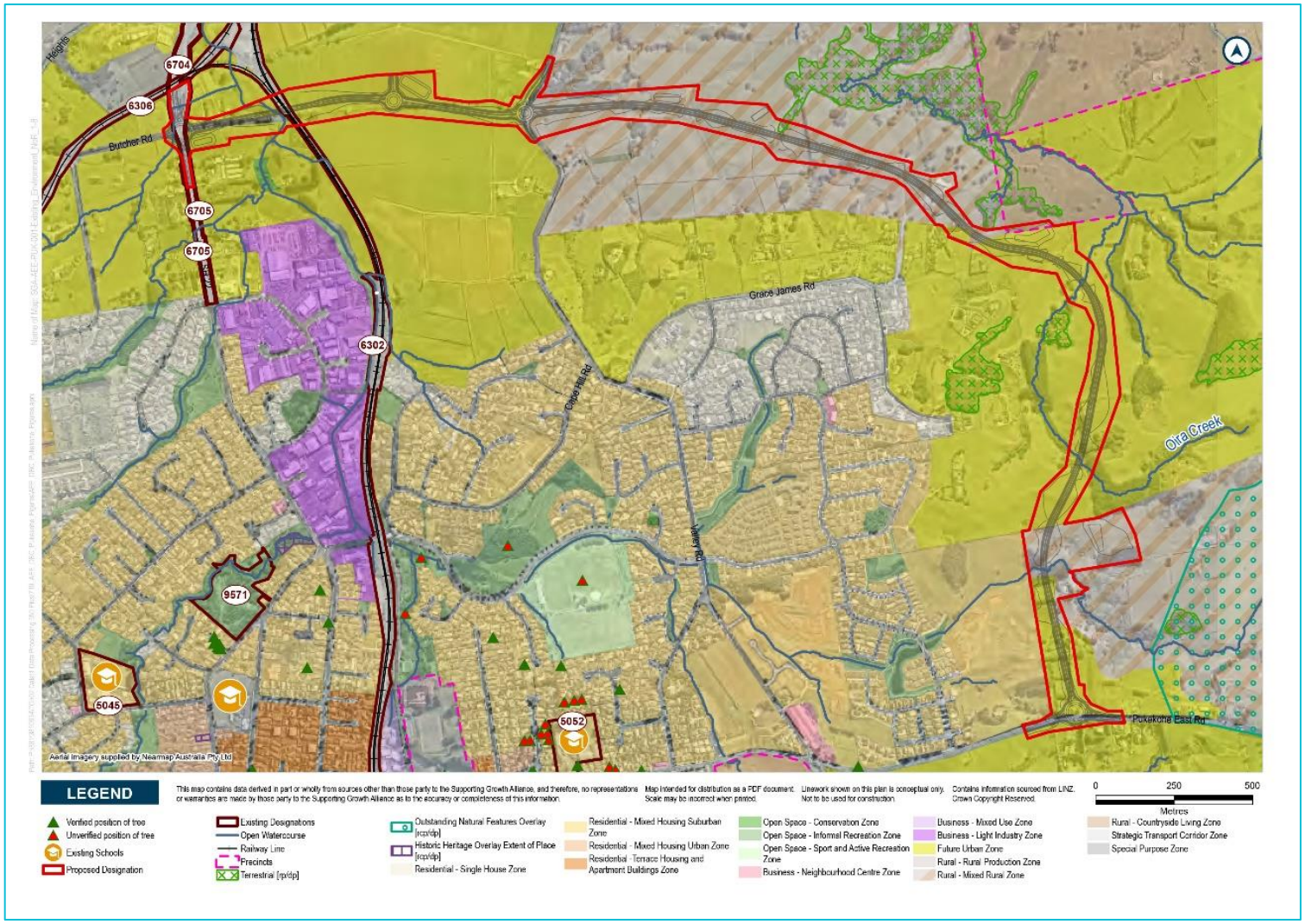

Figure 9-24: NoR 4 – Pukekohe North-East Arterial – Existing Environment

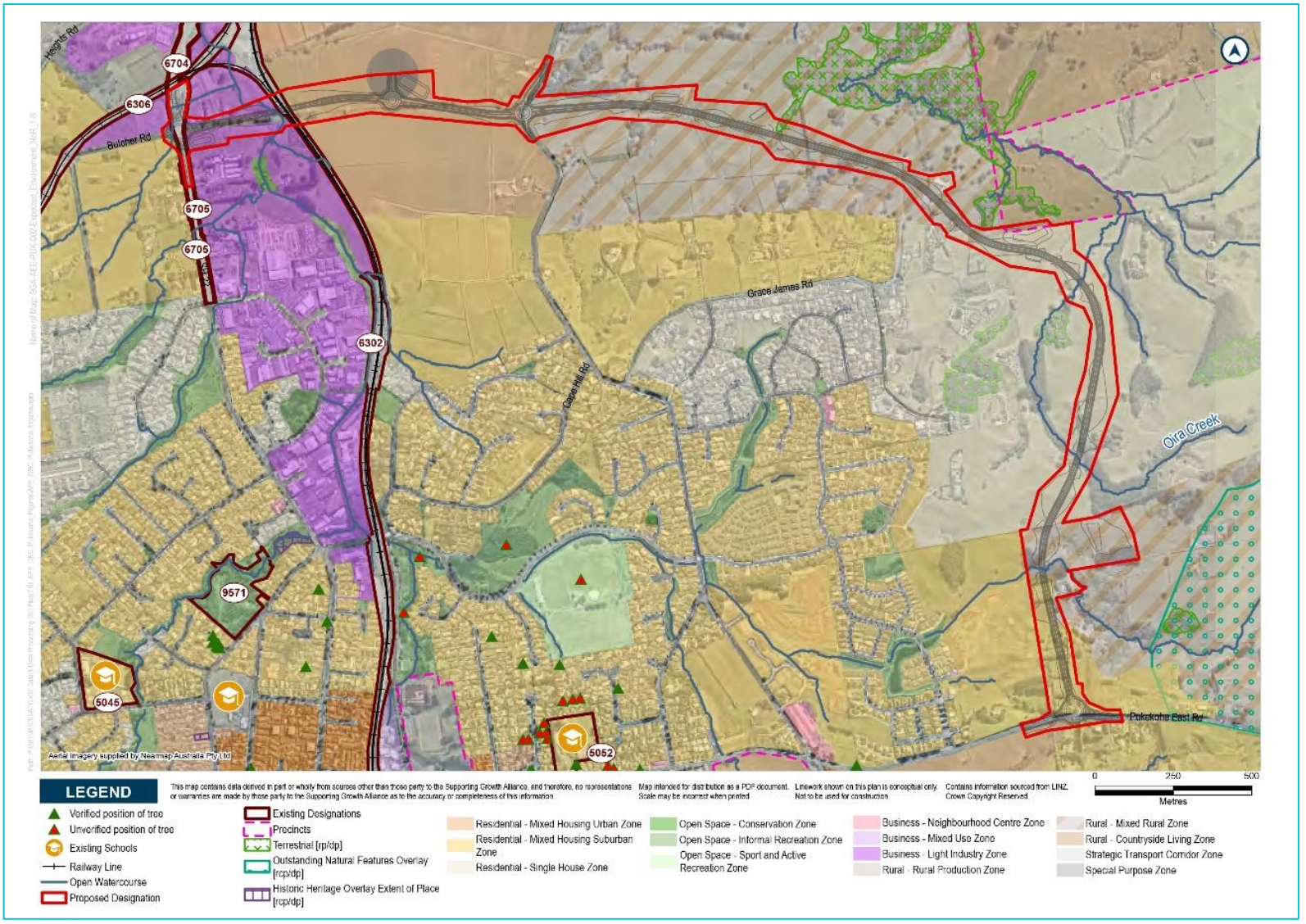

Figure 9-25: NoR 4 – Pukekohe North-East Arterial – Likely, Planned Future Environment

9.9.2 Receiving environment for NoR 4

Features	Description
Current zoning	• The majority of the project is within the Future Urban Zone • Part of the project is within the Rural – Mixed Rural Zone • Part of the project is within the Residential – Mixed Housing Suburban Zone • Part of the project is within the Rural – Countryside Living Zone
Likely future zoning	• The Pukekohe-Paerata Structure Plan indicates the likely future zoning as MHU, MHS • For the part of the project in the rural zone, this is highly likely to stay as rural zone in the future.
Planning Control, Overlays and Precincts	• The project is adjacent to a Significant Ecological Area SEA_T_4375. A small part of the SEA is within the proposed designation boundary. • Flood Plains, Flood Prone Areas, and Overland Flow Paths. • Outstanding Natural Feature (169) Pukekohe East Tuff Ring: NoR 4 is located approximately 115m from this overlay at its closest point. • At the most eastern point, the designation is partially located within the Runciman sub-precinct A
Existing designations	• KiwiRail North Island Main Trunk Railway designation (Designation 6302) at the north of the proposed intersection with SH22 • Waka Kotahi SH22 designations 6704 and 6705
Current land use	• Pastoral land and a small pocket of rural residential development • The area is covered by two natural resource overlays (high-use aquifer management area, quality-sensitive aquifer management area).
Community and recreational facilities	• n/a
Watercourses	• Whangapouri Creek unnamed tributary • Oira Creek unnamed tributary
Vegetation and Landscape	• An Outstanding Natural Feature (169) Pukekohe East Tuff Ring is not directly affected. It forms a significant landscape feature to east of the project approximately 115m from this overlay at its closest point. • Vegetation cover is consistent, with defined blocks of established vegetation (mixture of native bush and exotic) in gullies and on hill slopes. • There are no trees in NoR 4 that are protected under relevant District Plan provisions of the AUP:OP.
Ecology (terrestrial and riparian)	• The project is adjacent to a Significant Ecological Area SEA_T_4375. A small part of the SEA is within the proposed designation boundary. Majority of SEA avoided through Alternatives Assessment and concept design. • This project is located approximately 140m from SEA_T_4374. • The project is located approximately 250m from SEA_T_5278. • The project is located approximately 280m from SEA_T_4510.

Features	Description
	• Bat habitat - Bat passes were recorded within the NoR during the Jan/Feb and April/May 2023 surveys • Vegetation cover is consistent with the wider rural landscape, with only sporadic trees found along Sim Road and scrub vegetation along the railway alignment • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, Fernbird and South Island pied oystercatcher (all at risk). A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within NoR 4.
Areas of cultural value	• The Project is located to the west of the Outstanding Natural Feature (Pukekohe East tuff ring) which is of cultural significance to Manawhenua. • Whangapouri Creek and Oira Creek are of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.10 NoR 5: Pukekohe South-East Arterial

9.10.1 Project Overview

The Pukekohe South-East Arterial upgrades part of Pukekohe East Road, Golding Road and provides a new connection between Golding Road (from North of Royal Doulton Drive) and across Station Road and the NIMT to the existing industrial development on Crosbie Road to Svendsen Road, shown in Figure 9-29. It is a primary east-west connection to assist in redirecting general traffic and freight away from the Pukekohe town centre to provide additional resilience to the wider network.

Key features of the designation include:

- An indicative 24m wide cross section with two lanes for general traffic with active transport facilities on the southern side of the corridor on Pukekohe East Road and on both sides for the remainder of the corridor, shown in Figure 9-19 and Figure 9-20.
- One bridge crossing Station Road and the NIMT through the existing industrial development on Crosbie Road to Svensden Road.
- Five new stormwater wetlands and new and upgraded culverts.

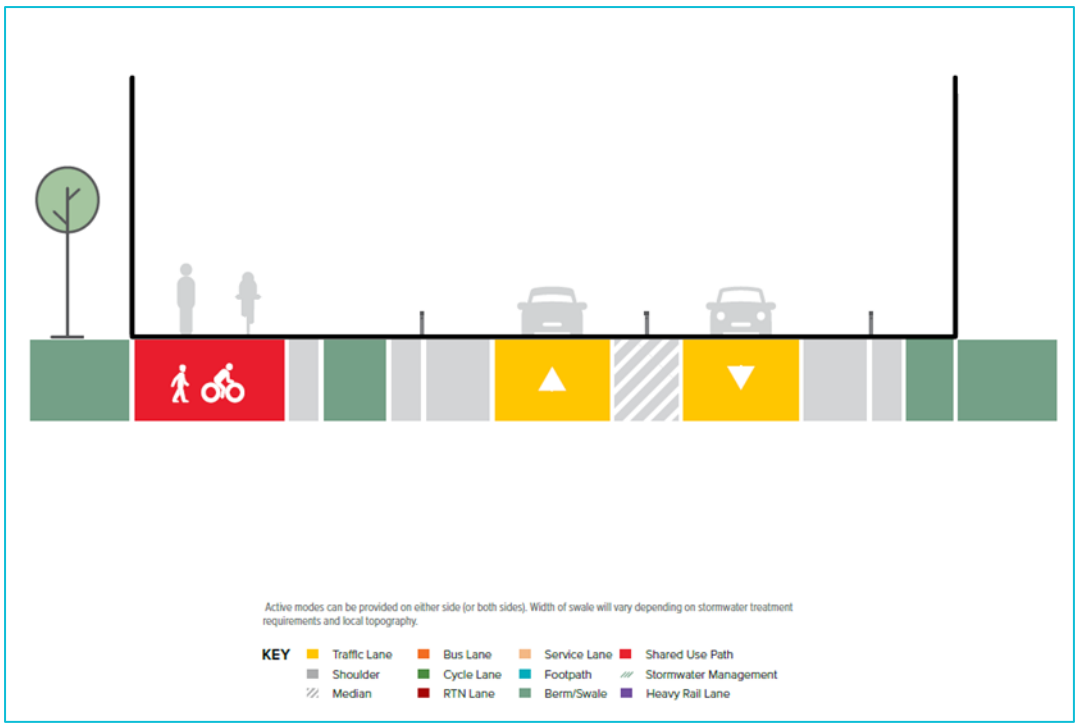

Figure 9-26: Indicative generic 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on one side of the southern side of the corridor. Proposed on Pukekohe East Road.

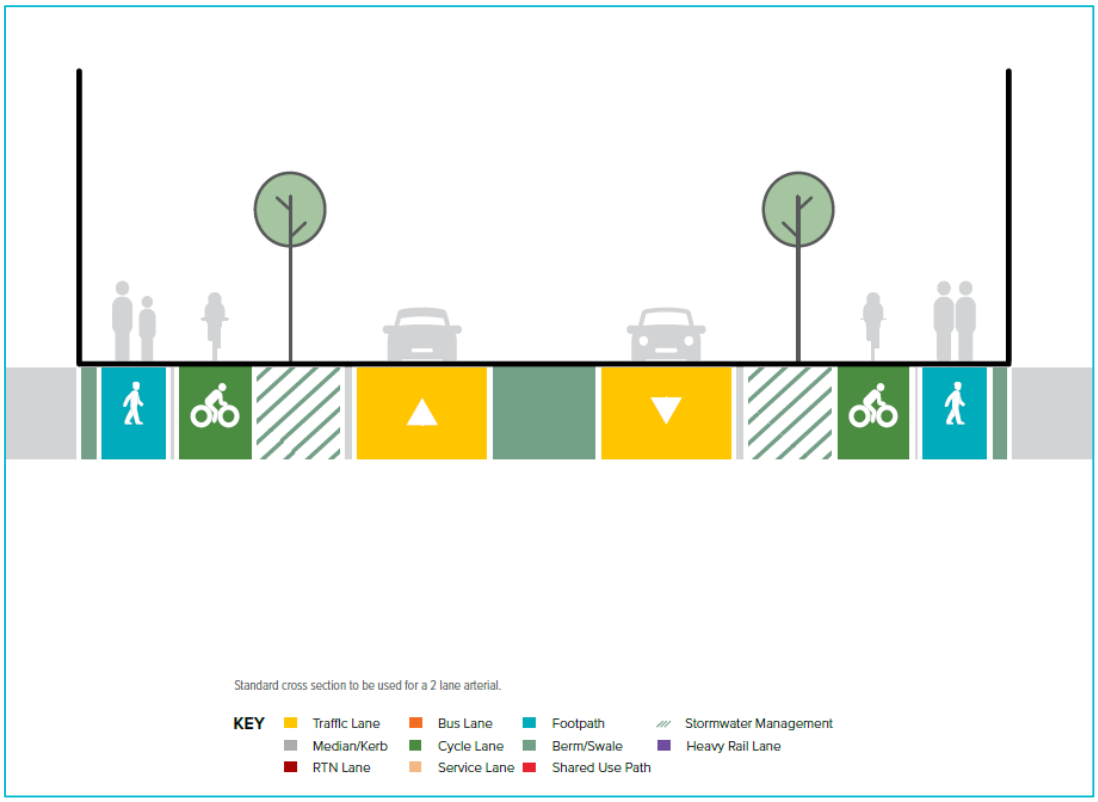

Figure 9-27: Indicative generic 24m wide cross section with two lanes for general traffic with active transport facilities on both sides for the remainder of the corridor.

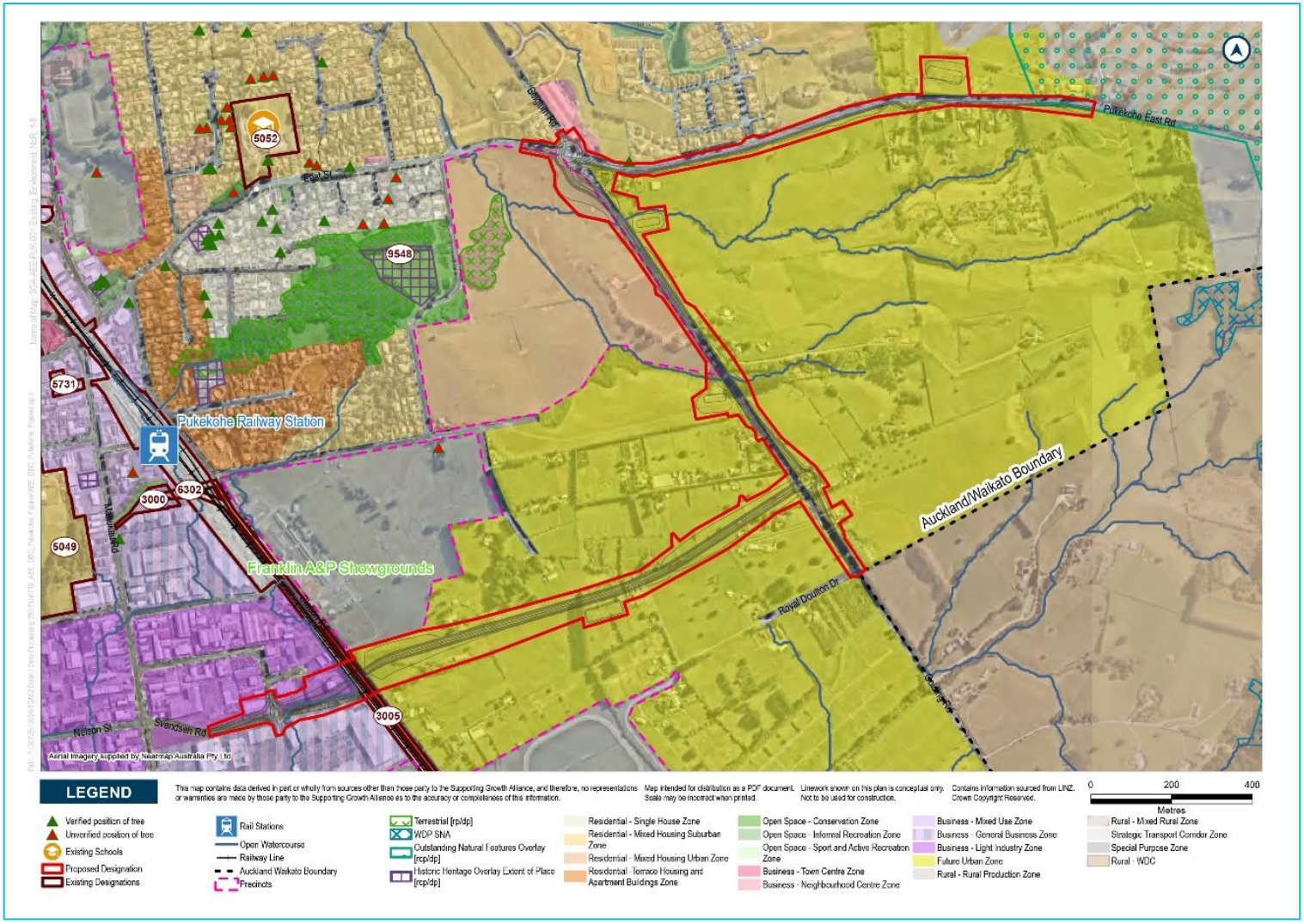

Figure 9-28: NoR 5 – Pukekohe South-East Arterial – Existing Environment

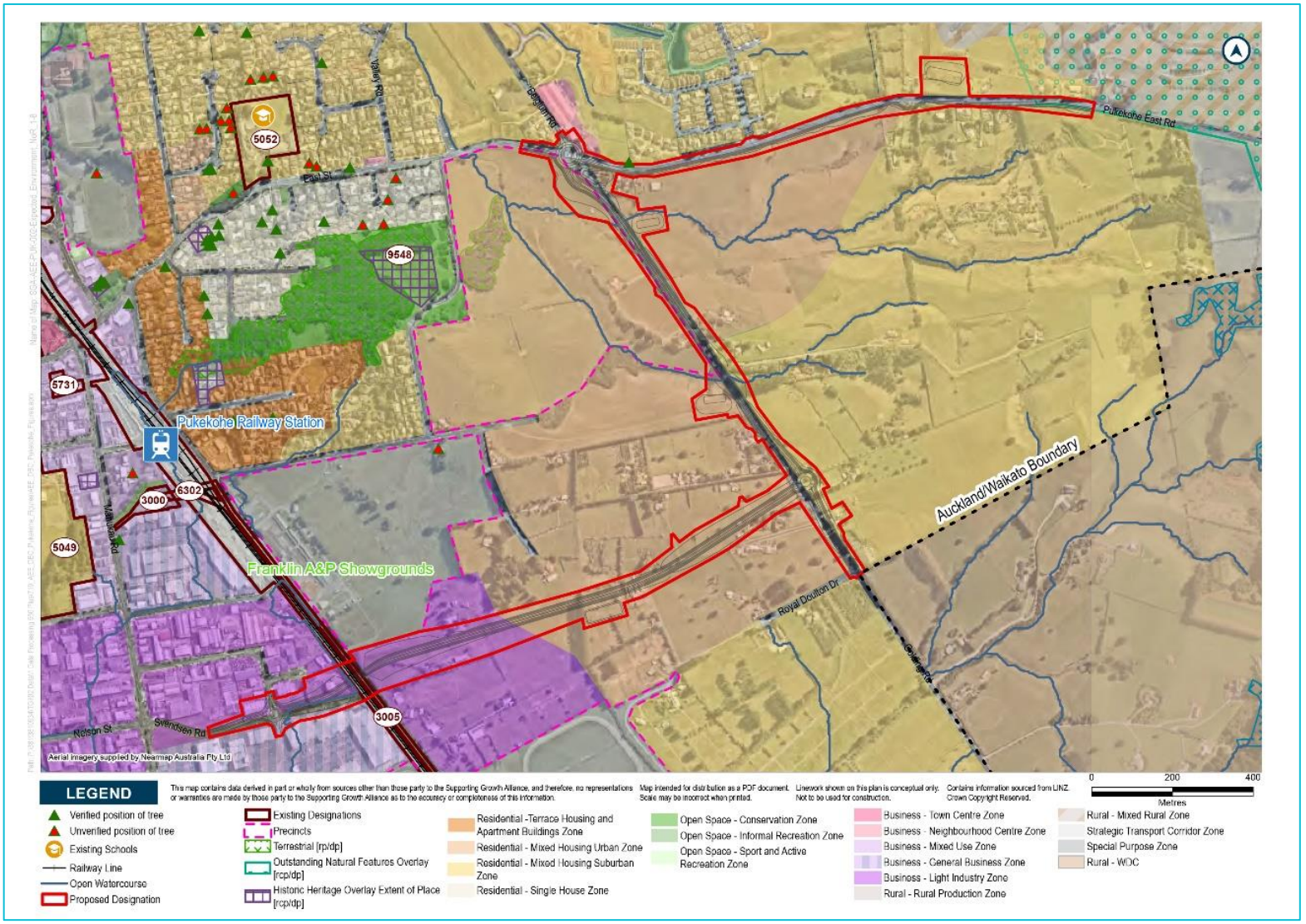

Figure 9-29: NoR 5 – Pukekohe South-East Arterial – Likely, Planned Future Environment

9.10.2 Receiving Environment for NoR 5 Pukekohe South-East Arterial

Features	Description
Current zoning	• Future Urban Zone • Business - General Business Zone • Business - Light Industry Zone • Neighbourhood Centre Zone • Residential – Mixed Housing Suburban Zone
Likely future zoning	• The Pukekohe - Paerata Structure Plan for the Future Urban Zone indicates the likely future zoning as, Business – Light Industry, Residential Mixed Housing Urban, Residential Mixed Housing Suburban. • A number of plan changes to rezone land to mixed housing urban zoning in the FUZ have recently been approved (PC 74 and 76). • The existing Business Zone around Crosbie and Svendsen Roads are very likely to remain the same zoning in the future.
Planning, controls, overlays and precincts	• The eastern extent of the alignment of the designation for NoR 5 is along (and within) the edge of the Pukekohe East tuff ring (identified ONF). • Flood Plains, Flood Prone Areas, and Overland Flow Paths • Franklin A&P Showgrounds (Precinct) • Notable Trees Overlay - 2732, Monterey Pine
Existing designations	• The project crosses NIMT (Designation 6302).
Current land use	• The land within the FUZ is characterised by predominantly agricultural pastoral land uses (with some arable), interspersed with rural residential properties. Further west between Golding Road and Station Road, the landscape is scattered with rural residential properties and farmstead. • Central to the designation, is an area of MHS zone adjacent to the road corridor, north of Pukekohe East Road. Anselmi Ridge is located here, which is a master planned community. • The land use in the Business - Light Industry Zone is used for trade, machinery, vehicles and farm goods and services. The land is characterised by established large scale industrial and commercial activities.
Community and recreational facilities	• The project is adjacent to the Pukekohe Showground (Special Purpose - Major Recreation Facility Zone).
Watercourses	• Crosses unnamed stream at Golding Road
Ecology (terrestrial and riparian)	• Bat habitat - The closest record was within 800m from the NoR (Feb 2023 survey site located off Kitchener Road). • Suitable habitat includes that of Dabchick. A full list of species identified in the desktop review is included in Appendix 7 of the l Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network

Features	Description
Vegetation and Landscape	• The eastern extent of the alignment of the designation for NoR 5 is along (and within) the edge of the Pukekohe East tuff ring (identified ONF). • The eastern and central sections of the alignment (spatially limited to Pukekohe East Road and Golding Road) are located within the Roseville tuff ring south (not identified as ONL / OFL) • The landscape is scattered with rural residential properties and farmsteads, with vegetation cover including sporadic / sparse tree planting, occasional shelterbelt planting and lot boundary planting. • Trees adjacent to NoR 5 that are protected under relevant District Plan provisions of the AUP:OP are: 1. Tree group 5/41 - 24 puriri and pohutukawa growing in the road reserve of Pukekohe East Road beside the rear boundaries of 3-15 Ridge View Crescent 2. Tree group 5/42 - 6 pohutukawa and totara growing in the road reserve of Pukekohe East Road beside the rear boundary of 4 Stockmans Lane.
Historic heritage and archaeological values	• No scheduled or recorded heritage sites within the designation of NoR 5.
Areas of cultural value	• The Outstanding Natural Feature (Pukekohe East tuff ring) is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.11 NoR 6: Pukekohe South-West Upgrade

9.11.1 Project Overview

Pukekohe South-West Upgrade involves the re-allocation of road space within the existing road corridor for a bi-directional cycle way and footpath upgrade. The proposed designation is limited to specific intersections and driveways shown in Figure 9-31 to safely accommodate active mode facilities.

The existing road reserve is to be utilised where possible. The intersections proposed to be upgraded include:

- Manukau Road / Svendsen Road / Nelson Street
- Nelson Street / John Street
- Nelson Street / Queen Street
- Ward Street / Puni Road
- West Street / Helvetia Road, and
- Helvetia Road / Princes Street

Key features include:

- An indicative reduced 20m cross section, 2 lane general traffic, walking on both sides, with a bi-directional cycleway on one side.

- No bridges or stormwater wetlands are proposed.

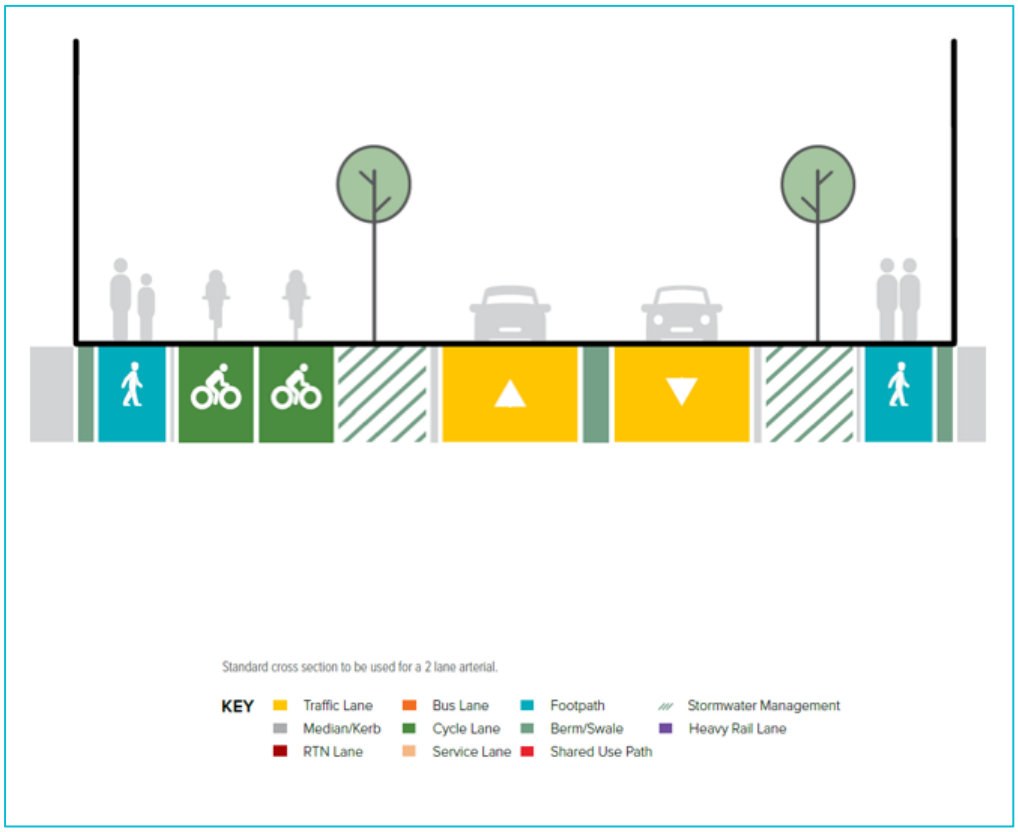

Figure 9-30: Indicative generic 20m wide cross section is proposed with two lanes for general traffic and active transport facilities on each side of the corridor.

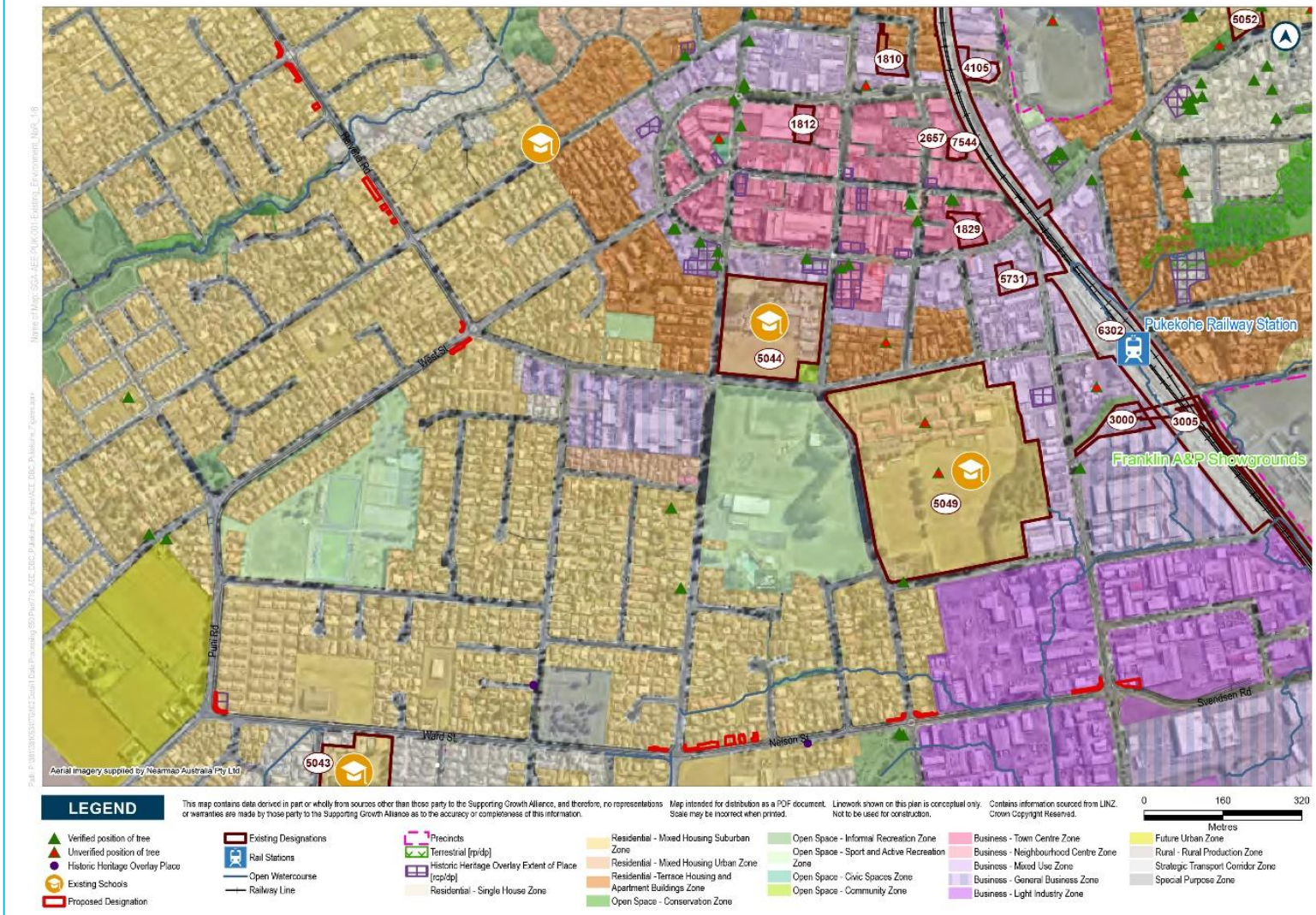

Figure 9-31: NoR 6 – South-West Arterial – Existing and Likely Future Environment

9.11.2 Receiving Environment for NoR 6

Features	Description
Current zoning	• Residential – Mixed Housing Suburban Zone • Business – Light Industry Zone • Future Urban Zone (adjacent at the corner of Ward Street and Puni Road, but not within proposed designation for NoR 6).
Likely future zoning	• The existing residential areas are likely to remain a similar zoning but may be intensified in response to the National Policy Statement on Urban Development 2020 (under proposed plan change 78). • The likely future receiving environment is therefore considered to be consistent with what is currently provided for in the AUP:OP.
Planning controls, overlays and precincts	• Floodplains, food prone area • Historic Heritage Overlay Extent of Place 2235
Existing designations	• n/a
Current land use	• The current land use for the industrial zone land along Nelson Street is a range of light industry shops and a mixture of business. Sites that interact with the NoR 6 designation interacts with include business' that provide car washing, panel beating or detailing services, coffee roasters, a Bunnings Trade Centre and a liquor store. • The residential land use is characterised by low density suburban living.
Community and recreational facilities	• The frontage of a property where a community centre (called Nehru Hall) is located at 59 Ward Street is proposed to be designated for the future upgrade of the Ward St/Puni Place intersection.
Watercourses	• n/a
Ecology (terrestrial and riparian)	• n/a
Vegetation and Landscape	• Vegetation and trees common to a residential setting in private properties. • There are no trees in NoR 6 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• Nehru Hall scheduled Historic Overlay Extent of Place 2235 within the proposed designation at 59 Ward Street.
Areas of cultural value	• There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.12 NoR 7: Pukekohe North-West Arterial

9.12.1 Project Overview

The Pukekohe North-West Arterial, as shown in Figure 9-34, provides a new connection between Helvetia Road in the southwest and SH22 in the northeast. It upgrades part of Helvetia Road, utilises part of Keith Road (a paper road), and forms a new connection between Beatty Road and Butcher Road to SH22 – connecting to the Pukekohe North-East Arterial NoR 4. It provides an alternative connection for all modes travelling north to south in west Pukekohe assisting in redirection of general traffic away from the town centre and provides additional resilience to the wider network.

Key features include:

- An indicative 24m wide cross section with two lanes for general traffic and active transport facilities on both sides of the corridor, shown in Figure 9-33.
- Two new stormwater wetlands and new and upgraded culverts.

The road cross section of the design for NoR 7 proposes the following indicative arrangement and mode share design:

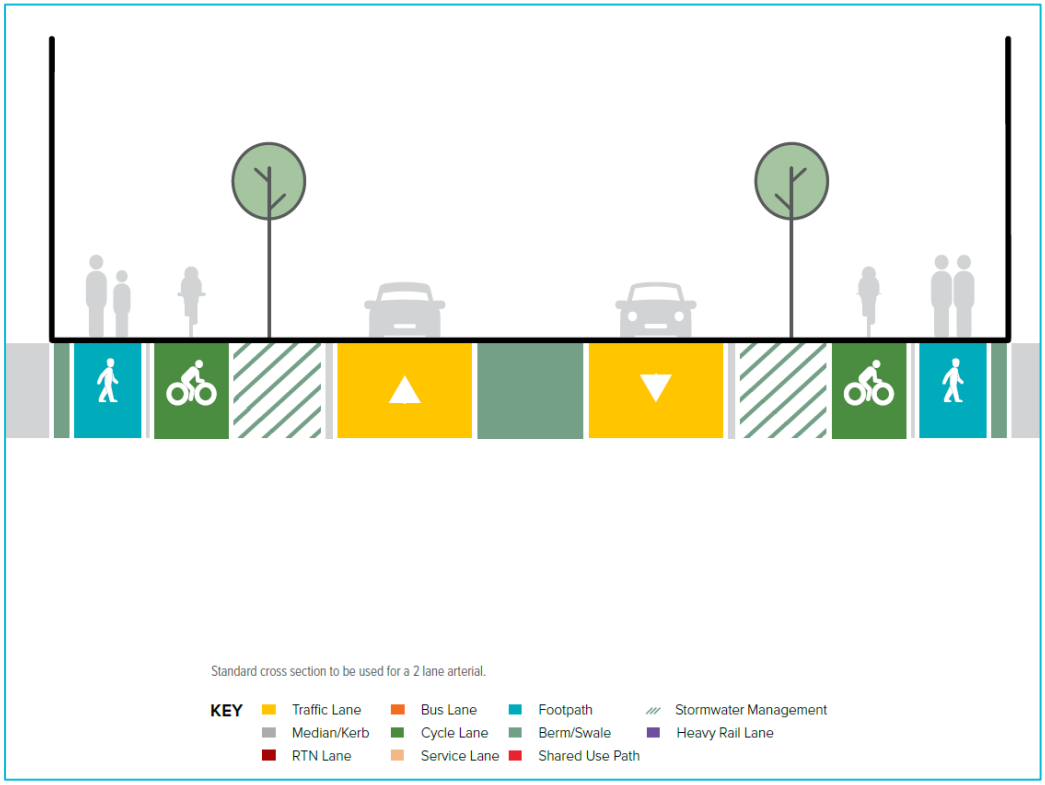

Figure 9-32: Indicative generic 24m wide cross section is proposed with two lanes for general traffic and active transport facilities on both sides of the corridor.

