



TE TUPU NGĀTAHI
SUPPORTING GROWTH

North

Assessment of Effects on the Environment

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

Volume	Title	Appendices
1	Notices of Requirement (Form 18s)	Attachment A: Designation Plans Attachment B: Schedules of Directly Affected Properties Attachment C: Conditions of Designations
2	Assessment of Effects on the Environment	Appendix A: Assessment of Alternatives Appendix B: Conditions of Designations Appendix C: Construction Area Requirements Appendix D: Statutory Assessment Appendix E: Cultural Impact Assessment Appendix F: Manawhenua Engagement Summary
3	Design and Designation Boundaries	Appendix A: General Arrangement Layout Plans Appendix B: Property Boundaries and Schedules
4	Supporting Technical Reports	Appendix A: Assessment of Arboricultural Effects Appendix B: Assessment of Archaeological and Heritage Effects Appendix C: Assessment of Construction Noise and Vibration Effects Appendix D: Assessment of Ecological Effects Appendix E: Assessment of Flooding Effects Appendix F: Assessment of Landscape, Natural Character and Visual Effects Appendix G: Assessment of Social Impacts Appendix H: Assessment of Traffic Noise and Vibration Effects Appendix I: Assessment of Transport Effects Appendix J: Urban Design Evaluation Report

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Acronyms and Terms Definitions

Acronym/Term	Description
AGRD	Austrroads Guide to Road Design
AADT	Annual Average Daily Traffic
AEE	Assessment of Effects on the Environment
AMC	Active Mode Corridor
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
AUP:OP	Auckland Unitary Plan – Operative In Part
BMP	Bat Management Plan
BPO	Best Practicable Option
CCRA	Climate Change Response Act 2002
CEMP	Construction Environmental Management Plan
CHI	(Auckland Council) Cultural Heritage Inventory
CIA	Cultural Impact Assessment
CMA	Coastal Marine Area
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
EIANZ	Environmental Institute of Australia and New Zealand
EMP	Ecological Management Plan
ERP	Emissions Reduction Plan
FDS	Future Development Strategy
FTN	Frequent Transit Network
FULSS	Future Urban Land Supply Strategy
FUZ	Future Urban Zone
GHG	Greenhouse Gas
GIS	Geographic Information System
GPR	Ground Penetrating Radar
GPS	Government Policy Statement

Acronym/Term	Description
GRPA	Government Roding Powers Act 1989
HGMPA	Hauraki Gulf Marine Park Act 2000
HHMP	Historic Heritage Management Plan
HNZPT	Heritage New Zealand Pouhere Taonga
HNZPTA	Heritage New Zealand Pouhere Taonga Act 2014
HOV	High Occupancy Vehicle
IBC	Indicative Business Case
LGA	Local Government (Auckland Council) Act 2009
LMP	Lizard Management Plan
LTA	Land Transport Act 1998
LTMA	Land Transport Management Act 2003
LUC	Land Use Capability
MDRS	Medium Density Residential Standards
MSM	Macro Strategic Model
NES-F	National Environmental Standards for Freshwater 2020
NoR	Notice of Requirement
North Projects	<p>The North Projects comprising the following new or upgraded transport corridors:</p> <ul style="list-style-type: none"> • NoR 1 – New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path • NoR 2 – New Milldale Station and Associated Facilities • NoR 3 – New Pine Valley East Station and Associated Facilities • NoR 4 – SH1 Improvements • NoR 5 – New SH1 crossing at Dairy Stream • NoR 6 – New Connection between Milldale and Grand Drive • NoR 7 – Upgrade to Pine Valley Road • NoR 8 – Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat • NoR 9 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany • NoR 10 – Upgrade to Wainui Road • NoR 11 – New Connection from Dairy Flat Highway to Wilks Road • NoR 12 – Upgrade and Extension to Bawden Road • NoR 13 – Upgrade to East Coast Road from Silverdale to Ō Mahurangi Penlink (Redvale) Interchange

Acronym/Term	Description
North DBC	Detailed Business Case for the North Growth Area
NPS-ET	National Policy Statement on Electricity Transmission 2008
NPS-FM	National Policy Statement for Freshwater Management 2020
NPS-HPL	National Policy Statement for Highly Productive Land 2022
NPS-IB	National Policy Statement for Indigenous Biodiversity 2023
NPS-UD	National Policy Statement on Urban Development 2020
NUMP	Network Utilities Management Plan
NZTTMG	New Zealand Temporary Traffic Management Guide
ONL	Outstanding Natural Landscape
PBC	Programme Business Case
PPF	Protected Premises and Facilities
PWA	Public Works Act 1981
QEII	Queen Elizabeth II Covenant Area
RLTP	Regional Land Transport Plan
RMA	Resource Management Act
RPS	Regional Policy Statement
RTC	Rapid Transit Corridor
RUB	Rural Urban Boundary
SCEMP	Stakeholder and Communication Engagement Management Plans
SEA	Significant Ecological Area
SH1	State Highway 1
SIA	Social Impact Assessment
TDM	Transport Design Manual
Te Tupu Ngātahi	Te Tupu Ngātahi Supporting Growth Alliance
TfUG	Transport for Future Urban Growth
THAB	Terrace Housing and Apartment Buildings Zone
The Structure Plan	Silverdale West Dairy Flat Industrial Area Structure Plan
TAR	Threatened – At Risk species

Acronym/Term	Description
TMP	Tree Management Plan
UDE	Urban Design Evaluation
ULDMP	Urban and Landscape Design Management Plan
VKT	Vehicle Kilometres Travelled
Waka Kotahi	Waka Kotahi NZ Transport Agency



PART A – INTRODUCTION AND BACKGROUND

1 Introduction

This Assessment of Effects on the Environment (AEE) supports the North Projects Notices of Requirement (NoRs) for Auckland Transport (AT) and Waka Kotahi NZ Transport Agency (Waka Kotahi) as requiring authorities under the Resource Management Act 1991 (RMA). The notices are to designate land for future strategic transport corridors and stations as part of Te Tupu Ngātahi Supporting Growth Alliance to enable the future construction, operation and maintenance of transport infrastructure in the North area of Auckland. The North area extends from Albany to Ōrewa, covering the growth areas of Dairy Flat, Silverdale West, Wainui East and Redvale.

The North Projects are intended to support future urban growth in the North area of Auckland and protect land for future development of these transport corridors/stations over the next 30 years or more.

The North Projects comprise 13 NoRs, with a mix of Waka Kotahi and AT projects. All are proposed as new NoRs, with the exception of NoR 4 – SH1 improvements, which comprises an alteration to Waka Kotahi's SH1 designations 6761, 6760, 6759 and 6751.

Each NoR is summarised in Table 1-1 and shown in Figure 1-1 below. More detailed project descriptions are provided in Section 8.

Table 1-1: Summary of North Projects NoRs

NoR	Project	Description	Requiring Authority
1	New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	<ul style="list-style-type: none"> A 16km-long RTC corridor. An 80km/hr design speed (other than around stations). Walking and cycling path (Active mode facilities) for the length of RTC between SH1 and Dairy Flat Highway, with connections to other proposed/existing active mode facilities including along SH1 (as part of NoR 4), Dairy Flat Highway (as part of NoR 8), and the future local active mode network. Grade separated crossings at intersections with other transport corridors. The NoR will overlap with the existing SH1 motorway designation and NoR 4 (SH1 Improvements) between Albany and just south of Bawden Road. The RTC is assumed to be bus-based for the purposes of assessment and this NoR; however the corridor is also futureproofed for light rail as the mode is uncertain. The RTC provides opportunity for 5-6 stations to be built in the future. Not all potential stations are proposed to be designated at this time, to allow flexibility for their locations and form to be confirmed as part of future planning of the future urban areas. 	Waka Kotahi