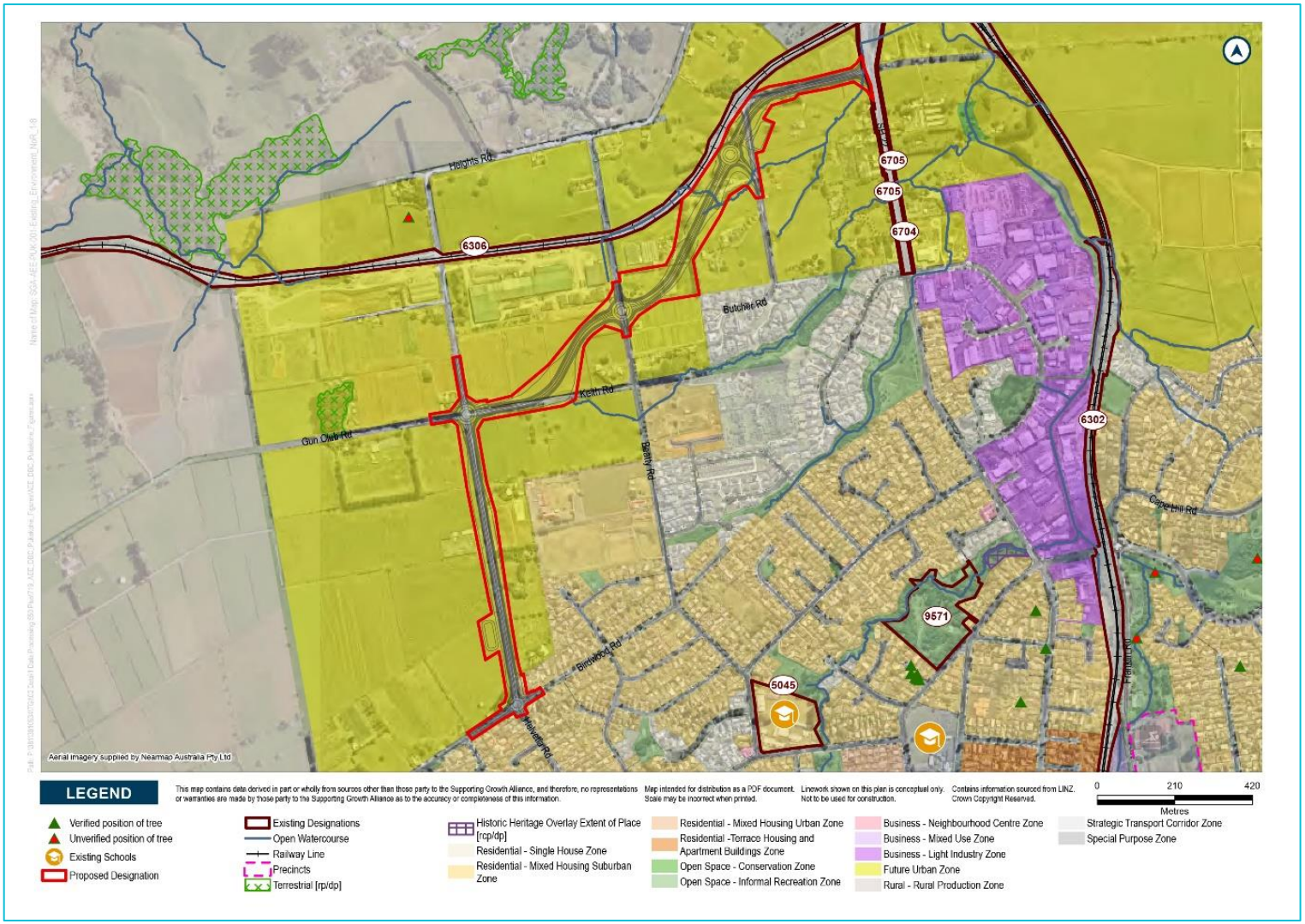

Figure 9-33: NoR 7 – Pukekohe North-West Arterial – Existing Environment

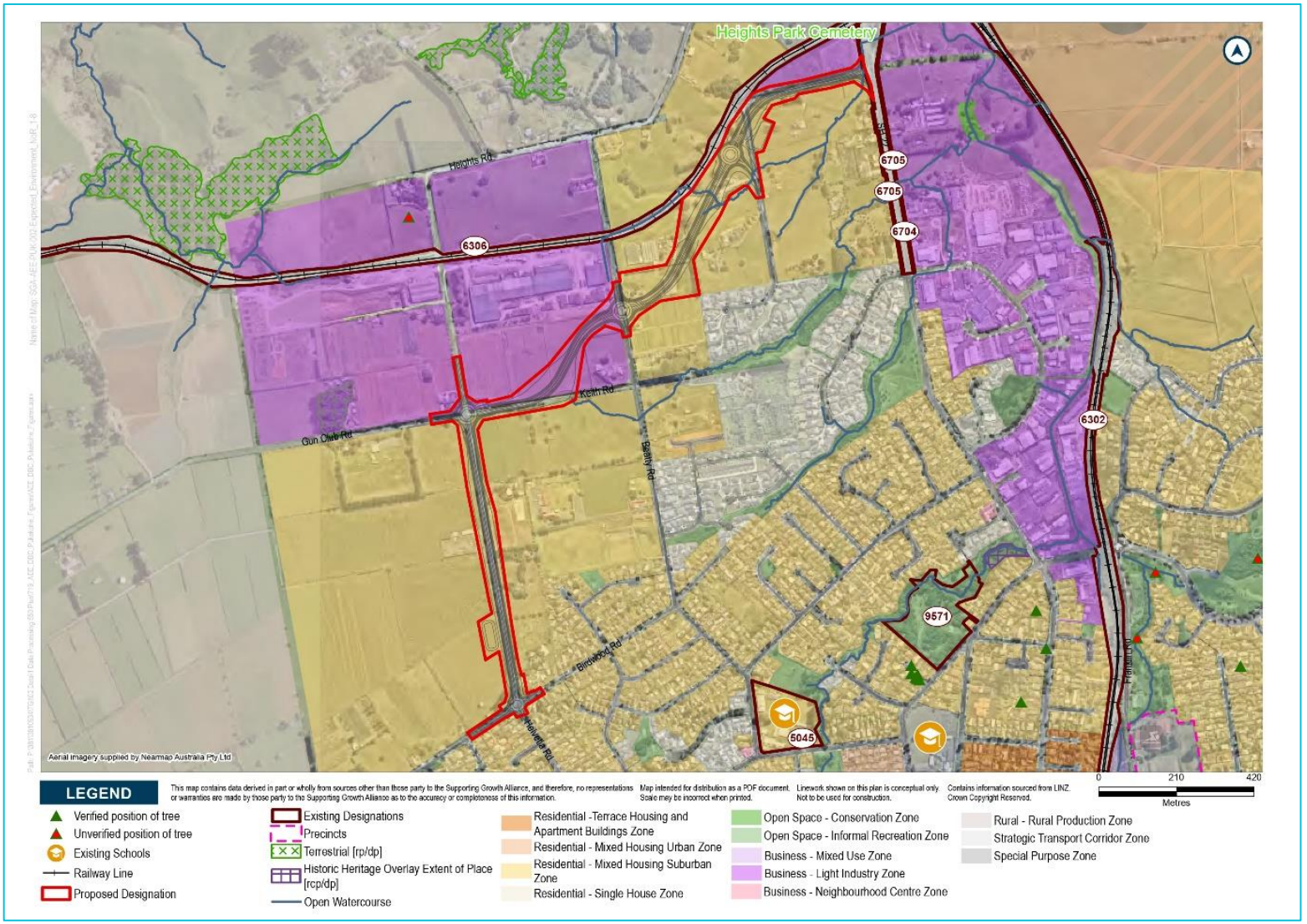

Figure 9-34: NoR 7 – Pukekohe North-West Arterial – Likely, Planned Future Environment

9.12.2 Receiving Environment for NoR 7 Pukekohe North-West Arterial

Features	Description
Current zoning	• Future Urban Zone • Residential – Mixed Housing Suburban Zone
Likely future zoning	• The Pukekohe - Paerata Structure Plan indicates the likely future zoning as Residential Mixed Housing Suburban and Business – Light Industry.
Planning controls, overlays and precincts	• Flood Plains, Flood Prone Areas, and Overland Flow Paths • The project area is covered by two natural resource overlays (high-use aquifer management area, quality-sensitive aquifer management area).
Existing designations	• The corridor at the western extent intersects with existing Waka Kotahi SH22 designation (Designation 6704). • The corridor is south of the Mission Bush Railway Line designation (Designation 6306).
Current land use	• The land use is characterised by largely flat arable land with scattered developments proximate to the urban edge. A band of existing commercial / agricultural activities and structures (including produce storage, a distribution facility and glasshouses) are located to the north and North-West of the alignment, south of the NIMT rail line (with the alignment crossing through one glasshouse).
Community and recreational facilities	• Nga Hau E Wha O Pukekohe Marae in proximity to the project.
Watercourses	• The project crosses Whangapouri Stream
Ecology (terrestrial and riparian)	• Bat habitat - Bat passes were recorded within the NoR during the April/May 2023 survey. • Suitable habitat includes that of Dabchick. A full list of species identified in the desktop review is included in Appendix 7 of the Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network
Vegetation and Landscape	• The Helvetia tuff ring is within the southern extent of the project on Helvetia Road. This is not identified as an ONF or ONL. • The vegetation pattern along the alignment of NoR 7 includes lot boundary planting, occasional shelterbelts and scattered groupings of trees. • There are no trees in NoR 7 that are protected under relevant District Plan provisions of the AUP:OP.
Historic heritage and archaeological values	• No scheduled heritage sites within the designation of NoR 7.

Features	Description
Areas of cultural value	• Whangapouri Stream is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

9.13 NoR 8: Mill Road and Pukekohe East Upgrade

9.13.1 Project Overview

NoR 8 upgrades Mill Road (Bombay) in the east and Pukekohe East Road in the west, as shown in Figure 9-28. It provides an important strategic connection between Auckland and Waikato and from SH1 to Pukekohe urban areas for traffic and freight, with a major rural active mode connection. Harrisville Road plays a significant role in distributing traffic from further south into Waikato. The upgrade of the existing roads requires designations in the Auckland Council and the Waikato District Council jurisdiction as shown in Figure 9-37 and Figure 9-38 (and therefore consists of two NoRs). However, as the jurisdictional boundary is located within the existing roads, the upgrade is generally described as one project in the AEE as both designations will need to be implemented to construct the project.

Key features include:

- Mill Road is proposed to be upgraded to four lanes (2.1 kms) from SH1 in the east to Harrisville Road in the west, shown in Figure 9-36. It has an indicative 30m wide cross section with four lanes for general traffic, with walking and cycling on the southern side, shown in Figure 9-26.
- Pukekohe East Road is proposed to be upgraded (3.4 kms) for active transport facilities on the southern side from Harrisville Road in the east to NoR 5 in the west, with an indicative cross-section shown in Figure 9-37.
- One new stormwater wetland, swales and new and upgraded culvert.

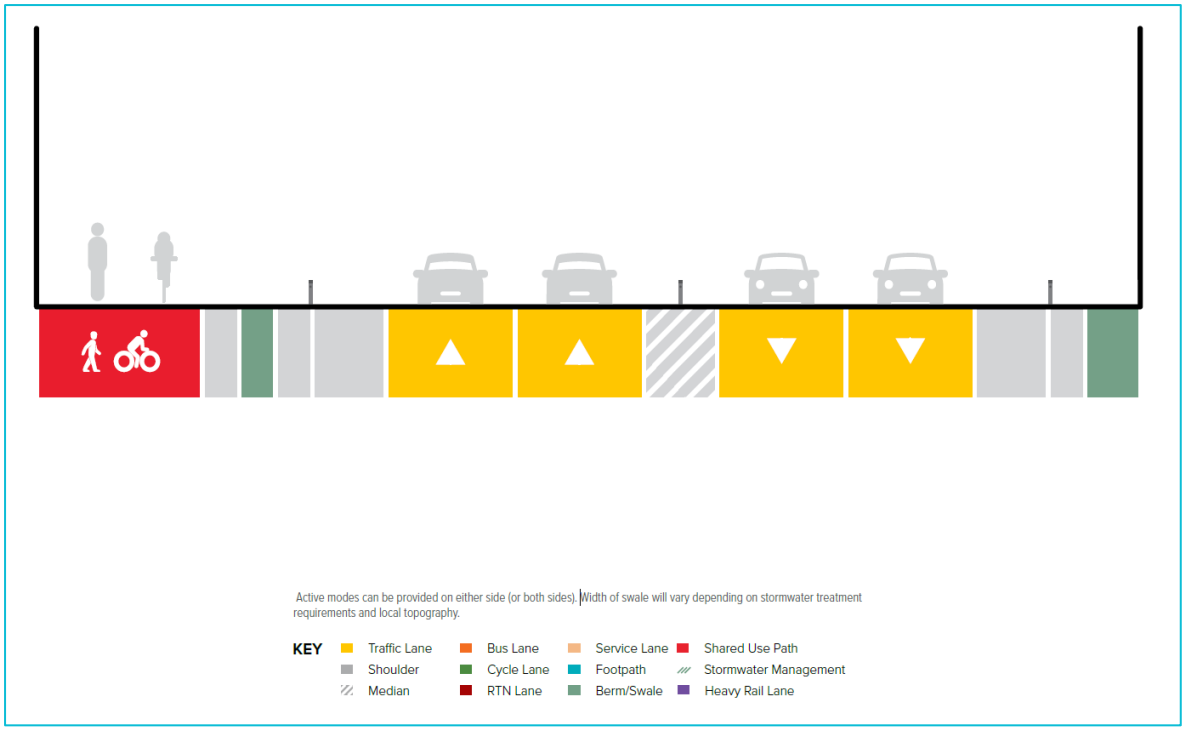

Figure 9-35: Indicative generic 30m wide cross section with four lanes for general traffic, with active mode facilities on the southern side. Proposed along Mill Road.

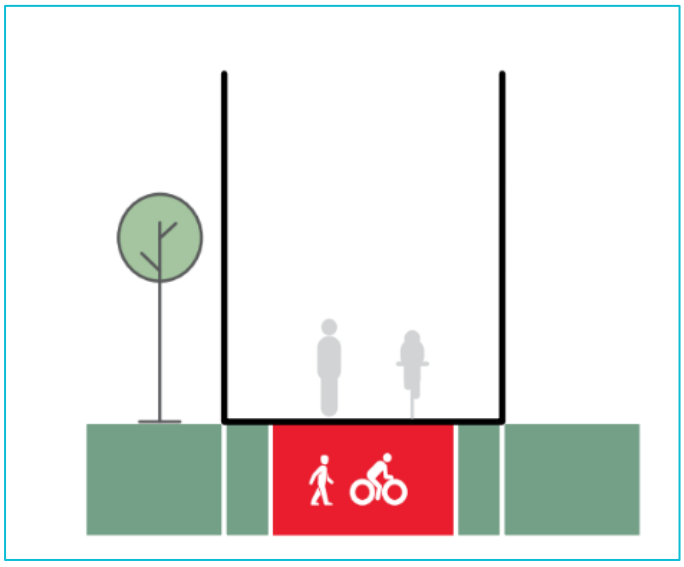

Figure 9-36: Indicative Rural Strategic Active Mode Corridor – 6m wide cross section accounting for active transport facilities on one side of the southern side of the corridor. Proposed on Pukekohe East Road.

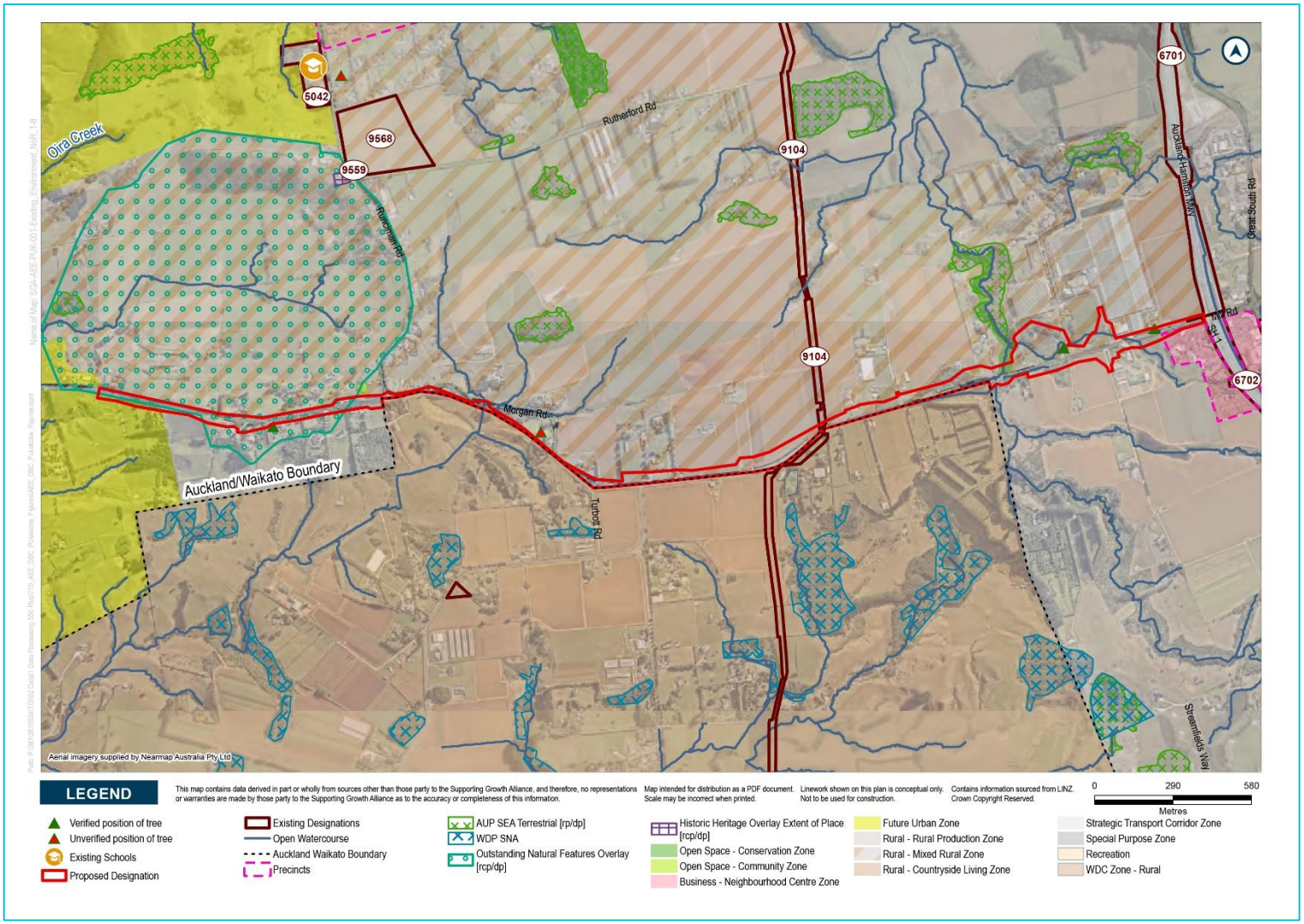

Figure 9-37: NoR 8 (AC) – Mill Road and Pukekohe East Road Upgrade – Existing Environment

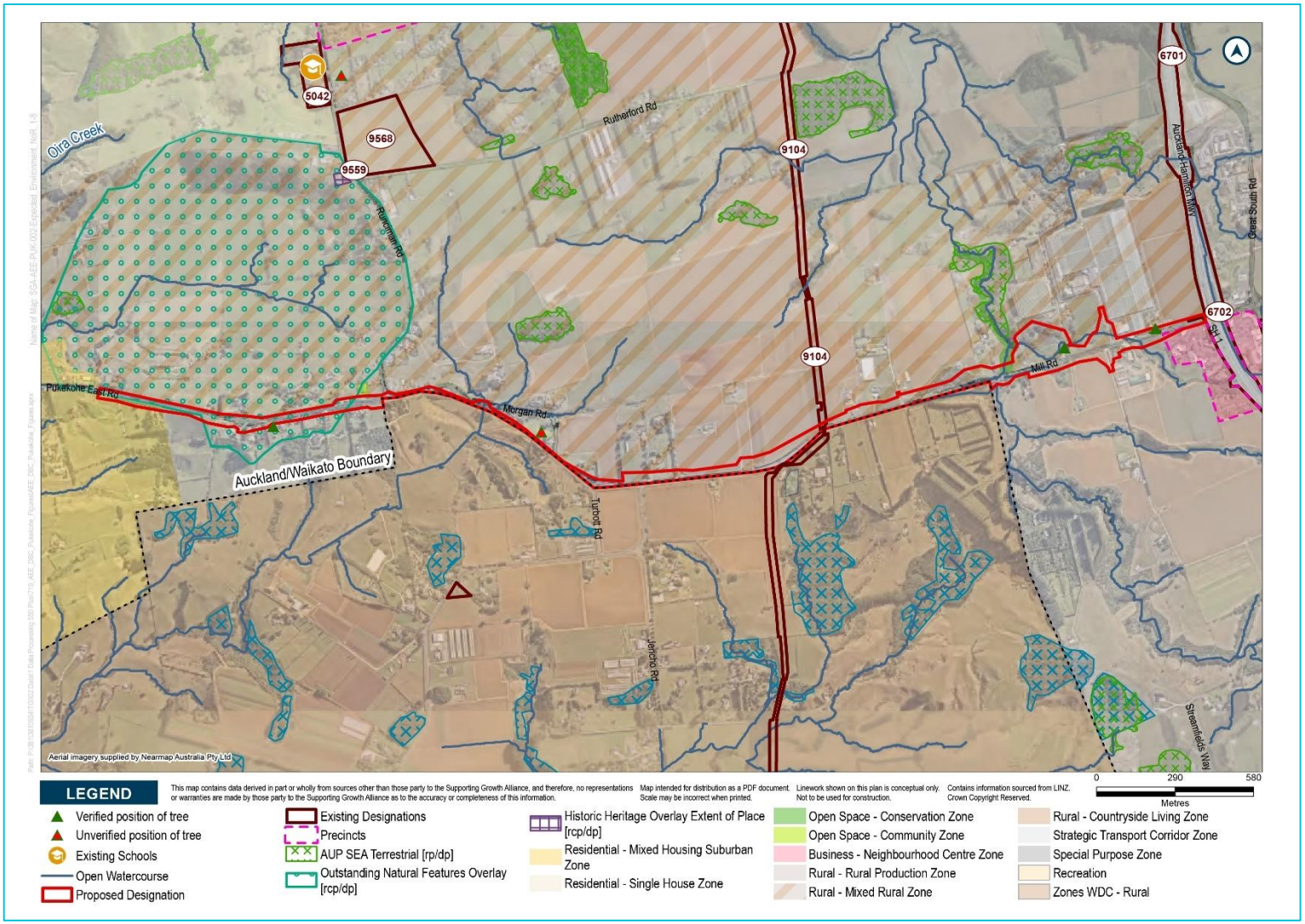

Figure 9-38: NoR 8 (AC) – Mill Road and Pukekohe Rod Upgrade – Likely, Planned Future Environment

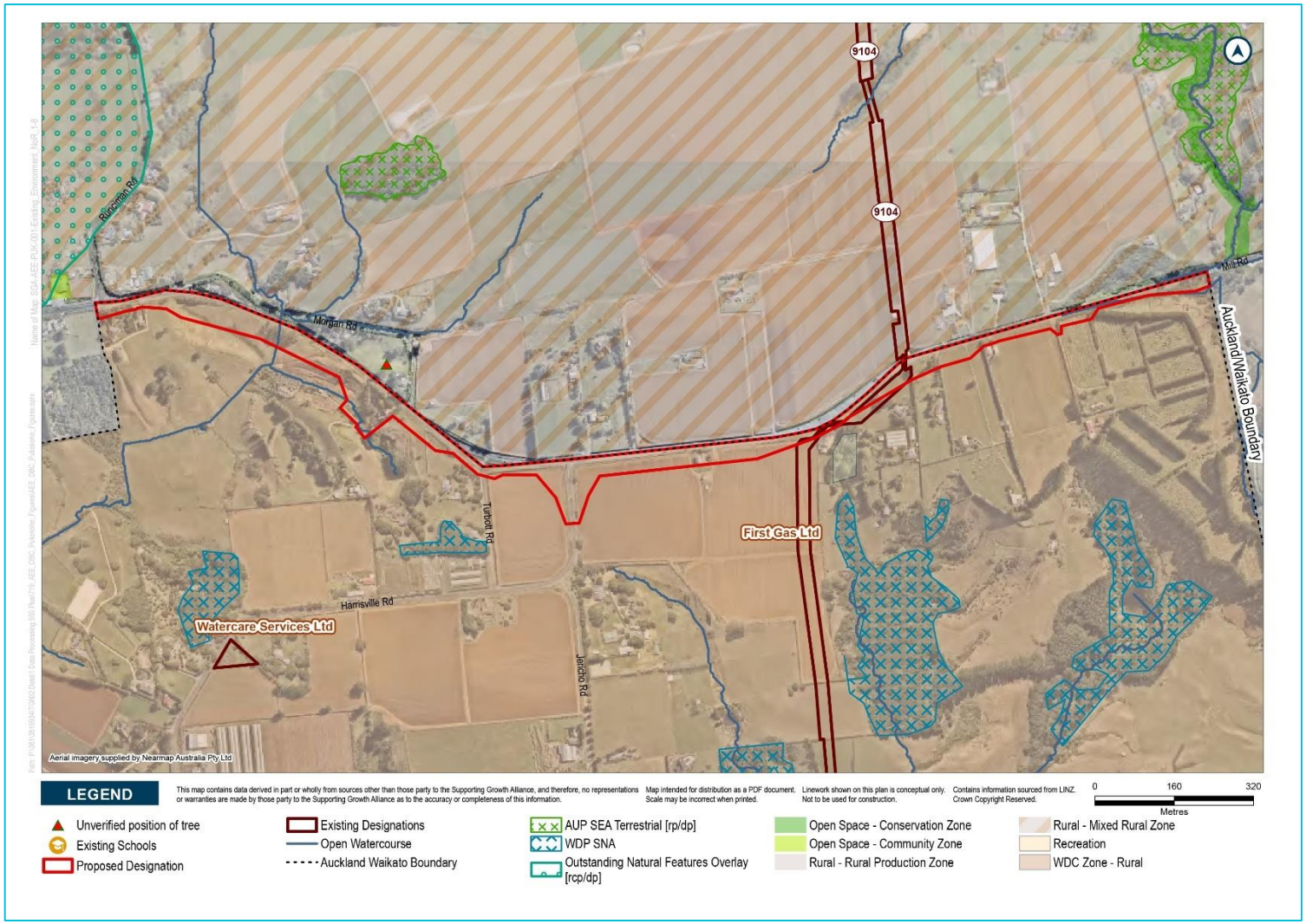

Figure 9-39: NoR 8 (WDC) – Mill Road and Pukekohe Rod Upgrade – Existing and Likely, Planned Future Environment

9.13.2 Receiving Environment for NoR 8

Features	Description
Current zoning	• AUP:OP – Mixed Rural Zone – Business Neighbourhood Centre Zone - Bombay 1 Precinct – A small part of the western extent of NoR 8 I located in the FUZ. – A small portion of NoR 8 is located in the Open Space – Conservation Zone • Waikato District Plan (Franklin Section (Operative) - Rural • Waikato District Plan (Proposed) - General Rural Zone
Likely future zoning	• The existing rural zoning is anticipated to remain the same in the future. • The Pukekohe – Paerata Structure Plan indicates that the area of FUZ at the western extent of the project is likely to be Residential – Mixed Housing Suburban.
Planning controls, overlays and precincts	• Pukekohe East tuff ring ONF overlay • Flood Plains, Flood Prone Areas, and Overland Flow Paths • There is one notable tree listed as notable trees in Schedule 10 along Pukekohe East Road. There are two notable trees located along Mill Road within the designation boundary - 2686, Redwood and 2705, Puriri
Existing designations	• Waka Kotahi SH1 Designation 6702 – located at the eastern extent of the project. • The project intersects with the First Gas designation 9104 – Pukekohe to East Tamaki Gas Pipeline in the AUP:OP and FRSTG- 1 in the Waikato District Plan.
Current land use	• Agricultural land (predominantly pastoral, with some arable to the east) with rural residential properties located along the road corridor and within the immediate rural setting.
Community and recreational facilities	• n/a
Watercourses	• n/a
Ecology (terrestrial and riparian)	• Bat habitat - Bat passes were recorded within the NoR during the April/May 2023 survey. • Bird habitat: Suitable habitat includes that of Australasian bittern, White heron, Dabchick (all threatened) and Banded rail, Spotless crake, and South Island pied oystercatcher (al at risk). A full list of species identified in the desktop review is included in Appendix 7 of the Assessment of Ecological Effects (Volume 4, Appendix E) • Native herpetofauna (copper skink and ornate skink) are likely to occur within suitable habitat in the Pukekohe Transport Network:

Features	Description
Vegetation and Landscape	• Pukekohe East tuff ring ONF overlay • Vegetation cover includes planted lot boundaries / curtilages, occasional shelterbelts and blocks of established vegetation within localised catchments. • There are a number of trees protected under the AUP:OP District plan provisions due to being located within the Pukekohe East Tuff Crater Outstanding Natural Feature (ONF) overlay, or are listed as notable trees in Schedule 10. There is one tree group protected under the Waikato District Plan The list of these trees can be found in the Arboricultural Assessment (Volume 4, Appendix H) or Section 11.12 of this AEE.
Historic heritage and archaeological values	• R12/1208 (Bombay Flour Mill or Pilgrim's Mill) – south of proposed designation. No remains are visible on the surface.
Areas of cultural value	• The Project directly interacts with the Outstanding Natural Feature (Pukekohe East tuff ring), which is of cultural significance to Manawhenua. • There are no identified Site of Significance to Manawhenua recorded in the AUP:OP within close proximity to the project area.

10 Engagement

10.1 Introduction

This section provides an overview of partner, stakeholder and public engagement for the Pukekohe Transport Network. It summarises engagement during each phase of the Project including the tools and activities implemented, the parties engaged, the common issues and themes raised and the engagement outcomes.

Where engagement has affected a specific corridor design outcome, such as alternatives consideration or identification and management of environmental effects, this has been considered in Alternatives Assessment (Volume 2, Appendix A) and Technical Assessments (Volume 4).

Prior to detailed design and construction, further engagement will be undertaken by the requiring authority, as needed to manage impacts of the projects within the Pukekohe Transport Network.

The Pukekohe Transport Network has been through a number of stages of engagement, as summarised in Table 10.1 and Figure 10-1.

Table 10-1: Pukekohe Projects Engagement Summary based on Business Case Stages

Project stage	Timing	Engagement Summary
South Indicative Business Case	2018-2019	• Te Tupu Ngātahi investigated the South Auckland growth area through an Indicative Business Case (IBC) in 2018. • Feedback was received on the options considered for the business case. • Engagement include information drops ins and workshops to develop the IBC for the South Auckland Indicative Transport Network. • Meetings with landowners in the IBC study areas were also met with in 2019 to present the recommend IBC Strategic Transport Network.
Strategic South DRAFT Detailed Business Case	2019 - 2020 – 2021	• Investigations into the Pukekohe Expressway, the Pukekohe North-East Arterial and other strategic connections in South Auckland were undertaken for a DBC. • This included various meetings with key stakeholders, advocacy groups, local boards and public engagement on preferred options in 2020. • In 2020 due to the COVID-19 pandemic the Strategic South DBC was paused. Projects were later reallocated to other business cases. •
Pukekohe Detailed Business Case and Notices of Requirement	2021 - 2023	• The Pukekohe DBC commenced in late 2021 and included part of the projects from the Strategic South DBC (the former Pukekohe Expressway and Pukekohe NE Arterial). • Partners, stakeholders and the public were engaged with to inform options assessment and the recommended network.

Project stage	Timing	Engagement Summary
		• Community engagement on the recommended options for the transport network included an advertising and social media campaign and three public open days to seek feedback. • Landowner engagement with those likely to be directly affected by the projects took place from mid-May 2023 to late June 2023. Letters and emails were sent (twice) to impacted property owners inviting them to discuss the projects and to further understand constraints including any characteristics or features of properties (environmental, historic, cultural) not previously known to the Project Team, • – 73 landowners contacted the project team, and 93 meetings were held.

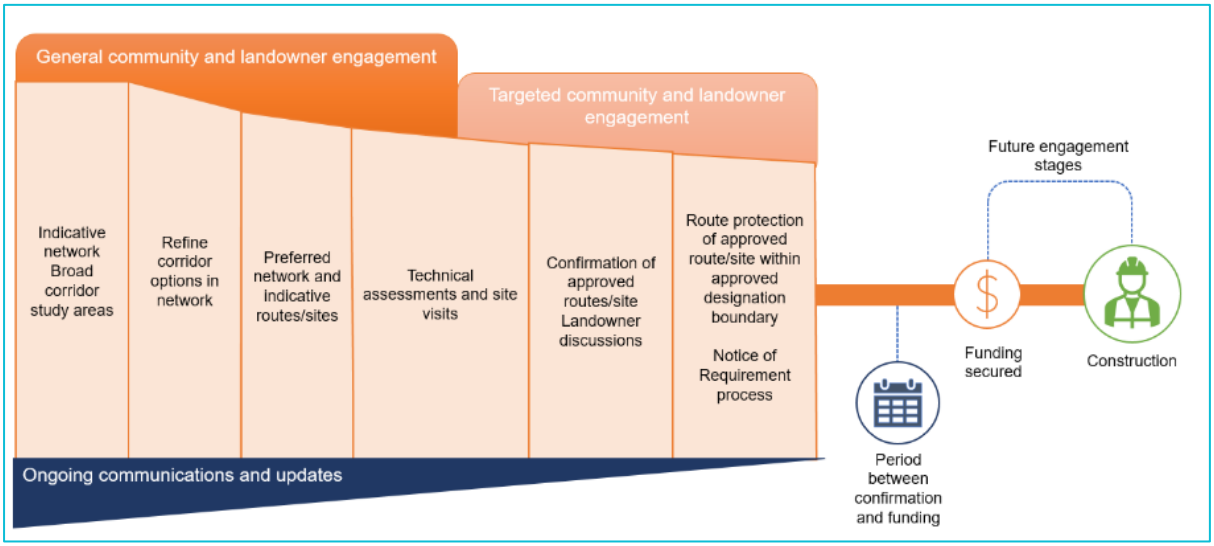

Figure 10-1: Te Tupu Ngātahi engagement process

10.2 Engagement Summary

This section summarises the engagement undertaken for the Pukekohe Transport Network, identifies key themes or issues raised and how these themes have influenced the Projects. Engagement and consultation have been undertaken with the following parties and stakeholders, in the following ways (see Table 10.2), as identified in Table 10.2.

Table 10-2: Engagement activity by stakeholder group for the Pukekohe Transport Network

Who we engaged	How we engaged
Partners	• **Auckland Council Partnership Forum** – twice monthly meetings to update Council on Te Tupu Ngātahi projects (including Pukekohe) • **Southern Manawhenua Hui** – monthly hui with Manawhenua partners and Te Tupu Ngātahi project teams from the southern projects. • **KiwiRail** – Partnership forums and regular workshops regarding designs.

Who we engaged	How we engaged
Elected Members	• **Elected members** – multiple memos were distributed to elected members of Franklin Local Board, Papakura Local Board, local councillors, the mayor (Jacqui Church- Waikato, and Wayne Brown - Auckland) and local MPs to update them on the project and community engagement. Email interactions also provided updates on the community engagement process. • **Franklin Local Board** – engagement through regular project updates (presentations and written) were provided to the Franklin Local Board.
Stakeholders	• **Pukekohe Business Association, local education facilities, social/recreational clubs, and churches** - communications through informative emails to these groups as advocacy stakeholders • **Pukekohe Vegetable Growers Association (17 November) and Pukekohe A&P Showgrounds (23 November)** – presentations • **Grace James Road Focus group** – engagement with a dedicated resident's representative group of Grace James Road and surrounding area on 30 November to discuss the proposed North-East Arterial, followed by regular communication • **Sim Road Residents Group**: Two meetings were held – one with 5 representatives of the Sim Road Residents Group (18 July 2023) and another community meeting with residents facilitated by MP Andrew Bayly (on 14 August 2023). • **Auckland Transport Freight Working Group** - 1:1 session held with the on 1 December. • **National Road Carriers Association** - 1:1 session held with the NRCA on 23 May 2023. Project Team presented to the Franklin NRCA members. • **Developers** - Meetings – the project team met with several developers across 2022 and 2023 in respect to their proposed development and the Pukekohe projects. • **Infrastructure interface meetings** – ongoing meetings with Watercare, Vector, First Gas, Counties Power and Transpower updating them with progress across all Te Tupu Ngātahi projects.
Community	• **Flyers** - two community flyer drops to 15,000 households across Franklin to socialise the project, inviting the community to Supporting Growth hosted community information sessions in Pukekohe. • **Media Advertising** - invitations for the November and December 2022 open day events in the Papakura Courier and Franklin Courier • **Social Media** - promotional adverts for the two open day events and online feedback through Auckland Council, Franklin Local Board, Pukekohe Business Association, Waka Kotahi, and Auckland Transport social media channels • **The Hive** - online engagement platform that contained project information and a place for the public to place online feedback • **Email Campaigns** - numerous email campaigns sent out to let subscribers know of key dates across the formal consultation period • **Community Open Days** - two Supporting Growth hosted community open days on 12 November 2022 (Franklin: The Centre) and 3 December 2022 (Pukekohe Memorial Hall) and attended the Waka Kotahi Papakura ki Pukekura – Papakura to Bombay open day on 10 December 2022 and in June 2023.
Potentially affected landowners	• **Letters and emails**– 239 letters sent to landowners identified as being potentially affected by the proposed designations. The letters invited them to discuss the projects and provide feedback and insights.

Who we engaged	How we engaged
	• **Landowner interactions** – 73 landowners contacted the project team, and 93 meetings were held. Ongoing discussions are being held with a number of landowners.

10.2.1 Engagement with Partners

Partners include representatives from Manawhenua, KiwiRail and Auckland Council (integration group). Partners were given the opportunity to provide feedback throughout the development of the projects.

Eight workshops were undertaken with Te Tupu Ngātahi partners to gain feedback on the options development and corridor assessment of the North South, Drury West and Paerata packages. Further engagement included workshops and hui as the project progressed through options assessment and route refinement.

10.2.1.1 Manawhenua

Manawhenua groups were involved in the development of the Pukekohe Transport Network. Te Tupu Ngātahi maintains a Manawhenua forum (for operational and kaitiaki level interaction). The hui provided an opportunity to strengthen the relationship between the project team and Manawhenua and offered a platform to share project updates regarding engagement activities and findings of technical reports for Manawhenua feedback.

Through regular hui Ngāti Tamaoho, Ngāti Whanaunga, Te Ākitati Waiohua, Ngaati Te Ata Waiohua, Ngāti Maru, Ngāi Tai Ki Tāmaki, Ngāti Tamaterā, and Ngāti Paoa Trust Board have contributed to option development and assessment and design refinement processes for each corridor (Appendix A). The Manawhenua forum also provided an opportunity for Manawhenua to highlight any concerns or opportunities that were then fed back into the design and planning processes.

Waikato Tainui advised for NoR 8 Mill Road-Pukekohe East Road Upgrade they defer to Ngāti Te Ata Waiohua, Ngāti Tamaoho and Te Ākitai Waiohua.

The partnership with Manawhenua, including key concerns and opportunities, are detailed in section 11.4 of this Report.

10.2.1.2 KiwiRail

Regular meetings were held with KiwiRail to provide updates and discuss interfaces with KiwiRail projects and the Pukekohe Transport Network. In particular, this included:

- Three new rail stations in Paerata and two in Drury and consideration of the connections to the rail stations through the Pukekohe Transport Network.
- Crossing of the NIMT, electrification of the rail network, and consideration of future expansion of the NIMT lines.
- Location of the Pukekohe Transport Network in proximity to the NIMT (in particular NoR 2).

10.2.1.3 Auckland Council

There is regular engagement between Te Tupu Ngātahi and Auckland Council through the Auckland Council Partnership Forum. These forums are an opportunity to share Project progress and seek feedback from Auckland Council. Additionally, the Pukekohe Te Tupu Ngātahi Project Team engaged in regular meetings to update AC on the progress, and seek feedback from AC.

10.2.2 Engagement with Key Stakeholders

Te Tupu Ngātahi have engaged with a number of key stakeholders. In particular, to seek feedback on the recommended network in late 2022. However, much of the engagement with key stakeholders is ongoing.

Local Boards

The Project Team have provided regular updates to the Papakura Local Board and regular updates, presentations and attendance at meetings with the Franklin Local Board. Feedback was received from the Franklin Local Board on 27 June 2023. Below is a summary of this. In general, the Franklin Local Board agree that this programme of work is essential in supporting the future planning of Pukekohe-Paerata and south Drury, and future economic, environmental, social, and cultural well-being in the area. Additionally, the Franklin Local Board support the north-east and north-west (to the intersection of Gun Club Road) sections of the proposed Pukekohe arterials. There were concerns raised on provision for freight and requested consideration of a route further to the west for freight. In particular, on safety upgrades required in the near future on rural roads, design of roundabouts, and future discussions with the Waikato District Council about strategic routes into Waikato. At the request of the Franklin Local Board and some members of the community, the project team considered a western route for freight. However, the project team advised that an outer western route utilising existing rural roads is not required to be route protected through the Supporting Growth Programme. This rural area is not at risk of build out by development does not require additional lanes for traffic (volumes are low). It was acknowledged that upgrades of existing rural roads may be required in the future. However, these would form part of Auckland Transport or Waikato District's regular maintenance of roads. Another concern raised by the Franklin Local Board included shifting scope of the programme, from the Indicative Business Case (2019). The Project Team presented to the Franklin Board on a number of occasions to keep them updated on the scope of the projects.

Developers

The Project Team has engaged with a number of active or planned developments in the area (including those discussed in Section 9.1.2) to inform options assessment, concept design and the designation boundary. Through consultation, implications on the developments have been integrated with (or avoided) where possible. For example, consideration of the consented Myland development (at Nanjing Road) for NoR 4, three plan changes at various stages on Golding Road for NoR 5, and proposed plan changes that interact with the Pukekohe North-East Arterial NoR 4 and North-West Arterial NoR 7.

Regular engagement with the Paerata Rise development has occurred. In particular, on the integration of the Paerata Connections NoR 3 with their future plans.

Grace James Road Focus Group

Due to a high level of interest from Grace James Road residents and residents living in proximity, a focus group with residential representatives was held in November 2022 to discuss the proposed Pukekohe North-East Arterial. This was based on an alignment that was presented as a recommended option in the public engagement material in October 2022.

The residents group strongly opposed the proposed North-East Arterial which at that stage involved upgrading Grace James Road. Residents believed that the alignment will heavily impact their community and level of amenity as the street would become an arterial connection. Other concerns were based around safety, land impact and property values, that the proposed arterial departed from earlier options consulted on by Te Tupu Ngātahi in 2018, and Auckland Council for the Pukekohe-Paerata Structure Plan 2019. The resident group suggested that the greenfield (rural) area to the north were a better location for the arterial.

The Project Team acknowledged the strong opposition to the proposed North-East Arterial option, specifically the section that runs along Grace James Road, and developed and assessed additional alignments during route refinement. An alignment further to the north in the greenfield area was the recommended option as it created a direct east-west connection through the Future Urban Zone. The Grace James focus group responded positively to the final recommended alignment.

Pukekohe Business Association, Pukekohe Vegetable Growers Association, Birch Land Development Consultants

Written feedback from the Pukekohe Business Association outlined that they supported the proposed ‘ring road’ in principle, but had concerns around heavy vehicles in high traffic areas, impacts of road widening, impacts on residential properties and land value, proximity of the alignment to schools and the safety of school children. They were also concerned around the suitability of existing roads to accommodate heavy vehicles. The Business Association suggested moving the Pukekohe Arterials away from residential areas.

Birch Land Development Consultants provided feedback on the proposal on behalf of several parties, including the Pukekohe Vegetable Growers Association. Feedback stated that the proposal for the Pukekohe Arterials does not consider the role of farming and vegetable sectors appropriately. Further, feedback is opposed to the redirection of heavy traffic through major residential streets (Helvetia Road, West Street and Ward Street) and onto narrow streets due to a lack of infrastructure and space.

An alternative proposal was provided in the feedback, which included an outer North-West Arterial in the rural area and a four-lane expressway from Drury to Pokeno (Waikato) including through the urban centres of Pukekohe, Tuakau and Pokeno. This option received broad support from school principals, residents groups, business groups, property owners, developers, the heavy transport sector, Federated Farmers, and the Pukekohe Vegetable Growers Association. The project team met with the main proponents of this alternative option to discuss. It was agreed that part of the alternative option was aligned with that proposed by the Drury - Pukekohe Link.

Further engagement was had with a number of the parties after receiving the feedback to clarify a number of matters and reasoning behind the location of the proposed projects.

A&P Showgrounds

The A&P Showgrounds was a key consideration through alternatives assessment for NoR 5. The project team met with representatives of the A&P Showgrounds in late 2022 to discuss the Pukekohe Transport Network. The representatives shared insights from the community and of previous transport projects in the area. The Project Team has reduced impacts on the A&P Showgrounds by locating NoR 5 south of the Showgrounds.

Network Utilities

Engagement with network utilities has been ongoing throughout the development of the Pukekohe Transport Network through a two monthly forum. This keeps network utilities across the development of the projects across the programme of Te Tupu Ngātahi. The forum includes representatives from Watercare, Vector, First Gas and Transpower. Feedback from network utilities has been considered through alternatives assessment and concept design of the project.

Transpower has provided the project team with information around the required clearances from the road to the conductor, and other information on working around lines and towers (including tower site access, earthworks near the tower, and earth potential rise). It was noted that this information is high level, and the actual clearances should be agreed at future engagement during detailed design.

10.2.3 Engagement with the Community

In late 2022, the wider community were invited to provide their feedback on the preferred options for the Pukekohe Transport Network. An online engagement tool was used to collect feedback, using an interactive map and an online survey. A flyer was distributed to around 15,000 properties in the Pukekohe, Paerata and Drury West area. This informed the community about the project prior to the beginning of the formal consultation period. The project team also held two community open days on 12 November 2022 (Franklin: The Centre) and 3 December 2022 (Pukekohe Memorial Hall) and attended the Waka Kotahi Papakura ki Pukekura – Papakura to Bombay open day on 10 December 2022 and 17 June 2023. All open days were well attended by the community.

Due to a high level of interest from Grace James Road residents on the Pukekohe North-east Arterial, a focus group with residential representatives was held in November 2022. This was to ensure that the project team and residents had an opportunity to discuss the Pukekohe North-east Arterial proposal in detail.

The following key themes were raised during public feedback:

- Support from the wider community for improved connections for future generations.
- A high level of support for a ‘ring road’ around Pukekohe, with the community suggesting that this is needed sooner rather than later. There were suggestions that the 'ring road' be located further on the outskirts of Pukekohe and an “expressway” proposed from Drury to Pokeno (through Pukekohe centre and Tuakau).
- In general, there was support for the Pukekohe Arterials. The sentiment from the community was that the arterials are needed to remove traffic and congestion from the centre of Pukekohe and provide an alternative route for users that will connect existing and new residential areas.
- There was strong opposition towards the upgrade of Grace James Road as part of the North-east Arterial (NoR 4) from Grace James residents and those living in proximity. The recommended alignment for the Pukekohe North-East Arterial was later changed as part of further assessment as discussed above and further below.

- Concerns around the impact to properties/land acquisition.
- People also wanted further connections to support traffic to and from Karaka (to the North of the project area), with regard to the SH 22 Connection (a section of the Drury to Pukekohe Link - NoR 2).
- General comments around public transport in Pukekohe and how this could improve in the future.
- Strong support for the Mill Road-Pukekohe East Road NoR 8 upgrade being a key strategic route.

After the public engagement period, additional transport modelling and site visits to further understand ecological features, the alignment of the Pukekohe North-east Arterial (NoR 4) was revised and the alignment shifted further to the north to provide a more direct connection with the western and Paerata arterials leading to improved transport benefits. This was communicated to the community in April 2023 and included the Grace James Road residents' group (with Grace James Road no longer being proposed to be upgraded to an arterial).

10.2.4 Engagement with Potentially Affected Landowners

Engagement with landowners potentially affected was undertaken in mid May 2023 to late June 2023 (and is ongoing). Letters and emails were sent to potentially directly affected landowners in May 2023 requesting to meet to discuss the Pukekohe Transport Network and how the proposed designations are likely to affect their property.

Key themes raised by landowners included:

- Property acquisition process, loss of value ongoing tenure of property, property subdivision.
- Development of the FUZ and timing of construction of the Pukekohe Transport Network projects.
- Development and other infrastructure projects happening in the area.
- Effects of construction activities including noise and maintaining access.
- NoR process.

Specific matters identified through engagement with directly affected landowners was used to make design changes and designation boundary adjustments where possible. The Project Team continues to meet and engage with directly affected landowners as required, to ensure landowners have adequate information about the Pukekohe Transport Network.

10.3 Summary

Engagement has occurred for the Pukekohe Transport Network through all project stages including at the IBC, the DBC including options assessment and NoR preparation. Engagement has been with partners, other network providers, stakeholders, directly affected landowners and the wider community. Engagement has been used by the Project Team to inform and as appropriate update or change the transport corridors put forward to NoR. As noted, further detail on engagement outcomes is set out in the relevant report sections of Appendix A of this AEE.

In the future stages of the Pukekohe Transport Network, prior to detailed design and construction, further engagement will be undertaken by the requiring authority as needed to manage impacts of the Pukekohe Transport Network Package. This is set out in detail in the sections below.

11 Assessment of Effects on the Environment

11.1 Introduction

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

Key transport outcomes, land use integration and the avoidance of adverse effects on areas or features of high value have informed the extent of the proposed designation boundaries. Where avoidance has not been possible, measures to remedy or mitigate adverse effects have been proposed. Details of these are included in Section 11.17 and reflected in proposed designation conditions.

For each effects section below, the assessment of effects is generally structured to outline the positive effects, then an assessment on the potential adverse effects resulting from the construction and operation of Pukekohe Transport Network. Followed by measures to avoid, remedy or mitigate potential effects. Where appropriate, common effects to all NoRs are discussed first. Followed by specific effects from individual NoRs. The assessment of effects has been grouped by theme rather than NoR to reduce repetition between effects relating to all NoRs.

11.2 Positive Effects of the Network

The Pukekohe Transport Network plays 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 network provides for the following positive effects and outcomes:

Transport

- Improved safety, and consequential reductions in the risk of Death or Serious Injuries (DSI's) for all road users, through:
    - Improved walking and cycling facilities in and between Drury, Paerata and Pukekohe for all users and vulnerable users;
    - Safer environments with enhanced place functions;
    - Improved network-wide capacity to avoid traffic rerouting to unsafe, high-speed rural roads;
    - Improved rail crossing facilities over the NIMT; and
    - Intersection safety upgrades including improved controls.
- Improvements to walking and cycling facilities, which will provide the following benefits:
    - Improved active modes connectivity through integration with the future walking and cycling network;
    - Reduced likelihood and exposure to potential crashes, including at intersections;
    - Encourage greater uptake of active modes as well as greater use of public transport by providing safe connector routes to the proposed Drury West and Paerata Stations (providing mode choice will contribute to mode shift outcomes);
    - Environmental and health benefits as a result of increased active mode trips; and

  - Support growth surrounding the corridors and improve access to employment, education, and social amenities.

- Improvements to public transport facilities (connecting to key rapid transit stops), which will provide the following benefits:

  - Improved integration with the future public transport network, including with the Pukekohe, Drury West and Paerata Stations, serving as a key enabler to achieve mode shift targets;
  - Improved network-wide capacity which will enable strategic traffic to use arterials and decongest local bus routes;
  - Improvements to north-south public transport connectivity, which will improve access to employment and social amenities; and
  - Dedicated FTN facilities in Drury West will improve capacity and resilience, resulting in reduced journey time and improved reliability.

- Improvements to general traffic and freight (including increased connectivity, capacity, safety and resilience of the network) will provide the following benefits:

  - Improve access to employment, educational and social amenities;
  - Improved intersection capacity and safety to provide for future growth;
  - Improved north-south and east-west connectivity between Drury, Paerata and Pukekohe by providing a reliable alternative that reduces travel time;
  - Improved north-south and east-west capacity and resilience, which will reduce strategic traffic rerouting to existing unsafe rural roads and collector roads;
  - Improved east-west connectivity through new NIMT rail crossings;
  - Improved integration with the Pukekohe Rail Station, the proposed Drury West and Paerata Stations, and the future urban areas surrounding the Project;
  - Improved route options, journey times and reliability for existing and future freight; and
  - Reduce vehicle kilometres travelled daily, which will result in positive environmental and health benefits.

Terrestrial Ecology

- Improved blue/green infrastructure, such as stormwater wetlands, swales, and associated landscaping (which will include indigenous vegetation) will provide a wide range of ecosystem services. This will enhance the ecosystem services provided by natural ecosystems in a modified landscape;
- The landscaping planting of berms, embankments, and stormwater wetlands are anticipated to enhance the connectivity of some of the retained forest remnants and mature trees, streams, riparian margins, and open space zones; and
- The proposed bat mitigation in association with the landscape planting of berms, embankments, and stormwater wetlands is likely to improve ecological connectivity for other native fauna.

Landscape and Visual

- Enhanced connectivity for Pukekohe and Paerata by integrating with the existing local street network and improving road user safety. The Network will also improve transport network connectivity to the adjacent landscape outside of Pukekohe;

- Landscape mitigation planting will create attractive environments, which can enhance the built character of their surroundings and positively contribute to the visual quality of the streets and the area's sense of place;
- The reduction in speed limits along upgraded alignments of existing roads both within the rural environment and the FUZ will improve the experiential qualities of the corridor for both road users and adjacent properties;
- Integration of active travel routes and recreational paths with Pukekohe's 'green network' of bush and vegetated riparian margins;
- NoR 4 provides viewing opportunities of the Te Māunu a Tūmatauenga pā, to the east of the designation. This pā sits upon a natural bluff and landform and is identified as an ONL within the AUP:OP;
- NoR 8 provides viewing opportunities of Pukekohe East tuff ring ONF as users of the active modes path will also gain a greater appreciation and visibility of the ONF; and
- Potential opportunity for stormwater wetlands to become attractive focal points through considered planting and wetland construction, and for stormwater wetlands to be integrated with active transport routes.

Arboriculture

- The NoRs for the Pukekohe Transport Network are designed with cross sections that include sufficient space for a formal berm on both sides of the transport corridor. This will allow for the planting of new trees in an environment conducive to good tree growth and enhance the emerging urban landscape where the projects are located in the FUZ.
- There is opportunity to introduce new trees, where the number of trees is currently limited.

Community

- **Supporting growth** – the Pukekohe Transport Network provides the necessary transport infrastructure required to support the planned urban zoning of land in Pukekohe, Paerata and Drury West and its future communities;
- **Improving access** – the Network provides multi-modal links enhancing access to new urban areas in Drury, Paerata and Pukekohe and contributing to higher quality land transport integration outcomes for future communities;
- **Maintaining connectivity** – the Pukekohe Arterials (NoRs 4 – 7) draw through traffic away from the Pukekohe town centre, improving access for regional and freight traffic across centres while reducing congestion and maintaining connectivity to amenities for communities within the Pukekohe town centre area;
- **Safety improvements** – the Projects will provide intersection treatments and upgrades to existing roads which will create a safer driving and active modes environment. Grade-separated crossings over the NIMT will also enable a safer crossing environment and improve access. This provides health and wellbeing benefits through the reduction of incidents, and safer environments to encourage uptake in active modes for shorter trips;
- **Improvements to active mode facilities** – positively impact both the health and wellbeing and way of life (the way people work, play and live) of the community. Provision of active mode facilities also improve mode choice, which has the potential to improve the way people live; and
- **Improved connections to public transport and rapid transit networks** – the Network provides direct access to the proposed new train stations, creating a continuous multi-modal link to planned communities in Drury West and Paerata. This will promote rapid transit for longer

distance trips, especially to employment centres within and beyond the Pukekohe-Paerata and Drury West Area.

Urban Design

Positive urban design outcomes identified for the Pukekohe Transport Network include:

- Integration of the Network to enable an appropriate interface with adjacent land uses, including rural integration;
- In future design stages, Manawhenua will be invited as Partners to provide input into relevant cultural, landscape and design matters including how desired outcomes reflect their identity and values;
- Maintenance and integration of water bodies, stream/creek crossings and connection of the Ngakotoa Stream, Oira Creek and Whangapouri Creek to achieve blue network connectivity;
- Ecological and biodiversity connectivity across the Ngakoroa Stream, Oira Creek and Whangapouri Creek;
- Integration of stormwater wetlands and swales to enable an appropriate interface with adjacent land uses;
- Incorporation of CPTED principles in the future design and functional layout of the corridors, including clear sightlines, good levels of lighting, passive surveillance, and avoidance of entrapment zones; and
- Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities.

11.3 Māori culture, values, and aspirations

Only Manawhenua can speak to the impact that a project may have on their cultural values, heritage and aspirations. This section draws on engagement that has been undertaken with Manawhenua and inputs provided by Manawhenua representatives during the concept design of each corridor. In developing the transport corridors, recognition has been given to both the relationship of Tangata Whenua to their lands, culture and traditions in the Pukekohe area and the commitment to partnership between Manawhenua and AT and Waka Kotahi (as a representative of the Crown) founded through Te Tiriti o Waitangi.

11.3.1 Manawhenua Feedback

As discussed in Section 10, the project team engaged with Manawhenua on the Pukekohe Transport Network throughout the development of the Project, primarily through the Te Tupu Ngātahi Manawhenua forum. Southern hui with Manawhenua representatives were held twice a month. The purpose of these hui was to provide project updates for Manawhenua feedback, as well as undertake constraints mapping and understand Manawhenua perspectives during options assessment. Manawhenua representation and attendance at each hui is detailed in the Alternative Assessment (Appendix A). The project team also met with Ngaati Te Ata Waiohua individually at the request of their representative. Waikato Tainui advised for NoR 8 Mill Road-Pukekohe East Road Upgrade they defer to Ngāti Te Ata Waiohua, Ngāti Tamaoho and Te Ākitai Waiohua.

In addition to regular hui with Manawhenua representatives, Manawhenua feedback was also provided through Manawhenua attendance at Project workshops and site visits.

11.3.2 Cultural Impact Assessment

The project team invited all Manawhenua groups to prepare CIAs for the project before the options assessment phase and then at the development of the concept design for each project to inform this AEE. The team received Cultural Values Assessment from Ngaati Te Ata Waiohua to inform the options assessment and a CIA from Ngaati Te Ata Waiohua to inform the concept design and AEE. Specific points from the CIA's and how and when these matters have and will be addressed are noted under Section 11.4.3.

11.3.3 Manawhenua Treaty areas and sites of significance

The Pukekohe Transport Network does not directly affect any identified properties or land currently being negotiated under Treaty settlements, land returned under a Treaty settlement, marae, Māori freehold lands, Tupuna Maunga Affected Areas, Tangata Whenua Management Areas, or Sites of Significance under the AUP:OP. The proposed designations are also not within the coastal environment under the Marine and Coastal Area (Takutai Moana) Act 2011, therefore there are no customary marine title areas / groups or protected customary rights that need to be considered in relation to these corridors. Much of the Network is within the Ngāti Tamaoho statutory acknowledgement area, which recognises the association between Ngāti Tamaoho and a particular area and enhances the iwi's ability to participate in specified RMA processes.

11.3.4 Key matters raised by Manawhenua

Through regular hui, project site visits and CIAs, Manawhenua have provided commentary on the Pukekohe Transport Network, set out below:

Impacts on streams and ecology

- Several catchments crossing the Pukekohe Transport Network are identified as having significance to Ngaati Te Ata Waiohua in the CIA, including Whangapouri stream, Oira stream, Ngaakooroa stream which flow into Pahurehure Inlet and ultimately Manukau Harbour, and Tuutaenui stream which flows into the Waikato River.
- The CIA notes that where works are occurring near streams, there is the potential for adverse impacts on freshwater systems and receiving environments. The CIA identified opportunities for riparian planting alongside the streams to restore and regenerate the environment and increase wetland areas as part of the Project.
- The improvement of water quality was also highlighted in the CIA. Ngaati Te Ata Waiohua seeks treatment of stormwater before it is discharged into waterways and that the mauri of all-natural waterways is protected and enhanced. This will be progressed further with Manawhenua at future design stages of the project and as part of future regional resource consenting.
- Manawhenua outlined the importance of streams and wetlands mauri, including lower quality ecological areas and vegetation. This informed the optioneering process to minimise or avoid impacts on streams and wetlands, where feasible and practicable.
- Manawhenua have also stated a preference of bridges to culverts where feasible to remove barriers to fish passage. This will be progressed further with Manawhenua at future design stages of the project and as part of future regional resource consenting.
- Manawhenua raised concerns relating to effects on native bats, lizards, birds and fish from proposed transport corridors as well as potential loss of native vegetation along corridors and near stream crossings. This will be considered further with Manawhenua at future design stages of the project and as part of future regional resource consenting.

- The CIA further highlights concern around disturbance or displacement of potential native bats and lizards due to habitat removal and/or light and noise effects during construction. It is suggested to increase native vegetation to improve habitat connectivity, as currently existing vegetation is fragmented and sparse. This will be progressed further with Manawhenua at future design stages of the project and as part of future regional resource consenting.
- The CIA expressed concern around bulk earthworks having potential adverse effects on cultural heritage, land stability, and the mauri of water. Concerns around sediment runoff and discharge caused by earthworks was also noted. This will be considered further with Manawhenua at future design stages of the project and as part of future regional resource consenting.

Impacts on tuff rings, hills and landscapes

- The CIA outlines that Ngaa Tawhaa oo Mataoho (Pukekohe tuff rings/craters) are outstanding geological features with cultural significance. It identifies concerns around visual and physical compromises of viewshafts to and from them, and a need to protect the tuff craters.
- The CIA also seeks the outcome that the communities and users of the Pukekohe Transport Network gain a greater understanding of history and the connection Ngaati Te Ata Waiohua has with these landscapes.
- Alongside the tuff ring, culturally significant landscapes identified by Manawhenua which the Project should seek to have minimal impacts on are the Pukewhau Bowl (Pukekohe East Crater), Pukekura (Bombay), and Coulthard's Scenic Reserve (Tuhimata Papakaainga).
- The Pukekohe Transport Network widens only to the south on Pukekohe East Road (NoR 8) to reduce impacts on the Pukekohe East Tuff Crater. This was discussed with manawhenua throughout the options assessment and concept design processes. Additionally, these features will be considered further with Manawhenua at future design stages of the project. In particular, opportunities to recognise the cultural significance of the Pukekohe East tuff crater (ONF) through the Cultural Advisory Report and ULDMP / Landscape Management Plan that are conditions on the proposed designation for NoR 8.

Cultural heritage and sites of cultural significance

- Manawhenua also expressed that protection and preservation of wāhi tapu had great cultural significance. Two Pā sites were identified in the wider study area. The Pukekohe Transport Network avoids these sites.
- The CIA noted a number of archaeological sites, wāhi tapu and other sites of significance to Manawhenua exist within the Project area, in particular Heights Road Ngahere, Coulthard's Scenic Reserve and Raventhorpe Scenic Reserve (Tuhimata Paa). The CIA also set out sites previously occupied by ancestors, including Te Puni Paa and Te Maunu-a-Tuu.
- Ngaati Te Ata Waiohua seeks that potential unknown archaeological sites may include wāhi tapu, which if discovered during construction of the Project should be protected and restored.
- The CIA further noted the importance of taonga such as elite and prime soils (onekura).
- These features will be considered further with Manawhenua at future design stages of the project and as part of future regional resource consenting.

Growth in rural areas

- Manawhenua do not support growth outside of the FUZ land.

- Manawhenua representatives expressed concern towards the potential for arterials in rural areas to encourage growth around the new roads.
- The CIA also noted concerns that future greenfield growth may be at the detriment of their taiao, taonga, and wāhi tapu.

Support for the future transport network

- Manawhenua expressed general support in hui for the proposed long-term transport network.
- The CIA neither supports nor opposes the Pukekohe Transport Network but agrees to the proposed designation corridor in principle, acknowledging that it will support population growth and planned business expansion across Pukekohe, Paerata and Drury West.

Socioeconomic wellbeing

- Alongside the restoration of the environment, the CIA also comments on the socioeconomic opportunities which the Project can have. This included opportunities for cultural design, place naming, walking and cycling access opportunities, and procurement plans to capture socioeconomic opportunities for Māori.
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11.3.5 Recommended measures to avoid, remedy or mitigate potential adverse effects

Engagement with Manawhenua is naturally broad and encompasses matters beyond those matters required to be considered in relation to a NoR under a district plan, including regional plan matters and broader partnership interests. Section 11.4.3 has included these matters for context. The measures proposed to avoid, remedy and mitigate potential adverse effects of the Pukekohe Transport Network in the following section address the relevant district plan matters and enables the relationship with Manawhenua to continue in the future stages of the projects, without predetermining regional consenting outcomes or matters best addressed directly between the treaty parties.

A number of workshops were held with Manawhenua to work collaboratively on the draft condition set proposed for each NoR. The conditions that relate to ongoing Manawhenua involvement in the Project were developed and agreed with Manawhenua. The proposed designation conditions include the following measures to ensure ongoing involvement of Manawhenua in Project design and construction and ensure the continued recognition of Manawhenua cultural values throughout the Project life cycle.

Cultural Advisory Report

Manawhenua will be invited to prepare a Cultural Advisory Report prior to the start of detailed design of the Project. The objective of the Cultural Advisory Report is to assist in understanding and identifying Ngā Taonga Tuku Iho (‘treasures handed down by our ancestors’) affected by the Projects, to inform their management and protection. To achieve the objective, the requiring authority will invite Manawhenua to prepare a Cultural Advisory Report that:

- Identifies the cultural sites, landscapes and values that have the potential to be affected by the construction and operation of the Project;
- Sets out the desired outcomes for management of potential effects on cultural sites, landscapes and values;

- Identifies traditional cultural practices within the area that may be impacted by the Project;
- Identifies opportunities for restoration and enhancement of identified cultural sites, landscapes and values within the Project area;
- Taking into account the outcomes of the above, identifies cultural matters and principles that should be considered in the development of the ULDMP and Landscape Management Plan (see Section 11.10) and the Cultural Monitoring Plan (see below); and
- Identifies and (if possible) nominates traditional names along the Project alignment, noting there may be formal statutory processes outside the Project that apply to any decision-making process.

The desired outcomes for management of potential effects on cultural sites, landscapes and values identified in the Cultural Advisory Report will be discussed with Manawhenua and those outcomes reflected in the relevant management plans where practicable.

Cultural landscape and design expression

Manawhenua will be invited to participate in the development of the ULDMP and Landscape Management Plan, proposed as a condition on the NoRs, to input into relevant cultural landscape and design matters on each transport corridor. This includes the management of potential effects on cultural sites, landscapes and values. The ULDMP is provided for via a condition on each proposed transport projects. The Landscape Management Plan is provided for NoR 8 (WDC).

Cultural Monitoring Plan

Prior to the start of construction works or enabling works, Manawhenua will be invited to prepare a Cultural Monitoring Plan. The objective of the Cultural Monitoring Plan is to identify methods for undertaking cultural monitoring.

The Cultural Monitoring Plan will include:

- Requirements for formal dedication or cultural interpretation to be undertaken prior to start of Construction Works in areas identified as having significance to Manawhenua;
- Requirements and protocols for cultural inductions for contractors and subcontractors;
- Identification of activities, sites and areas where cultural monitoring is required during particular Construction Works;
- Identification of personnel to undertake cultural monitoring, including any geographic definition of their responsibilities; and
- Details of personnel to assist with management of any cultural effects identified during cultural monitoring, including implementation of any Accidental Discovery Protocol.

11.4 Traffic and Transport

The potential effects of the new and upgraded transport corridors in the Pukekohe Transport Network on traffic and transportation have been assessed in the Assessment of Transport Effects report provided Appendix A of Volume 4. The effects are considered in this section and should be read in conjunction with the report.

To consider the effects of the Project, the ‘existing environment’ includes the likely future urban development but does not include the Project. The effects of the Project are then assessed using the same land use assumptions. Given the long-term perspective of the assessment, the analysis is based on the estimated ‘full build out’ for the future urban area. This is based on development yield

estimates provided by Auckland Council through the Drury-Opāheke and Pukekohe-Paerata Structure Plans and the Auckland Forecast Centre.

The subsequent sections provide a summary of the transport effects and proposed management measures.

11.4.1 Operational Effects

As established, the significant growth anticipated in the Pukekohe and Paerata areas will pose a number of future transport challenges for the region. The ratio of people to jobs also means that people living in the area will need to travel elsewhere to access employment, increasing cross-area employment trips during peak morning and evening periods. Given the scale and duration of the growth proposed, there is increasing pressure on the capacity and quality of the existing transport corridors.

The assessment of potential operational transport effects has been undertaken for key elements of the transport system, including effects on safety, different modes and property access. Based on the assessment, operational effects associated with the Project are predominantly positive. These are summarised in the sections to follow.

11.4.1.1 Safety

The Ministry of Transport, Waka Kotahi and AT have adopted the Vision Zero philosophy.[5] The design of the Pukekohe Transport Network has been undertaken with consideration of the latest safety guidance at all stages of corridor design. The effects of the Project on safety consist of:

- Improved walking and cycling facilities in and between Drury, Paerata and Pukekohe, resulting in improved protection for vulnerable users and a safer environment for all users;
- Reduced speed limits to more appropriate urban speeds and enhanced place function;
- Improved network-wide capacity to avoid strategic traffic rerouting to existing unsafe high-speed rural roads (Burtt Road, Runciman Road, Tuhimata Road, Sim Road and Cape Hill Road);
- Improved rail crossing facilities by adding several grade-separated crossings over the NIMT;
- Improved intersection controls through 41 new or upgraded intersections; and
- Consequential reductions in the risk of Death or Serious Injuries (DSI's) for all road users.

Overall, the Project will provide a safer transport system which is likely to reduce the number of DSI's.

11.4.1.2 Walking and cycling

The Project proposes separated walking and cycling facilities across Drury, Paerata and Pukekohe for all NoRs, including 26.2km of new walking facilities, 30.6km of new cycle network, several grade-separated active crossings over the NIMT and dedicated pedestrian and cycle crossing facilities. The proposed facilities differ between NoRs depending on the surrounding land use. Where alignments travel through the FUZ, facilities are proposed on both sides of the carriageway, however, where alignments run along a FUZ boundary, facilities are proposed on the FUZ side of the carriageway.

The upgrade is expected to result in positive walking and cycling effects including:

[5] As part of the "Road to Zero: New Zealand's Road Safety Strategy 2020-2030" and "Vision Zero for Tāmaki Makaurau: A Transport Strategy and Action Plan to 2030"

- Reduced likelihood and exposure to potential crashes as it will enable safe movement for vulnerable road users along all NoRs and at intersections;
- Improved integration with the future walking and cycling network, resulting in improved east-west and north-south walking and cycling connectivity;
- Environmental and health benefits as a result of increased active mode trips and reduced reliance on vehicle trips;
- Enable greater use of public transport by providing safe connector route between urban areas and the proposed Drury West and Paerata Stations;
- Support growth surrounding the corridors and significantly improve access to employment, education and social amenities;
- Improved walking and cycling network connectivity with land use on both sides of NIMT and safer NIMT crossing facilities;
- Improved integration with the proposed wider walking and cycling network (including the SH1 cycleway and the AMC cycleway along rail corridor and key trip attractors); and
- Strengthened effectiveness of the rail stations and desired mode shift outcomes.

The provision of walking and cycling facilities will significantly improve safety for vulnerable users and will significantly reduce the risk of DSIs. Overall, the provision of walking and cycling facilities as part of the Pukekohe Transport Network will provide a choice of transport options, reduce reliance on private vehicle trips and result in positive environmental and health benefits.

11.4.1.3 Public transport

The Project forms an integral part of the future public transport network, providing a primary east-west and north-south function for future planned services and serves as a gateway to key destinations in Drury, Paerata and Pukekohe. The Project includes the provision of dedicated bus lanes in Drury West and new arterial routes, allowing for future bus stops and enabling local buses to get access key destinations and public transport stations.

The effects of the Project on public transport are:

- Improved network-wide capacity which will enable strategic traffic to use arterials and decongest various local bus routes;
- Significant improvement to east-west and north-south public transport connectivity, which will improve access to employment and social amenities;
- Dedicated FTN facilities in Drury West will improve capacity and resilience, resulting in reduced journey time and improved consistency for public transport users;
- Improved integration with the future public transport network and services; and
- Improved integration with Pukekohe, Drury West and Paerata Stations, serving as a key enabler to achieve mode shift targets.

Overall, the Pukekohe Transport Network will respond to the existing and future demand on public transport and improve the connection of communities between centres, employment, and rapid transit stations.

11.4.1.4 General traffic and freight

The Pukekohe Transport Network will significantly increase north-south and east-west connectivity and capacity for existing and future communities in Drury, Paerata and Pukekohe. It significantly improves access for localised trips as well as providing for freight and traffic movements on strategic

roads, linking to major centres such as Manukau and Auckland City Centre and other districts such as Hamilton and the wider Waikato.

The Pukekohe Transport Network is predicted to significantly improve the distribution of traffic on the wider roading network. The increased connectivity and capacity will increase the safety, reliability and resilience of the wider network by limiting the need for strategic traffic to use unsafe rural roads or congested urban roads. Improved corridor capacity will also accommodate more freight movements and improve choice by providing alternative options for both local and strategic freight.

Overall, the effects of the Project on general traffic and freight consist of:

- Significantly improved access to employment, educational and social amenities;
- Improved intersection capacity and safety to cater for future growth;
- Improved north-south and east-west connectivity between Drury, Paerata and Pukekohe by providing a reliable alternative that reduces travel time;
- Improved north-south and east-west capacity and resilience, which will reduce strategic traffic rerouting to existing unsafe rural roads and collector roads;
- Improved east-west connectivity by adding four new safe NIMT rail crossings;
- Improved integration with the Pukekohe Rail Station, the proposed Drury West and Paerata Stations, and the future urban areas surrounding the Project;
- Improved route options, journey times and reliability for existing and future freight; and
- Reduce vehicle kilometres travelled daily, which will result in positive environmental and health benefits.
-
- With regard to freight improvements the Transport Assessment (Volume 1, Appendix A) details connections in section 5.1.4 of the Report.

11.4.1.5 Property access

For existing properties, the overarching design philosophy for the Project has been to maintain driveway access where practicable. However, due to the high speed and strategic nature of some of the proposed corridors in the Pukekohe Transport Network, direct property access is not recommended for some NoRs. Property access impacts range from minor changes to the physical access arrangements to prohibiting right turn movements into and out of properties, requiring detours.

In situations where a project impacts access (such as the need for realignment or regrading), these specifics will be confirmed during the detailed design phase, in coordination with the landowner, as part of property discussions under the Public Works Act.

As the area develops in Drury, Paerata and Pukekohe, current property accesses will be redirected as needed onto the collector road network, as outlined in the Drury-Opāheke and Pukekohe-Paerata Structure Plans. The collector network is expected to be confirmed by developers as they progress these connections through plan changes or resource consents.

Where existing properties will face a diversion impact given that only a left-in and left-out access will be permitted, the engineering design has taken this into account and included new turning facilities to minimise the potential adverse effects (e.g., 185 Mill Road, NoR 8).

Given the differences in access arrangements, speed and adjacent land uses, the effect of the Project on access for each NoR is discussed in more detail in the Assessment of Transport Effects in Volume 4, Appendix A.

11.4.2 Construction Effects

The assessment of construction effects associated with transport is based on the indicative construction methodology.

There are several potential temporary adverse effects mainly linked to traffic management. Potential adverse effects on transport during the construction of the Project can be summarised as follows:

Traffic routing – 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; and
- 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 capacity in the network, construction traffic can be accommodated.

Pedestrian and cyclist safety – the provision of walking and cycling facilities is variable across the network. However, it is anticipated that the existing network of parallel collector roads can be used as alternative routes during construction.

Road safety – impacts from site access points, posted speeds and sight lines for construction.

Property access – existing driveways that remain during construction will be required to have temporary access provision through temporary traffic management controls.

On-street and public parking – during the time of construction, the works or associated temporary traffic management controls may result in existing on-street parking or public parking not being available.

Parallel construction of projects – it has been assumed that each of the Pukekohe Transport Network corridors will be able to be constructed at separate times, due to the extended lapse dates. However, the potential that some of the corridors are constructed in parallel could further affect the volume of construction traffic on the transport network.

Land use activities that will require further consideration – some key land uses located adjacent to the corridors will need specific consideration in the management of construction traffic (such as additional controls at key access locations), including:

- Existing O-D routes in NoR 6;
- Existing development and a primary collector road in NoR 7;
- An arterial road with high traffic volumes in NoR 8; and
- Any other land uses or activities which may be established between now and the time of construction.

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

11.4.3.1 Operational

The Project provides significant positive effects as outlined above, including improvements to safety, network resilience and capacity, public and active mode connectivity, and north-south and east-west connectivity between Drury, Paerata and Pukekohe.

In terms of adverse operational effects, some existing properties will face a minor diversion impact on the main network given that direct property access will be limited. In situations where a project impacts access (such as the need for realignment or regrading), these specifics will be confirmed during the detailed design phase, in coordination with the landowner, as part of property discussions under the Public Works Act. A condition is proposed on all NoRs that requires that where existing property vehicle access is proposed to be altered by the project, the requiring authority will consult with the directly affected landowner and the Outline Plan will demonstrate how safe access will be provided, unless otherwise agreed with the landowner.

11.4.3.2 Construction

Temporary effects from the construction activities on the network can be adequately managed through the development and implementation of a CTMP. The purpose of the CTMP is to ensure construction 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 properties and local activities. If required, Site-Specific Traffic Management Plans (SSTMP) should be developed to manage constraints on access to affected properties.

The CTMP covers:

- Methods to manage the effects of temporary traffic management activities on traffic;
- Measures to ensure the safety of all transport users;
- The estimated numbers, frequencies, routes and timing of traffic movements, including any specific non-working or non-movement hours to manage vehicular and pedestrian traffic near schools or to manage traffic congestion;
- Size access routes and access points for all construction vehicles, the size and location of parking areas for plant, construction vehicles, and the vehicles of workers and visitors;
- Identification of detour routes and other methods to ensure the safe management and maintenance of traffic flows, including pedestrians and cyclists, on existing roads;
- Methods to maintain vehicle access to property and/or private roads where practicable, or to provide alternative access arrangements when it will not be;
- The management approach to loads on heavy construction vehicles, including covering loads of fine material, the use of wheel-wash facilities at site exit points and the timely removal of any material deposited or spilled on public roads; and
- Methods that will be undertaken to communicate traffic management measures to affected road users (e.g. residents/public/stakeholders/emergency services).

11.4.4 Conclusions

Overall, it is anticipated that the Pukekohe Transport Network has significant positive benefits and will provide a safe and reliable transport network that supports growth in the wider Pukekohe, Paerata

and Drury areas. It will significantly improve travel choice, safety, network connectivity, capacity, and access to employment, educational and social amenities. This improved network offering is necessary to support a shift to alternative modes and increase the attractiveness of active modes and public transport as a mode choice, and to support future growth of communities in these areas.

Some existing properties will face a minor diversion impact on the main network given that limited direct property access will be permitted, but the significant safety benefits will offset effects.

Adverse traffic effects may occur during construction, particularly related to temporary traffic management. However, the effects can be appropriately mitigated and managed through the development and implementation of a CTMP.

11.5 Construction Noise and Vibration

The Assessment of Construction Noise and Vibration Effects, included in Appendix B of Volume 4 contains predictions for construction noise and vibration levels carried out using the method recommended in the 6803 in accordance with the AUP:OP. The methodology included:

- Determining construction noise setback distances and vibration emission radii based on assumptions of construction activities and equipment;
- Determining setback distances where compliance with the relevant standards can be achieved; and
- Calculating vibration emission radii to provide a reasonable worst-case scenario for receivers.

Construction noise and vibration levels is generally higher than that of ongoing continuous activities. Therefore, while effects are based on how people are likely to react to equivalent internal noise levels, construction is a temporary activity with a finite duration. Most people are more likely to accept increased noise (or vibration) levels if durations and magnitudes are well communicated prior to works occurring.

11.5.1 Construction Noise Effects

Overall, predicted noise levels for the majority of works will be able to comply with the relevant construction noise standards following mitigation. Some receivers will still intermittently experience noise levels over 85 dB L_{Aeq} (predicted worst case scenario) after mitigation, if high noise construction activities (e.g. pavement works) occur on the edge of the designation boundary.

However, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works, mitigated noise levels can comply with the 70 dB L_{Aeq} noise criterion (set out in NZS 6803 and the Waka Kotahi “State Highway Construction and Maintenance Noise and Vibration Guide”) for most of the construction works.

Where high noise activities are likely, these activities will be intermittent and temporary in nature. The activities would occur for short periods before moving along the alignment or being completed. Some limited night-time works may be required but will be limited in duration.

Overall, it is considered that effects will generally be reasonable for the majority of activities.

11.5.2 Construction Vibration Effects

Construction vibration effects are considered in terms of Category A standards (relating to human perceptions of amenity) and Category B standards (relating to building damage).

For the majority of receivers, vibration levels in existing or future buildings may exceed the Category A standards (relating to human perceptions of amenity) if they are occupied during the works while the roller compactor passes. Vibration can typically be tolerated inside buildings if it occurs intermittently during the day and is of limited duration.

Compliance with the Category B standards is achieved for the majority of receivers in NoRs 1, 2, and 3. However, existing receivers in NoRs 4, 5, 6, 7 and 8 have been identified which may exceed the 5mm/s PPV daytime criteria for residential buildings and 10mm/s PPV daytime criteria for commercial buildings.

Without mitigation, at these receivers there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration.

11.5.3 NoR Specific Effects

NoR 6 is located largely in an established urban environment, so will likely experience higher construction noise and vibration levels than the rest of the Pukekohe Transport Network. If high vibration activities occur on the construction boundary, around 21 existing receivers (including 19 dwellings, one commercial, and one historic structure) could experience vibration levels that exceed the daytime standards, without mitigation.

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

To determine and implement the best practicable options to manage construction noise and vibration effects and reduce, as far as practicable, any exceedance of the noise and vibration standards, a Construction Noise and Vibration Management Plan (CNVMP) will be prepared prior to construction. This is included as a condition on each of the NoRs. The Assessment of Construction Noise and Vibration Effects in Appendix B of Volume 4 sets out the minimum level of information that must be provided in the CNVMP. Communication and consultation will occur with the affected receivers.

In addition to a CNVMP, it may be necessary to produce Site Specific or Activity Specific Construction Noise and Vibration Management Schedules where noise and/or vibration limits are predicted to be exceeded for a more sustained period or by a large margin.

For buildings where the daytime Category B vibration criteria may be exceeded, a building precondition survey will be undertaken prior to the start of construction, and a post-construction survey of the same buildings will be conducted once construction is complete. Any damage shown as a result of the Project construction will be rectified.

11.5.5 Conclusion

Overall, construction noise and vibration can be controlled for all NoRs to reasonable levels with the implementation of appropriate mitigation and management measures through a CNVMP which is proposed as a condition on all of the NoRs.

Exceedances of the noise and vibration criteria could occur intermittently across all NoRs, if high noise or vibration generating equipment is used near occupied buildings. However, this is considered to be temporary in duration and can be managed with prior notice, communication and consultation with affected landowners or occupiers.

11.6 Operational Noise

The Assessment of Operational Noise Effects, included in Appendix C of Volume 4, sets out predictions of road traffic noise for any new or altered roads against NZS6806 and other relevant guidance. The assessment of effects is twofold and considers NZS 6806 noise criteria categories as well as the anticipated noise level change with and without the Project.

11.6.1 Operational Noise Effects

Existing Protected Premises and Facilities (PPFs) within 100m from the proposed new road edge were assessed in urban areas, and 200m for rural areas, based on NZS6806. The number of PPFs for each NoR is shown in Table 11-1 below. PPFs are assessed under different NZ6806 criteria for new roads and altered roads.