NoR	Project	Description	Requiring Authority
2	New Milldale Station and Associated Facilities	<ul style="list-style-type: none"> A new rapid transit station which comprises the northern terminus of the RTC and includes: <ul style="list-style-type: none"> Station platforms and building with associated station facilities. Cycle and shared mobility device parking provision. Local bus layover and stop provision. Taxi and ride share drop-off facilities. Parking bays for on-demand vehicles and station operations / services. 	Waka Kotahi
3	New Pine Valley East Station and Associated Facilities	<ul style="list-style-type: none"> A new rapid transit station which includes: <ul style="list-style-type: none"> Station platforms and building with associated station facilities on a structure over New Pine Valley Road. Cycle and shared mobility device parking provision Local bus layover and stop provision. Layover facilities for bus based RTC mode. Taxi and ride share drop-off facilities. Park and ride facility (up to 500 car parking spaces). Upgrade to Old Pine Valley Road along station frontage. Parking bays for on-demand vehicles and station operations / services. 	Waka Kotahi
4	SH1 Improvements	<ul style="list-style-type: none"> Improvements to the existing SH1 corridor between Albany and Grand Drive, Ōrewa, including: <ul style="list-style-type: none"> Widening the SH1 carriageway from two lanes to three lanes in each direction from just south of the Lonely Track Road overbridge to the Silverdale interchange. The additional lanes are likely to be used for interim bus shoulder lanes initially until the RTC is operational, beyond which the lanes could be managed for freight or high occupancy vehicles. Upgraded Ō Mahurangi Penlink (Redvale) interchange - upgrading this interchange (soon to be constructed) to add north facing ramps and a separated active mode bridge. New interchange at Wilks Road (south facing ramps only) with separated active mode crossing; and an upgraded Wilks Road connection to East Coast Road (30m urban arterial with 4 vehicle lanes and separated walking and cycling both sides). 	Waka Kotahi

NoR	Project	Description	Requiring Authority
		<ul style="list-style-type: none"> Silverdale interchange upgrade for east-west capacity and allowing for separated active modes. New active mode corridor (cycleway and / or shared path) along SH1 with connections to the local road network- an approximately 16 km long active mode facility (cycleway and / or shared path) along one side of SH1 from Albany to Grand Drive (starts on east of SH1 at Ōteha Valley Road, crosses to west of SH1 around Bawden Road on a new bridge and then back to east around Silverdale interchange) Silverdale to Highgate Active Mode Connection – connection between the new active mode corridor along SH1 at Silverdale across to Highgate Parkway. Wainui interchange upgrade for active modes – new bridge for active modes across SH1. 	
5	New SH1 crossing at Dairy Stream	<ul style="list-style-type: none"> A new two-lane urban arterial connection and SH1 motorway overbridge between Top Road and East Coast Road near Huruhuru (Dairy Stream). Active mode facilities on both sides of the carriageway. The overbridge would cross six lanes of motorway, a two-lane link road to the motorway service centre and the New Walking and Cycling Path on SH1 (refer to NoR 4 above). 	AT
6	New Connection between Milldale and Grand Drive	<ul style="list-style-type: none"> A new two-lane urban arterial with separated walking and cycling facilities on both sides between Wainui Road (Milldale) and the western edge of the Ara Hills development in Ōrewa. This will connect through to Grand Drive at SH1 via a new road corridor to be vested by the Ara Hills developer. 	AT
7	Upgrade to Pine Valley Road	<ul style="list-style-type: none"> An upgrade to Pine Valley Road (Future Urban Zone (FUZ) section) between Poynter Lane and Argent Lane to a two-lane urban arterial with separated walking and cycling facilities on both sides. 	AT
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	<ul style="list-style-type: none"> Upgrade to a 4-lane urban arterial on sections where FUZ land is located both sides of the road (between Silverdale interchange and Wilks Road and between Richards Road and Durey Road), with separated walking and cycling paths on both sides of the corridor. Upgrade to a 2-lane rural arterial between Wilks Road and Richards Road – with a swale on the west and separated walking and cycling on the east 	AT

NoR	Project	Description	Requiring Authority
		<ul style="list-style-type: none"> Upgraded bridge over Huruhuru (Dairy Stream). 	
9	Upgrade to Dairy Flat Highway between Dairy Flat and Albany	<ul style="list-style-type: none"> An upgrade to Dairy Flat Highway between NoR 8 at Durey Road in Dairy Flat and Albany village for active mode and safety improvements including a central wire rope barrier and side barriers. The widened road corridor will retain two lanes (one in each direction) and will also retain the northbound crawler lane. Cycle path added on the western side of the carriageway between Durey Road and the Coatesville Riverhead Highway Roundabout and then on the eastern side between the Roundabout and Te Wharau (Albany Village). 	AT
10	Upgrade to Wainui Road	<ul style="list-style-type: none"> Upgrade to Wainui Road to a 2-lane urban arterial between Lysnar Road and the Wainui interchange. Separate, dedicated, walking and cycling facilities on both sides of the carriageway. Upgraded bridge over Waterloo Creek (tributary to Ōrewa River). 	AT
11	New connection between Dairy Flat Highway and Wilks Road	<ul style="list-style-type: none"> A new 2-lane urban arterial with separated walking and cycling facilities on both sides between Kahikatea Flat Road and Postman Road. Connecting to a new 4-lane urban arterial between Postman Road and SH1 at the new Wilks interchange, with separated cycling and walking facilities, two lanes of general traffic and two-lanes where priority may given to freight traffic. 	AT
12	Upgrade and Extension to Bawden Road	<ul style="list-style-type: none"> Upgrade and extension to Bawden Road between Dairy Flat Highway (NoR 8) and the upgraded Ō Mahurangi Penlink (Redvale) interchange at SH1 (NoR 4). This will include a four-lane urban arterial with walking and cycling facilities on both sides. Two lanes for general traffic and two lanes for a frequent transit network (likely bus lanes). Road intersects with the RTC. The road is likely to go under the RTC (grade separated crossing). 	AT
13	Upgrade to East Coast Road between Silverdale and	<ul style="list-style-type: none"> Upgrade to the footpath on the west side and new footpath on east side between Hibiscus Coast Highway and Silverwater Drive. From Silverwater Drive to Newman Road the upgrade features a two-lane urban arterial upgrade (24m) with separated walking and cycling facilities on both sides . 	AT