Table 11-1: Number of PPFs in each NoR

NoR	Number of PPFs (altered roads)	Number of PPFs (new roads)
NoR 1	13	0
NoR 2	5	59
NoR 3	0	2
NoR 4	22	2
NoR 5	28	7
NoR 6*	N/A	N/A
NoR 7	45	6
NoR 8*	22	0
* NoR 6 and half of NoR 8 involve only active mode upgrades of existing roads, which does not cause elevated noise levels. Therefore, no PPFs were assessed adjacent to the active mode upgrades.		

The individual traffic noise level predictions were compared with the noise criteria Categories A, B and C of NZS6806, and the anticipated noise level change due to the Project was calculated.

Overall, most PPFs are predicted to receive noise levels within Category A (the desired noise criteria category). Further, ambient noise levels are likely to increase as the area urbanises, so the changes in noise levels due to the Project may not be as noticeable at the time.

Only PPFs in NoRs 2 and 8 require noise mitigation, set out in further detail below.

11.6.2 NoR Specific Effects

NoR 2 Drury to Pukekohe Link provides for a new state highway which consists of new and upgraded roads in an area currently relatively unaffected by traffic noise. With the Project in place and the future development in the area due to urban growth, 13 PPFs (out of 61) are predicted to receive noise levels in Category B and two PPFs in Category C, without mitigation.

NoR 8 Mill Road – Pukekohe East Road Upgrade provides for upgrades to Mill Road, which is a relatively busy road in a rural environment. The Project proposes to upgrade the road surfacing as part of widening the road, which will result in a slight improvement in noise environment for some existing PPFs. Most PPFs will receive noise levels in Category A. However, two PPFs are predicted to receive noise levels in Category B, and one PPF in Category C, without mitigation.

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

Mitigation in the form of low noise road surface as the base surface for all NoRs has been assessed. Mitigation in the form of roadside barriers have been assessed where effective for existing PPFs.

For NoR 2, low noise road surfaces are already part of the base design of the road, so mitigation in the form of barriers was assessed. While the majority of PPFs are predicted to receive noise levels in Category A (47 of the total 61), 14 PPFs are still predicted to receive noise levels in Category B, after mitigation.

For NoR 8, with the mitigation of barriers for four houses, most PPFs are predicted to receive noise levels in Category A and for two PPFs Category B.

Prior to construction, mitigation measures will be reassessed to confirm the best practicable option for the PPFs that are predicted to receive noise levels above Category A. The effects of mitigation in the form of noise barriers have also been considered in the Assessment of Landscape and Visual Amenity Effects Report, summarised in Section 9.9.

11.6.4 Conclusions

Overall, most PPFs are predicted to receive noise levels within Category A, and ambient noise levels are likely to increase as the FUZ area undergoes urban development, so the changes in noise levels due to the Project may not be as noticeable when the Project becomes operational.

PPFs in NoRs 2 and 8 are predicted to experience noise levels greater than Category A. With mitigation in the form of low noise road surface and some barriers, noise levels can generally be controlled to be within a reasonable range. Mitigation measures will be reassessed prior to construction to confirm the best practicable option for the PPFs that are predicted to receive noise levels above Category A. The process for doing this is included in the proposed designation conditions.

11.7 Flood Hazard

The Assessment of Flooding Hazard Effects, included in Appendix D: Volume 4, assesses the potential flood hazard risks associated with the construction, operation and maintenance of the Pukekohe Transport Network. This summary below should be read in conjunction with the report.

Flooding is a natural hazard and has therefore been considered as part of the (NoRs.

A wider range of potential stormwater quantity and quality effects that relate to regional plan and / or NES matters will be assessed, and resource consents sought through a future consenting process. Any required mitigation will be identified as part of that future consenting process. While these matters are not required to be assessed as part of this AEE, potential effects relating to future regional resource consents have been considered to the extent they are relevant to inform the alignment and the designation footprint for each proposed transport corridor. While stormwater effects apart from flooding are not assessed (as they will be assessed during a future regional consent process), provision is made for the future management of potential stormwater effects (stormwater quantity and stormwater quality) by identifying the space required for stormwater management devices i.e. treatment swale and wetlands and incorporating land for that purpose into the designation footprint.

The flood model has assessed 2.1 degrees of warming and a 16% increase in rainfall based on AC Guidance and MfE. However, given the uncertainty of climate change effects in the future the assessment has also considered a more severe climate change scenario allows for 3.8 degrees of warming and a 32.7% increase in rainfall. This takes a precautionary approach to the assessment of low probability of likelihood but high potential impact events addressing the uncertainty associated with climate change.

11.7.1 Construction Effects

There may be some flood hazards effects during the construction phase, if not managed appropriately, which are summarised below:

1 The removal of vegetation can disrupt natural drainage patterns and require temporary diversions/ the flooding risks associated with the third phase of construction

2 Construction of new culvert crossings or upgrading of existing culvert crossings or bridges can block flow paths and create upstream flooding if not managed appropriately. This could result in an increased risk of construction site and upstream flooding.

3 Construction can require installation of diversion drains or realignment of existing overland flow paths or natural streams, as a last resort

4 Construction of new attenuation wetlands or upgrading of existing attenuation wetlands

5 Temporary use of lay down and construction areas can block flow paths and create upstream

6 Bulk earthworks to complete the contouring for new landscape features (e.g. attenuation wetlands and new or upgraded culverts) require a dry works area and can alter overland flow paths or generate erosion and sediment effects

7 The siting of attenuation or stormwater wetlands within an existing overland flow path can obstruct runoff and result in flows being diverted towards existing properties due to the need for embankments.

These effects are considered to similarly effects all NoRs except, NoR 6, which will have no changes to the existing drainage infrastructure.

The details of the construction approach will be confirmed at detailed design. The works can be carried out in a way that will appropriately manage the risk, and this can be defined through flood risk mitigation measures that are included in the Construction Environmental Management Plan (CEMP).

11.7.2 Recommended measures to avoid, remedy or mitigate potential adverse construction effects

Measures to manage flood hazard associated with the construction of the Pukekohe Transport Network are included in the CEMP that is included as a condition of the proposed designations.

The CEMP will be developed prior to construction in conjunction with an experienced Stormwater Engineer and will consider the effects of temporary works, earthworks, storage of materials, temporary diversion and drainage on flow paths, flow levels and velocities. In preparing the CEMP, key matters include:

- Siting construction yards and stockpiles with minimal effects on flood flows
- Methods to reduce the conveyance of materials and plant that is considered necessary to be stored or sited within the flood plain (e.g. actions to take in response to the warning of heavy rainfall events) and
- Staging and programming to carry out work when there is less risk of high flow events,
- Diverting overland flow paths away or through areas of work
- Minimizing the physical obstruction to flood flows at the road sag point

11.7.3 Operational Effects relating to all NoRs

Operational effects have been assessed through flood modelling to consider the flooding extents at culvert crossings, bridge structure and areas where the new road embankment is within an existing flood plain or major overland flow paths. The assessment also considers the extents of flooding on existing properties due to the proposed projects. A 2.1 degree (2.1ºC) and 3.8 degree (3.8ºC) climate change scenario were assessed to give context and sensitivity of future flood effects that may result from a changing climate.

Flood hazard risk resulting from the Pukekohe Transport Network may result from changes to:

- The flood freeboard to existing habitable buildings;
- Overland flow paths and flood prone areas;
- Flood levels on urban land and developable land (in the FUZ);
- The ability to access property by residents and emergency vehicles.

11.7.4 NoR Specific Operational Effects

Table 11-2: Summary of NoR Specific Operational Flood Hazards (from the 100 year ARI flood with a 2.1ºC and 3.8ºC climate change adjustment to rainfall)

NoR	Effect	Proposed Mitigation
1	NoR 1 crosses six overland flow paths – four smaller tributaries and two main branches of the Ngakoroa Stream. The land is currently rural (in	• Appropriately size culverts and bridges • No attenuation in wetlands, attenuation will increase flow coincidence downstream.

NoR	Effect	Proposed Mitigation
	FUZ) with some nearby buildings in the vicinity to natural waterways. The flood hazards associated with NoR 1 are predominantly due to interaction with the existing floodplains surrounding the Ngakoroa Stream and crossings over the streams. While some existing moderate risk was identified on land at 110 Karaka Road, this is at the location of the proposed Drury West Rail Station and flood risks will be mitigated through that development. The effects of using a 3.8º climate change adjusted rainfall pattern compared to the 2.1º climate change pattern shows deeper flood depths in all six flowpath crossings for the NoR 1 road alignment. The changes in flood depth are relatively small with the change range of 0.1m to 0.3m.	• Provide diversion channels at the toe of fill embankments to prevent ponding. • Maintain 1200mm freeboard to new bridge soffits using the 100-year ARI flood level with 3.8º C climate change hydrology. Flood outcomes for all NoRs are set out above.
2	NoR 2 crosses 8 overland flow paths and includes some floodplain displacement around the Drury South Connection segment. There is a mostly a negligible flood risk due to the mostly uninhabited land upstream of flowpath crossings. A moderate existing and future risk was identified at the existing dwellings at: • 767 Runciman Road • 763B Runciman The effects of using a 3.8º climate change adjusted rainfall pattern compared to the 2.1º climate change pattern shows deeper flood depths in all eight flowpath crossings for the NoR 2 road alignment. The changes in flood depth are relatively small with the change range of 0.09m to 0.32m.	• Appropriately size culverts and bridges • No attenuation in wetlands in the lower half of the Ngakoroa and Oira Streams. • Attenuation for the 10yr and 100yr where wetlands are located in the upper half of the Ngakoroa and Oira Streams • Attenuation in wetlands located within the Whangapouri Stream catchment. • Provide diversion channels at the toe of fill embankments to prevent ponding. • Offset the flood volume displaced by filling in the floodplain with an equivalent volume of excavation within the floodplain. Maintain 1200mm freeboard to new bridge soffits using the 100-year ARI flood level with 3.8º Climate change hydrology. Flood outcomes for all NoRs are set out above.
3	One flowpath is located within NoR 3 (Paerata Station Connection segment). It is located in unoccupied farmland and floodplain with no dwellings nearby. The flowpath is proposed to be culverted as part of the Paerata Rail Station access road (by KiwiRail). No alteration of the culvert is likely to be require. There is negligible flood risk to upstream land. The modelled 3.8ºC climate change scenario produced an overall higher flood level. However, the flood risk rating will remain negligible based on the land use being agricultural and no buildings in the vicinity. The land is within the FUZ and is likely to be developed. Future buildings will need to set floor elevations to a suitable height to maintain	Flood outcomes for all NoRs are set out above.

NoR	Effect	Proposed Mitigation
	compliance with the Building Code and the Auckland Design Manual.	
4	NoR 4 crosses 7 flowpaths. Within the Oira and Whangapouri catchments The land is generally unoccupied farmland and floodplain with no dwellings nearby. However, there is one commercial and residential building at 1221 Paerata Road very close to the floodplain near the proposed crossing of the Whangapouri Creek. This dwelling as been identified as having a moderate existing risk. All other crossings have negligible risk. Using a 3.8º climate change adjusted rainfall pattern compared to the 2.1º climate change pattern shows deeper flood depths at all flow path crossings. Flooding is indicated at the building at 1221 Paerata Road and therefore the risk increases to high in this scenario.	• Appropriately size culverts and bridges. • Attenuation for the 10yr and 100yr events in the Whangapouri, Ngakoroa and Oira Stream catchments • Provide diversion channels at the toe of fill embankments to prevent ponding. • Offset the flood volume displaced by filling in the floodplain with an equivalent volume of excavation within the floodplain. • Maintain 1200mm freeboard to new bridge soffits using the 100-year ARI flood level with 3.8º Climate change hydrology. Flood outcomes for all NoRs are set out above.
5	NoR 5 crosses four flowpaths and within the Whangapouri Stream and Tatuanui Stream catchments. The land uses upstream of the crossing points have dwellings nearby that may be subject to flood effects if the upstream flood level caused by NoR 5 not adequately managed. The buildings in the floodplain along Station Road at the flowpath crossing in the FUZ to the east of Station Road are flooded due to the constrictive nature of the railway line and the drainage beneath. There is some moderate and high risk locations related to NoR 5 (listed below) where there are existing buildings. • 65 Golding Road residential building:–: Moderate existing and future risk • 124 Station Road residential building: Moderate existing and future risk • 150 Station Road residential building: High risk existing and future risk • 170 Station Road residential building:- Moderate existing and future risk • 15 Austen Place industrial building:- Moderate existing and future risk • 44-46 Crosbie Road industrial building: Moderate existing and future risk The 3.8º climate change scenario would likely increase by 100mm to 400mm as a result. The moderate risk locations would likely become high risk and low risk would become moderate risks.	• Adequately size culverts and the bridge over the NIMT rail line and Station Road. • Avoid lifting the crown of the road along Golding Road to prevent adverse effects upstream. • Attenuation for the 10yr and 100yr in the Whangapouri and Tatuanui Stream catchments • Provide diversion channels at the toe of fill embankments to prevent ponding. • Offset the flood volume displaced by filling in the floodplain with an equivalent volume of excavation within the floodplain. • Maintain 600mm freeboard to the new bridge soffit over the NIMT rail using the 100-year ARI flood level with 3.8º Climate change hydrology. Flood outcomes for all NoRs are set out above.

NoR	Effect	Proposed Mitigation
6	NoR 6 includes individual areas around some intersections and driveways for regrading for an active mode upgrade. No changes to flooding are expected.	Flood outcomes for all NoRs are set out above.
7	NoR 7 crosses seven flowpaths within the Whangapouri Stream catchment. Three culverts will need to be replaced near the Glenbrook rail line and Butcher Road. At these locations, the upstream railway line culverts control the headwater and therefore the flood risk to the upstream properties. Existing residential dwellings are located upstream of the proposed crossings. All crossing have negligible risk, except at the residential building at 248 Helvetia Road that is already within the existing floodplain. This location has a high existing and future risk, caused by an undersized culvert beneath Helvetia Road. There is opportunity to improve flooding risks at this location which should be investigated further at detailed design stages. The 3.8ºC climate change scenario would likely increase by 100mm to 400mm as a result. This would worsen the existing effect at 248 Helvetia Road.	• Adequately size culverts and bridges. Retain culvert sizes at the existing culverts near the Glenbrook rail line and Butcher Road to maintain the same flowrate and not cause new or exacerbate upstream flood risk. • Attenuation for the 10yr and 100yr in the Whangapouri Stream catchment. Flood outcomes for all NoRs are set out above.
8	NoR 8 upgrades existing roads crosses two flowpaths on Mill Road both serviced by existing culverts. The road widening will not require any culvert lengthening or include any floodplain filling. At 155 Mill Road there is moderate (2.1ºC) and high (3.8ºC) existing and future flooding risks, due to low-lying elevation.	• Extend culverts at the same diameter and replace culverts at the same diameter. • Avoid lifting the crown of the road along Mill Road to prevent adverse effects upstream. Or lowering the road crown to cause effects downstream • Attenuation for the 10yr and 100yr in the Ngakoroa and Tatuanui Stream catchments Flood outcomes for all NoRs are set out above.

11.7.5 Recommended measures to avoid, remedy or mitigate potential adverse operational effects relating to all NoRs

A Flood Hazard condition is proposed which will require the future detailed design of the transport corridors to be designed to achieve specific flood risk outcomes. This includes flood modelling of the pre-Project and post-Project 100 year ARI flood levels (for Maximum Probable Development land use and including climate change).

Future detailed design of the alignments will be subject to a separate detailed flood hazard assessment which will refine the design of formations, culverts, bridge crossings and location / size of treatment (attenuation, water quality or both). Regional stormwater consents will also be required closer to the time of construction.

The following flood hazard outcomes are included on all NoRs. This requires that the Projects be designed to achieve the following:

- No increase in flood levels in a 1% AEP event for existing authorised habitable floors that are already subject to flooding or have a freeboard less than 150mm;
- No more than a 10% reduction in freeboard in a 1% AEP event for existing authorised habitable floors with a freeboard of over 150mm;
- No increase in 1% AEP flood levels for existing authorised community, commercial, industrial and network utility building floors that are already subject to flooding;
- No more than a 10% reduction in freeboard in a 1% AEP event for existing authorised community, commercial, industrial and network utility building floors;
- No increase of more than 50mm in flood level in a 1% AEP event on land zoned for urban or future urban development where there is no existing dwelling;
- No new flood prone areas (with a flood prone area defined as a potential ponding area that relies on a single culvert for drainage and does not have an overland flow path); and
- 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 time the Outline Plan is submitted. The assessment shall be undertaken for the 50%, 20%, 10% and 1% AEP rainfall events.
- Compliance shall be demonstrated in the Outline Plan, which shall include flood modelling of the pre-Project and post-Project 10% and 1% AEP flood levels (for Maximum Probable Development land use and including climate change).
- Where the above outcomes can be achieved through alternative measures outside of the designation such as flood stop banks, flood walls, raising existing authorised habitable floor level and new overland flow paths or varied through agreement with the relevant landowner, the Outline Plan shall include confirmation that any necessary landowner and statutory approvals have been obtained for that work or alternative outcome.

11.7.6 Conclusions

The flood hazard risks during construction can be adequately managed. Proposed works will be located outside of flood plains and overland flow paths as far as practicable. Where this is not possible, potential flooding effects will be managed through the flood risk mitigation measures set out in the CEMP for existing high flood hazard areas. For those areas where there is an increased flood risk, mitigation measures are proposed within 11.7.2.

There are potential operational effects risks of increased flood levels upstream and downstream of crossings and where the vertical alignment of the road is elevated. A number of potential management and mitigation measures have been provided to manage operational effects at the future detailed design stage within section 11.7.5. Flood hazard outcomes are included as conditions on all of the NoRs so that flood hazard effects can be appropriately managed.

11.8 Terrestrial Ecology

The Assessment of Ecological Effects provided in Appendix E, Volume 4 assesses the potential ecological effects which are the subject of district plan controls under the relevant statutory documents, for each of the NoRs within the Pukekohe Transport Network. The summary below should be read in conjunction with this report. Ecological effects that relate to regional plan and / or

NES matters will be assessed, and resource consents sought through a future consenting process. Any required mitigation will be identified as part of that future consenting process. While these matters are not required to be assessed as part of this AEE, potential ecological effects relating to future regional resource consents and / or wildlife permits have been considered to the extent they are relevant to inform the alignment and the designation footprint for each proposed transport corridor.

The Assessment of Ecological Effects follows the Ecological Impact Assessment Guidelines (EIANZ, 2018). These guidelines were used to assess the ecological value of identified ecological features for each NoR and evaluate the magnitude and level of potential effects that the proposed transport corridors could have on these features as summarised in the sections below. The full methodology is provided in the Assessment of Ecological Effects provided in Appendix E, Volume 4.

11.8.1 Positive Effects

Positive ecological effects have been outlined within the Assessment of Ecological Effects and are summarised below:

- Improved blue/green infrastructure, such as stormwater wetlands, swales, and associated landscaping (which will include indigenous vegetation) will provide a wide range of ecosystem services that will not only contribute to the mitigation of the relevant effects from the proposed Pukekohe Transport Network, but also enhance the ecosystem services provided by natural ecosystems in a modified landscape.
- Landscape planting of berms, embankments, and stormwater wetlands are connected and integrated with retained forest remnants and mature trees, streams, riparian margins, and open space zones. Where applicable, the landscaping is anticipated to enhance the connectivity of some of the remaining natural and semi-natural areas.
- The proposed bat mitigation in association with the landscape planting of berms, embankments, and stormwater wetlands is likely to improve ecological connectivity for other native fauna.

11.8.2 Construction Effects

The construction activities associated with the Pukekohe Transport Network have the potential to cause adverse effects on ecological features within or adjacent to the designation footprint if they are not mitigated. Potential construction effects that relate to the activities authorised by the designation include the disturbance and displacement of roosts / nests and individual (existing) long-tailed bats, avifauna and herpetofauna due to construction activities (noise, light, dust etc.). It is assumed that this effect will occur after vegetation clearance (subject to regional consent controls excluding the Waikato jurisdiction as vegetation removal is assessed at district level in WDC) has been implemented and is therefore likely to happen in habitats adjacent to the project footprint / designation or underneath structures such as bridges. The following sections detail the potential magnitude of effect and subsequent level of effect on ecological features. Impact management and residual effects are also presented where the level of effect is assessed to be low with mitigation.

11.8.2.1 Vegetation Clearance

Effects on district plan vegetation have been considered in the Assessment of Arboricultural Effects Report and Section 11.12 of this Report. Removal of vegetation protected under AUP:OP provisions is highlighted in Section 11.12.2. The effects relating to the removal of these trees protected as an Auckland district planning matter is considered low from an ecological perspective. No impact

management is recommended. The likely future ecological environment is anticipated to be the same as the baseline.

Vegetation clearance within the Waikato jurisdiction in NoR 8 is addressed at district level and therefore, is subject to this NoR process. This has been considered in the Assessment of Arboricultural Effects Report. The only vegetation which triggers consent is a solitary Totara tree and no impact management is recommended for this effect. The effects of the removal of the vegetation types on long-tailed bats, TAR and native birds, and TAR skinks are discussed below

11.8.2.2 Long-tailed Bats

The ecological value of long-tailed bats is assessed to be very high. Bats may utilise habitats associated with all the NoRs, except NoR 6, for roosting, foraging or commuting. Night works and site compounds are likely to be lit overnight, which has the potential to affect the behaviour of bats if foraging within this area or roosting nearby. Noise and vibration during construction can also cause effects if bats are roosting in the immediate vicinity of construction works.

Bats may be impacted by the removal of vegetation protected by the district plan provisions within NoR 8, and the removal of vegetation within the Waikato section of NoR 8.

Bat foraging has been confirmed in areas proximate to NoR 2, 3, 4, 7, and 8 and within close proximity to the other NoRs (i.e., <2km). Surveys at the corridor scale cannot confirm roost occupation within or adjacent to transport corridors, however, it can be assumed that bats will utilise roost sites within the designation footprints based on:

- Confirmed habitat suitability (numerous trees with moderate to high bat roost potential, connected to linear stream corridors and wetlands).
- Confirmed foraging presence
- Frequent utilisation of numerous roosting sites throughout their home range.

During construction the overall level of effect due to the potential disturbance and displacement to roosts and individual bats for each project is presented in Table 11.2.

Table 11-3: Overall level of effect on bats from construction for each NoR

NoR	Level of disturbance and displacement to roosts and individual bats (existing) pre-mitigation	Mitigation required?	Level of effect post-mitigation
1	**Moderate**	Yes	Low
2	**Moderate**	Yes	Low
3	**Moderate**	Yes	Low
4	**Moderate**	Yes	Low
5	**Moderate**	Yes	Low
6	Very Low	No	N/A
7	**Moderate**	Yes	Low

NoR	Level of disturbance and displacement to roosts and individual bats (existing) pre-mitigation	Mitigation required?	Level of effect post-mitigation
8	**Moderate**	Yes	Low

The residual impact is assessed as **Low** post mitigation (discussed in section 11.9.3) and no further impact management is anticipated.

11.8.2.3 Birds

There are a number of Threatened and At-Risk (TAR) bird species and non-TAR bird species likely to be present within the project areas. The key species likely to be present in each NoR area are outlined in Table 11.3. Noise, vibration and lighting disturbance caused by construction activities could potentially displace native birds from suitable nesting and foraging habitat within and adjacent to construction works for all NoRs. During construction the overall level of effect on birds for each NoR is presented in Table 11.3.

TAR, and native, birds may also be impacted by removal of district plan vegetation within NoR 8 , through the following effects:

- Disturbance and displacement to TAR and native birds due to construction activities (noise, light, dust, etc.).
- Loss of foraging habitat;
- Nest loss; and
- Mortality or injury to birds.

Where birds are unlikely to be nesting in or adjacent to construction areas, birds are likely to naturally relocate to alternative habitats during construction, and therefore, effects are limited. Where effects are considered to be moderate or higher, mitigation is proposed in, as provided in 11.9.3. The overall level of effect with mitigation is also presented in the table below.

Table 11-4: Overall level of effect on TAR birds from construction for each NoR requiring mitigation

Disturbance and displacement to TAR and native birds, and nest sites, resulting from construction activities				
Designation	**TAR Species**	**Level of effect (pre - mitigation)**	**Mitigation required?**	**Level of effect (post mitigation)**
NoR 1	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, and South Island pied oystercatcher	Moderate	Yes	Very low
NoR 2	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, South Island pied oystercatcher, and Fernbird	Moderate	Yes	Very low
NoR 4	Australasian bittern, White heron, and Dabchick	Moderate	Yes	Very low

Disturbance and displacement to TAR and native birds, and nest sites, resulting from construction activities				
	Banded rail, Spotless crake, South Island pied oystercatcher, and Fernbird			
NoR 5	Dabchick	Moderate	Yes	Very low
NoR 7	Dabchick	Moderate	Yes	Very low
NoR 8	Australasian bittern, White heron, and Dabchick Banded rail, South Island pied oystercatcher, and Spotless crake	Moderate	Yes	Very low

With mitigation in place (discussed in section 11.9.3), the overall level of effect on birds is low for all corridors, except NoR 3 and 6, where mitigation is not required.

Mitigation is not required for NoR 6 as the portions of designated areas of NoR 6 are located within an urban environment with limited habitat that is unlikely to support TAR birds. As such, the upgrading of the road within NoR 6 is unlikely to affect birds. Mitigation is not required for NoR 3 as it was found that the environment is unlikely to support the majority of TAR bird species. New Zealand falcon/ Kārearea, Kaka and Red-billed gull were observed or likely to occur within NoR 3, however, impact are considered low and therefore not mitigation is required.

11.8.2.4 Herpetofauna

In general, only two TAR species of skinks are likely to occur within the Pukekohe Transport Network. These species include copper skinks and ornate skinks, as identified in the Assessment of Ecological Effects. During construction activities associated with the upgrade of existing transport corridors, lizards are likely to be habituated to noise and vibration from the existing road. For new corridors, lizards will not be habituated to noise and vibration increasing the likelihood of adverse effects occurring. Noise, vibration, and lighting disturbance caused by construction activities could potentially displace these native skinks from suitable habitat associated with all NoRs, except NoR 6 (where Copper and Ornate Skink are unlikely to occur).

The ecological value of both skinks was assessed as high (At Risk-Declining species), and the magnitude of effects were assessed as negligible in the Auckland Region due to the skinks being considered habitat generalists and the local extent of the construction related effects. As a result, the overall level of effects due to construction disturbance were assessed as low prior to mitigation. As such no impact management is required.

However, the effects resulting from the removal of vegetation NoR 8 is assessed as moderate. The potential effects are outlined as disturbance and displacement due to construction activities, and mortality or injury. The resulting effect from the removal of vegetation in the Waikato section of NoR 8 is assessed as High prior to mitigation. As such, mitigation is required for the NoR 8 as discussed in 11.9.4. The residual impact is assessed as **Low** post mitigation.

11.8.3 Recommended measures to avoid, remedy or mitigate potential adverse construction effects

Pre-construction ecological surveys and Ecological Management Plans (EMP) will be prepared for each project prior to construction. These are included as conditions on all NoRs except NoR 6.

Mitigation is not required for NoR 6 is due to the urbanised environment. The pre-construction ecological surveys will inform the detailed design of the EMP by confirming whether the identified species of value are present in the project areas and confirming whether the project will or may have a moderate or greater level of ecological effect on the ecological species of value prior to the implementation of management measures. Where moderate or higher effects are identified, EMPs will be developed which will include the following specific measures:

A Bat Management Plan (BMP) is recommended as a condition on the proposed designations for NoRs 1-5, 7-8 (all except NoR 6). The BMP will include the following:

- Surveys prior to construction to confirm presence / likely absence. Surveys to confirm bat roost locations if activity is confirmed
- Confirmation of maternity roosts may require a seasonal restriction on construction activity (no or restricted construction during Dec-Mar)
- Siting of compounds and laydown areas to avoid bat habitat
- Lighting design to reduce light levels and spill from construction areas
- Restriction of nightworks around bat habitat.

If required, bat management will also be integrated with any relevant regional consent conditions that may be required for regional compliance.

An Avifauna Management Plan (AMP) for all Threatened and At Risk-Declining birds is recommended as a condition on the proposed designations for NoRs 1,2,-4, 5, 7 and 8 (all except 3 and 6) due to the potential presence of TAR birds. This will consider:

- Pre-construction nesting bird surveys throughout wetlands and riparian habitat
- Timing consideration for construction works (avoiding breeding season, where practicable).
- Methods to protect and buffer nesting birds (if present).

A Lizard Management Plan is recommended as a condition on the proposed designations for NoR 8. The LMP will include the following:

- Preconstruction surveys to confirm potential habitats.
- Timing of the implementation of the LMP.
- A description of methodology for survey
- A description of the relocation site(s)
- Monitoring methods
- A post-vegetation clearance search for remaining lizards.
- A suitably qualified and experienced ecologist/herpetologist approved to oversee the implementation of the LMP
- Lizard management should be consistent with any regional consent conditions (and the Wildlife Act 1953) that may be required for regional compliance.

11.8.4 Operational Effects

The operational activities associated with each NoR in the Pukekohe Transport Network have the potential to cause adverse effects on ecological features within or adjacent to the designation footprints. The potential operational effects are:

- Loss in connectivity for indigenous fauna, in particular bats, birds, lizards, associated with light, noise and vibration effects from the operation of the road, leading to fragmentation of habitat; and
- Disturbance and displacement of indigenous fauna and their nests / roosts, in particular bats, birds, herpetofauna, associated with light, noise and vibration effects from the operation of the road.

For the NoRs that are existing transport corridors to be upgraded, many of the operational effects are likely to be pre-existing. Bats, birds and particularly lizards may therefore be habituated to noise, light, and vibration from the existing road operations. The following sections detail the level of effect on ecological features (habitat and species), as relating to district plan matters only.

11.8.4.1 Long-tailed Bats

The ecological value of long-tailed bats is assessed to be very high. The loss of connectivity through permanent habitat loss and disturbance such as operational noise, vibration and light from the operation of each transport corridor can lead to an overall reduction in size and quality of bat foraging habitat and can impact on bat movement in the broader landscape. Lighting spillage from street lighting could disturb commuting and foraging bats at night and adversely affect insect prey populations. The overall level of effect from the operation of each corridor is presented in Table 11.4.

Areas designated by NoR 6 are unlikely to be suitable habitats for long-tailed bats. As such, the upgraded road within NoR 6 is unlikely to affect bats, and therefore no mitigation is required. For all other transport corridors, the overall level of effect is assessed as moderate without mitigation. With mitigation in place (discussed in section 11.9.3), the level of effect is low for all corridors. Details on the proposed mitigation is provided in Section 11.9.3.

Table 11-5: Overall level of effect on bat species from operation for each NoR

NoR	Level of effect (pre – mitigation)	Mitigation required?	Overall level of effect with mitigation
1	**Moderate**	Yes	Low
2	**Moderate**	Yes	Low
3	**Moderate**	Yes	Low
4	**Moderate**	Yes	Low
5	**Moderate**	Yes	Low
6	Very low	No	N/A
7	**Moderate**	Yes	Low
8	**Moderate**	Yes	Low

11.8.4.2 Birds

The operational effects of the NoRs of the Pukekohe Transport Network, could have the below effects:

- Vibration, and lighting disturbance caused by the presence of the road corridors, could potentially disturb and displace native birds from suitable nesting and foraging habitat within and adjacent to the proposed designations.
- The permanent habitat loss and operational noise, vibration, and light may also affect connectivity in the broader landscape.

NoR 6 is located within an urban environment with limited habitat that is unlikely to support TAR birds. As such, the upgraded road within NoR 6 is unlikely to affect birds and therefore a low level of effect was determined for NoR 6 for all TAR and native birds. Additionally, for NoR 3 the overall level of operational effect on birds is assessed as very low, as such, no mitigation is required for the operation of this corridor.

For the remaining NoRs, mitigation will be required due to the potential presence of TAR birds listed below. These birds will need to be managed so that nesting sites can be avoided or provided for within the corridor. With mitigation in place, the level of effect reduces to very low for relevant NoRs. Details on the proposed mitigation is provided in Section 11.9.3 below. The overall level of effect from the operation of each corridor is presented in Table 11.5.

Table 11-6: Overall level of effect on bird species from operation for each NoR requiring mitigation

Disturbance and displacement of TAR and native birds, and nest sites due to light, noise, and vibration effects from the operation of the road				
NoR	**TAR Species**	**Level of effect (pre - mitigation)**	**Mitigation required?**	**Level of effect (post mitigation)**
NoR 1	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, and South Island pied oystercatcher	Moderate	Yes	Low
NoR 2	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, South Island pied oystercatcher, and Fernbird	Moderate	Yes	Low
NoR 4	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, South Island pied oystercatcher, and Fernbird	Moderate	Yes	Low
NoR 5	Dabchick	Moderate	Yes	Low
NoR 7	Dabchick	Moderate	Yes	Low
NoR 8	Australasian bittern, White heron, and Dabchick Banded rail, South Island pied oystercatcher, and Spotless crake	Moderate	Yes	Low

Disturbance and displacement of TAR and native birds, and nest sites due to light, noise, and vibration effects from the operation of the road				
NoR 1	Australasian bittern, White heron, and Dabchick Banded rail, Spotless crake, and South Island pied oystercatcher	Moderate	Yes	Low

11.8.4.3 Herpetofauna

Suitable habitat (exotic scrub, exotic treeland edge and rank grassland) has been identified within the designation footprint for each corridor which could potentially support native herpetofauna species. The loss of connectivity through the presence of the road and associated disturbance such as operational noise, vibration, and light could lead to an overall reduction in size and quality of suitable habitat for TAR skinks within the broader landscape. However, the overall level of effect due to operational disturbance is assessed as low prior to mitigation, therefore, mitigation is not proposed.

11.8.5 Recommended measures to avoid, remedy or mitigate potential adverse operational effects

Mitigation measures for the operational ecological effects of the Pukekohe Transport Network includes:

A Bat Management Plan (BMP) is recommended as a condition on the proposed designations for NoRs 1, 2, 3, 4, 5, 7, and 8 (all except 6). The BMP will include the following:

- Early-stage / mature buffer planting, late-stage buffer planting, and retention of existing mature trees between the road alignment and features with potential for bat roosts
- Light and noise management through design
- Future presence of roosts within the alignment (placement of flaps on features with high roost potential)
- Assumptions in the efficacy of the proposed mitigation will be addressed through an adaptive management framework that will outline bat activity thresholds, robust monitoring, and potential corrective action.

An Avifauna Management Plan (AMP) for all Threatened and At Risk-Declining birds is recommended as a condition on the proposed designations for NoRs 1,2,4, 5, 7 ,8 (all except NoR 3 and NoR 6) due to the potential presence of TAR birds, and will include the following:

- Retention of vegetation near wetland habitat, and riparian habitat (specific habitat is set out in the Assessment of Ecological Effects in Appendix E, Volume 4).
- Buffer planting between the road alignment and suitable habitat adjacent to the relevant wetlands and riparian habitats (specific habitat is set out in the Assessment of Ecological Effects in Appendix E, Volume 4).

11.8.6 Conclusions

Following the implementation of the identified mitigation measures the residual level of construction and operation effects on terrestrial ecology associated with the construction and operation of all

upgraded or new transport corridors is assessed as low. Potential effects are therefore able to be appropriately managed, as outlined above.

11.9 Landscape and Visual

The Assessment of Landscape and Visual Amenity Effects Report is provided in Appendix F, Volume 4. The report considers the actual and potential effects associated with the construction, operation, and maintenance of the Pukekohe Transport Network on the existing and likely future environment as it relates to landscape and visual effects and recommends measures that may be implemented to avoid, remedy and/or mitigate these effects.

11.9.1 Positive Effects

The Pukekohe Transport Network includes the provision of new and upgraded roads both within the existing urban and rural environment, and within the FUZ (including upgrading roads in existing urban areas). The new and upgraded transport corridors provide positive effects through the design including landscape mitigation planting and safety improvements as summarised below.

- Enhanced connectivity for Pukekohe and Paerata as a whole by integrating with the existing local street network and improving road user safety. It will also improve transport network connectivity to the adjacent landscape outside of Pukekohe.
- Potential for stormwater wetlands to become attractive focal points through considered planting and wetland construction, and for stormwater wetlands to be integrated with active transport routes.
- Landscape mitigation planting will be provided to create attractive environments, which can enhance the built character of their surroundings and positively contribute to the visual quality of the streets and the area's sense of place.
- Opportunity to highlight cultural narratives in the landscape.
- The reduction in speed limits along upgraded alignments of existing roads both within the rural environment and the FUZ will improve the experiential qualities of the corridor for both road users and adjacent properties.
- Integration of active travel routes and recreational paths with Pukekohe's 'green network' of bush and vegetated riparian margins.
- NoR 8 provides viewing opportunities of Pukekohe East tuff ring ONF as users of the active modes path will also gain a greater appreciation and visibility of the ONF which is visible to the north of Pukekohe East Road.
- NoR 4 provides viewing opportunities of the Te Māunu a Tūmatauenga pā and landscape, to the east of the designation. This pā sits upon a natural bluff and landform and is identified as an ONL within the AUP:OP.

11.9.2 Construction Effects relating to all NoRs

The following section discusses the temporary potential natural character and visual effects which could arise during construction of the Pukekohe Transport Network. The detailed construction effects assessment can be found in the Assessment of Landscape and Visual Amenity Effects Report (Volume 4, Appendix F). It is noted that bulk earthworks and works within waterbodies will be the subject of a future regional resource consent process where the effects of these works will be assessed and mitigation measures confirmed. It is acknowledged that there is overlap in the

consideration of the landscape and visual effects of these activities between the district and regional plan provisions of the AUP:OP.

The temporary adverse landscape character and visual amenity effects resulting from all NoRs within the Pukekohe Transport Network due to construction are summarised below:

- **Construction footprint:** Potential adverse construction effects are expected to result from the construction works footprint, where construction machinery will be present which may require access tracks. The additional width of works required during construction may cause vegetation outside of the permanent corridor to be removed and for work to occur within the drip line of existing trees.
- **Waterbodies:** It is anticipated that work will be undertaken near waterways and wetlands potentially resulting in effects on natural character. The concept design includes bridges across stream catchments which will assist in retaining the natural alignment and pattern of the stream, albeit with some vegetation removal along the stream corridor likely required to construct the bridge.
- **Exposed earthworks:** Exposed earthworks can result in visual landscape effects during construction.
- **Reduced amenity:** During the construction phase of the transport corridors, adjacent residents are likely to experience reduced amenity, including from noise, dust, and lighting, as well as from visual effects caused by the presence of construction activities.
- **Reduced visual amenity:** Rural residential properties along the alignment will be proximate to the which alignment may result in existing planting surrounding the curtilage being removed to facilitate the works. Where this occurs, direct and prolonged views of the construction works throughout the construction period are likely. Views from public locations will likely be restricted to motorists travelling along road corridors and users of the NIMT rail line where it is proximate to the alignment. From these locations, the proposed works will be seen within a transient context.
- **Temporary effects:** It is anticipated that activities during construction of the upgraded or new transport corridors will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by public transient viewing audiences within an arterial corridor. Another important consideration is that landscape change by way of vegetation removal and land modification forms part of the expected backdrop of the existing environment as the area urbanises. Notwithstanding this, some public and private vantage points within transport corridors are likely to witness heightened adverse visual effects through the construction phase. Adverse effects of this nature are common to infrastructure projects and are mitigated by the short-term duration of the works and subsequent remediation.

11.9.3 Operational Effects relating to all NoRs

The following section discusses the potential natural character and visual effects which could arise from the operation of the Pukekohe Transport Network. The detailed construction effects assessment can be found in the Assessment of Landscape and Visual Effects (LVA) (Volume 4, Appendix F). For the purpose of this assessment, it is assumed that at the time of 'operation' of the Pukekohe Transport Network projects, the current land zoned as FUZ (and those which form part of the operative plan changes) within the context of Pukekohe, Paerata and Drury will be an urban area. As such, the context and setting of the NoRs located in the FUZ will be located within urbanised environments, as opposed to the existing rural environment.

The key components of landscape character and visual amenity are outlined in the LVA and are addressed for each respective NoR alignment below.

All operational effects are assessed against the completed works of the project, and include any proposed landscape mitigation measures.

11.9.4 NoR Specific Effects

11.9.4.1 NoR 1 – Drury West Arterial

NoR 1 is a new transport corridor in the FUZ. The alignment connects to SH22, Burtt Road and Runciman Road.

Construction Effects

The landscape character temporary effects resulting from the construction of NoR 1 are anticipated to be low – moderate. The extent of landform modification is unlikely to detract from the wider landform, hydrological and vegetation patterns; with effects being localised. The alignment spans across multiple intermittent and permanent stream corridors along the alignment and the concept design of the alignment includes three bridges across the stream corridors (inclusive of the bridge over the NIMT rail line). The alignment is for a new road within the rural environment, zoned FUZ. Roading and rail infrastructure are notable components of the rural environment within the setting of the proposed designation. Some properties proximate to the alignment may experience the removal of existing planting surrounding the curtilage to facilitate the works effecting visual amenity. Where this occurs, direct and prolonged views of the construction works throughout the construction period are likely. Visual amenity effects of construction resulting from NoR 1 are expected to be low – moderate. Moderate temporary effects are anticipated for properties immediately adjacent to the alignment (being retained), and low temporary effects for properties within the wider setting and from public viewpoints.