NoR	Project	Description	Requiring Authority
	<p>Ō Mahurangi Penlink (Redvale) Interchange</p>	<ul style="list-style-type: none"> From Newman Road to Jackson Way (where one or both sides is rural) the upgrade has a shared path to the west only, with no works to the existing carriageway and no swales. From Jackson Way to south of the Ō Mahurangi Penlink (Redvale) interchange the upgrade features a two-lane urban arterial upgrade with walking and cycling facilities on both sides. 	

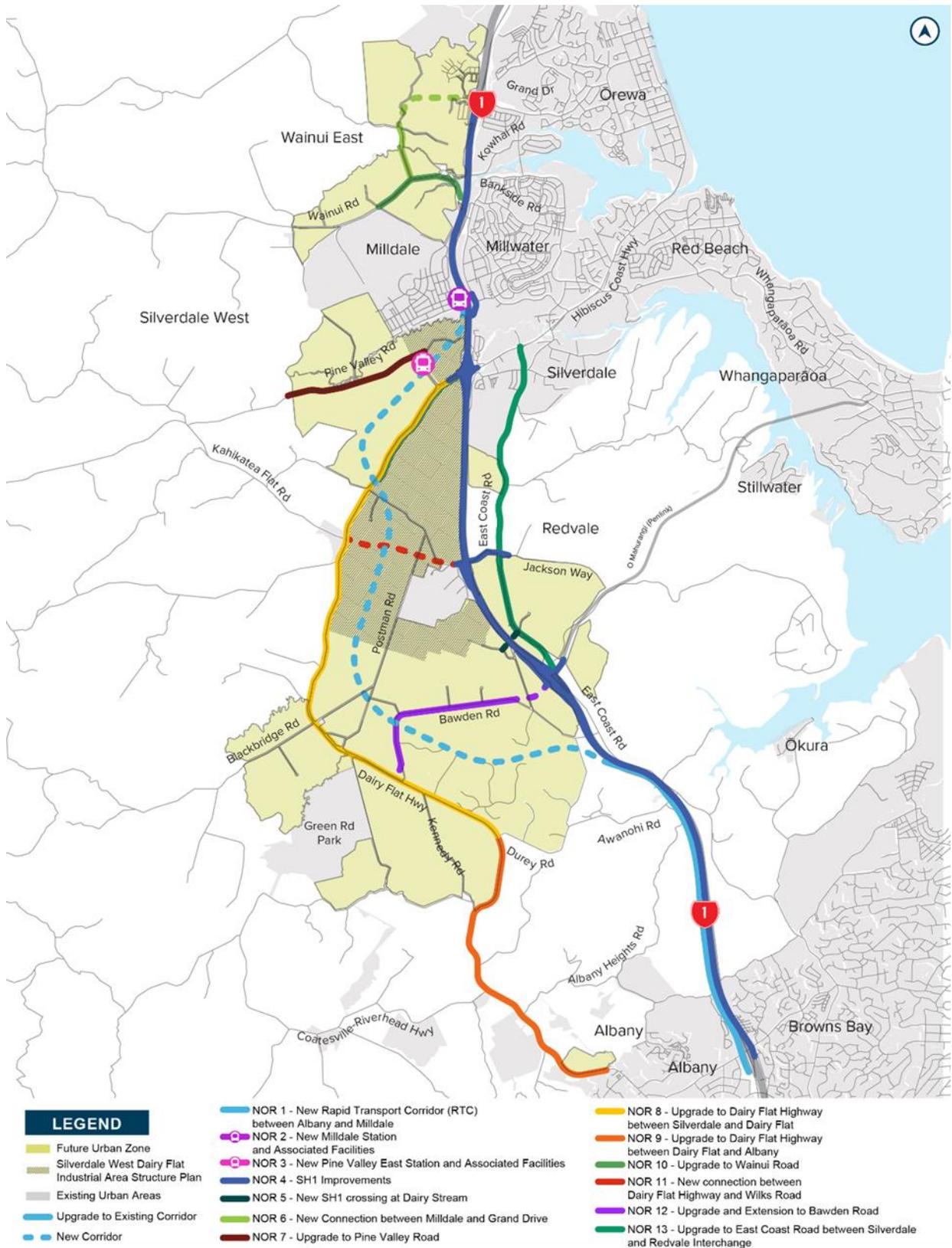


Figure 1-1: The North Projects/NoRs

1.1 Te Tupu Ngātahi Supporting Growth

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

AT and Waka Kotahi have partnered with Auckland Council and Manawhenua 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 1-2.

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.

Designations are important as they provide certainty for the Requiring Authorities that they can implement the work. Designations also provide property owners, businesses and the community with increased certainty regarding future infrastructure, so they can make informed decisions. They can also significantly reduce long-term costs for local and central government and enable more effective land use and transport outcomes.