Operational Effects

While the project adds a new road element through this area, the area is expected to change to an urbanised context due to the current zoning of FUZ. As identified through the Drury-Opāheke Structure Plan, this area is likely be to the THAB, MHU and MHS zones of the AUP:OP. The proposed designation will form a complementary element as the FUZ develops and any adverse effects on landscape character are assessed to be very low.

It is anticipated that visual amenity effects for the operation of project and its alignment (post-construction) will be low. This is based upon the design working with and integrating into the surrounding topography (including the raised topography for bridge access), and visual amenity and user experience associated with the streetscape design, street trees, berm planting and active modes enabled along the route.

11.9.4.2 NoR 2 – Drury to- Pukekohe Link

South Drury Connection Segment

This new road connection is within the existing rural environment and along the southern edge of the FUZ. The alignment connects to Great South Road (west of the SH1 corridor), Runciman Road and Burtt Road.

Construction Effects

The landscape character effects resulting from the construction of South Drury Connection Segment are anticipated to be low-moderate due to limited vegetation removal and earthworks. A bridge will span the Ngakoroa Stream which will assist in retaining its natural alignment and pattern remains. Roading, overhead electrical (transmission) and rail infrastructure are notable components of the rural environment within the setting of this segment of NoR 2, proximate to the FUZ. The proposed designation largely follows the alignment of the overhead transmission line. Whilst the project will introduce an additional roading corridor into the landscape, it will not be inconsistent with the existing and anticipated landscape character of the area.

Rural residential properties along the alignment predominantly include established planting within the curtilage proximate to the respective houses. This will provide partial screening of the construction. In contrast, some properties have limited or no vegetation within the curtilage or along lot boundaries, resulting in likely direct and prolonged views of the construction works throughout the construction period. Overall, for those properties immediately adjacent to the alignment, the designation of the Drury South segment of NoR 2 will likely result in moderate – high temporary effects on visual amenity due to limited screening. Views from public locations will likely be restricted to motorists travelling along Great South Road, Burtt Road and Runciman Road. From these locations, the proposed works will be seen within a transient context. For properties within the localised and wider setting, and from public viewpoints, this segment of NoR 2 will likely result in low effects on visual amenity.

Operational Effects

Through rurally zoned land, the South Drury Connection segment will permanently change the character of that landscape. It will introduce a road into this location which has established rural and rural residential land use and landscape patterns, however its alignment is proximate to the area identified as FUZ. Where the South Drury Connection segment spans through the FUZ, the existing environment will change to that of an urbanised environment through the provision of the MHS zone. There will be considerable landform modification required, however, this can be mitigated through the recommendations outlined within Section 11.10.6. Overall, any landscape character effects associated with this segment of NoR 2 are low – moderate, post implementation of mitigation measures.

The alignment spans close to rural properties predominantly accessed off Great South Road, Runciman Road and Burtt Road, resulting in moderate – high visual amenity effects, reducing to low – moderate given the proximity to urban areas and implementation of mitigation measures discussed in 11.10.6. Where the alignment spans through the southern part of the FUZ land, the South Drury Connection will be seen in the context of this emerging urban environment and also the existing overhead transmission lines. There are a number of properties (between Runciman Road and Burtt Road) which will have visibility of the proposal, albeit with partial screening within the intervening landscape. Potential visual effects from these locations are assessed to be moderate reducing to low with the implementation of the mitigation.

SH22 Connection Segment

This section of NoR 2 will introduce an urban arterial road into this location and permanently change the character of this landscape which has existing rural characteristics.

Construction Effects

The SH22 Connection segment of NoR 2 will result in low- moderate temporary effects on the rural landscape character during construction. It is anticipated that substantial earthworks will be required to make-up levels to establish a bridge / crossing to span both Oira Creek and the NIMT rail line. The bridge proposed to span Oira Creek will assist in retaining the natural alignment and pattern of the stream (and its enclosing floodplain) will remain. It is anticipated that the alignment will result in low temporary effects on the streetscape character of Sim Road during construction. As Sim Road is existing, it is anticipated that only minimal earthworks will be required to implement the designation.

The SH22 Connection segment of NoR 2 will likely result in low – moderate temporary effects on visual amenity on local properties which are proposed to be retained. When considering views from public viewpoints, the designation will likely result in low effects on visual amenity. For properties along Sim Road, it is anticipated that front-of-lot boundary planting may be removed to facilitate the road widening works, with views of the proposed construction works and activities being directly afforded. Where visible, the upgrade of Sim Road will be seen within the context of an existing road corridor, however in contrast, the southern part of the alignment will introduce new infrastructure (roading, bridge and associated earthworks) into the rural environment.

Operational Effects

The new arterial road follows logical alignment of the topography and includes bridges across the streams and NIMT route which ensures the natural alignment and patterns are not affected and reduces potential adverse effects. SH22 Connection also upgrades the existing Sim Road which limits the introduction of new roading in this environment. Overall, the landscape character effects are assessed to be low .

The alignment spans through properties predominantly accessed off Sim Road and Karaka Road which will remain in the rural environment. There are also houses set back from the alignment (accessed from Sim Road and Karaka Road) which will afford views. However, some views are partially screened by topography and vegetation in the intervening landscape. From public locations such as motorists travelling along Sim Road and SH22 and users of the NIMT rail line the proposal will be seen within a transient context. With mitigation measures (discussed in 11.10.6) any visual effects will be low. There will also be improved visual amenity and user experience associated with the streetscape design, street trees, berm planting and active modes enabled along the route.

Drury – Paerata Link Segment

The Drury – Paerata Link segment of NoR 2 is a new road within the rural environment, connecting the two FUZ areas north in Drury and south in Paerata. The alignment connects between Burtt Road and Sim Road (south).

Construction Effects

The temporary effects on landscape character resulting from the construction of Drury – Paerata Link Segment are anticipated to be moderate. The northern section of the Drury-Paerata Link is located on gently rolling topography, and it is anticipated that earthworks will be limited to implement the corridor. In contrast, the central and southern sections of the alignment is located on more undulating landform, and it is anticipated that more significant cut / fill works will be required to implement the designation. Effects will be localised, with the broader topographic pattern remaining unchanged (beyond the designation boundary). The alignment of the Drury-Paerata Link segment of NoR 2 again

broadly follows overhead transmission lines to the north and the alignment of the NIMT rail line to the south. Whilst the alignment includes a new road within the rural environment, its alignment is consistent with existing patterns of infrastructure within the landscape fabric.

Rural residential properties and farmsteads along the alignment generally have open boundaries, with occasional sporadic and sparse planting. For properties adjacent to the alignment, the proposed construction works and activities will be visible with direct and prolonged views of the construction works screened by intermittent planting, resulting in moderate-high temporary effects on visual amenity. It is anticipated temporary effects on visual amenity from properties within the wider setting, and from public viewpoints will be low.

Operational Effects

This section of NoR 2 again will introduce a new road into this location and permanently change the landscape character which aligns generally adjacent to the NIMT rail line. It is anticipated that the proposal will integrate into the surrounding landscape through the cut / fill proposed response and as it spans a bridge over the Oira Creek which retains its natural alignment. This landscape has existing rural characteristics. The effects on landscape character from the Drury – Paerata Link Segment are assessed to be low – moderate,

The properties predominantly accessed off Sim Road (south) will afford views of the alignment however; some views are partially screened by topography and vegetation. Overall, the adverse visual effects from the properties adjacent to the alignment will be moderate, reducing to low with the mitigation measures implemented including screening planting, minimising earthworks, integrating into the surrounding topography and the design of the streetscape.

Paerata Arterial Segment

The Paerata Arterial segment of NoR 2 is for the upgrade of part of Sim Road (south) and Cape Hill Road, and a new road within the future FUZ.

Construction Effects

The effects on landscape character resulting from the construction of Paerata Arterial Segment are anticipated to be moderate and temporary. The northern part of this alignment is for the upgrade of three existing roads. The upgrade will be focussed along the western side of the corridors, where topography is generally more consistent with the existing road level and offset from rural residential properties (which are generally located on the eastern side of the road). It is anticipated that the new road alignment in the southern part of the designation will require earthworks to make-up levels on the descent from the northern edge of the Pukekohe North tuff ring to tie-in to NoR 4 Pukekohe Northeast Arterial.

Rural residential properties and farmsteads along the alignment generally have open boundaries / frontages with the existing road corridor, with the exception of more regular screening / hedgerow planting along the central parts of Sim Road. For properties adjacent to the alignment the proposed construction works and activities will be visible with direct and prolonged views of the construction works, resulting in moderate-high temporary effects on visual amenity. Views from public locations will likely be restricted to motorists travelling along the road corridors to be upgraded as part of the alignment works. From these locations, the proposed works will be seen within a transient context, resulting in low-moderate effects on visual amenity.

Operational Effects

The Paerata Arterial Segment will change the character of the area and the composition of the existing road. When considering the alignment proximate to the identified FUZ land, the Paerata Arterial will form part of that emerging urban environment. Along its eastern side there are minimal cut and fill requirements which minimises disturbance to the existing topography. Where vegetation is to be removed along the alignment (especially proximate to the SEA although noting the alignment has avoided the extent of SEA through alternatives assessment and concept design) this should be offset by additional planting in this area. Overall, the proposed designation will result in low-moderate adverse effects on landscape character, reducing to low with the implementation of the mitigation measures.

The alignment presents new sections of roading but also the upgrade of roads which are predominantly located upon ridgelines. As such these roads will have high visibility from both the localised context and from adjacent properties. From within the visual catchment to the east there are a number of existing rural residential properties. Views from these locations will be partially restricted by intervening existing vegetation and topography. This project will form an anticipated element of the landscape in the context of the emerging urban environment in relation to the FUZ. The visual amenity effects are therefore, anticipated to be low. The new sections of road will provide for viewing opportunities of the Te Māunu a Tūmatauenga pā, to the east of the designation, resulting in positive visual amenity effects, especially considering the addition of active transport modes This pā sits upon a natural bluff and landform and is identified as an ONL within the AUP:OP.

NoR 2 – Overall Effects

Overall, the anticipated effects for the construction of NoR 2 on **Landscape Character** will be **low** to **moderate**, and **low** to **moderate-high** on **visual amenity**.

Overall, the anticipated effects for the operation of NoR 2 on **landscape character** will be **low-moderate**, and **low** to **low-moderate** on **visual amenity**. There will also be positive effects related to the provision of mode share.

11.9.4.3 NoR 3 – Paerata Connections

Construction Effects

The effects on landscape character resulting from the construction of NoR 3 are anticipated to be low. The alignment does not cross stream or catchments, there is a minimal level of vegetation removal and the cut / fill earthworks formation is consistent with roading and agricultural land uses. Existing roading and rail infrastructure is a notable component of the rural environment within the setting of the designation. The designation will introduce an additional roading corridor into the landscape, however it will not be out of place or inconsistent with the existing landscape character of the area.

The alignment of NoR 3 is not located immediately proximate to any existing properties. Views from rural residential properties will likely have distant views of the construction, partially screened by the wider vegetation pattern, resulting in low – moderate temporary effects for properties immediately adjacent to the alignment. Views from public locations will likely be restricted to motorists travelling along Sim Road and users of the NIMT rail line, resulting in low temporary effects anticipated for properties within the wider setting and from public viewpoints.

Operational Effects

NoR 3 will provide an element into the FUZ which is consistent with the emerging urban environment anticipated through the FUZ. As such, any adverse effects on landscape character are assessed to be very low.

It is anticipated that visual effects for the operation of Paerata Connections will be low. This is based upon the design working with and integrating into the surrounding topography (including the raised topography and batters for bridge over the NIMT) and improved visual amenity and user experience associated with the streetscape design, street trees, berm planting and active modes enabled along the route.

11.9.4.4 NoR 4 – Pukekohe North-East Arterial

NoR 4 is proposes a new transport corridor through land zoned FUZ, Business – General Industrial, and MHU. It then extends through Rural – Mixed Rural zoned land extending across to proximate with Grace James Road before spanning through another area of FUZ land to the south linking through to Pukekohe East Road.

Construction Effects

The effects on landscape character resulting from the construction of NoR 4 are anticipated to be moderate – high. The construction requires the removal of limited amounts of vegetation (notably along the Whangapouri Creek corridor) and substantial earthworks due to topography. The concept design of the alignment includes bridges spanning across Whangapouri Creek and catchments, which will assist in ensuring the natural alignments and patterns of these hydrological features remain.

The temporary visual amenity effects of resulting from the construction of NoR 4 are anticipated to be Moderate to Moderate-High. For those properties immediately adjacent to the alignment located to the north and east of Grace James Road, NoR 4 will likely result in up to moderate-high temporary effects on visual amenity. This is due to the open nature of the views and the potential landform modification required and the potential direct and prolonged views of the construction works will be likely during the construction period (resulting from the potential curtilage being removed to facilitate the works). Properties in the wider rural residential setting within both the rural and FUZ zoned land likely have views of the alignment and construction activity (including landform modification), partly contained by the existing vegetation pattern within the rural environment and existing planting within the curtilage. Views from public locations will likely be restricted to motorists travelling along road corridors.

Operational Effects

The FUZ land will experience a change to that of an urbanised environment through the provision of these future urban zones identified through the Pukekohe-Paerata Structure Plan. The project will add another ‘urban element’ to that environment and future land. Where NoR 4 spans through the land which is to remain as Rural – Mixed Rural zone, the project will permanently change the character of that landscape through the addition of an urban arterial road. The design includes bridges across the NIMT railway line, a number of streams and areas of established vegetation. To a certain degree the alignment does follow the underlying topography by following along areas of higher topography / spurs, however it does drop into and across a number of catchments. In relation to landscape character, for the reasons outlined above adverse effects are assessed to be very low within the areas zoned as FUZ, but moderate within the rural zoned landscape.

Where the project spans through the rural environment it will be visible from a greater visual catchment of properties (including from public open spaces such as the elevated Glens Hill Reserve). From a number of these properties, they will be distant views to NoR 4 across spurs, catchments and existing areas of vegetation, resulting in moderate – high adverse visual amenity effects, reducing to moderate over time as vegetation becomes established. To the south of NoR 4 (where it extends through the rural environment) is Grace James Road where existing development (Residential – Single House zone within the AUP:OP) forms the existing 'suburban edge' to Pukekohe. The elevated properties in this location overlook the rural environment to the North, part of which is identified as FUZ under the AUP:OP within the RUB. As such, over time these properties (between Grace James Road and the project) will change into an urban character. Any adverse effects from the existing development on these properties is anticipated to be low.

11.9.4.5 NoR 5 – Pukekohe South-East Arterial

The alignment of the designation for NoR 5 provides upgrades to existing roads along Pukekohe East Road and Golding Road, and a new connection between Golding Road and Svendsen Road (to the west). Along the alignment, NoR 5 for the majority is located in FUZ land

Construction Effects

The construction works will be visible from rural residential properties along the alignment, with partial screening provided by existing vegetation, resulting in anticipated high temporary effects on visual amenity. Properties in the wider rural residential setting within both the rural and FUZ zoned land (including north and east of Grace James Road) likely have views of the alignment and construction activity, partly contained by the existing vegetation, resulting in anticipated moderate visual amenity effects for those properties within the wider setting, and from public viewpoints.The effects on landscape character resulting from the construction of NoR 5 are anticipated to be low- moderate. The upgrade of Pukekohe East Road and Golding Road will require the removal of limited sections of lot boundary planting along the existing road corridor where the proposed designation encroaches into adjacent properties. The level of effects is reduced as the construction of NoR 5 will require limited earthworks considering the integration with existing topography will also be required and no stream or catchments crossings. As the alignment is for the upgrade of existing roads and a new road within the rural environment (within the FUZ), roading and rail infrastructure are anticipated components within the setting of the proposed designation and the eastern urban fringe of Pukekohe. NoR 5 is also within the Light Industry Zone, with effects on a number of commercial properties (including the refuse and recycling transfer station). The designation will not introduce new or uncharacteristic features into the environment.

NoR 5 will have moderate – high visual amenity effects for a number of urban and rural residential properties immediately adjacent to the alignment. Anticipated temporary visual amenity effects within the wider setting, and from public viewpoints are anticipated to be low – moderate properties.

Operational Effects

Urban development is anticipated within this area therefore, any adverse effects on landscape character related to the operational effects are therefore assessed to be very low. At the south-western extent the projects bridges Station Road and the NIMT and connects to Svendsen Road in the Business – Light Industry Zone. The alignment and structures will be expected features within this environment. The visual context of the FUZ is anticipated to change to that of an urbanised environment, therefore, the anticipated visual effects for the operation of NoR 5 will be low.

The operational visual amenity effects resulting from NoR 5 are anticipated to be low. This is based upon the design working with and integrating into the surrounding topography (including the raised topography and batters for bridge over the NIMT) and improved visual amenity and user experience (positive effects) associated with the streetscape design, street trees, berm planting and active modes enabled along the route. Additionally, the visual context of the FUZ will change over time to that of an urbanised environment.

11.9.4.6 NoR 6 – Pukekohe South-West Upgrade

NoR 6 provides a partial upgrade to the existing road network along Nelson Street West, Ward Street, Puni Road, West Street and Helvetia Road within the existing Pukekohe urban environment.

Construction Effects

The landscape character effects resulting from the construction of NoR 6 are anticipated to be very low. During the construction phase, there will be a change to these intersections as the roads are to be widened at these locations. This will mean the removal of small areas of vegetation (street trees and boundary planting) and fences along these streets. Although the removal of these elements and the introduction of additional roading elements, the designations will not be out of place or inconsistent with the existing landscape character of the area.

Works of this nature occur in the existing urban area, are temporary and there are a number of elements along the street and within private property that will provide partial screening. It is anticipated any potential effects are low.

Operational Effects

Although there will be an upgrade to the existing roads and modification / additional elements implemented, there will only be a limited change to the character of the area. As such, any adverse effects on landscape character and visual amenity are assessed to be very low.

11.9.4.7 NoR 7 – Pukekohe North-West Arterial

NoR 7 provides an upgrade to part of Helvetia Road (in the south) and Butcher Road (in the north). Between these locations new roading is proposed largely parallel with the NIMT. The location of NoR 7 is entirely through FUZ land.

Construction Effects

The effects on landscape character resulting from the construction of NoR 7 are anticipated to be low. Butcher Road will likely require minimal earthworks, whereas the upgrade of Helvetia Road will likely require fill works to make-up levels to enable the width expansion. The designation will introduce an additional roading corridor into the rural environment (zoned FUZ), however it will not be out of place or inconsistent with the existing landscape character of the area.

In terms of visual amenity, the construction works will be visible from rural residential properties along the alignment. Removal of planting surrounding the curtilage is anticipated to facilitate the works, or there may be no vegetation within the curtilage; where this occurs, direct and prolonged views of the construction works will likely be available throughout the construction period. The effects on properties immediately adjacent to the alignment are anticipated to be low – moderate visual amenity effects for those properties immediately adjacent to the alignment. Views from public locations will likely be restricted to motorists travelling along road corridors and users of the NIMT rail line where it

is proximate to the alignment, resulting in low visual amenity effects for those properties within the wider setting, and from public viewpoints.

Operational Effects

Urban development is anticipated within this area and adverse effects on landscape character related to the operational effects are therefore assessed to be low. The alignment will likely require the limited removal of existing vegetation along existing road corridors and generally is integrated with the underlying topography. Furthermore, the underlying landform of the rural environment proximate to NoR7 is gently undulating, resulting in reduced earthworks (mostly fill). The alignment of NoR 7 anticipates the construction of three roundabouts. Due to the gently undulating landform of the area, the construction of these features is anticipated to require only minimal earthworks. The alignment is for the upgrade of existing road corridors and a new road within the rural environment (zoned FUZ). Roading infrastructure is a notable component of the rural environment and urban fringe of Pukekohe.

The temporary visual amenity effects are anticipated to be in low-moderate. In relation to the visual context in this FUZ area, it will change to that of an urbanised environment. Rural residential properties along the alignment generally include established planting within the curtilage, some of which is proximate to the respective houses and will provide partial screening of the proposed construction works. Views from rural residential properties within the wider setting will likely be partially visually contained by the existing vegetation pattern (which includes shelterbelt rows, lot boundary and groupings of trees). Views from public locations will likely be restricted to motorists travelling road corridors and users of the NIMT rail line.

11.9.4.8 NoR 8 – Mill Road and Pukekohe East Road Upgrade

NoR 8 provides for the widening of Mill Road and upgrade of the existing Pukekohe East Road. It extends predominantly through the existing rural environment, with only a small section of FUZ at the western extent of the NoR.

Construction Effects

The effects on landscape character resulting from the construction of NoR 8 are anticipated to be moderate. This is a result of the removal of vegetation, generally limited to roadside planting, lot boundary planting, and parts of some groups of trees. The proposed designation will also extend into the location of the identified Pukekohe East tuff ring (ONF) requiring both cut and fill within this location. Albeit, on the southern side of the existing road only. Earthworks are required due to existing topography.

The visual amenity effects are anticipated to be low-moderate. Where existing planting along the lot boundary / road edge is removed to facilitate the works, rural and commercial properties along Mill Road and Pukekohe East Road will have direct and prolonged views of the construction works, resulting in low – moderate visual amenity effects for those properties immediately adjacent to the alignment. Views from rural residential properties within the wider setting will likely be largely visually contained by the existing vegetation pattern, resulting in low visual amenity effects for those properties within the wider setting, and from public viewpoints.

Operational Effects

The proposed designation extends into the location of the identified Pukekohe East tuff ring which is a ONF in the AUP:OP as the overlay is located on the existing road. The project will require both cut

and fill within this location. Through options assessment and design, the active mode path has been located on the southern side of the existing road to reduce impacts on the tuff ring. A number of catchments within the designation will be affected by its alignment through the potential extent of cut / fill required. This will modify these features and change their character. The alignment encroaches into properties adjacent to the road along its full alignment. The mitigation measures proposed are to provide additional planting along the road alignment which will enhance amenity of the corridor. When taking these factors into account, adverse effects on landscape character are assessed to be low – moderate.

The majority of the NoR 8 follows along elevated topography including localised ridges / spurs, the southern edge of the Pukekohe East Tuff Ring and broader landscape patterns. As such, the alignment of the designation has a potentially large visual catchment. Consequently, there are likely to be a range of visual effects on public and private viewing locations and audiences relative to the proximity to the NoR. For existing properties located along the alignment adverse effects are assessed to be low – moderate due to the proximity of the upgraded road and modification to the landscape, these effects reduce to low where sites are setback from the road reserve. Overall, any potential adverse visual amenity effects on private properties are assessed to be low (post mitigation described in section 11.10.6).

11.9.5 Recommended measures to avoid, remedy or mitigate potential construction adverse effects

The recommended measures to avoid, remedy or mitigate construction effects are outlined below, and relate to all NoRs. These measures are included in the ULDMP and CEMP (where noted) proposed as conditions on all transport projects:

- Site compounds, construction yards, the storage of construction machinery and locations of any overburden areas should be located in visually discrete locations. Screening of these elements should occur during the construction period (included in the CEMP condition).
- Where possible during detailed design, the alignment of the corridor should minimise effects on streams and the extent of earthworks and vegetation removal. In particular of mature and native vegetation.
- Where possible, the balance of fill earthworks should be sourced from cut earthworks along the alignment.

A ULDMP is recommended as a condition on all transport projects to mitigate operational effects of the Pukekohe Transport Network. The proposed ULDMP condition incorporates the below measures to avoid, remedy or mitigate operational effects:

Bridges and structures:

- To be designed to visually integrate with the localised context and to minimise any potential adverse effects on landscape character and visual amenity in both the rural environment and also within the emerging urban context.
- Bridges should be designed to contribute to local identity, demonstrating a sense of place. This relates to bridges and structures located within both rural and urban environments which demonstrate the character and appropriate scale within that context. Their design should also be tailored to integrate with landscape features and attributes such as topography and vegetation and celebrate localised context (such as gateways etc) and associative values of the landscape.

- Engagement with Manawhenua should be undertaken with the use of preferred Māori design principles. Where appropriate, bridges and structures should be designed as features within the landscape and create a threshold experience for users as they transition between urban and rural areas.
- Avoiding noise barriers where possible. If these are to be included, they should be designed to integrate into the localised environment to avoid visual prominence and adverse effects.

Integration with surrounding context:

- Designed to integrate into the adjacent urban (including proposed urban) and landscape context. This relates to topography, the urban environment (responding to density and land uses), landscape character, and any open spaces zones (including those anticipated within the FUZ).

Walking and cycling connectivity:

- Investigate opportunities to integrate with existing and future open space along the proposed designation and within the FUZ areas. This will ensure stronger connections and active mode share across a wider catchment. Footpath and cycleway connections should be designed in a manner which contributes to the local identity and urban amenity of the landscape, and aligned with Manawhenua preferred design principles. Designs should also look to enhance any landscape and ecological corridors (designed in conjunction with topography and planting – outlined below).

Stormwater wetlands:

- Configure stormwater wetlands to a naturalised appearance (avoiding a purely engineered design / form), conforming and integrating with the adjacent landform and future urban context. Provide planting of appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function.

Permanent earthworks:

- Integrate cut and fill slopes with the surrounding context
- Shape fill slopes to a naturalised profile and integrate into the surrounding natural landform.
- Modified slopes are to be a suitable gradient to allow terrestrial and riparian planting to be established.
- Where it is anticipated that a bridge is required to span a vegetated gully or stream catchment, a construction methodology should be prepared to minimise vegetation loss within the corridor. Any vegetation removed should be offset through future planting works.

Private properties:

- Reinstate driveways, accessways, private fences and garden plantings for existing remaining properties affected by works within the proposed designations.

Planting design details:

- Landscape design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:
    - Retains existing vegetation where possible
    - Provide street trees along the full length of each of the NoR designations in conjunction with shrubs and ground cover species. This will enhance streetscape amenity. The species selected should be appropriate for use within stormwater treatment areas and berms. Species and tree

stature should be selected to correspond with adjacent land uses and to provide ecological enhancement, in accordance with the nine key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy
  - Reinstatement planting within private property boundaries
  - Treatment of fill slopes and residual land to integrate with adjacent land use patterns (in relation to visual and biophysical aspects)
  - Stormwater wetland design and planting
  - Integration of Manawhenua preferred design principles in relation to planting, structures and hard landscape elements
  - Site preparation, implementation and maintenance requirements for all planting typologies.
  - Planting to be designed to provide an extension of, and be contiguous with, existing established vegetation patterns.

In the Waikato NoR 8, the Landscape Management Plan is to provide details of:

- Landscape treatments which reflect cultural values and heritage landforms, and integrate with the surrounding topography, natural environment, and landscape character.
- Landscape treatments which support road safety, consider visual and acoustic amenity for adjacent residential dwellings, and integrate biodiversity and ecology, and stormwater management.
- Planting zones and layouts.
- Site preparation, subsoil and topsoil and mulch treatments.
- Plant sourcing and planting, including hydrodressing and grassing, and use of eco-sourced species.
- Pest plant and animal management (to support plant establishment).Landscape and visual outcomes for NoR 8 (WDC) will also integrate with NoR (AC) as the LMP is required to be appropriately aligned with the ULDMP of NoR 8 (AC).

The proposed mitigation measures should, where practicable, be integrated with revegetation requirements of future resource consent processes.

11.9.6 Conclusions

The LVA finds that the scale and components of the proposed Pukekohe Transport Network are appropriate and are able to be integrated into the landscape.

A high proportion of the areas where the designations are proposed form part of emerging urban environments identified through the AUP:OP FUZ and respective structure planning processes. This will substantially change the character of development in the area from rural to urban. The Pukekohe Transport Network will form visually integrated elements within these locations. They will be consistent with the anticipated urban landscape character and will be supported by the mitigation measures proposed which are to be implemented through a ULDMP or Landscape Management Plan proposed as a condition on each of the NoRs.

Where the designations are located in the rural zone, the Pukekohe Transport Network will change the character of the landscape. However, the mitigation measures are appropriate and adequate to remedy any potential adverse effects arising from the Project.

11.10 Historic Heritage and Archaeology

The Assessment of Historic Heritage Report is provided in Appendix G, Volume 4. The report considers the actual and potential effects associated with the construction, operation, and maintenance of the Pukekohe Transport Network on the existing and likely future environment as it relates to archaeology and heritage effects and recommends measures that may be implemented to avoid, remedy and/or mitigate these effects.

11.10.1 Construction Effects

11.10.1.1 Construction Effects relating to all NoRs

Unrecorded archaeological and historic heritage sites may be present within the proposed designation boundaries, in particular near the banks of waterways such as the Ngaakoroa and Oira Streams. Should previously unrecorded sites exist, they could be impacted by the disturbance or removal of subsurface features and deposits at the construction phase of the Pukekohe Transport Network. Buildings within the designation boundaries will need to be removed and could be relocated and are subject to a HNZPTA if they are pre-1900, however, no buildings which qualify as definite pre-1900 heritage have been recorded.

Mitigation is further discussed in Section 11.11.2.

11.10.1.2 NoR Specific Construction Effects

NoR 4

Two possible pre-1900 villas are located in the proposed designation boundary of NoR 4 at 1201 Paerata Road at 87 Pukekohe East Road. The date of construction of the villas have not been confirmed and detailed archival and buildings research should be undertaken at the design and construction phase of the project to outline the buildings' history. It is recommended that an HHMP (discussed in Section 11.11.2) is prepared for NoR 4 to address these potential pre-1900 villas, specifically, as a precautionary measure.

NoR 6

Nehru Hall is scheduled as a Category B Historic Heritage Place (# 2235) in the AUP at 59 Ward Street (on the corner of Puni Road). NoR 6 extends into the scheduled extent of place, and immediately abuts the hall building. Most of the designation here will be used for temporary construction but earthworks, including batters, berms and sidewalks will extend into the extent of place. While there will be no direct effects on the building, there will be a contraction of the extent of place and this will have minor effects on its setting and context. This includes the location of the brick gateway, which is built from the same bricks as the hall and is assumed to date to the time of the halls' construction in 1953. This will result in the removal of the gateway.

A Historic Heritage Management Plan (HHMP) is recommended to avoid and mitigate potential effects on the Nehru Hal. Refer to Section 11.11.2.6.

NoR 8

R12/1208 – Bombay Flour Mill (or Pilgrim's Mill) is a recorded historic heritage site adjacent to NoR 8. It is likely the building is south of the designation, but associated features are within the designation.

There are no remains visible on the surface. While the site has been demolished and the structure itself appears to be just outside the proposed designation, it is possible that sub surface remains associated with the mill operation exist which could be unearthed during construction.

All other previously recorded heritage places in the project area are not located in proximity to the proposed designations or have been avoided through options assessment process. The two significant sites avoided are:

- Pukekohe East Church, R12/741, and
- Te Māunu a Tūmatauenga pā, R12/1170.

An HHMP is recommended to avoid and mitigate potential effects on the Bombay Flour Mill. Refer to Section 11.11.2

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

NoR 4 / 6 / 8

An HHMP is proposed as a condition on NoR 4, 6 and 8. This is proposed to manage potential adverse effects on the following sites:

- 1201 Paerata Road and 87 Pukekohe East Road (NoR 4),
- Nehru Hall (NoR 6) and
- Bombay Flour Mill (NoR 8).

The HHMP is limited to the identification of heritage protected under the District Plan, as heritage protected under Regional Plan provisions will be addressed as part of a future resource consent process. The HHMP will:

- Set out the methods for the identification and assessment of historic heritage within the designation to inform detailed design
- Identify the known and potential historic heritage sites within the designation
- Set out the HNZPTA authority requirements for any pre-1900 sites identified for an authority.
- Set out any unrecorded archaeological sites or post-1900 heritage sites within the designation. Set out the methods to avoid or manage effects on historic heritage.
- Set out methods to increase public awareness and interpretation signage

All other NoRs (1 / 2 / 3 / 5/ 7)

No buildings which qualify as definite pre-1900 heritage has been recorded. Therefore, it is recommended that further research and survey should be undertaken to support applications for HNZPTA authority before construction commences. Damage or destruction of any previously unrecorded archaeological sites that are exposed during the works can be mitigated under the provisions of the authority, and the means of mitigation detailed in an Archaeological Management Plan prepared for the HNZPTA authority application.

11.10.3 Operational Effects

There are no operational effects to either known or unknown historic heritage deposits. As there are no operational effects, no mitigation is required.

11.10.4 Conclusions

There are only two recorded heritage sites relevant to the proposed designation boundary of NoR 6 and NoR 8. This includes Nehru Hall (Category B Historic Heritage Place (# 2235)) (and Bombay Flour Mill (or Pilgrim's Mill) (R12/1208), respectively

NoR 6 extends into the scheduled extent of place, and immediately abuts the hall building. Most of the designation here will be used for temporary construction, and while there will be no direct effects on the building, there will be a contraction of the extent of place and this will have minor effects on its setting and context. Mitigation is provided in the form of an HHMP, previously discussed.

It is likely that the mill building is outside the designation, but features associated with it probably extend into the designation, of NoR 8. Mitigation is provided in the form of an HHMP, previously discussed.

All other previously recorded heritage places in the project area are not located in proximity to the proposed designations or have been avoided through options assessment process.

It is appropriate to obtain an archaeological authority from HNZPT to construct the roads.

11.11 Arboricultural Effects

The Assessment of Arboricultural Effects included in Appendix H, Volume 4 provides an assessment of the actual and potential effects of the future construction and operation of the Pukekohe Transport Network on existing trees protected under the district plan provisions (for both the Auckland Council and Waikato District Council) and recommends ways of managing these effects.

11.11.1 Positive Effects

The NoRs for the Pukekohe Transport Network are designed with cross sections that include sufficient space for a formal berm on both sides of the transport corridor. This will allow for the planting of new trees in an environment conducive to good tree growth and enhance the emerging urban landscape where the projects are located in the FUZ.

The widening of Pukekohe East Road and Mill Road (NoR 8) will provide an opportunity to introduce new trees, where the number of trees is currently limited. The overall tree quality and canopy cover will be improved though the implementation of NoR 8, where the current quality of trees is poor and sporadic.

11.11.2 Construction Effects

11.11.2.1 Construction Effects Relating to all NoRs

Removal of trees is required to enable construction of the Pukekohe Transport Network. Under the AUP:OP rules, the majority of trees that are potentially affected by the road network construction and upgrade are not protected by District Plan provisions but are considered as a regional consenting matter. For those trees that are protected by the District Plan provisions, the loss of those trees and tree canopy cover removes the benefits and ecosystem services that those trees provide and has the potential to result in adverse amenity and ecological effects on the surrounding environment. Tree loss can be remediated if adequate space and resources are provided for planting and establishment of large specimen trees within the road reserve created alongside the transport corridors. Works near

trees may require works within the protected root zone or trimming of trees. These works have the potential to affect the health of trees where tree protection methodologies are not followed. A full tree schedule of specific trees affected by each corridor is provided in Appendix B of the Assessment of Arboricultural Effects in Volume 4, Appendix H.

Trees adjacent to the construction corridors could be harmed by movement of construction vehicles and machinery during construction and upgrading of the roading network. Physical damage to the trees or alteration to their growing environment could cause adverse effects on the health and safety of the trees unless they are adequately protected during the work. The magnitude of effects may be minimised if the design of the road adequately allows for retention of mature specimen trees that are able to be accommodated adjacent to the road, subject to detailed assessment and tree management procedures at the time of design and construction.

The arboriculture effects of the projects on those trees that are protected by Regional Plan provisions will be assessed during resource consent applications in the future prior to construction.

11.11.2.2 NoR Specific Construction Effects

NoR 5

The construction of Pukekohe South-East Arterial (NoR 5) may affect two groups of trees that are protected under the AUP:OP district planning provisions as outlined below. Two identified groups of trees that contain native trees that are growing between the footpath and the private property boundaries on the northern side of Pukekohe East Road (in the existing urban area). These two tree groups are protected trees according to District Plan provisions of the AUP:OP. The root zones of these trees are within the designation boundary.

- Tree groups 5/41: The mature puriri (*Vitex lucens*) and totara (*Podocarpus totara)*
- Tree group 5/42: early-mature pohutukawa (*Metrosideros* exclesa) have root zones that are within the proposed designation boundary

As the widening of Pukekohe East Road for an active mode upgrade extends the southern side of the road, it can be anticipated that there will be no change to the kerb and footpath on the northern side. The potential for effects on these trees is therefore limited and actual effects are likely to be nil if the construction works are carried out according to standard tree protection protocols. A tree Management Plan is included as a condition on the proposed designation discussed further in Section 11.12.3. Tree protection protocols will be developed under the Tree Management Plan.

One notable tree is present on the AUP planning maps within the extent of this designation. This is listed in Schedule 10 – Notable Trees Schedule of the AUP as: ID 2732 – Monterey pine, at 3 Pukekohe East Road. This tree no longer exists on the property.

NoR 8 – AUP:OP Trees Protected by District Plan Provisions

The construction of NoR 8 may affect fourteen groups of trees that are protected under the AUP:OP district planning provisions as outlined below. The tree groups growing within or adjacent to the designation boundary for NoR 8 are protected under the AUP:OP District Plan provisions where they are within the Pukekohe East Tuff Crater Outstanding Natural Feature (ONF) overlay or are listed as notable trees in Schedule 10. These are listed below. The upgrade and construction of Pukekohe East Road and Mill Road (NoR 8) will result in loss of trees and potential effects on remaining trees within the ONF overlay. The proposed upgrade of Pukekohe East Road is for active mode facilities on

the southern side of the existing road. Therefore, it is assumed that trees on the northern side of the road can be retained and protected through protocols set out in a tree management plan.

Within the Outstanding Natural Feature (ONF) overlay

- Tree group 8/9 – containing pine, redwood and totara growing in the front of 131 Pukekohe East Road, within the ONF overlay. The magnitude of effects may be minimised if design and construction of the road allows for retention of mature specimen trees that are able to be accommodated adjacent to the new upgraded road, subject to detailed assessment and tree management procedures at the time of design and construction.
- Tree group 8/10 – containing Banksia, Grevillea, Liquidambar and Liriodendron are exotic specimen trees growing in the front of 131 Pukekohe East Road, within the ONF overlay.
- Tree group 8/13 – containing redwoods growing along the frontage of 133 Pukekohe East Road, within the ONF overlay. As the widening of Pukekohe East Road extends to the southern side of the road, it is anticipated that there will be little or nil change to the root zone of these trees, the potential for effects on these trees is therefore limited and actual effects are likely to be nil if the construction works are carried out according to standard tree protection protocols
- Tree group 8/15 – Lawson cypress and English oak at 197A Pukekohe East Road, within the ONF overlay
- Tree group 8/52 – containing brush cherry and feijoa at 220 Pukekohe East Road, within the ONF overlay. The removal of these trees will be required for the widening of Pukekohe East Road.
- Tree group 8/53 – containing four London planes flanking the driveway at 218A Pukekohe East Road, within the ONF overlay. The two northernmost trees are likely to be affected by road widening works, as they are positioned very close to the designation boundary. Removal of two of the many London plane trees will not significantly reduce the amenity values that the trees provide in this setting.
- Tree group 8/54 – containing puka, tarata and kohuhu at 216 Pukekohe East Road, within the ONF overlay. The removal of these trees will be required for the widening of Pukekohe East Road.
- Tree group 8/55 – containing Japanese cedar shelterbelt at 216 Pukekohe East Road, within the ONF overlay. The removal of these trees will be required for the widening of Pukekohe East Road.
- Tree group 8/56 – Photinia at 200 Pukekohe East Road, with the ONF overlay
- Tree group 8/57 – containing Italian cypress, palms at 200 Pukekohe East Road, within the ONF overlay. The removal of these trees will be required for widening for Pukekohe East Road.
- Tree group 8/58 – camellia and tarata at 196 Pukekohe East Road, within the ONF overlay. The removal of the smaller trees does not raise any significant concerns from an arboricultural perspective, provided that replanting occurs upon completion of construction.
- Tree group 8/59 – Melia and kohuhu at 196 Pukekohe East Road, within the ONF overlay. The removal of the smaller trees does not raise any significant concerns from an arboricultural perspective, provided that replanting occurs upon completion of construction
- Tree group 8/60 – titoki, puka, pohutukawa, tarata, kohuhu and puriri at 190 Pukekohe East Road, within the ONF overlay. The removal of these trees are likely required for the widening of Pukekohe East Road.

Those trees on the Northern side (tree groups 8/9, 8/10, 8/13 and 8/15) are likely to be unaffected during works. However, as a precaution subject to implementation of standard tree protection measures specified as part of a Tree Management Plan (included as a condition on the proposed designation) at the time of construction. The loss of the remaining tree groups (listed above) and the

benefits each provide can be mitigated by replanting within the road reserve upon completion of the road building. This is further discussed in Section 11.12.3

Listed in Schedule 10 – Notable Tree Schedule

- Tree 8/22 – scheduled English oak, being listed as a notable tree at 60 Morgan Road, Pukekohe and tree group 8/23 – scheduled three Norfolk Island pine trees, being listed as notable trees at 60 Morgan Road, Pukekohe.
- Tree group 8/23 contains three Norfolk Island pine trees at 60 Morgan Road. The schedule lists just two notable trees, so it is unclear which of the three Norfolk Island pine trees is the scheduled item as all have similar characteristics and proportions.

These scheduled notable trees are located outside of the proposed designation but have root zones that extend over the existing road boundary and designation boundary. Adverse effects on these trees could occur if the road design and construction processes are not conducted with arboricultural input. It can be anticipated that there will be little change to the root zone of these trees, so the potential for effects on these trees is limited. Actual effects are likely to be nil if the construction works are carried out according to tree protection protocols that are produced when the road design is developed.