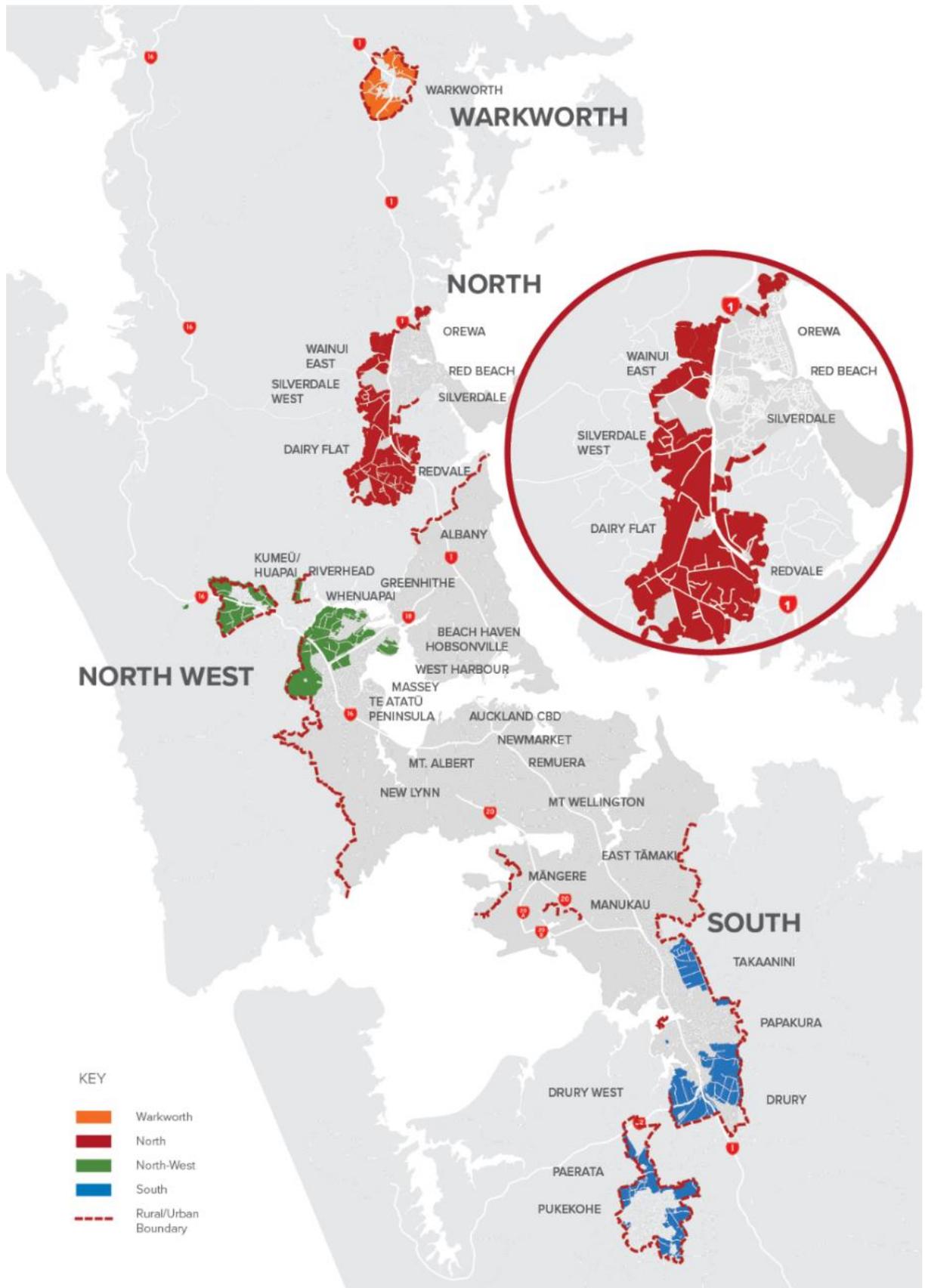


Figure 1-2: Future Urban Areas of Auckland, highlighting the North growth area

1.2 The Requiring Authorities

1.2.1 Auckland Transport (AT)

AT is financially responsible for Auckland's regional and local transport network and services, 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 Auckland transport 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". AT may therefore 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.

1.2.2 Waka Kotahi New Zealand Transport Agency (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 Waka Kotahi operates (in conjunction with the Government Rounding Powers Act 1989 (GRPA) and the Land Transport Act 1998 (LTA)).

The 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 outlined 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". Under the 2015 notice, 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.

1.3 Notification

Waka Kotahi (for NoRs 1 – 4) and AT (for NoRs 5 – 13) request that the notices are publicly notified.

1.4 Document Structure

The AEE (this report) and supporting documents are structured as set out in Table 1-2, below.

Table 1-2: Document Structure

Part	Title	Contents
VOLUME 1: APPLICATION		
	Notices of Requirement	<ul style="list-style-type: none"> Attachment A: Designation Plans Attachment B: Schedule of Directly Affected Properties Attachment C: Conditions of Designation
VOLUME 2: ASSESSMENT OF EFFECTS ON THE ENVIRONMENT (this document)		
Part A	Introduction and Background (Chapters 1, 2 and 3)	<ul style="list-style-type: none"> Introduction Background and Context Overview of the North Projects
Part B	Approach (Chapters 4, 5 and 6)	<ul style="list-style-type: none"> Assessment of Alternatives Lapse Periods Sought and Rationale Design and Assessment Approach, including Indicative Construction Methodology