- Tree 8/71 – mature puriri that is a scheduled tree at 203 Mill Road listed as: 2705, puriri. This trunk of this tree appears to be within the designation, where road widening of Mill Road will substantially impact the root zone. The impact of earthworks that are required to construct new road lanes and active mode transport routes is likely to result in a significant portion of the tree's roots being damaged and lost, unless alternative means of constructing the road and path are available. Removal of the scheduled puriri should be anticipated as a consequence of the proposed designation. However, the actual impact on this tree is subject to confirmation during detailed design, which should attempt to retain and protect this tree.
- Tree 8/72 – coast redwood at 165C Mill Road, listed in Schedule 10 – Notable Tree Schedule as: 686, Redwood. This tree is part of a large group of trees that surround a proposed stormwater wetland. The redwood is part of a group of trees that are separated from the proposed stormwater wetland by an access road. The redwood could be retained and protected, provided that sufficient space is provided around the tree to accommodate a viable root zone. Detailed design for any work in and around the stormwater wetland must take this tree into account.

NoR 8 – Waikato District Plan Tree Provisions

A section of NoR 8 is within the Waikato jurisdiction as the regional boarder runs down the middle of Mill Road. The construction of NoR 8 will affect one tree group that is protected under the Waikato District planning provisions as outlined below.

Tree 8/47 is a solitary totara that is deemed to be a protected tree according to the Waikato District Plan, as it is indigenous vegetation. It is likely that this tree requires removal as part of the widening on the southern side of Pukekohe East Road.

It is considered the effects on the tree groups discussed above (for both Auckland and Waikato District Council) can be avoided mitigated or remedied through a Tree Management Plan included as a condition on the designation of NoR 5 and 8. Mitigation is proposed in Section 11.11.3 (below).

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

Mitigation is required for those trees protected by the district plan provisions for the Pukekohe South-East Arterial (NoR 5) and Mill Road – Pukekohe East Road Upgrade (NoR 8). A Tree Management Plan is proposed as a condition on NoR 5 and NoR 8 which includes the following measures to manage adverse effects:

- Confirmation that protected trees identified in Appendix A of the Assessment of Arboricultural Effects still exist;
- Advice on how the design and location of works can avoid, remedy or mitigate effects on the existing trees;
- Recommended planting to replace trees that require removal;
- Establishing tree protection zones and specifying tree protection measures during construction such as protective fencing, ground protection and physical protection of roots, trunks and branches;
- Detailing methods for all work within the rootzone of trees during construction that are to be retained in line with appropriate arboricultural standards.

The Tree Management Plan is limited to the identification of trees protected under the District Plan, as trees protected under Regional Plan provisions will be addressed as part of a future resource consent process.

The effects of tree loss can be mitigated by comprehensive planting within the new berms, and areas identified in the UDE. Replacement planting will be decided through a planting plan for the Project under the proposed ULDMP or Landscape Management Plan condition.

Mature and native trees will be retained where possible – this is included in the ULDMP condition on all transport projects. Replacement planting will be decided through planting details for the Project under the ULDMP or Landscape Management Plan proposed as a condition on the proposed designations. The ULDMP or landscape Management Plan also includes detail of methodologies to establish new trees within the road reserve, including creation of quality below ground environments, correct planting and appropriate maintenance.

11.11.4 Operational Effects

As detailed within the Assessment of Arboricultural Effects, once the road network has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects.

11.11.5 Conclusions

Two groups of trees are within the road reserve adjacent to the designation boundary for NoR 5. These trees are likely to be unaffected by construction of the active mode upgrade on the southern side of the road. However, as a precaution, a Tree Management Plan will be prepared at the time of construction and recommend measures to manage effects on these trees during construction works.

A number of trees growing within or adjacent to the designation boundary for NoR 8 are protected under either the AUP:OP or Waikato District Plan. Those trees on the Northern side (tree groups 8/9,

8/10, 8/13 and 8/15) are likely to be unaffected during works. However, as a precaution subject to implementation of standard tree protection measures specified as part of a Tree Management Plan at the time of construction. Removal of trees and tree groups on the southern side of Pukekohe East Road will have adverse effects due to the loss of the benefits of trees and canopy cover. The construction of NoR 8 will affect two groups of trees that are protected under the Waikato District planning provisions. These effects will be mitigated by replanting that is specified in the Tree Management Plan and carried out as part of the UDLMP.

11.12 Community Effects

11.12.1 Positive Effects

The Pukekohe Transport Network provides the necessary transport infrastructure required to support the planned urban zoning of land in Pukekohe, Paerata and Drury West which is accelerating as a result of numerous private plan changes and resource consents being lodged with Auckland Council. The proposed designations ensure that the transport network is planned and integrated (and identified in the AUP:OP) to meet the feasible development targets over the next 30 years to support the growing communities in the Drury, Pukekohe and Paerata area.

The Projects improve access and connectivity between key growth areas.

8 The Drury West Arterial (NoR 1) provides a connection with the Drury West Town Centre and the proposed KiwiRail Drury West Rail Station and provides access to the strategic transport network including SH1 and SH22. It connects future urban areas – from Burtt Road and to Runciman Road in the south.

9 The Drury to Pukekohe Link (NoR 2) provides a multi-modal link enhancing access to new urban areas in Drury, Paerata and Pukekohe and contributes to higher quality land transport integration outcomes for future communities.

10 Similarly, the Pukekohe Arterials (NoRs 4-7) provide alternative routes for through traffic to bypass the Pukekohe town centre, improving access for regional and freight traffic across centres while reducing congestion and maintaining connectivity to amenities for communities within the Pukekohe town centre area.

The Mill Road and Pukekohe East Road Upgrade provides a connection for communities between Auckland and Waikato and from SH1 to Pukekohe urban areas for traffic and freight, with a major rural active mode connection. Safety improvements to the Pukekohe Transport Network also generates community benefits. The current Pukekohe-Paerata roading network is largely rural beyond suburban Pukekohe and many corridors currently have a high risk of incidents of deaths and injuries from vehicle accidents. The Project will provide intersection treatments and upgrades to existing roads which will create a safer driving and active modes environment. Grade-separated crossings over the NIMT will also enable a safer crossing environment and improve access. This provides health and wellbeing benefits through the reduction of incidents, and safer environments to encourage uptake in active modes for shorter trips.

The provision of active mode facilities provides additional means of transport to commute to employment and education. Improved mode choice has the potential to improve the way people live and enhance community connectivity for both the existing environment and the future urban community. In particular, active mode facilities positively impact both the health and wellbeing and way of life (the way people work, play and live) of the community.

The Project will also provide community benefits through improving connections to public transport and rapid transit networks. The Drury West Arterial (NoR 1) and Paerata Connections (NoR 3) provide direct access to the proposed new train stations, creating a continuous multi-modal link to planned communities in Drury West and Paerata. This will promote rapid transit for longer distance trips, especially to employment centres within and beyond the Pukekohe-Paerata and Drury West Area.

11.12.2 Construction Effects

A number of the NoRs are new roads in undeveloped greenfield areas, resulting in fewer community impacts during construction. However, the acquisition of land will sever some properties and may prompt changes to some rural operations. Prior to construction, there may be a reduction in the existing rural community within the greenfield areas of the Project, as AT acquires properties and they become vacant. Notwithstanding this, the FUZ is planned to urbanise and the proposed transport networks will be implemented at the time that greenfield areas start to urbanise. Therefore, this is anticipated to be a temporary effect as the community transitions into an urban area once the land is live zoned.

The function of businesses along the corridor could be disrupted if access is restricted during construction, in particular for businesses operating in the Light Industry Zone in south-eastern Pukekohe that experience multiple traffic (including heavy and freight vehicles) movements through daily operations. Traffic impacts resulting from construction works can decrease patronage to local shops and decrease business efficiency where businesses are reliant on deliveries or dispatch.

Some businesses will move due to the Project, such as the Pukekohe Refuse and Recycling Transfer Station which is affected by NoR 5. This will slightly alter the business community in terms of service offerings and interdependencies. However, relocating a business affected by the Project is part of the Public Works Act processes.

Residents in existing urbanised areas may experience temporary disruptions to traffic and access restrictions or diversions due to intersection upgrades and roading works. Depending on the availability of alternate routes at the time of construction and the extent of urban development in the area, disruptions to the corridor could impact on way of life and community cohesion due to increased commuting time and disruptions to access.

The amenity values in both the existing and future urban areas could also be disrupted during construction due to dust and noise generated from construction.

11.12.3 Operational Effects

No adverse operational effects on the community are anticipated from the Project. There are numerous positive community effects from the Projects which have been addressed above.

11.12.4 NoR Specific Effects

In NoR 6, the frontage of 59 Ward Street where a community centre (Nehru Hall) is located is proposed to be designated for the future upgrade of the Ward Street and Nelson Street intersection. Nehru Hall will not be impacted, but the pedestrian footpath is proposed to be brought closer to the frontage of the building. This is not anticipated to generate a significant community impact as continued access to and use of Nehru Hall will not be impacted.

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

It is anticipated that all community effects during the construction of the Project will be temporary and can be minimised. A Stakeholder Communication and Engagement Management Plan (SCEMP) will be prepared prior to the start of construction to identify how the public and stakeholders (including directly affected and adjacent owners and occupiers of land) will be communicated with throughout the Construction Works.

Access and trip disruption will be managed by the CTMP and SCEMP proposed as conditions of the designation. This will allow the contractors to identify movement and access requirements of residents and business along the corridor, enable alternate access or access at peak times, and minimise trip disruption where practicable.

Construction effects on amenity values of property can be managed by engagement with stakeholders identified through the SCEMP, as well as through the development and implementation of the CVNMP and the CEMP.

No adverse community impacts are anticipated from the operation of the Project, therefore no mitigation is required. However, through the implementation of the ULDMP or landscape Management Plan, a range of measures will be implemented to ensure the Project is appropriately integrated into the surrounding landscape and urban context.

11.12.6 Conclusions

It is considered that overall, the Project will provide significant positive effects to the community in which it will operate including community connectivity and health and wellbeing. The proposed works support planned urban growth and will have significant safety, access and mode choice benefits providing multi-modal connections to existing and future communities in Pukekohe, Paerata and Drury.

Any potential construction effects can be managed with the development and implementation of the appropriate management plans as outlined above and communication with the identified landowners and stakeholders.

11.13 Property and Land use

Potential adverse effects on existing private properties have been reduced, where practicable through the development of the Project concept design and the proposed designation boundary. This has included specific consideration of the potential property and business impacts in the assessment of alternatives as discussed in Section 5 and detailed in Appendix A, and through design refinement and designation boundary refinement. Notwithstanding this, there is a strategic need to protect the Project corridor to address the existing and future transport demand in Pukekohe, Paerata and parts of South Drury.

Where impacts on property, land use and businesses cannot be avoided, the potential effects discussed in this section relate to directly affected properties/landowners. Potential effects on properties and businesses affected by proximity to the Project have been discussed in Section 11.13.

The proposed designations require land to provide a sufficient footprint to enable the construction, operation and mitigation of effects of the Pukekohe Transport Network. 288 private properties will be directly affected. These properties are primarily rural and working agricultural, with some rural-residential and light industrial land use. NoR 2 in particular affects more properties due to the length of the corridor.

The land required for the Project is shown in the Concept Design drawings included in Volume 1, Attachment A. It is likely that urban development will begin to occur adjacent to the proposed designations before the Project is implemented. This is already beginning to be evident with numerous private plan changes around Pukekohe and Paerata (detailed in Section 9.1.2) submitted to Auckland Council.

Potential adverse effects on the development of private property may arise. However, development is not precluded within the proposed designated area. AT and Waka Kotahi will work with landowners and developers under the process in s176(1)(b) to provide written consent for development within the proposed designations, provided those works will not prevent or hinder the work authorised by the proposed designation. For AT NoRs, a land use integration process (LIP) is included in the conditions for NoRs 1, 3, 4 – 7. This sets out a process where developers can request information to inform land use development adjacent to the transport corridors. This will support development that may go ahead of the proposed transport corridors and provides opportunities to co-ordinate and integrate infrastructure and development.

11.13.1 Construction Effects

Land required for the permanent work will be acquired prior to construction. If only temporary occupation of the land is required, it will be leased. Potential effects from the temporary lease/use of land include disruption to farm activities and businesses, disruptions to access, loss of vegetation, temporary loss of grazing pasture and temporarily affected amenity.

Measures to mitigate adverse effects from construction activities are addressed throughout section 10, including development and implementation of a SCEMP, CTMP, CNVMP and CEMP prior to the start of construction. These measures will appropriately minimise disruption to affected properties and allow the continued use of the properties were practicable. Potential construction effects will generally be temporary.

11.13.2 Post-Construction Effects

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 ongoing operation, maintenance or mitigation of effects of the Project will be reinstated in coordination with directly affected landowners or occupiers.

This will include the reinstatement and reintegration of construction areas with the surrounding landform, reinstatement of driveways, accessways, fences and gardens, and integration of batters and cut/fill slopes with the landscape.

These matters will be discussed prior to or during construction with directly affected landowners and will follow the provisions under the Public Works Act 1981 which is a process separate from the requirements of the RMA.

11.14 Network Utility Effects

Table 11.6 summarises the known existing and proposed utilities within and around the proposed designation.

Table 11-7: Summary of network utilities within the proposed designation boundaries

NoR	Utility Provider	Asset	Designation
1	New Zealand Transport Agency	State Highway 22	6707
1, 2, 3, 4	KiwiRail	North Island Main Trunk Railway Line	6302
1	Auckland Transport	Jesmond to Waihoehoe West FTN Upgrade	1840
1, 2, 5, 6, 7, 8	Watercare	Watermain, sewermain, and pipe assets	N/A
1, 2, 4, 5, 7	Counties Energy	ADSS fibre optic cable and medium and high voltage cables	
2, 4	New Zealand Transport Agency	State Highway 22: Karaka to Pukekohe	6704
2, 4	New Zealand Transport Agency	State Highway 22: Karaka to Pukekohe – Road Widening	6705
2, 3	KiwiRail	Paerata Interchange and Accessway	6311
2	Transpower New Zealand Limited	National Grid	N/A
8	First Gas Limited	Pukekohe to East Tamaki Gas Pipeline	9104
8	New Zealand Transport Agency	State Highway 1	6701
8	New Zealand Transport Agency	State Highway 1	6702

Some of the land to be designated for the Project is already subject to existing designations which are generally other network utility operators (refer to Table 11.8 above).

To undertake work in accordance with a designation on land where there is an existing designation in place, the written consent of the requiring authority for the earlier designation is required under section 177(1)(a).

This written approval is required in order for Auckland Transport and Waka Kotahi to be able to undertake works in accordance with the later designations for the Pukekohe Transport Network. It is not required in order to designate the land for the later works required. For this reason, written approval under section 177(1)(a) of the RMA has not yet been obtained at this stage.

Consultation with all the requiring authorities, whose approval will be required in the future, has taken place and will continue as the Project is developed. Written approval from these requiring authorities will be obtained by Auckland Transport and Waka Kotahi at a later date during the detailed design stage of the Project.

11.14.1 Mitigation Measures

Engagement with network utility operators has been ongoing throughout the Project as detailed in Section 10 of the AEE. Engagement will continue throughout the detailed design and construction of the Project.

To mitigate effects on network utilities, a Network Utilities Management Plan (NUMP) will be prepared prior to construction of the Project. The NUMP will set out a framework for protecting, relocating and working in proximity to existing network facilities. The NUMP will be prepared in consultation with the relevant network utility operators and will include methods to:

- Provide access for maintenance at all reasonable times, or emergency works at all times during construction activities;
- Manage the effects of dust and any other material potentially resulting from construction activities and able to cause material damage beyond normal wear and tear to overhead transmission lines in the Project area; and
- Demonstrate compliance with relevant standards and Codes of Practice.
- Prior to construction, Network Utility Operators with existing infrastructure located within the proposed designations will not require written consent under section 176 of the RMA for the following activities:
    - Operation, maintenance and urgent repair works;
    - Minor renewal works to existing network utilities necessary for the on-going provision or security of supply of network utility operations;
    - Minor works such as new service connections; or
    - The upgrade and replacement of existing network utilities in the same location with the same or similar effects as the existing utility.

11.15 Urban Design Evaluation

An Urban Design Evaluation (UDE) is included in Appendix I of Volume 4. The urban design evaluations are provided for the Pukekohe Transport Network as a whole, and then specifics for each of the individual NoRs.

11.15.1 Urban Design Outcomes

The UDE provides urban design commentary on the concept designs that should be considered in future design stages through the implementation of the Urban Landscape and Design and Management Plan (ULDMP) included as a condition on the proposed designations. The design principles that make up the Design Framework, provided in Appendix A in the Urban Design Evaluation (Volume 4, Appendix I), seek that transport corridors contribute positively to existing and new communities, the environment and the social and economic vitality of Auckland.

The opportunities identified could be considered by AT, Waka Kotahi or other parties at future stages of design and development but are not required to mitigate effects of the projects. The outcomes (summarised through theme) are detailed in the Outcomes and Opportunities Plan (Appendix B of the UDE).

In summary, the urban design opportunities for the Pukekohe Transport Network are outlined below, with some specific examples relating to each NoR. The outcomes form part of the ULDMP so that the

detailed design of the corridors respond appropriately to the principles and the project specific urban design outcomes sought.

- **Identity drivers** – The identification and integration with key local community drivers such as:
    - Future Drury West Station and future centres including the Drury West Town Centre;
    - Paerata Train Station (NoR 3);
    - Ngakoroa Stream (NoRs 1 and 2);
    - Oira Creek (NoR 2s and 4);
    - Whangapouri Creek (NoRs 3, 4, 5, 6, and 7);
    - Other local centres in relevant structure plans and residential areas; and
    - Key distinctive landscape character qualities such as the Pukekohe East Tuff Crater and the rural character and landscape.
- **Blue network connectivity**: Maintain and integrate water bodies, stream/ creek crossings and connection of the Ngakoroa Stream, Oira Creek and Whangapouri Creek.
- **Ecological connectivity**: Ecological connectivity and biodiversity of the Ngakoroa Stream, Oira Creek and Whangapouri Creek.
- **Stormwater management**: Integration of stormwater wetlands and swales to enable an appropriate interface with adjacent land uses.
- **Bridges**: Consideration of visual integration, interface and sense of place for bridge structure.
- **CPTED**: Incorporation of CPTED principles in the future design and functional layout of the corridors, including clear sightlines, good levels of lighting, passive surveillance, and avoidance of entrapment zones.
- **Rural integration**: Landscape outcomes should integrate rural sections of the corridor sections into the context.
- **Active mode permeability:** Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities (such as Nehru Hall).
- **Active mode legibility and priority:** Legibility, connectivity demands, safety and modal priority for active modes should be addressed at intersections. Such as:
    - Intersection at Burtt Road and Jesmond Road (NoRs 1, 4, 7, and 8),
    - Intersection at Jesmond Road and Karaka Road (NoR 1);
    - Intersections along Sim Road (NoR 2),
    - intersections at Golding Road and Pukekohe East Road (NoRs 5 and 6),
- **Earthworks**: Minimise earthworks and level changes at corridor boundaries and interfaces with future development areas to enable integration with adjoining future landuse.
- **Landscape plan** development which considers recommendations from the landscape and visual, arboricultural, flooding and ecological assessments including:
    - Street tree, stormwater wetland planting;
    - Opportunities to support ecological connectivity; and
    - Construction compound and private property reinstatement and treatment of batter slopes.
- **Access:** Existing access will be maintained where practicable. However, retaining full turning movements for existing access is not recommended for some NoRs due to safety reasons. It is proposed to manage existing property access through the Public Works Act processes and

confirm the details of existing access at future design stages. A condition is proposed on all NoRs whereby if an existing access is altered by the projects, the requiring authority will consult with the affected land owner and demonstrate safe access can be provided in the future design and outline plan. As the areas develop, future access will be directed to new local roading within developments. The new local roads will connect to the Pukekohe Transport Network.

- In future design stages, Manawhenua will be invited as Partners to provide input into relevant cultural, landscape and design matters including how desired outcomes reflect their identity and values;
- Measures to demonstrate that the project design has included adaptations to climate change such as reducing urban heat island effects in future urbanised areas, supporting modal shift and accounting for flood hazard risks;
- Identifying and addressing potential conflicts between placemaking aspirations within local communities and the operating speed of the corridor;

The measures to achieve these outcomes will be confirmed at the detailed design stage and form part of the Urban Landscape and Design Management Plan (ULDMP) as a condition on the proposed designations.

11.16 Summary of Key Proposed Mitigation

The majority of adverse effects have been avoided and/or mitigated via alignment decisions and design choices. Where potential effects have not been able to be addressed via alignment or design, measures are proposed to avoid, remedy or mitigate the potential adverse effects. 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.

Table 11-8 Summary of Key Proposed Mitigation

Matter	Proposed Condition to Manage Effects
Manawhenua partnership	• Cultural Advisory Report; • Urban and Landscape Design Management Plan (ULDMP); and • Cultural Monitoring Plan.
Transport / Traffic	• Construction Traffic Management Plan (CTMP); and • Existing property access condition (where an access is altered the Outline Plan will demonstrate how safe alternate access will be provided, unless otherwise agreed with the affected landowner).
Noise and Vibration	• Construction Noise and Vibration Management Plan (CNVMP); • Site Specific Construction Noise and Vibration Management Schedules; and • Operational noise conditions
Flooding	• Construction Environmental Management Plan (CEMP); and • Flood hazard outcomes condition.

Terrestrial Ecology	• **Pre-Construction Ecological Survey**
	  ○ For all NoRs except NoR 6.
	  ○ If the ecological survey finds no presence of ecological species, then no EMP is required.

Matter	Proposed Condition to Manage Effects

	• **Ecological Management Plan (EMP)**
	  ○ NoR 1, 2, 4, 5, 7
	  ○ Ecological Management Plan (EMP) required for the presence of long tail bats, the presence of Threatened or At-Risk birds (excluding wetland birds), and the presence of Threatened or At-Risk wetland birds.
	  ○ NoR 3
	  ○ Ecological Management Plan (EMP) required for the presence of long tail bats.
	  ○ NoR 8
	  ○ Ecological Management Plan (EMP) required for the presence of long tail bats, the presence of Threatened or At-Risk birds (excluding wetland birds), the presence of Threatened or At-Risk wetland birds, and the presence of native lizards.

Landscape and Visual, Urban Design	• Urban and Landscape Design Management Plan (ULDMP).
Heritage	• HHMP (NoRs 4, 6 and 8 only).
Arboriculture	• Tree Management Plan (for NoRs 5 and 8). • ULDMP
Social / Community and property	• Project Information condition; • Designation Review condition; • Stakeholder and Communication Engagement Management Plan (SCEMP); and • Construction Noise and Vibration Management Plan (CNVMP); • Construction Traffic Management Plan (CTMP); • Urban and Landscape Design Management Plan (ULDMP). • Land use Integration Process (LIP)
Network utilities	• Network Utilities Management Plan (NUMP); and • Network Utility Operators (Section 176 Approval).

12 Assessment of Relevant RMA Planning Documents

This section sets out an assessment of section 171(1)(a) and Section 171(1)(d) RMA matters, as well as other policy considerations relevant to the Pukekohe Transport Network. Table 12.1 sets out an assessment of the relevant statutory provisions.

On 18 August 2022, Auckland Council notified:

- Plan Change 78 (PC78) – Intensification;
- Plan Change 79 (PC79) – Amendments to the transport provisions; and
- Plan Change 80 (PC80) – Regional Policy Statement Well-functioning urban environment, resilience to the effects of climate change and qualifying matters.

Pursuant to Section 171(1)(a)(iv) of the RMA, PC78, PC79 and PC80 have been considered in Table 12.1. Where objectives and policies have been added or amended by Plan Change 78, 79 and 80, provision references have been highlighted in the table in *italics*.

How PC78 zoning has informed the future environment is considered in the Section 9.1.2 of this AEE.

Auckland Council has also released a draft Future Development Strategy to update the Future Urban Land Supply Strategy. At the time of preparing this report, the FDS was out for public feedback.

Table 12-1: Assessment of the Pukekohe Transport Network against the relevant statutory provisions

Theme	Key Objectives and Policies	Analysis
Urban growth and development capacity *Development capacity is planned and sequenced with infrastructure to meet the future needs of communities.* *Urban growth and its associated infrastructure is provided for (and integrated) in appropriate locations.* *Relevant to all NoRs.*	**NPS-UD** Objective 1, 4, 6 and 8, Policy 1(c), 1(e), 1(f), and 6. **AUP:OP (RPS)** *B2.2.1(1A),* *B2.2.1(1),* B2.2.1(3),*B2.2.1(5),* *B2.2.2(4),* B2.4.1(5),B2.4.1(6), B2.4.2(6), B3.2.1(5), B3.3.1(1)(b), B3.3.1(1)(c), B3.3.2(4)(b), B3.3.2(5)(a), B9.2.1(2), **AUP:OP (DP)** E27.2(1), E27.2(2), E27.2(5), *E27.2(5A)* E27.2(6),	**Summary of Objectives and Policies** • 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 is therefore 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. • Both the AUP:OP RPS and WRPS have key outcomes of integrated management to give effect to the NPS – UD. • The objectives and policies of the AUP:OP RPS seek to provide sufficient feasible development capacity for housing with set dwelling targets over the next 30 years. In order to reach these targets adequate infrastructure must be existing or provided prior to or with development. Developments are also expected to be well-functioning urban environments that enable people and communities to provide for their social, economic, and cultural wellbeing, while improving resilience to climate change.B9.2.1(2) within the AUP:OP RPS seek to protect areas of land containing elite soil from inappropriate subdivision, urban use and development. Please refer to theme *Highly Productive Land* for this assessment. • The objectives and policies of the Waikato Regional Policy Statement (WRPS) similarly aim to provide infrastructure and associated land uses in an integrated and planned manner, by recognising the value and long-term benefits of infrastructure to service urbanisation and developing communities. Enabling positive environmental, social, cultural and economic outcomes through the development of the built environment is emphasised. The strategic planning for growth is a clear objective to provide for integrated land use and infrastructure planning to ensure that the development of the built environment does not compromise the safe, efficient and

Theme	Key Objectives and Policies	Analysis
	E27.3(20A), *E27.3(20B),* **WRPS** UFD-O1, UFD-P2, IM-O1, IM-O2, IM-O9, IM-P1, **WDP (Operative)** 2.10.5, 2.10.6, 9.3.2, 9.3.3, **WDP (Proposed)** 4.1.1 (a), 4.1.2(a), 4.1.4(a), 4.1.8	effective operation of infrastructure corridors. Provisions in Chapter E27 seek to ensure that land use and all modes of transport are integrated in a manner that realises the benefits of an integrated network and managing the adverse effects of traffic generation. This includes safe and direct on-site access to for pedestrian and other users. **Assessment** • The objectives and policies emphasise the importance of providing short, medium and long term residential and business capacity. This includes long-term strategic planning for urban development and generally indicate that ad hoc or out of sequence urban expansion is less desirable than that which is planned and integrated. The Pukekohe Transport Network is consistent with these objectives and policies by providing for the necessary transport infrastructure to support the development of land and the eventual establishment of the necessary development capacity. • Route protection will ensure that the necessary transport infrastructure is planned and integrated (and identified in the AUP:OP) to meet the feasible development capacity targets over the next 30 years. • As set out in Section 11.2, the Pukekohe Transport Network will: ○ Support and enable growth by protecting improved and new transport corridors that will support Auckland Council's growth aspirations for the growth areas of Drury West, Paerata and Pukekohe area, including intensification or density of growth resulting in more efficient urban land development. This is becoming increasingly important as a result of private plan changes being lodged with Auckland Council, and developer interest around Pukekohe identified via engagement with developers and landowners. Protecting the transport network now means that it can integrate with urban development when required in the future.

Theme	Key Objectives and Policies	Analysis
		○ Influence and support growth in the north of the Waikato. ○ Improve access to economic and social opportunities and resilience of the strategic network; and ○ Support transformational mode shift from private vehicles to public transport, walking and cycling. In particular, the network provides direct connections to the rapid transit network (rail stations and rail network) and provides walking and cycling and new bus routes for existing and future communities. **Conclusion** The Pukekohe Transport Network contributes to the achievement of these objectives and policies by protecting corridors to deliver a transport system to positively contribute to quality, connected urban and natural environments.
Enabling Infrastructure and Transport *Infrastructure (including effective, efficient and safe transport) is enabled and where appropriate protected.* *Benefits of infrastructure are recognised while adverse effects are*	**AUP:OP (RPS)** B3.2.1(1), B3.2.1(2), B3.2.1(3), B3.2.2(1), B3.3.1(1), B3.3.2(1), B3.3.2(3) **AUP:OP (DP)** E17.2(1), E17.2(3),	**Summary of Objectives and Polices** • The objectives and policies in Chapter B3 of the AUP:OP recognise the importance infrastructure (including transport infrastructure) plays in realising Auckland's full economic potential. This includes integrating the provision of infrastructure with urban growth, avoiding incompatible land uses and increasing resilience. The provisions recognise the importance of the transport network in the movement of people, goods and services, urban form, enabling growth, and providing choices. • Objectives and policies in Chapter E26 of the AUP:OP identify that infrastructure is critical to the social, economic, and cultural well-being of people and communities and the quality of the environment. The development, operation, use, repair, maintenance, upgrading and removal of

Theme	Key Objectives and Policies	Analysis
avoided, remedied or mitigated. *Relevant to all NoRs.*	E17.3(1)E26.2.1(1), E26.2.1(2), E26.2.1(4), E26.2.1(9), E26.2.2(4), E26.2.2(14), E26.2.2(15). **WRPS** (relevant for NoR 8): UFD-O1, UFD-P2 **WDP (Operative**) (relevant for NoR 8): 9.3.2, 9.3.3 15.1.1.1, 15.1.1.2 , 15.1.1 (1-4) **WDP (Proposed)** (relevant for NoR 8): SD – O5, SD – O7, AINF- O1, AINF - O3, AINF - O8,	infrastructure is anticipated, and the benefits infrastructure can have, as well as a range of adverse effects, are acknowledged within the objectives and policies. • The AUP:OP directs that land use, and all modes of transport should be integrated so that the benefits of an integrated transport network can be realised, and the adverse effects of traffic generation on the transport network can be managed. This includes enabling effective, efficient, and safe transport that supports the movement of people, goods and services, integrates with, and supports a quality compact urban form, enables growth, avoids, remedies or mitigates adverse effects on the quality of the environment and amenity values, and facilitates transport choices. The AUP:OP also outlines the prioritisation of pedestrian safety along footpaths and seeks that road/rail crossings are operated safely with neighbouring land use . • Objectives and policies in Chapter E17 seek to protect trees in roads and the cultural, amenity, landscape, and ecological values they contribute. Provision of transport infrastructure and utilities is enabled. • The WRPS seeks to develop transport and infrastructure in an integrated sustainable and planned manner which enables positive environmental, social, cultural and economic outcomes. Importance is given to the recognition and protection of long-term benefits of regionally significant infrastructure and integrating land use and infrastructure planning, to not compromise infrastructure corridors. • NoR 2 interacts with the Transpower National Transmission Grid. The National Policy Statement on Electricity Transmission (NPS-ET) objectives seek that the national significance of the electricity transmission network is recognised while managing adverse effects of other activities on the network. The policies of the NPS-ET outline that reverse sensitivity effects on the electricity transmission network are avoided and that the operation, maintenance, upgrading and development of the electricity network is not compromised. **Assessment**

Theme	Key Objectives and Policies	Analysis
	AINF- P1, AINF-P29, AINF- P7, AINF - P35, AINF - P10, EW – O1 **NPS-ET (relevant for NoR 2):** Objective 5., Policy 1, 10, 11	• The Pukekohe Transport Network strongly meets these objectives and policies by providing for a wide range of transport benefits for the community. • The Pukekohe Transport Network will significantly improve transport facilities for all modes, providing for a range of mode choices to support the projected growth in transport demand from urban development. The Pukekohe Transport Network will integrate well with proposed surrounding land uses and the wider transport network, responding to the timing, scale and form of urban development triggers and staging of future infrastructure corridors. This will help to facilitate urban development and enable the general social and economic growth of South Drury, Paerata, Pukekohe, and wider area. • Improving the safety, reliability, and efficiency of the public transport network. The adverse effects of the Pukekohe Transport Network have been largely addressed through the implementation of proposed conditions on the designations. Not all effects of the projects can be avoided or mitigated. Chapter E26 also recognises that linear infrastructure may have an operational need to traverse features or areas of value identified in the AUP:OP. The same policy recognises the benefits derived from infrastructure, the adverse effects of not providing the infrastructure and seeks consideration of how the infrastructure contributes to the strategic form or function, or enables the planned growth and intensification, of Auckland. • The Pukekohe Transport Network supports areas of FUZ to provide for future growth • The Pukekohe Transport Network will enable intensification and growth of Auckland. • The Pukekohe Transport Network is consistent with the objectives and policies of the NPS-ET because where the transport network interacts with Transpower National Grid at NoR 2, the transport corridor been designed so that it will not compromise the integrity of the National Grid, will not lead to reverse sensitivity issues and will comply with safe distance requirements (outlined in further detail in the discussion on the National Grid Corridor overlay below). The projects have been discussed with Transpower and the concept design accounts for Transpower requirements

Theme	Key Objectives and Policies	Analysis
		including access to and earthworks in proximity to towers, spacing beneath transmission lines and metallic installations near the towers (Earth Potential Rise risks). **Conclusion** • It is considered that the Pukekohe Transport Network contributes to the achievement of these objectives and policies by enabling strategic transport infrastructure where appropriate while ensuring that adverse effects are avoided, remedied or mitigated.
Enabling infrastructure *within an overlay and in addition to the above* *Protect scheduled values but provide for infrastructure where:* *11 There is functional or operational need; and* *12 No practicable alternative.* *Relevant to all NoRs.*	**AUP:OP (RPS)** B3.2.1(4), B3.2.1(8), B3.2.2(3), B3.2.2(6), B3.2.2(7), B3.2.2(8) **AUP:OP (DP)** D9.2(1), D9.2(3), D9.3(1), D9.3(2), D9.3(8), D10.2(1), D10.3(2), D10.3(3), D10.3(4), D10.3(5), D13.2(1), D13.3(2), D17.2(1), D17.2(2), D17.2(3), D17.3(24), D17.3(26), E26.2.1(9),	**Summary of Objectives and Policies** • The policies of Chapter B3 seek to enable the development and operation of infrastructure, even in sensitive areas that are scheduled in the AUP:OP in relation to natural heritage, significant ecological areas and historic heritage, provided adverse effects are avoided where practicable and an operational and functional need to locate in sensitive areas is demonstrated. • While the objectives and policies of the AUP:OP generally seek to recognise the benefits, functional and operational needs and value of investment in infrastructure and enable the safe, efficient and secure provision of infrastructure where appropriate, the objectives and policies also anticipate that there may be some adverse effects as a result of the provision of such infrastructure. However, the objectives and policies recognise that in some instances such adverse effects may be appropriate given the necessity of, and essential services provided by, infrastructure. **Assessment** • In light of the high values within some parts of the Pukekohe Transport Network, the Pukekohe Transport Network has sought to avoid adverse effects as far as practicable, and this is demonstrated through the options assessment process.

Theme	Key Objectives and Policies	Analysis
	E26.2.2(4), E26.2.2(5), E26.2.2(6), E26.2.2(8)	• All Projects have been considered through a comprehensive alternatives assessment process, which included constraints mapping of sensitive areas and avoidance of these where practicable through option development and refinement. The alternatives assessment concluded it is not practicable to avoid all sensitive overlays in the AUP:OP by selecting alternative route options. The alternatives assessment provides details of the alternative alignment options considered. • SEAs have largely been avoided by the proposed designations. One small area of SEA is within NoR 4. This is to allow area for a bridge to be constructed over a tributary of a stream. The road alignment itself avoids the SEA. It is anticipated that through the detailed design phase and future regional consenting process there will be further opportunities to minimise and mange potential impacts on SEA including protection of the SEA during construction. • NoR8 and a smaller portion of NoR 5 are partially located in the Pukekohe East tuff ring which is a ONF. The ONF extends across the existing Pukekohe East Road. Effects on the ONF were considered through options assessment and with mana whenua to upgrade the walking and cycling facilities on Pukekohe East Road. Through options assessment, the upgrade of Pukekohe East Road widens to the south of the existing road. This reduces impacts on the ONF, as the main feature is located to the north of the existing road. While permanent works will occur within the extent of the ONF as the overlay extends over the existing road, the walking and cycling upgrade will enable public views for those using the shared part to this geological, cultural and heritage site where currently the view is from high-speed vehicle travel. Opportunities to further recognise the ONF can be identified through the Cultural Advisory Report, ULDMP and Cultural Monitoring Plan for NoR 8 in particular. • NoR 6 extends into the Historic Heritage extent of place of the Nehru Hall (AUP:OP ref: 2235). The NoR does not impact the Nehru Hall itself, and effects on the Hall will be avoided or remedied through construction. The improvements to the road will provide greater access to the site via active modes and will provide opportunities to improve the amenity of the streetscape in this area, which will benefit the heritage site. Specific measures to mitigate disturbance of site, such a

Theme	Key Objectives and Policies	Analysis
		potential removal of brick wall and entrance way, will be set out in the HHMP required as a condition on the NoR 6. • There are two notable trees within the designation of NoR 8. - Tree 8/71 (mature puriri) that is a scheduled tree at 203 Mill Road listed as: 2705, puriri and Tree 8/72 - coast redwood at 165C Mill Road, listed in Schedule 10 – Notable Tree Schedule as: 686, Redwood. Tree 8/71 is likely required to be removed due to construction of the new road lanes on Mill Road and active mode upgrade. However, the actual impact on this tree is subject to confirmation during detailed design, which should attempt to retain and protect this tree. Tree 8/72 -is part of a large group of trees that surround a proposed stormwater wetland. The redwood could be retained and protected, provided that sufficient space is provided around the tree to accommodate a viable root zone. Detailed design for any work in and around the stormwater wetland will take this tree into account under a Tree Management Plan recommended as a condition on NoR 8. **Conclusion** • The Pukekohe Transport Network is consistent with these objectives and policies. Alternative corridor alignments were explored as part of the alternatives assessment which concluded that no practicable alternative exists to avoid impacts on sensitive areas or features (such as SEAs, the ONF and notable trees). However, the extent of the designation footprints in these sensitive areas have been limited as much as practicable, and this may be revised further at the detailed design stage.

National Grid *The operation, maintenance and upgrading of the National Grid is enabled and co-location of infrastructure is encouraged where it is safe and satisfies operational and technical requirements.* *Relevant to and 2.*	NPS-ET Objective, Policies 1, 10 AUP:OP (RPS) B3.2.1(7), B3.2.2(7) AUP:OP (DP) D26.2(1), D26.3(1), E26.2.1(7) WRPS EIT-O1, EIT-P1 WDP (Operative) 15.1.1.1, 15.1.1.2 WDP (Proposed) 6.1.6, 6.2.1, 6.2.2, 6.2.3	Summary of objectives and policies • The relevant objectives and policies of the NPS for Electricity Transmission (NPS-ET) and the AUP:OP RPS seek to enable and provide for the National Grid, recognising the national significance of the electricity transmission network and to manage the adverse effects of other activities on the network to ensure its operation is not compromised. • The objectives and policies of Chapter B3 of the AUP:OP RPS also encourage co-location of infrastructure where safe to do so and operational and technical requirements are satisfied. • Specific AUP:OP, WRPS, and WDP objectives and policies aim to ensure the efficient development, operation, maintenance, upgrading and removal of regionally significant infrastructure (including the National Grid) is not compromised by subdivision, use and development by ensuring operational and technical requirements and standards are satisfied. • • Assessment • Engagement with Transpower has been ongoing throughout the development of the Pukekohe Transport Network and their feedback has been considered as part of refinement of the Project. • At locations within 2 there is vertical clearance constraints by the transmission lines. As outlined in section 10, the design has been informed from engagement with Transpower which has been developed to provide adequate clearance to the lines. These details will be agreed with Transpower ae detailed design. • The Network Utility Management Plan (NUMP) condition sets out a framework for protecting, relocating and working in proximity to existing network facilities. • At detailed design, and through the implementation of the NUMP proposed as a condition of the designation, ongoing engagement will be undertaken with Transpower to confirm working room clearance around the 220kV lines during construction. Any potential adverse effects on the National Grid can be managed appropriately. • • Conclusion

Theme	Key Objectives and Policies	Analysis
		• Pukekohe Transport Network contributes to the achievement of these objectives and policies by recognising the national significance of electricity transmission and by appropriately managing any potential adverse effects to ensure its operation is not compromised.

Manawhenua *Manawhenua values are recognised and protected.* *Manawhenua are to be included in resource management processes, particularly in decision making in their role as kaitiaki.* *Relevant to all NoRs.*	**AUP:OP (RPS)** B4.2.1(2), B6.2.1(1), B6.2.1(2), B6.3.1(1), B6.3.1(2), B6.3.1(3), B6.3.2(1), B6.3.2(2)(d), B6.3.2(3), B6.3.2(6), B6.5.1(1), B6.5.1(3), B6.5.1(5), B6.5.2(1), B6.5.2(4), B6.5.2(5), B6.5.2(6), B6.5.2(9), B7.4.1(6). **AUP:OP (DP)** E1.2(2), E11.3(3), E12.3(1), E12.3(2)(c), E12.3(4). **WRPS** HCV-O1, HCV-P1, HCV-P2**,** UFD-O1, IM-O7, IM-P3 **WRP**	**Kaitiakitanga** **Summary of Objectives and Policies** • The AUP:OP RPS and WDP requires recognition of and provision for the principles of Te Tiriti o Waitangi, in particular through Manawhenua participation in resource management processes. • The WRPS seeks to take into account the values and aspirations of hapū and iwi for urban development. • The WRP seeks to enable tangata whenua to be able to give effect to kaitiakitanga, meaning 'the exercise of guardianship by the tangata whenua' as defined in the RMA. **Assessment** • Recognition of Te Tiriti o Waitangi partnerships is a key objective for Te Tupu Ngātahi, and Manawhenua have been involved in Te Tupu Ngātahi from the start of the early IBC works (2018). • Through Te Tupu Ngātahi Manawhenua forum, and with Manawhenua also attending Project workshops, Manawhenua have been actively involved in the discussions and decision-making process on the future network proposed by Te Tupu Ngātahi for the Pukekohe Transport Network. This has included input into the development of the early concepts, through the options/alternatives assessment, identification of the preferred options and recommended network, engagement and the further assessment and documentation of this through the NoR/AEE phase. The feedback and input from Manawhenua informed the decisions made by the Project team at each step in the assessment process.In particular, mana whenua helped develop the conditions on each NoR that involve mana whenua in the future stages of the project – the Cultural Advisory Report, Cultural Monitoring Plan and input into the ULDMP, Landscape Management Plan and HHMP. • Te Tupu Ngātahi is committed to ongoing engagement with Manawhenua which aligns closely with the AUP:OP RPS, WDP and WRP's long term view. Early and meaningful engagement aims to reduce

Theme	Key Objectives and Policies	Analysis
	2.3.2 objective (a) and (b) 5.3.2 objective (d) **WDP (Operative)** 4.1.1, 4.1.1(1), (2), (3), 8.1.1, 15.1.1.2 **WDP (Proposed)** SD – O2, AINF – P18, MV-O1, MV-O2, MV-O3, MV-O4, MV-O5, MV-P1, MV-P4, MV-P5	uncertainty with regard to the relationship between tangata whenua and resources for which they are Kaitiaki minimised. **Māori values** **Summary of Objectives and Policies** • The principles of Te Tiriti o Waitangi are also recognised and provided for in the sustainable management of natural and physical resources, wāhi tapu and other taonga. Sites and places of significance to Manawhenua are recognised and provided for in the objectives and policies of the AUP:OP. • The WRPS recognises the relationship of tangata whenua and their culture and traditions with their ancestral lands, sites, wāhi tapu, sites and other taonga. **Assessment** • The partnership approach that Te Tupu Ngātahi has with Manawhenua means that Manawhenua values are embedded in Te Tupu Ngātahi which gives effect to the provisions of the AUP:OP and WDP. Having involved Manawhenua in design development and decision-making, has resulted in a distinctive and transformational outcome for the social, cultural, and economic environment. • In particular, Te Tupu Ngātahi has sought to avoid wāhi tapu and other taonga where possible in order to avoid destruction of sites of significance. Te Tupu Ngātahi has generally sought to locate routes outside of Maori land and Treaty Settlement land. Te Tupu Ngātahi has also recognised Manawhenua cultural values, particularly with regards to the mauri of, and the relationships of Manawhenua with natural and physical resources including freshwater, land, air and coastal resources. Significant adverse effects on these values are required to be avoided, with lesser adverse effects avoided, remedied or mitigated as appropriate. • Cultural Values Assessments were provided by Ngāti Te Ata to inform the options assessment process and AEE. The matters raised and response is included in section 11.3.

Theme	Key Objectives and Policies	Analysis
		• The proposed designation conditions provide a conditions framework for the ongoing engagement and participation of Manawhenua in the future detailed design and implementation of the transport corridor(s) which make up the Pukekohe Transport Network in Volume 1, Attachment C. **Conclusion** • The Pukekohe Transport Network contributes to the achievement of these objectives and policies by actively involving Manawhenua in the process to identify the preferred options and by avoiding wāhi tapu and other taonga where possible in order to avoid destruction of sites of significance.
Indigenous biodiversity and Ecological Values *The protection and enhancement of ecological values (including in degraded areas) is promoted.* *Relevant to all NoRs.*	**NPS – IB** **Objective 1, Clause 1.7, Policy 3, 4, 8, 10, 14, 15, 17** **AUP:OP (RPS)** B7.2.1(2), B7.3.1(3), B7.3.2(1), B7.3.2(4), *B7.3.2(5),* B7.3.2(6), B7.4.1(4), B7.4.1(5), B7.4.2(1)(a), B7.4.2(1)(d), B7.4.2(7)(b), *B7.4.2(9),* B7.5.1(2), B7.5.2(1)(f)	**Summary of Objectives and Policies** • The NPS-IB seeks to maintain indigenous biodiversity across New Zealand so that there is at least no overall loss in indigenous biodiversity. The Policies of NPS-IB seek that a cautionary approach is used when considering effects on indigenous biodiversity both within and beyond Significant Natural Areas (SNAs) and including areas supporting highly mobile fauna. Increased indigenous vegetation cover in urban and non-urban environments is promoted, as is information gathering and monitoring of indigenous biodiversity. • At the same time, the NPS-IB sets out a need to recognise and allow for activities which contribute to New Zealand's social, economic, cultural and environmental wellbeing, and provides a consenting pathway for specified infrastructure which provides significant national or regional public benefit, and which has a functional or operational need to locate in a particular location, when there are no practicable alternatives. • The NPS-IB sets out a number of adverse effects of use and development on a SNA, which must be avoided, except where an exemption applies. Exemptions include where a use or development is for specified infrastructure which provides significant national or regional benefit, where there is a functional or operational need to locate within a SNA, and where there are no practicable

Theme	Key Objectives and Policies	Analysis
	AUP:OP (DP) E12.2(1), E12.3(1), E12.3(2)(c), E15.2(1), E15.2(2), E15.3(2), E15.3(3) E15.3(4)(b), E15.3(7). **WRPS (NoR 8):** ECO-P1, ECO-P2, CE-P1, CE-P2, LF-O1, LF-O3, LF-P3, IM-O6 **WRP (NoR 8):** 4.2.2 Objective (c), 4.3.2 Objective (b), Policy 1 5.1.3 policy 2 5.3.2 objective (a - e) **WDP (Operative)**	alternative locations (Clause 3.11) and the effects are managed with the effects management hierarchy (Clause 3.10). • At the date of preparing this application the NPS:IB has not been given effect to in the AUP. However, many of the policy directions in the NPS:IB are already contained within the AUP and in relation to large scale infrastructure projects there is not a notable change in policy direction. The assessment of the project against the NPS:IB is therefore substantively similar to the assessment against the corresponding AUP provisions. • The AUP:OP,WDP and WRPS objectives and policies seek to protect and enhance ecological values across both terrestrial, freshwater and coastal environments. • The primary method the AUP:OP uses to protect biodiversity is the identification of SEAs and the WDP identifies SNAs. These areas receive the highest level of protection. Biodiversity values outside SEAs/SNAs need to be considered and effects on them addressed. • Significant adverse effects on biodiversity are to be avoided as far as practicable, and where avoidance is not practicable, adverse effects are to be minimised. Other adverse effects on biodiversity and ecosystems should be avoided, remedied or mitigated. The provisions recognise that avoidance of areas with biodiversity values is not always practicable for infrastructure. Where biodiversity is affected, measures to protect and restore biodiversity through legal protection and active management should be considered. **Assessment** • Mapping of high value habitat areas was undertaken by the project ecologists to inform the assessment of route options/alternatives, selecting and refining preferred alignments, and confirming designation boundaries, (noting these areas are subject to confirmation as SNAs through future assessment and plan change processes by Auckland Council). This is further detailed in the Volume 4, Appendix E: Assessment of Ecological Effects. Along with existing SEAs (which are considered the Auckland equivalent of SNAs in the NPS-IB), other high value habitat areas and areas supporting highly mobile fauna were considered in the development and

Theme	Key Objectives and Policies	Analysis
	5.2.1(2) Objective 5.2.2 Policies 2 (a, b) 5.2.3 Objective (1) (2), 5.2.3 Policies (1) (2) **WDP (Proposed)** SD-O12, SD-P (1)(2)(3)(5), ECO-O2, ECO-P8 (1)(2), NATC-O1 (2), NATC-P(1), (3)	assessment of options for the projects, as well as design refinement of the preferred options. Identified / indicative biodiversity areas have therefore been avoided where practicable, in line with the effects management hierarchy, as further discussed in the Assessment of Ecological Effects (Volume 4, Appendix E) • The south-western edge of SEA_T_4375 is located within the designation boundary of NoR 4. This is to allow area for a bridge to be constructed over a tributary of a stream. The road alignment itself avoids the SEA. It is anticipated that through the detailed design phase and future regional consenting process there will be further opportunities to minimise and mange potential impacts on SEA including protection of the SEA during construction. There is an operational need for NoR 4 to be located as proposed resulting from technical and operational characteristics and constraints in the environment. This is further discussed in the Alternatives Assessment which sets out a comprehensive assessment of options in this location. • The Pukekohe Transport Network seeks to maintain indigenous biodiversity through the implementation of the Ecological Management Plans (EMPs) as required as a condition of each designation (except NoR 6). • Future assessment of the Pukekohe Transport Network at the regional consenting phase will require assessment against relevant policies. • The Pukekohe Transport Network projects have sought to avoid areas with high or significant biodiversity and ecological values where practicable, through consideration of ecological constraints through the alternatives assessment and design refinement process (as detailed in Appendix A). This has included SEAs and other areas of high value indigenous vegetation or habitat. Where avoidance is not practicable, design refinement has looked at ways to minimise effects. This AEE has also considered how terrestrial ecological effects that are subject to district plan rules can be avoided, remedied and mitigated, as well as opportunities for enhancement. • Regional consent matters have been considered as part of Project design, the alternatives assessment of alignment options and in determination of the spatial footprint that is reasonably

Theme	Key Objectives and Policies	Analysis
		necessary for the Project. Given this, regional resource consents are not being sought now, and will be applied for at a later date, closer to when construction is anticipated. • Stormwater discharge quality will be managed through the use of soft stormwater infrastructure where possible such as through the use of swales and stormwater wetlands. An integrated stormwater network will be designed at the detailed design/regional consenting stage that is sensitive to receiving environments, recognising capacity constraints of streams and the importance of maintaining or enhancing the quality of freshwater and coastal water. • Matters such as freshwater ecology, vegetation removal (under the AUP OP), native herpetofauna in the AUP OP are assessed under regional consenting requirements. Regional matters have not been formally assessed as part of the NoR process. However, the relevant matters have been screened to inform the concept design, options assessment, the designation boundary, and future regional resource consents. Bat and bird management will also be developed further at regional consenting. • Manawhenua have been involved throughout the development and refinement of options and because of this Manawhenua are integrated into decision making with the options selected (and discounted) reflecting the discussions that have occurred. • The policies provide for infrastructure in sensitive areas considering the benefits of providing the infrastructure, its role in supporting planned growth (as set out earlier in this AEE) and the functional and operational need of the infrastructure to locate/traverse in those areas. Many of the NoRs are upgrades to existing transport corridors and therefore have an established functional and operational need to locate in these areas. The functional and operational need of new corridors to locate in sensitive areas is demonstrated through the detailed Alternatives assessment process, the range of alternatives considered (which sought to balance benefits with constraints), and the need to meet the requiring authority's objectives for the Project around transport and land use integration outcomes. **Conclusion**

Theme	Key Objectives and Policies	Analysis
		• There is a strong alignment and consistency between the NPS:IB, and the biodiversity provisions in the AUP. • The Pukekohe Transport Network is consistent with the objectives and policies of the AUP and NPS-IB because option development and assessment considered existing and likely sensitive ecological features and environments. Furthermore, the policies allow for infrastructure in sensitive areas like SNAs and SEAs where it can be demonstrated that significant effects have been avoided where practicable (and where not minimised), and the infrastructure has an operational need to locate in these areas. • NoR 4 has a operational need to be located within the SEA environment or within areas of indigenous biodiversity due to the location of existing infrastructure and requirements for construction. Additionally, the proposed infrastructure is critical for existing and future communities to provide for their needs and well-being. • The Pukekohe Transport Network will require regional resource consents for the alteration of SEA vegetation and for works in other sensitive areas. These consents will be sought at the detailed design stages of the Projects and will therefore demonstrate in more detail how adverse effects on these areas are avoided, remedied or mitigated. • The policies allow for infrastructure in sensitive areas like SEAs where it can be demonstrated that significant effects have been avoided where practicable (and where not minimised), and the infrastructure has an operational need to locate in these areas.
Freshwater *The health and wellbeing of water bodies and freshwater ecosystems is maintained or enhanced.*	NPS-FM Objectives (1)(a), (1)(c), Policies (2), (5), (6), (7), (9)	Summary of Objectives and Policies • The overarching concept of the NPS:FM is Te Mana o te Wai, which refers to the fundamental importance of water, and recognises that protecting the health of freshwater protects the health and well-being of the environment. In line with Te Mana o te Wai, the objective of the NPS:FM is to ensure that natural and physical resources are managed in a way that prioritises the health of

Theme	Key Objectives and Policies	Analysis
Permanent loss and significant modification or diversion or streams and wetlands are to be avoided unless it is necessary to provide for infrastructure and no practicable alternative exists. *Relevant to all NoRs*	AUP:OP (RPS) B7.2.1(2), B7.3.1(3), B7.3.2(1), B7.3.2(4), B7.3.2(5), B7.3.2(6), B7.4.1(4), B7.4.1(5), B7.4.2(1)(a), B7.4.2(1)(d), B7.4.2(7)(b), B7.4.2(9). AUP:OP (DP) E12.2(1), E12.3(1), E12.3(2)(c). WRPS (NoR 8)	water bodies and freshwater ecosystems first, the health needs of people second and the ability of people and communities to provide for their well-being third. • The National Policy Statement for Freshwater Management (NPS-FM) objective and policies seek 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. • Key policies include the need to ensure that the health of degraded water bodies and freshwater ecosystems is improved (Policy 5), that there is no further loss of extent of natural inland wetlands (Policy 6), that the loss of river extent and values is avoided to the extent practicable (Policy 7) and that the habitats of indigenous freshwater species are protected (Policy 9). • The relevant AUP:OP objectives and policies seek to protect and enhance ecological values in freshwater environments. The permanent loss and significant modification or diversion of lakes, rivers, streams (excluding ephemeral streams), and wetlands are to be avoided unless, amongst other matters, it is necessary to provide for infrastructure and no practicable alternative exists. The objectives and policies seek to manage subdivision, use, development, including discharges and activities in the beds of lakes, rivers, streams, and in wetlands, to limit the establishment of structures within the beds of lakes, rivers and streams and in wetlands to those that have a functional need or operational requirement to be located there. • The relevant WRPS objectives and policies seek to enhance the mauri and identified values of fresh water bodies. Riparian areas and wetlands are to be managed in a way that either maintained or enhances the water quality, indigenous biodiversity, riparian habitat quality and extent; and wetland quality and extent. • The WRP seeks to ensure the loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted. There are a range of activities listed for exception,

Theme	Key Objectives and Policies	Analysis
	LF-O1, LF-O3 LF-P1 LF-P3, WRP (NoR 8) Objective 3.1.2 Policy 3.A Policy 3.2.3	including for the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater). Assessment • The AEE is focused on district plan matters as regional resource consents and any consents required under NES are not being sought for the Pukekohe Transport Network at this time. Ecological effects arising in respect of activities that require regional consents are only relevant to the extent they inform alternatives assessment, transport corridor design and the designation footprints. Matters such as freshwater ecology are assessed under regional consenting requirements. Regional matters have not been formally assessed as part of the NoR process. However, the relevant matters have been screened to inform the concept design, options assessment, the designation boundary, and future regional resource consents. • The Pukekohe Transport Network projects have sought to avoid wetland areas and minimise impact on rivers and waterbodies where practicable, through consideration of ecological constraints through the alternatives assessment and design refinement process. Where avoidance is not practicable, design refinements have looked at ways to minimise effects. • Manawhenua have been involved throughout the development and refinement of options and because of this Manawhenua are integrated into decision making with the options selected (and discounted) reflecting the discussions that have occurred. • As discussed under the indigenous biodiversity assessment above, some freshwater environments have been impacted where there is a functional and operational need to do so. In considering the potential future effects arising from activities that may require regional consents in the future, the Assessment of Ecological Effects identified that any potential effects of the Pukekohe Transport Network on ecological features within or adjacent to the transport corridors, can be adequately managed and will be subject of future regional consent processes. There is flexibility in the designation to further minimise impacts at detailed design.

Theme	Key Objectives and Policies	Analysis
		• Stormwater discharge quality will be managed through the use of soft stormwater infrastructure where possible such as through the use of swales and stormwater wetlands. An integrated stormwater network will be designed at the detailed design/regional consenting stage that is sensitive to receiving environments, recognising capacity constraints of streams and the importance of maintaining or enhancing the quality of freshwater and coastal water. Conclusion • The transport infrastructure is critical to enable existing and future communities to provide for their social, economic, and cultural well-being. • The Pukekohe Transport Network contributes to the achievement of these objectives and policies by avoiding or minimising adverse effects on water bodies and freshwater ecosystems at this stage (noting regional consents will be obtained in future).
Natural hazards *Avoid increasing risk of adverse effects in areas subject to natural hazards (including climate change).* *Where infrastructure and development are required in these areas, natural hazard risks must be managed.* *Relevant to all NoRs.*	**AUP:OP (RPS)** *B2.3.1(1),* B10.2.1(2), B10.2.1(3), *B10.2.1(4),* B10.2.1(5), B10.2.1(6), B10.2.2(7), B10.2.2(8), *B10.2.2(12)* **AUP:OP (DP)**	**Summary of Objectives and Policies** • The objectives and policies of the AUP:OP and WDP enable and recognise the importance of infrastructure to support urban growth which includes integrating the provision of resilient transport networks and infrastructure in these areas and avoiding effects in areas subject to natural hazards and risk and adapting to the effects of climate change. • Specific AUP:OP objectives and policies reinforce the unique requirements of infrastructure and that it can have an operational or functional need to locate within a natural hazard area. Where infrastructure is required to locate within a hazard area, significant adverse effects on people and property are sought to be first avoided, and otherwise mitigated to the extent practicable. **Assessment** • The route alignments have considered and sought to avoid areas subject to natural hazards (such as flood hazards and areas vulnerable to sea level rise, which were considered in the MCA

Theme	Key Objectives and Policies	Analysis
	E12.2(1), E12.3(5), E12.3(6), E36.2(1), E36.2(2), E36.2(3), E36.2(4), E36.2(5), E36.2(6), E36.3(1), E36.3(3), E36.3(4), E36.3(21), E36.3(23), E36.3(26), E36.3(29), E36.3(30). **WRPS (NoR 8)** LF-O3, HAZ-O1, HAZ-P1, HAZ-P2 **WDP (Operative) (NoR 8):** 7.2.2(2), 7.2.3(4), (5), (6), (10), (11) **WDP (Proposed)** SD – O13, NH - O2, NH-P28, EW – O2	process). Where natural hazard areas such as floodplains cannot be avoided, the projects have demonstrated functional and operational need to cross these areas, and this AEE and the and conditions framework have considered ways to avoid and otherwise mitigate adverse effects on people and property to the extent practicable. • The Pukekohe Transport Network also seek to address these policies through appropriate and sensitive corridor selection and design methods. The RPS and AUP:OP district plan provisions and direction have guided the assessment and location of the transport network and have taken into account the appropriateness and eventual establishment of development in new growth areas to avoid where practicable and manage the effects of climate change and natural hazards on urban communities and infrastructure. Specifically, where NoRs are located within or near to areas susceptible to flooding, corridor alignments during option development, first sought to avoid these areas, allowing for the conveyance function of flood plains and overland flow paths to continue. However, where this was not possible, the Projects sought to minimise the extent each corridor would impact the flood areas. During detailed design the designation extent will provide for some flexibility in corridor designs to appropriately avoid, remedy or mitigate adverse effects on flood areas. As discussed in Section 11.7.1, the flood hazard risks during construction can be adequately managed. Proposed works will be located outside of flood plains and overland flow paths as far as practicable. Where this is not possible, potential flooding effects will be managed through the flood risk mitigation measures set out in the CEMP for existing high flood hazard areas. For those areas where there is an increased flood risk, mitigation measures are proposed within 11.7.2. There are potential operational effects risks of increased flood levels upstream and downstream of crossings and where the vertical alignment of the road is elevated, discussed in Section 11.7.4. A number of potential management and mitigation measures have been provided to manage operational effects at the future detailed design stage within 11.7.5. Flood hazard outcomes are recommended as conditions on all NoRs. The future design stages of the projects will be required to meet these outcomes so that operational flood hazard effects can be managed appropriately.

Theme	Key Objectives and Policies	Analysis
		B10.2.2 (6) AUP:OP (RPS) and NH-P28 (WDP (Proposed)) adopts a precautionary approach to natural hazard risk assessment and management in circumstances where the effects of natural hazards and the extent to which climate change will exacerbate such effects are uncertain but may be significant. This includes the possibility of low probability but high potential impact event. The Pukekohe Transport Network adopts this through the sensitivity analysis further discussed in section 11.7 and detailed in the Flood Hazard Effects Assessment (Volume 4, Appendix D). **Conclusion** • The Pukekohe Transport Network contributes to the achievement of these objectives and policies by avoiding or minimising adverse effects on areas susceptible to natural hazards, and where the Projects are required in these areas, managing potential effects through the conditions framework.
Urban form and quality design *Transport networks support a quality urban form and are designed to achieve high levels of amenity and safety for users. The place function of transport networks is balanced with the functional movement purpose.* *Relevant to all NoRs*	**NPS-UD** Objective 4, Policy 6 **AUP:OP (RPS)** *B2.2.1(1A),* *B2.2.1(1),* B2.3.1(3), *B2.3.2(1)(d),* B2.3.2(2)(b), B2.3.2(4), B3.3.1(1)(d),	**Summary of Objectives and Policies** • The objectives and policies seek to create and protect urban environments that are both functional and enjoyable for people, by balancing the place and movement function of transport networks. • To achieve balance between place and movement, the objectives and policies recognise a need for mode shift, minimising private vehicle travel in favour of public transport, walking and cycling. • The objectives and policies of the Bombay 1 Precinct (adjacent to NoR 8) seek to enable the establishment of motorway and rural service activities where the amenity values of land adjoining the precinct are maintained and protected, and the site layout ensures safe and convenient access for vehicles and pedestrians. • The objectives and policies of the Runciman Precinct (within NoR 2 and 4) enable the provision of rural countryside living subdivision that has an open and spacious rural character and provides for safe, well-connected vehicle access and recreation trails.

Theme	Key Objectives and Policies	Analysis
	B3.3.2(4)(a), B3.3.2(7) **AUP:OP (DP)** E17.2(1), E17.2(2), E17.2(3), E17.3(1), E17.3(4), E25.2(1), E25.2(2), E25.3(2), E25.3(5). I406.2(1), I406.2(2), I406.2(3), I406.3(1), I406.3(2), I406.3(4), I437.2(4), I437.3(1), Franklin 2 Precinct: Objective: 1, 2, 7 Policy: 3, 22, 30 **WRPS** UFD-O1, UFD-P1 **WDP (Operative)** 2.10.6, 9.3.1, 9.3.3,	• The objectives and policies of the Franklin 2 Precinct (within NoR 3) seek to enable the development of mixed residential living that is supported by passenger rail and walkable neighbourhoods. • The WRPS seeks to improve connectivity within urban areas particularly by active transport and public transport. **Assessment** • The Pukekohe Transport Network provides for active modes along all main corridors and will also integrate transport infrastructure with existing town centres and neighbourhoods to support compact urban development. The projects have taken into account the environmental context of places to design and position the preferred network. • The Pukekohe Transport Network is designed to achieve high levels of safety for users (which is a key benefit). In regard to amenity, due to the long delivery timeframes, details tree species are not required or appropriate to be determined at this time and will be decided through Outline Plans (including the ULDMP) and resource consents. The design does not preclude the provision of amenity within the transport corridors (e.g., trees, planting or other landscaping) and appropriate construction management will be provided. • Noise and vibration during construction can be appropriately managed through the implementation of a CNVMP, which will detail the appropriate noise and vibration mitigation measures for particular areas. • NoR 8 is consistent with the objectives and policies of the Bombay 1 Precinct as it will enable safe access to the precinct for vehicles and active modes of transport. The NoR will provide upgrades to Mill Road which will improve the safety and amenity of the area. • NoR 2 and 4 are consistent with the objectives and policies of the Runciman Precinct as it will contribute to the enablement of safe access to and from the precinct without impacting on the rural character of the precinct.

Theme	Key Objectives and Policies	Analysis
	WDP (Proposed) TREE – O1, TREE - P1, EW – P2	• NoR 3 is consistent with the objectives and policies of the Franklin 2 Precinct as it will enable greater access to and from the neighbourhood via public, active and private modes of transport which will enhance the liveability of the precinct. **Conclusion** • It is considered that the Pukekohe Transport Network contributes to the achievement of these objectives and policies by supporting quality, compact urban form, allowing space for amenity planting within/next to the corridors and preserving existing natural assets (where practicable) which positively contribute towards amenity values.
Highly Productive Land *Protection of Highly Productive land for use in primary production* *Relevant to NoRs 2, 4 and 8 only.*	**NPS:HPL:** Objective within Section 2.1. Policy 1, 2 and 8 **AUP:OP (RPS)** B9.2.1 (1) (2) B9.3.2 (2) (5)**WRPS (NoR 8)** LF-O5, LF-P11	**Summary of Objectives and Policies** • The NPS-HPL seeks to ensure highly productive land is protected for use in land-based primary production, both now and for future generations. The NPS-HPL requires that territorial authorities avoid the inappropriate use and development of highly productive land. NPS-HPL clause 3.4(2) excludes any land identified as FUZ from highly productive land as these areas have been through a planning process to be identified as suitable for urban development. The below assessment is limited to those areas where the transport corridors are located in the rural zone and are within class 1-3 soils. This is relevant to sections of NoR 2, 4 and 8 only. • A use or development of highly productive land is inappropriate except where the exemptions in Clause 3.9(2) apply. These exemptions include where a use or development of highly productive land is for an activity by a requiring authority in relation to a designation or a notice of requirement under the RMA, or where a use or development is associated with the maintenance, operation, upgrade, or expansion of specified infrastructure, and there is a functional or operational need for the use or development to be on the highly productive land. Where one of the exemptions applies, territorial authorities must also take measures to ensure than any use or development on highly productive land minimises or mitigates any actual loss or potential cumulative loss of the

Theme	Key Objectives and Policies	Analysis
		availability and productive capacity of highly productive land in their district, and avoids, if possible, or otherwise mitigates, any actual or potential reverse sensitivity effects on land-based primary production activities from the use or development. • Key policies include the need to recognise highly productive land as a resource with finite characteristics and long term values for land based primary production (Policy 2), avoid urban rezoning of highly productive land, except as provided for in the NPS-HPL (Policy 5) and protect highly productive land from inappropriate use and development (Policy 8). Specific AUP:OP and WRPS objectives and policies reinforce that land containing elite soils is protected through land management practices to maintain its capability, flexibility and accessibility for primary production and is managed to enable its capability, flexibility and accessibility for primary production. **Assessment** • The NPS-HPL recognises that there may be situations where it is appropriate for use and development to occur on highly productive land. The Pukekohe Transport Network predominantly traverses FUZ which is not highly productive land for the purposes of the NPS-HPL. Designations within FUZ are therefore not included in the below assessment. Clause 3.9(2) provides further direction to implement Policy 8 by providing a specific list of activities that may be appropriate on HPL. This is associated with the functional or operational need for the use or development to be on the highly productive land. A listed exemption is specified infrastructure such as where a new road may need to traverse over an area of HPL. in many cases, the presence of specified infrastructure on HPL does not preclude the balance of the HPL being used by land-based primary production. • NoRs 2, 4 and 8 are located along the edge of or through land parcels zoned Mixed Rural and Rural Zone (WDP – NoR 8). This land has also indicatively been identified as highly productive in the AUP:OP (land use class 1-3). The Pukekohe Transport Network projects meet the definition of an exemption under Clause 3.9(2) of the NPS-HPL, because the use and development of this land

Theme	Key Objectives and Policies	Analysis
		is required in relation to a designation or a notice of requirement under the RMA. The projects are also associated with the maintenance, operation, upgrade, or expansion of specified infrastructure, and have a functional or operational need for the use or development to be on the highly productive land (Clause 3.8(2)(j)(i)). The projects are not expected to significantly erode or fragment the highly productive land, given large parcels of land are not required, and rural production land uses can occur on either side of the new transport networks. • NoR 2 partially traverses through HPL. The majority of the transport corridor (both the South Drury Connection and Paerata Arterial segments) are within the in FUZ, and therefore not classed as HPL. NoR 2 connects two areas of FUZ (Drury and Paerata) and operationally needs to be located within the rural zone. to achieve this. The SH22 Connection segment partly utilises the existing Sim Road, and part of the connection s located within HPL (LUC 2, 3 and 4). Utilsing an existing roads reduces impacts on HPL. • NoR 4 connects SH22 at Paerata with NoR 2 (a new state highway) with Pukekohe East Road, Pukekohe. To provide a high quality, strategic transport connection, locating in the rural zone in LUC soil class was selected from an extensive alternatives assessment process. There is an operational need to locate in this location to connect FUZ and the strategic network. NoR 8 upgrades existing roads. In particular, the upgrade of Mill Road will provide for an improved strategic corridor providing an inter regional connection between Auckland and Waikato to SH1. There is an operational need to upgrade in the proposed location to connect SH1 with the future urban zone. Impacts on HPL have been reduced through the use and upgrade of an existing road. **Conclusion** • It is considered the Pukekohe Transport Network contributes to the achievement of these objectives and policies because the projects are generally located along the edge of the highly productive land, or will enable the ongoing use of the land either side of the projects for rural production purposes. Adverse effects of the projects on adjacent highly productive land will be

Theme	Key Objectives and Policies	Analysis
		appropriately mitigated prior to construction is required. A listed exemption is specified infrastructure such as where a new road may need to traverse over an area of HPL. In many cases, the presence of specified infrastructure on HPL does not preclude the balance of the HPL being used by land-based primary production. • The adverse effects of this will be appropriately mitigated prior to construction if required. In these cases, the highly productive land (if classified) is adjacent to an existing road corridor which is being upgraded and therefore the designations will not significantly erode or fragment the highly productive land.
Future Urban Zone *Maintain and complement rural character and amenity.*	**AUP:OP (DP)** H18.2(1), H18.2(2), H18.2(3), H18.2(4), H18.3(1), H18.3(2), H18.3(3), H18.3(4), H18.3(5), H18.3(6)	**Summary of Objectives and Policies** • The relevant objectives of Chapter H18 seek for land to be developed to achieve the objectives of the Rural Production Zone until such time as it has been rezoned for urban purposes, and that urbanisation is avoided until the sites have been rezoned. • The relevant policies seek to avoid use and development that may result in the inefficient and ineffective operation of the local and wider transport network, require significant upgrades to infrastructure, inhibit the efficient provision of infrastructure or undermine the form or nature of future urban development. Further, use and development is required to maintain and complement rural character and amenity. **Assessment** • The Pukekohe Transport Network has been designed to support future urban development and is not intended to be implemented until such time as the FUZ is rezoned and developing or anticipated to soon develop. Until the Projects are implemented, the rural character and amenity of the FUZ will be maintained. • The Pukekohe Transport Network seeks to protect future transport corridors within the FUZ. Protection of these corridors will enable future urban developments to be efficiently and effectively

Theme	Key Objectives and Policies	Analysis
		serviced by a range of transport modes including by private vehicle, active modes, public transport while also enabling the efficient movement of freight. The intensity of the corridors correspond to the anticipated urban development intensity of surrounding FUZ land and therefore are not anticipated to require significant upgrades after implementation. **Conclusion** • The Pukekohe Transport Network aligns with the relevant FUZ objectives and policies because the projects are not intended to be developed until such time as development is occurring or planned to occur. The proposed corridors will also enable the effective and efficient movement of people, goods and services at an intensity that is appropriate for the anticipated urban land uses.
Rural Zones, including Countryside Living	**AUP:OP (DP)** H19.2.1(1), H19.2.1(3), H19.2.2(3), H19.2.2(4), H19.2.2(5), H19.2.3(2), H19.4.2(1), H19.7.2(2), H19.7.2(5), H19.7.3(1), H19.7.2(4)	**Summary of Objectives and Policies** • The relevant objectives and policies of the AUP:OP and the WDP seek to protect elite soils and manage prime soils, protect and enhance areas of significant indigenous biodiversity, maintain rural character and amenity, and protect rural land from reverse sensitivity effects. **Assessment** • As described in the NPS:HPL assessment row above, it is possible the land adjacent to NoR 2, 3, 4 and 8 will be mapped as HPL in the future because it is either appropriately zoned or the existing zoning could be considered as HPL. Mitigation of this loss (should this land be mapped as HPL in the future) will be implemented prior to construction if required which aligns with the objectives and policies contained within the NPS:HPL and the rural zone chapters in the AUP:OP and WDP. • The amenity of the rural zone (where this zoning is expected to remain in the future) will be maintained through the integration of the transport corridors with the surrounding landscape,

Theme	Key Objectives and Policies	Analysis
	WDP (Operative) 17A(8), (10), **WDP (Proposed)** GRUZ-O1, GRUZ-P2, GRUZ-P5,	which will be set out in the ULDMP for each transport project. Areas of significant biodiversity in rural zones have largely been avoided by the chosen transport alignments, as described in the ecological values row above. Where they are not able to be avoided, mitigation measures are proposed, including the implementation of an EMP during construction and operation as appropriate. **Conclusion** • The transport corridors contribute to the achievement of these objectives and policies by improving the efficiency of rural zones through better transport connections and reliability and mitigating adverse effects on rural character and amenity values.
Business Zones	**AUP:OP (DP)** H12.2(1), *H12.2(3),* *H12.2(4),* H12.2(5), H12.3(3), H14.2(2), *H14.2(3*), H14.2(5), H14.3(3), H14.3(12), H14.3(21), H17.2(1), H17.2(2), H17.2(3), H17.2(4), H17.3(4), H17.3(7)	**Summary of Objectives and Policies** • The relevant objectives and policies of the Business - General Use Zone seek for development to positively contribute towards planned future form and quality, creating a sense of place particularly with regard to streets by providing pedestrian amenity, movement, safety and convenience for people of all ages and abilities. • The relevant objectives and policies of the Business – Light Industry Zone seek to ensure light industry activities are able to function efficiently and any adverse effects on surrounding zones are avoided, remedied, or mitigated. • The relevant objectives and policies of the Business – Neighbourhood Centre Zone seek to enable small scale commercial centres to function within residential areas. • The objectives and policies of the relevant business zones also seek to recognise the functional and operational requirements of activities and development while avoiding, remedying or mitigating adverse effects on amenity values and the natural environment of adjacent public open spaces and residential areas.

Theme	Key Objectives and Policies	Analysis
		Assessment • NoRs 5, 6 and 8 cross some areas of General Business, Light Industry and Neighbourhood Centre Zone. These projects will positively contribute towards the planned future form and quality of Pukekohe, including these business zones. The transport corridors will create a sense of place particularly for streets by providing improved pedestrian and cyclist amenity, movement, safety and convenience for people of all ages and abilities. The transport corridors will improve the reliability of the transport network enabling business zones to operate efficiently, particularly with regard to improved efficiency of freight movements and better transport connections. • A ULDMP or Landscape Management Plan is proposed as a condition of the transport projects. This will integrate the permanent works of each transport corridor into the surrounding landscape and urban context so that potential adverse landscape and visual effects are managed. The amenity of adjacent areas during construction will be managed through engagement with the community and stakeholders (through the SCEMP), and through the construction management plans (in particular the CTMP) proposed as conditions on the designations. **Conclusion** • It is considered that the transport corridors contribute to the achievement of these objectives and policies by positively contributing towards planned future form and quality of business zones, improving the efficiency of access to these zones through better transport connections and reliability and mitigating adverse effects on amenity values and the natural environment of adjacent public open spaces and residential areas.
Residential Zones	**AUP:OP (DP)** H4.2(3), H4.2(4), *H4.3(9),* H4.3(10),	**Summary of Objectives and Policies**

Theme	Key Objectives and Policies	Analysis
	H5.2(A1), H5.2(1), H5.2(4), *H5.2(5), H5.2(6), H5.2(8), H5.2(10),H5.3(C1),* H5.3(8), H5.3(10)	• The relevant objectives and policies of the Residential – Mixed Housing Urban and Mixed Housing Suburban zones seek to ensure land is efficiently used to provide higher density urban living, increase housing capacity and improve choice and access to public transport. • Specific objectives and policies also seek to recognise the functional and operational requirements for development, in particular that the zones provide a well-functioning urban environment that enable all people to provide for their social, economic and cultural well-being. The objectives and policies direct that safe street environments are provided for pedestrians, and that intensification is avoided in areas with significant transport infrastructure constraints. **Assessment** • Some of the NoR corridor alignments interact with these zones (NoRs 2, 3, 4, 5, 6 and 7). The NoRs are consistent with the objectives and policies because they provide for the necessary transport infrastructure to support the residential zoning currently under development within the transport corridor areas and to increase the development capacity. • The NoRs will ensure land is protected to contribute to the accessible, high quality, effective, efficient and safe transport routes (including public and active transport modes) that support the movement of people, goods and services for residential zoned areas enabling communities' social, economic and cultural wellbeing to be provided for. • A ULDMP is proposed as a condition of the designations. The ULDMP will integrate the permanent works of each transport corridor into the surrounding landscape and urban context and ensure potential adverse landscape and visual effects are managed. • Amenity of the corridors during construction will be managed appropriately through engagement with residents, the community and stakeholders, and through the construction management plans proposed as conditions of the designations. **Conclusion**

Theme	Key Objectives and Policies	Analysis
		• It is considered that the NoRs support the objectives and policies of the residential zone chapters by providing the necessary transport infrastructure required to support the growth of these areas while avoiding, remedying or mitigating adverse effects on residential amenity**.**
Natural and Built Environment Act 2023 and Spatial Planning Act 2023		The Natural and Built Environment Act was passed into law on 23 August 2023. The Natural and Built Environment Act (along with the Spatial Planning Act) will replace the RMA. Under the Natural and Built Environment Act, each region will develop natural and built environment plans that will regulate the way in which a region's resources will be managed, how environmental limits and targets will be set locally, how to enable infrastructure and development, and how to resolve conflicts between outcomes. These will replace the regional policy statements and district and regional plans currently required under the RMA. An immediate repeal of the Resource Management Act (RMA) will not take place. There will be sequential development of each part of the new system region by region. The provisions of the RMA (with some exceptions), RMA national direction, RMA plans and RMA consenting continue to be in force until a NBE plan applies on the region's NBEA date. For the present case, the relevant resource management system in use is the Resource Management Act (RMA). Some changes that start the day after Royal assent include: • 10-year reviews of plans are no longer mandatory • some freshwater-related resource consents under the RMA are subject to maximum duration controls • a fast-track consenting process is available for specified applications

Theme	Key Objectives and Policies	Analysis
		• some compliance and enforcement provisions are applied • some provisions relating to contaminated land and aquaculture are applied. The above are either not relevant to Pukekohe Transport Network, or will be considered at future design stage, closer to construction (freshwater-related resource consents, and provisions relating to contaminated land).

12.1 Other Matters (section 171(1)(d))

When considering the Pukekohe Transport Network, the territorial authority must have particular regard to any other matter the territorial authority considers reasonably necessary to make a recommendation on the requirement. Other matters considered relevant to each of the NoRs are consistent across the Pukekohe Transport Network. Therefore, one assessment against these matters has been undertaken. Other matters considered relevant to the Pukekohe Transport Network are set out and assessed in Table 12.3 Table 12.3 and Table 12.5 below.

Table 12-2: Assessment Against Other Relevant Central Governance Matters

Central Government
Government Policy Statement on Land Transport (GPS) for 2021/22 – 2030/31
The Government Policy Statement on Land Transport 2021 (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 the GPS are: • 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; and • Improving freight connections – improving freight connections for economic development. The Pukekohe Transport Network provides: • a safe and reliable arterial network that supports growth, enables sustainable travel choice, addresses safety concerns and improves access to employment and social amenities. The Perata – Pukekohe Project is anticipated to significantly reduce the risk of DSI's and improve road safety for all users. • The Pukekohe Transport Network will significantly improve all transport facilities for all modes, resulting in improved safety for those that travel by car, freight, active mode and public transport. It improves corridor capacity, resulting in improved journey times and reliability for future freight and public transport demand. • The GPS 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 Project which is forecasted to increase mode shift to public transport and walking and cycling. Overall, the Pukekohe Transport Network positively contributes towards the strategic priorities in the GPS.
National Land Transport Programme 2021-2024
The National Land Transport Programme (NLTP) is a three-year programme of planned activities and a 10-year forecast of revenue and expenditure prepared by Waka Kotahi to give effect to the GPS 2021. As identified above, the Pukekohe Package positively contributes towards the strategic priorities identified in the GPS. Additionally, the NLTP highlights the investment in the Supporting Growth Programme to confirm and protect transport networks that are needed to support the development of new future urban growth areas over the next 30 years.
The Thirty-Year New Zealand Infrastructure Plan 2015

Central Government

The Thirty Year New Zealand Infrastructure Plan developed by The Treasury looks to advance the debate of long-term provisions, make 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 and co-ordinated and contributes to a strong economy and high living standards.