Part C	Project Descriptions and Receiving Environment (Chapters 7 and 8)	<ul style="list-style-type: none"> Planning and Environmental Context Project Overviews and Receiving Environment
Part D	Assessment of Effects (Chapter 9 - 21)	<ul style="list-style-type: none"> Positive effects of the network Effects and Suggested Mitigation per specialist topic
Part E	Engagement Summary (Chapter 23)	<ul style="list-style-type: none"> Engagement Strategy and Overview
Part F	Statutory Assessment (Chapters 24 - 27)	<ul style="list-style-type: none"> Assessment against the relevant statutory and non-statutory documents Other matters Proposed Measures to Manage Adverse Effects Assessment of Part 2 of the RMA Reasonable Necessity of work and designations
APPENDICES		<ul style="list-style-type: none"> Appendix A: Assessment of Alternatives Appendix B: Conditions of Designations Appendix C: Construction Area Requirements Appendix D: Statutory Assessment Appendix E: Joint Cultural Impact Assessment Appendix F: Manawhenua Engagement Summary

Part	Title	Contents
VOLUME 3: INDICATIVE DRAWING SET		
		<ul style="list-style-type: none"> Appendix A: General Arrangement Layout Plans Appendix B: Property Boundaries and Schedules
VOLUME 4: SUPPORTING TECHNICAL REPORTS		
		<ul style="list-style-type: none"> Appendix A: Assessment of Arboricultural Effects Appendix B: Assessment of Archaeological and Heritage Effects Appendix C: Assessment of Construction Noise and Vibration Effects Appendix D: Assessment of Ecological Effects Appendix E: Assessment of Flooding Effects Appendix F: Assessment of Landscape, Natural Character and Visual Effects Appendix G: Assessment of Social Impacts Appendix H: Assessment of Traffic Noise and Vibration Effects Appendix I: Assessment of Transport Effects Appendix J: Urban Design Evaluation Report