Regarding Auckland, 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, Auckland will need to provide 400,000 more dwellings. The Pukekohe Package provides an integrated approach to land-use and infrastructure planning which is critical to deliver good urban outcomes. The plan envisages $18.7 billion expected to be spent on infrastructure between 2015 and 2025. The Pukekohe Transport Network forms part of this spending and falls within the scope of this plan by enabling and providing for future urban growth in the Southern Growth Area in Auckland.

Waka Kotahi Arataki: 30-year plan (March 2023)

Arataki has been developed by Waka Kotahi as a shared sector view of how we need to plan, develop, and invest in the land transport system during the next 30 years. Arataki provides direction that will guide how we will work together during the next 30 years to deliver the future land transport system needed to keep Aotearoa New Zealand moving. In regard to Auckland, Arataki makes reference to the Auckland Transport Alignment Project (ATAP) and the Auckland Plan 2050, stating that continued close collaboration between the government and Auckland Council through ATAP will be critical to delivering the right outcomes in a complex and constantly challenging landscape. Arataki identified a number of key directions that identify the most important issues to be resolved over the next ten years to make progress towards transport outcomes. Of relevance to the Pukekohe Transport Network, these include: confirm timing and sequencing of major planned strategic projects, especially the rapid transit network, to provide greater certainty to the public about these investments to help shape future growth patterns, and to establish new methods of effective, long-term, integrated planning and investment decision-making for infrastructure that reflects the high-level of uncertainty around the location and timing of growth.

The Pukekohe Transport Network is consistent with Arataki, as the projects will provide greater certainty about the type and delivery of strategic transport projects in Pukekohe. The designation of these projects will also allow for them to be commenced in response to the growth in these areas. The Pukekohe Transport Network projects are consistent with ATAP and the Auckland Plan 2050 (as described below), in particular they will provide greater, more integrated transport choice for communities in Pukekohe including via active and public transport modes. This will lead to safer, more efficient and sustainable transport outcomes.

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 Pukekohe Transport Network plays a key role in providing opportunity to plan and design system improvements that embed the Road to Zero strategy. The Pukekohe Transport Network is anticipated to significantly reduce the risk of DSI's and improve road safety for all users. The Pukekohe Transport Network will significantly improve all transport facilities for all modes, resulting in improved safety for those that travel by car, freight, active mode and public transport.

Central Government

Waka Kotahi Integrated Planning Strategy

This strategy sets out what Waka Kotahi aim to achieve from an integrated planning approach leading and working with a range of government and private organisations to bring land use and transport planning and investment together. Waka Kotahi's vision is to help create better transport systems and options (safer, cheaper and offering more choice, reliability and efficiency) for all customers (commuters, freight operators, consumers, tourists, students and the wider public), especially at peak travel times.

Congruent with the Integrated Planning Strategy, the Pukekohe Transport Network has been developed through the Supporting Growth Programme which is a collaboration between AT and Waka Kotahi to plan for integrated transport investment in Auckland's future urban zoned areas over the next 10 to 30 years. AT and Waka Kotahi have partnered with Auckland Council, Manawhenua and KiwiRail and have worked closely with stakeholders and the community to develop the Pukekohe Transport Network which will provide a safe and reliable arterial network 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.

Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009

The construction and operation of Pukekohe Transport Network will not have any likely adverse effects on the National Grid, or require resource consent pursuant to the NES for Electricity Transmission Activities.

Resource Management (National Environmental Standards for Freshwater) Regulations 2020

The construction and operation of the Pukekohe Transport Network will likely result in works that affect freshwater streams and wetlands. Any necessary resource consents will be obtained as part of the future consent process which will consider regional issues.

Climate Change Response Act 2002 (CCRA)

The main regulatory tool for managing New Zealand's climate change response is the CCRA. The CCRA sets a system of emissions budgets to meet a long term 2050 emissions target (net zero GHG emissions, other than biogenic methane).

The CCRA sets the overarching legal framework to drive domestic emissions reductions to enable New Zealand to meet its international climate change commitments, and to provide a means for identifying and adapting to the effects of climate change that pose a material level of risk to New Zealand now and in the future. Waka Kotahi and Auckland Transport work within this framework and actively consider climate change considerations throughout the business case, optioneering and planning phase of project development. This includes considering how an efficient transport network can be developed that:

- Seeks to reduce carbon emissions from transport infrastructure, particularly in the context of vehicle kilometres travelled (VKT), and
- Seeks to ensure both existing and new transport infrastructure can adapt and be resilient to the effects of climate change.

The CCRA also sets a framework to enable New Zealand to adapt effectively to the consequences of climate change. The CCRA requires risks and opportunities arising from the effects of climate change to be identified through National Climate Change Risk Assessments, and appropriate policy responses to be developed through National Adaptation Plans.

Emissions Reduction Plan 2022

Central Government
Section 5ZN of the CCRA provides that a person or body may, in exercising or performing a public function, power, or duty conferred on that person or body by, or under law, take into account the following matters "if they think fit": • The 2050 target; or • An emissions budget; or • An emissions reduction plan. In May 2022 the Government published the first three emissions budgets (for 2022-25, 2026-30 and 2031-35), as well as the national Emissions Reduction Plan (ERP) setting out policies and strategies for meeting emissions budgets. The first ERP sets the following specific transport targets (relevant targets are bolded): 1. **Reduce total vehicle kilometres travelled (VKT) by the light fleet (private vehicles) by 20 per cent by 2035 through improved urban form and providing better travel options, particularly in our largest cities;** 2. Increase zero-emissions vehicles to 30 per cent of the light fleet by 2035; 3. Reduce emissions from freight transport by 35 per cent by 2035; and 4. Reduce the emissions intensity of transport fuel by 10 per cent by 2035. The Project has taken into account transport target 1 as it seeks to connect communities in a manner that assists in reducing vehicle kilometres travelled light fleet by increasing accessibility to the Drury and Paerata Train Stations and high- quality walking and cycling facilities.
Waka Kotahi Statement of Intent 2021-2026
This document sets out how Waka Kotahi will realise the vision of its new strategic direction, Te kāpehu | Our compass. Te kāpehu was developed in response to changes to the strategic and operating environments, including release of the Government Policy Statement on land transport 2021/22 – 2030/31. The Waka Kotahi focus is on creating an efficient and sustainable transport system that is safe, easy and connected providing one integrated land transport system that helps people get the most out of life and supports business. The Pukekohe Transport Network provides a safe and reliable strategic transport network that supports growth, enables sustainable travel choice, addresses safety concerns and improves access to employment and social amenities, and is consistent with the Waka Kotahi Statement of Intent.

Table 12-3: Table 12-4: Assessment Against Other Relevant Regional (Auckland and Waikato) Matters

Regional Matters
The 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 Pukekohe Transport Network will provide a safe and reliable arterial network that

Regional Matters
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 Pukekohe Transport Network is a direct response to the Auckland Plan and will help facilitate the sustainable growth of Paerata – Pukekohe area enabling the bulk transport infrastructure required to unlock development potential.
Auckland Future Land Supply Strategy (FULSS)
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. The Pukekohe Transport Network is critical to delivering a safe, efficient, reliable and resilient transport network to enable the greenfield capacity planned for both the Drury-Opāheke and Paerata - Pukekohe area therefore supports the growth objectives of the FULSS. This is discussed in further detail in Section 3.3.
Auckland Transport Integrated Transport Programme 2012-2041 (Published 2013).
Auckland's Integrated Transport Programme (ITP) sets out the 30-year investment programme to meet the transport priorities outlined in the Auckland Plan across modes covering the responsibilities of all transport agencies. Developed by AT and Waka Kotahi in collaboration with Auckland Council, the ITP provides a consolidated transport investment programme across the transport system over the next 30 years. In line with the Auckland Plan, the ITP identifies a key challenge for Auckland's transport networks will be servicing the forecast growth in residential and business activity in greenfield areas and that land use and infrastructure planning require careful planning and integration. The ITP identified that transport improvements within and through Auckland will be crucial in facilitating land use changes in Auckland's growth areas. This approach includes investment into strategically important road, public transport and active transport improvements. The Pukekohe Transport Network directly responds to the ITP providing a safe and reliable arterial network that integrates with land use planning, supports growth, enables sustainable travel choice for all transport users, addresses safety concerns and improves access to employment and social amenities.
Auckland Regional Public Transport Plan 2018-2028
The Auckland Regional Public Transport Plan 2018-2028 (RPTP) describes the public transport network that AT proposes for the region, identifies the services that are integral to that network over the next 10 years, and sets out the policies and procedures that apply to those services. The vision to have a public transport system with seamless end-to-end customer journeys that are safe, accessible and reliable focussing on making walking, cycling and public transport, the preferred choice for many more Aucklanders. Key outcomes of the RPTP include an increasingly safe, secure and sustainable public transport system with services that integrate with surrounding, and planned, land uses and contribute to placemaking. The Pukekohe Transport Network will significantly improve transport facilities for all modes, resulting in improved safety for those that travel by car, freight, active mode and public transport. The Package will significantly improve capacity and resilience, resulting in improved journey time performance and consistency for future public transport users. Consistent with the direction of the RPTP, the Pukekohe Transport Network will provide a safe, reliable multi-modal arterial network that supports growth, enables sustainable travel choice, addresses safety concerns and significantly improve access to employment and social amenities, integrating with existing and future planned urban development in both the Drury-Opāheke and Paerata – Pukekohe area.
Vision Zero for Tāmaki Makaurau: a transport safety strategy and action plan to 2030

Regional Matters
Developed in 2019, Vision Zero extends the existing safe system approach to stop the human sacrifice of mobility, placing 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 Pukekohe Transport Network 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 Pukekohe Transport Network is anticipated to significantly reduce the risk of DSI's and improve road safety for all users. The Pukekohe Transport Network will significantly improve all transport facilities for all modes, resulting in improved safety for those that travel by car, freight, active mode and public transport.
Auckland Long-term Plan 2018-2028
The Auckland Long Term Plan 2018-2028, which is required under LGACA 2002, sets out the Council's 10-year financial plan, and is guided by the strategic direction set by the Auckland Plan, as described and assessed above.
Auckland Economic Development Strategy 2012
The Auckland Economic Development Strategy sets out Auckland Council's 10-year strategy to make Auckland an internationally prosperous city. The top priority of the Auckland Economic Development Strategy is to — Grow a business-friendly and well-functioning city. This strategy aims to strengthen collaboration, provide and develop supporting infrastructure, and attract, build and retain talent and business capital in Auckland. Part of this purpose is to make Auckland more internationally connected and increase Auckland's exporting capacity. The Pukekohe Transport Network will play a vital role in unlocking the growth and success of new neighbourhoods and economic centres by improving and creating more reliable and efficient access to economic and social opportunities. The Pukekohe Transport Network will improve the resilience of the transport network and increase corridor capacity allowing improvements in freight movements in and around Drury-Opāheke and Paerata – Pukekohe. Overall, The Pukekohe Transport Network is consistent with the Auckland Economic Development Strategy, improving reliability and access to the critical economic and social needs of existing and future communities.
Auckland Parks and Open Spaces Strategic Action Plan (2013)
This Action Plan seeks to protect, and conserve Auckland's environment, heritage and landscape, expand and develop Auckland's park and open space networks, and to connect and utilise these parks and open spaces. Through the Alternatives Assessment, the Pukekohe Transport Network has largely avoided the acquisition of land from parks/open spaces along the route during construction. Mill Road Esplanade Reserve is the only exception of this, whereby, the frontage of this site is designated for the widening of Mill Road (NoR 8).
Auckland Sport and Recreation Strategic Action Plan 2014-2024 (refreshed 2017)
This plan seeks to increase the availability to, and participation in, physical activities, recreation and sport within Auckland. In particular, the Plan focuses on increasing participation in informal recreation, providing infrastructure to improve access to open spaces and waterbodies, sporting achievement and improving Council's parks and recreation sector. Through the Alternatives Assessment for the Pukekohe Transport Network, sport and recreation facilities have been largely avoided. The A&P Showgrounds was a key consideration through alternatives assessment for

Regional Matters
NoR 5 and the Project Team has reduced impacts on the A&P Showgrounds by locating NoR 5 south of the Showgrounds. The Pukekohe Transport Network will also provide cycleway and walkway connections which will help increase informal physical activity and improve access to open spaces and recreation facilities.
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 Pukekohe Transport Network has been designed having regard to and taking into account climate change and resilience. The Pukekohe Transport Network will deliver better accessibility and mode choice (thus avoiding the present reliance on low occupancy vehicles (LOV)). 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 Growing Greener
Auckland Growing Greener is an ongoing initiative to help realise the vision of the Auckland Plan. It outlines the role of council and council-controlled organisations to deliver on four priority areas – restoring nature, urban transformation, zero waste and healthy waters. Concentrating on urban transformation, the strategy identifies the key role better public and active transport choices play in achieving the Auckland Plan vision. The Pukekohe Transport Network will provide a safe, reliable multi-modal arterial network that supports growth and enables sustainable travel choice throughout both the Drury-Opāheke and Paerata – Pukekohe area. This provision supports the Auckland Growing Greener strategy and contributes towards achieving the Auckland Plan vision.
Auckland Indigenous Biodiversity Strategy 2012
The Auckland Indigenous Biodiversity Strategy seeks to protect, maintain and restore the indigenous biodiversity within Auckland. This involves conserving as many species as possible with particular attention being given to those species which are threatened, implementing iwi values, educating Auckland's communities and fostering guardianship and the collaboration of governmental organisations. Biodiversity has been a key consideration of the Pukekohe Transport Network in particular in efforts to avoid, remedy or mitigate the potential adverse effects.
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 Pukekohe Transport Network seeks the removal of some trees within the proposed designation boundary (protected by district plan rules), this will be mitigated by planting within the new road layouts and results in positive effects due to the lack of trees within the Pukekohe Transport Network. The long-term outcome of comprehensive street tree planting will be more trees in the public realm and increased amenity value within the road network, consistent with the Auckland Urban Ngahere (Forest) strategy.

Regional Matters

The 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.

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 Pukekohe Transport Network is consistent ATAP as it will provide a safe and reliable arterial network 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, NZTA and KiwiRail, and forms part of the National Land Transport Programme.

The Te Tupu Ngātahi Supporting Growth Programme 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.

The Waikato Regional Public Transport Plan (RPTP)

The (RPTP) sets out the priorities and needs of public transport services and infrastructure to be delivered in the Waikato over a 10-year period. It's prepared in partnership with territorial authorities and key stakeholders from a wide range of sectors.

The Pukekohe Transport Network Package provides an integrated approach to land-use and infrastructure planning which is critical to delivering good urban outcomes.

Waikato Regional Land Transport Plan (RLTP) 2021-2051

The Waikato Regional Land Transport Plan 2021-2051 (RLTP) continues to build off the strategic direction of the 2018 RLTP, setting out the policy framework and transport programme for land transport in the Waikato region.

The Regional Transport Committee (RTC) has identified priority transport problems in the RLTP to be addressed through a range of implementation measures. The key focus is on:

Regional Matters
• Ensuring our strategic inter and intra-regional corridors are fit for purpose and are efficient, particularly in the context of growth pressures in the Hamilton-Waikato metro spatial area, the Hamilton to Auckland Corridor and in the wider upper North Island. • Tackling our complex road safety problem to ensure we have a safe and accessible transport system where no-one is killed or seriously injured on our region's roads. • providing better transport options for our people, in our urban and rural communities. • Ensuring we are making every effort to meet our climate change responsibilities under a national policy framework that has set net carbon emissions targets and is steering towards a net carbon zero transport system by 2050. • Working together in partnership to ensure integrated landuse and transport outcomes that benefit people, their health and well-being, and our environment. Within the Pukekohe Transport Network, the Mill Road and Pukekohe East Road is a key inter-regional connection and the upgrade provides for a safer transport corridor with between transport options (such as active modes) for those within nearby communities.

Table 12-5: Assessment Against Other Auckland Local Governance Relevant Matters

Local Matters
Franklin Local Board Plan 2020
Auckland Council has a unique model of local government in New Zealand, made up of the Governing Body (the mayor and 20 councillors) and 21 local boards. Of relevance to the Pukekohe Transport Network, the Franklin Local Board is the governing local body in the southern area of Auckland which the Project is situated and is responsible for decision-making on local matters, activities and services, and provide input into regional strategies, policies, and plans.

Figure 12-1: Local Board Connectivity with The Auckland Plan and Auckland's Budget

Franklin Local Board Plan 2020 highlights the population growth in the area, stating that the population is expected to increase from 75,387 to 160,671 by 2051. In the next 30 years, Pukekohe – Paerata will increase by 33,800 new people and Drury-Opāheke will increase by 60,000 people. The Franklin Board consists of 23% of Auckland's total land area. In terms of transport, the Franklin Board has 1 existing and 3 proposed new train stations and 2 state highways, with the roading next work making up 16% of Auckland's total road network

Local Matters

including 951km of rural roads and 297km of urban roads. The Local Board Plans outline outcomes for the respective local board areas.

13 Outcome 1: Our strengths generate local opportunity and prosperity
14 Outcome 2: Improved transport options and fit for purpose roads
15 Outcome 3: Fit for purpose places and facilities
16 Outcome 4: Kaitiakitanga and protection of our environment
17 Outcome 5: Cultural heritage and Māori identity is expressed in our communities
18 Outcome 6: A sense of belonging and strong community participation

The Pukekohe Transport Network identifies 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 Pukekohe Transport Network 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. The Pukekohe Transport Network will provide a multimodal, safe and reliable arterial network that supports growth, enables sustainable travel choice for all transport users, address safety concerns and improve access to employment and social amenities.

Pokeno Public Realm Concept Plan, Tuakau Structure Plan

Waikato District Council Structure Plans are described within section 9.1.1 of this Report.

The Pokeno Public Realm Concept Plan and the Tuakau Structure Plan highlight the land use patterns of development within the Northern Waikato District High growth and development has been observed and the continuation of growth is planned. This has been considered for the alignment of NoR 8, as a is a key inter-regional connection and the upgrade provides for a safer transport corridor with between transport options (such as active modes) for those within nearby communities.

The Pukekohe-Paerata Structure Plan 2019, Drury-Opāheke Structure Plan 2019

Auckland Council Structure Plans are described within section 9.1.1 of this Report.

The land surrounding the proposed alignment for NoRs 1, 2, 3, 4 and 5 is predominantly FUZ. FUZ land is planned to undergo significant growth and change in the future, as it is planned to be live zoned based on FULSS timeframes. The likely future land use environment in which NoRs 1, 2, 3, 4 and 5 will operate is therefore assumed to be an urban or developing urban environment. The Pukekohe Transport Network has considered these structure plans throughout the development of the alignments. This is discussed in further detail in Section 3.3.

Based on the Drury-Opāheke Structure Plan and private plan changes lodged with Auckland Council, the land use pattern surrounding the Project is planned to be largely medium density residential, with MHS zoning shown along the alignment of NoR 1. Based on the Pukekohe-Paerata Structure Plan 2019 and private plan changes lodged with Auckland Council, the land use pattern surrounding the Project is planned to be largely medium to high density residential summarised below:

- MHS zoning along NoR1
- THAB and MHU zoning along NoR 2 and 3
- MHU zoning along NoR 4 (at the beginning of the alignment from SH22)
- Industrial, MHU and MHS zoning along NoR 5

Local Matters

The change in land use is subject to future plan changes to rezone the land. At the time of writing of this report, there were multiple plan changes already lodged and multiple plan changes being prepared to be lodged with Auckland Council. Information of this can be found in section 9.1 of this Report.

Waikato 2070

The Waikato District Council Growth & Economic Development Strategy (Waikato 2070) has been developed to provide guidance on appropriate growth and economic development that will support the wellbeing of the district. Waikato 2070 will guide and inform how, where and when growth occurs in the district over the next 50 years. The strategy takes a broad and inclusive approach to growth over the long term, taking into account its economic, social, environmental, cultural and physical dimensions. Waikato 2070 is concerned with the growth and development of communities throughout the district, including rural and urban environments.

There are eight opportunities highlighted for the Waikato District, of relevance to the Pukekohe Transport Network is transport. The Waikato Expressway (SH1), State Highway 2 and the North Island Main Trunk (NIMT) rail line run through the district. These critical transport corridors have shaped the district and bisect many of the district's towns and settlements along the route. Future development of these corridors and the provision of improved public transport (road, river and rail) can leverage off these assets to help connect the district regionally, nationally and internationally. Public transport and commuter trails must be utilised to open up a range of areas that connect our people to jobs and community assets throughout our district and region. Furthermore, the Walkways, Cycleways & Bridle Trails Strategy provides additional connections and access to nature and tourism opportunities through off-road linkages.

For the reasons below, the Pukekohe Transport Network aligns with the opportunities for transport highlighted in Waikato 2070:

- Mill Road (Bombay) and Pukekohe East Road provide an important connection between the Waikato and Auckland and is a key freight route.
- The upgrade will tie in with the proposed Waka Kotahi NZ upgrade to the Bombay Interchange.

This corridor also includes an active mode upgrade, from Harrisville Road along Mill Road and continues along Pukekohe East Road to the FUZ in Pukekohe (at the North-East Arterial).

Long Term Plan 2021 - 2031

The Long Term Plan (LTP) sets out the vision, direction, work plan and budgets for the next 10 years. With input from the communities, Waikato District Council (WDC) develop a new LTP every three years. WDC recently adopted the LTP 2021-2031 on 28 June 2021. A key focus of our Long-Term Plan (LTP) is to build the Council's capacity and capability to fulfil our vision of creating liveable, thriving and connected communities

30 Year Infrastructure Strategy

This Infrastructure Strategy sets the strategic direction for the provision of infrastructure in the Waikato district and responds to the requirements in the Local Government Act 2002, specifically section 101B. It is intended to have a strategic focus, which can be read as a standalone document that sits alongside the growth and development, and financial strategies, and will direct the activity management planning process, as shown below in **Figure 12-2**.

Local Matters

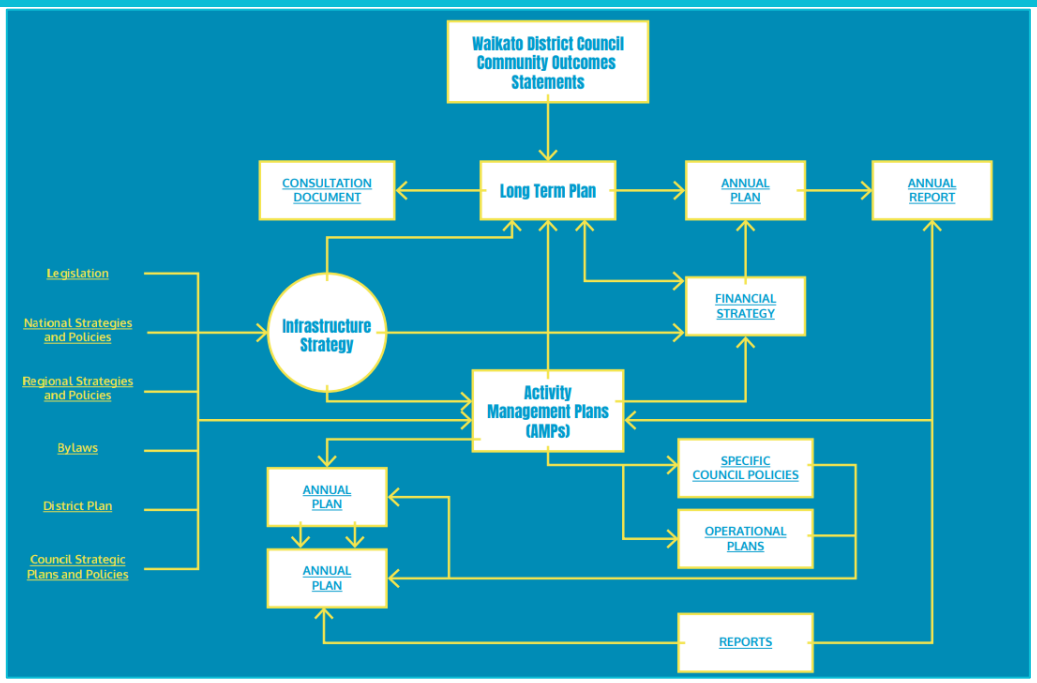

Figure 12-2: Infrastructure strategy linkage with other documents.

Waikato District Council is experiencing high levels of growth in parts of the district which border the larger urban centres of Hamilton and Auckland. Over the next 30 years, Waikato District Council plans to build new infrastructure to meet development needs as well as renew existing assets to maintain its level of service and provide resilience to natural hazards. It is noted that the Waikato district lies within the Northern growth corridor between the large cities of Hamilton and Auckland along State Highway 1, and major growth centres include Huntly, Ngaruawahia, Raglan, Te Kauwhata and Tuakau. With regard to the corridor upgrade, Tuakau and Pokeno is located approximately 10km away from Mill Road and Pukekohe East Road and is a key connection between Waikato and Auckland communities. Tuakau and Pokeno are high growth areas which will benefit from the infrastructure upgrades.

The Pukekohe Transport Network provides an integrated approach to land-use and infrastructure planning which is critical to delivering good urban outcomes.

Climate Action Plan - WDC Climate Response and Resilience Action Plan Framework (2020)

The purpose of the Climate Action Plan is to provide a plan for Waikato District Council to meet its audit and statutory obligations and community expectations. This plan outlines the Council's response to climate change and provides actions that will help Council teams and the district to mitigate, build resilience and adapt to climate change.

The Climate Action Plan is a response to the national framework set out below:

- Zero Carbon Act (discussed above)
- Resource Management Act (discussed above)
- National Risk assessment for climate change
- Local Government Leaders Statement
- LGNZ position statement
- Controller and Auditor General LTP requirements

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• Regional framework (the Waikato Plan and partner Councils) Within the Climate Action Plan, it is noted to encourage compact growth, non-motorized transport e.g. walking, cycling, public transport, with the aim to reduce the number of cars. The Mill Road and Pukekohe East Road Upgrade includes an active mode upgrade. The Pukekohe Transport Network has been designed having regard to and taking into account climate change and resilience. The Pukekohe Transport Network 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 Plan.
Reserve Management Plans and Sports Park Reserve Management Plan.
On 8 June 2015 Waikato District Council adopted the General Policies Reserve Management Plan and Sports Park Reserve Management Plan. There are no Waikato reserves impacted through the widening of Mill Road or Pukekohe East Road.
Waikato District Plan (Operative) and (Proposed)
Refer to Section 12.
Auckland Unitary Plan
Refer to Section 12.
Pukekohe-Paerata Paths Plan - an Aspirational Plan (Adopted 2018) and Draft Trails Strategy 2016 – Waikato District Council
The purpose of this document is to provide guidance to Franklin Local Board, council departments, council-controlled organisations (CCOs), community groups, private developers and other interested parties relating to the long-term Local Path network for the Pukekohe-Paerata areas. One key objective of this document is to improve connectivity between outdoor areas and help increase use, as shown through Figure 12-4. Priority connection projects are further detailed within the document, however a summary of the key routes a is provided below: • Heights Road, Helvetia Road and Harris Street (shared path) • Between Paerata and Pukekohe Township • Between Paerata and Pukekohe Township • Pukekohe Stadium to Ernies Reserve, Reynolds Road Reserve / Cape Hill • Hickey's Recreational Reserve to Princes Street Reserve. • Cape Hill to the train station connecting through Rooseville Park. • Bledisloe Park. • Pukekohe Township to Puni Recreational Reserve via Pukekohe Hill Reserve. • John Street and Kitchener Road to Upper Queen Street and Tuakau Road

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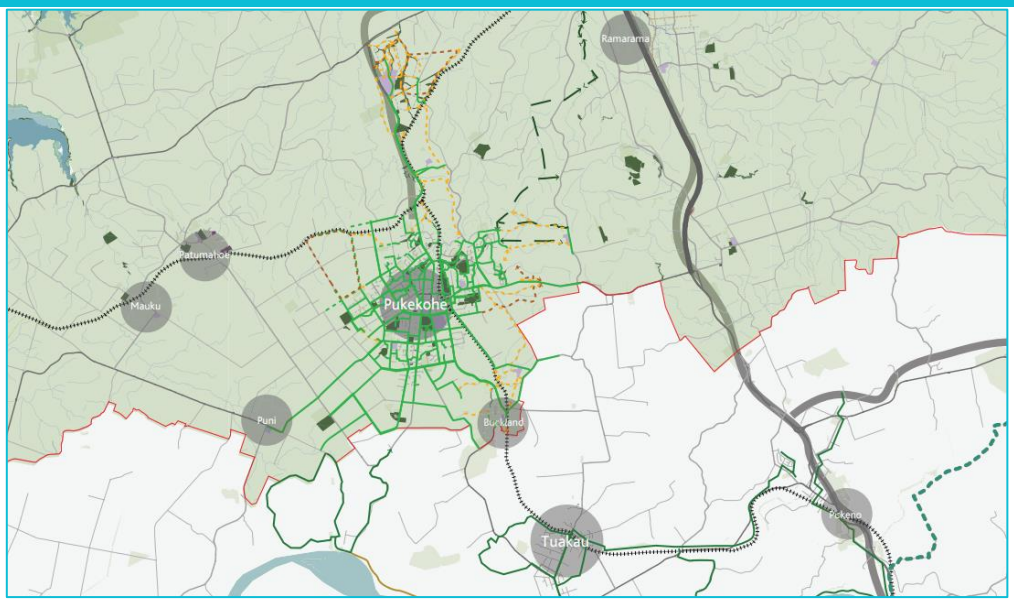

Figure 12-3: Key routes and wider connections - Pukekohe-Paerata Paths Plan

The Pukekohe Transport Network improves connectivity through introducing active mode paths allowing for increased travel choices including both walking and cycling facilities.

It is also noted the importance of providing connectivity with opportunities in Waikato. Waikato District Council developed the 'Draft Trails Strategy 2016', a document with maps showing the locations of existing and aspirational walking, cycling, and bridle trails. These routes were considered for the Pukekohe - Paerata Paths Plan.

13 Assessment of Part 2 of the RMA

Section 171(1) of the RMA states that when considering a NoR, a territorial authority must consider the effects on the environment having particular regard to a number of matters (assessed above) and subject to Part 2 of the RMA.

Section 5(1) of the RMA states that the purpose of the RMA is to promote the sustainable management of natural and physical resources.

Section 5(2) of the RMA then provides a definition of sustainable management. In our view, in determining whether the Pukekohe Transport Network promotes sustainable management, consideration of Sections 6, 7 and 8 of the RMA is required before drawing any conclusions regarding consistency with Section 5 of the RMA.

The following section provides an assessment of the effects of the Pukekohe Transport Network subject to Part 2 of the RMA.

13.1 Matters of national importance

Section 6 of the RMA states that in achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for specified matters of national importance. We consider the following matters of national importance to be relevant to the Pukekohe Transport Network:

Table 13-1: Matters of National Importance

Matter of national importance	Assessment
(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*	The Pukekohe Transport Network is not located within the coastal environmental. Adverse effects on natural character values have largely been avoided or minimised through the alternatives assessment process for stream and wetland environments. This matter is most relevant to the Project areas surrounding the Ngakoroa Stream, Oira Creek, and Whangapouri Creek. The streams and wetland environments within the Project area have been heavily modified by historical drainage and reclamation such that they remain in a state of degradation Through future resource consent processes and reinstatement and mitigation planting at the completion of works, this provides opportunities for natural character values to be improved through enhancements to the landscape.
(b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development*	The Pukekohe East tuff ring is an ONL in the AUP. The overlay extends over the existing Pukekohe East Road. NoR 8 and a small part of NoR 5, that upgrades Pukekohe East Road is located within the overlay. Through alternatives assessment process, effects on the ONL were minimized by widening for an active mode connection to the southern side of the existing road. While permanent works will occur within the extent of the ONF as the overlay extends over the existing road, the walking and cycling upgrade will enable public views for those using the shared part to this geological, cultural and heritage site where

Matter of national importance	Assessment
	currently the view is from high speed vehicle travel. Opportunities to further recognise the ONF can be identified through the Cultural Advisory Report, ULDMP, Landscape Management Plan and Cultural Monitoring Plan for NoR 8 in particular.
(c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna*	Through the development of the Pukekohe Transport Network, we have sought to avoid or minimise impacts on a range of high value ecological areas including high value wetlands, streams and SEAs. This is demonstrated through the alternatives assessment process undertaken. The Pukekohe Transport Network avoids all SEAs, except NoR 4 which includes a small part of SEA_T_4375 so that a bridge can be constructed over a stream. Impacts on the SEA have been reduced as much as reasonably practicable at this stage of design. Further mitigation related to resource consent requirements will also be incorporated in the future consenting phase of the Project. In considering the potential future effects on areas of significant indigenous vegetation and habitats arising from activities that may require resource consent in the future, it was determined that any potential effects of the Pukekohe Transport Network can be adequately managed in any future consent processes.
(d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers*	The proposed designations will not impact upon any existing public access to streams or the CMA. The Pukekohe Transport Network has the potential to increase access to rivers/streams by providing walking and cycling facilities and integrating with future parks and connections proposed through development.
(e) *The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga*	This matter is recognised and provided for throughout the Pukekohe Transport Network. Manawhenua have been actively involved throughout development of the early concepts, through alternatives assessment and identification of the preferred options. They have also helped develop the conditions proposed on the designations that set out mana whenua involvement throughout the future project phases. The opportunity to provide CIAs was provided to all Manawhenua groups within the Pukekohe Transport area, with Ngaati Te Ata Waiohua providing CIAs to inform the alternatives assessment and this AEE Report. The ongoing partnership with Manawhenua has provided an understanding and the incorporation of Manawhenua values and expression of kaitiakitanga throughout the Projects. Sites and matters of significance to Manawhenua are discussed in Section 11.4 of this AEE. The relationship of the respective iwi with the Project area, their ancestral lands, waahi 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 involvement of mana whenua in the future stages for the project are embedded in the proposed designation conditions.
(f) *The protection of historic heritage from inappropriate subdivision, use, and development*	Heritage items potentially impacted by the construction of the Pukekohe Transport Network can be appropriately mitigated through the proposed HHMP. .

Matter of national importance	Assessment
	Two possible pre-1900 villas are located in the proposed designation boundary of NoR 4 at 1021 Paerata Road at 87 Pukekohe East Road. Buildings within the designation boundaries will need to be removed and could be relocated and are subject to a HNZPTA if they are pre-1900. This is to be confirmed at detailed design phase. There is one site (Nehru Hall) within the designation of NoR 6. The road widening to allow for active facilities is partly located within the heritage site, but does not impact the building. The measures to managed effects of the Nehru Hall will be set out in the HHMP proposed as a condition on NoR 6. There is one pre-1900 site recorded south of the proposed designation NoR 8, R12/1208 - Bombay Flour Mill or Pilgrim's Mill. It is likely the former building site is located outside of the designation, but associated features may be unearthed during construction within the designation. There are no remains visible on the surface and the site has been demolished. A HNZPT authority will be sought for the works before construction. The potential to disturb unrecorded sites during construction is managed by seeking a pre-cautionary HNZPT approval. An accidental protocol will also be established.
(g) The protection of protected customary rights	None of the NoRs within the Pukekohe Transport Network impact upon any protected customary rights.
(h) The management of significant risks from natural hazards	The Pukekohe Transport Network manages risk from natural hazards during both the construction and operation phases. Measures to mitigate flood risk during construction (measures included in the CEMP proposed as a condition of the designations) and future flood risk modelling will ensure the design does not exacerbate flood risks.

13.2 Other matters

Section 7 of the RMA states that, in achieving the purpose of the RMA, particular regard shall be had to specified other matters. We consider the following other matters to be relevant to the Network:

Table 13-2: Other Matters

Other matter	Assessment
Kaitiakitanga:	Manawhenua have been actively involved through the NoR phase of the Pukekohe Transport Network and will continue to exercise kaitiakitanga through the future phases of the Project. This includes the preparation of management plans and the involvement of Manawhenua as partners in the detailed design and consenting phases of these projects, as set out in the conditions.
The ethic of stewardship:	This has been recognised through engagement with key stakeholders, business associations, community groups and the wider community who exercise stewardship over particular resources. Input throughout the design process for various agencies has enabled the development of an integrated transport solution, and that provides important community and environmental outcomes.

Other matter	Assessment
The efficient use and development of natural and physical resources:	Through the assessment of alternatives process, the Pukekohe Transport Network was determined to be the most efficient use of natural and physical resources to achieve the needs of the community.
The efficiency of the end use of energy:	Not considered relevant to the Pukekohe Transport Network.
The maintenance and enhancement of amenity values:	This will primarily be achieved through the implementation of the ULDMP which is a proposed condition on the designations.
Intrinsic values of ecosystems:	Adverse effects on ecosystems have been avoided as far as practicable while providing sufficient width within the designation boundaries. It is expected that designation boundaries will be further refined during the detailed design phase. Appropriate mitigation will be undertaken where ecosystem values are compromised.
Maintenance and enhancement of the quality of the environment	The quality of the environment will be maintained and enhanced in some places through the implementation of the ULDMP or Landscape Management Plan which is a condition on the designations.
Any finite characteristics of natural and physical resources:	Not considered relevant to the Pukekohe Transport Network.
The protection of the habitat of trout and salmon:	Not considered relevant to the Pukekohe Transport Network.
The effects of climate change:	The Project responds to the effects of climate change and the reduction of greenhouse gas emissions by high-quality walking and cycling facilities and connections to the rapid transit network. The Pukekohe Transport Network reduces 15.4 million vehicle kilometers travelled (VKT) yearly, when compared with the existing and likely future network (without the Project). Further information on the modelling assumptions relating to the base scenario and likely future network is available in the Transport Assessment. The Project responds to the effects of climate change through the provision of replanting that, when delivered, will contribute to reducing urban heat island effects.
The benefits to be derived from the use and development of renewable energy.	Not considered relevant to the Pukekohe Transport Network.

13.3 Treaty of Waitangi

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

AT and Waka Kotahi have partnered with Manawhenua throughout the development of the Pukekohe Transport Network to identify areas and matters of cultural significance and incorporate this as part of the alternatives assessment process. This has included avoiding or minimising impacts on SEAs, wetlands and streams, reducing impacts on the Pukekohe East tuff crater (ONF) and ensuring that construction management plans will be in place to protect water quality and any previously

unrecorded items of cultural heritage encountered.

Further engagement will be undertaken in the detailed design and construction phases to ensure that the principles of the Te Tiriti o Waitangi are taken into account.

Given the above, the development of the Pukekohe Transport Network is considered to be consistent with the principles of the Te Tiriti o Waitangi, and section 8 of the RMA.

13.4 The purpose of the Act

Section 5 of the RMA sets out the purpose of the RMA which is to promote the sustainable management of natural and physical resources.

The Pukekohe Transport Network will result in some adverse effects, however, when considering the significant regional and local benefits of the Network, and the measures proposed to avoid, remedy and mitigate the adverse effects, the Pukekohe Transport Network achieves the purpose and principles of the RMA.

14 Other Statutory Approvals Required

Further and separate approvals under other legislation will be required and will be sought in the future. This report does not seek authorisation or approval for those works, but they are set out in Table 14-1 for clarity.

Table 14-1: Other Statutory Approvals Required

Other statutory approval required	Discussion
Outline plan of works	In accordance with section 176A of the RMA, Waka Kotahi and AT (as the requiring authorities) will submit to Auckland Council and Waikato District Council (as the territorial authority) one or more outline plan(s), detailing all relevant aspects of the transport corridors following the completion of detailed design and prior to the commencement of construction.
Land subject to existing designations	Some land to be designated for the transport corridors is subject to existing designations by other requiring authorities. In order to undertake work in accordance with a designation on land with an existing designation, written consent from the requiring authority of the earlier designation is required under section 177(1)(a). The section 177(1)(a) approvals required for each corridor are set out in Section 9 under the existing planning environment. Written approval is required to undertake works within the earlier designations where those works may prevent or hinder the earlier designation's purpose or project. Consultation has occurred with these requiring authorities to confirm acceptability of indicative designs. However, it is appropriate that written consent is sought at detailed design prior to construction when further details and timing of the works within the requiring authority's designation will be known and to account for any changes to status of earlier designation. Therefore, written approval under section 177(1)(a) of the RMA will be sought closer to construction.
Future resource consents	The transport corridors will require NES and regional resource consents to enable works (noting the consenting requirements may change between now and implementation of these Projects). Although not being sought at this stage, this has been considered in the indicative designs, options assessment and the designation footprints. These consents will be sought during the detailed design phase for each of the transport corridors.
Approvals under other legislation	Other matters which will need to be considered include: Public Works Act 1981 – the acquisition of required land Heritage New Zealand Pouhere Taonga Act 2014 – authorities for works on or in any archaeological sites Wildlife Act 1953 – the disturbance or relocation of protected species

15 Conclusion

The Pukekohe, Paerata and Drury areas in the south of Auckland has been signalled to undergo significant urban growth in the next 30 years. The Pukekohe-Paerata and Drury area will experience significant change over the coming years as the existing rural environment develops into a new urban area. This is accelerating as private plan changes are lodged with Auckland Council. The Pukekohe Transport Network will provide critical transport infrastructure to support and integrate with the planned future growth in Pukekohe, Paerata, Drury and the wider south Auckland growth areas.

While some adverse effects will be generated during construction and operation of the Projects, these can be mitigated by the management plans and other measures which are proposed as conditions of the proposed designations. The Projects will have significant positive effects, and provide for the social, economic and cultural wellbeing of communities at a local and regional level.

The Pukekohe Transport Network is consistent with the relevant planning documents and statutory tests, thereby satisfying the requirements necessary for Auckland Council to recommend confirmation of the NoRs on the basis of the conditions proposed by Waka Kotahi and AT.