1.5 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 on the environment of allowing a Requirement. These matters are set out in the table below:

Table 1-3: Index of RMA matters and the Section of this AEE in which they are addressed

Matter to consider	Section of the AEE where the matter is primarily addressed
Subject to Part 2, consider the effects on the environment of allowing the requirement ¹	Refer to this AEE in Sections 9 – 21 and Section 26 for consideration of Part 2
Whether particular regard has been had of any relevant provision of ² : 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 24 for the policy assessment, AEE Appendix D and Section 24.3 – Other Policy Considerations of this AEE.
Whether adequate consideration has been given to alternative sites, routes or methods of undertaking the work if ³ :	Refer to the Assessment of Alternatives, AEE Appendix A and Section 4 – Assessment of Alternatives of this AEE.

¹ Section 171(1) of the RMA

² Section 171(1)(a) of the RMA

³ Section 171(1)(b) of the RMA

Matter to consider	Section of the AEE where the matter is primarily addressed
<p>a) The requiring authority does not have an interest in the land sufficient for undertaking the work; or</p> <p>b) It is likely that the work will have a significant adverse effect on the environment.</p>	
<p>Whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought⁴</p>	<p>Refer to Section 27 – Whether the Work and Designations are Reasonably Necessary for Achieving the Objectives</p>
<p>Any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement⁵</p>	<p>Refer to Section 24.3 – Other Policy Considerations.</p>

⁴ Section 171(1)(c) of the RMA

⁵ Section 171 (1)(d) of the RMA

2 Background and Context

2.1 The Need for the Supporting Growth Programme

Auckland is New Zealand's largest city, home to approximately 1.65 million people. In 2017, Auckland attracted 36,800 new residents; more than the rest of the country combined. The Auckland Plan 2050 – Development Strategy signals that Auckland could grow by 720,000 people to reach 2.4 million over the next 30 years. This will generate demand for more than 400,000 additional homes and require land for 270,000 more jobs.⁶ To manage growth, the Auckland Unitary Plan: Operative in Part (AUP:OP) signalled that up to a third of this growth will be accommodated within future urban zone areas (greenfield areas).

In July 2017, the Future Urban Land Supply Strategy (FULSS) was updated in line with AUP:OP zonings, with 15,000 hectares of land allocated for future urbanisation. The FULSS identifies a programme to sequence future urban land over 30 years in the North, North West and South of Auckland.

Auckland Council is currently revisiting the FULSS land use strategy, via Council's 'Future Development Strategy' workstream. This document will set out the Council's desired sequencing of land development in the Auckland region. At the time of preparation of this AEE, the early consultation material suggests 'further investigation' is required for the north FUZ area. Auckland Council has not proposed removal of FUZ areas in the North, in the draft FDS. Therefore, the likely future environment is still urban and route protection of transport corridors to support this future growth is still valid and important. The timing of development in the FUZ has always been uncertain, and the draft FDS does not change this position.

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

The North growth areas are approximately 20km north of Auckland's central city, and 4km north of Albany. Auckland Council has identified approximately 4000 ha of land for future urban development in the North, including parts of Ōrewa, Wainui East, Silverdale West, Dairy Flat and Redvale. The North growth areas will make a significant contribution to the future growth of Auckland's population by providing for approximately 41,000 new dwellings, 110,000 new residents, and employment activities that will contribute approximately 22,000 new jobs across the North.

⁶ Auckland Plan 2050 Development Strategy June 2018: <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>

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 Auckland 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, the AT and Waka Kotahi Boards approved Indicative Business Cases for each growth area (Warkworth, North, North West and South) to further test and develop the recommendations of the Programme Business Case. The Indicative Business Cases 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 North Indicative Business Case recommended the Indicative Strategic Transport Network for North Auckland as shown in Figure 2.1. This network was endorsed by the AT Board in February 2019 and Waka Kotahi Board in May 2019.

NORTH INDICATIVE STRATEGIC TRANSPORT NETWORK

JULY 2019

Projects described in these maps have been identified by indicative business cases and will require further technical investigation, engagement with communities and landowners and statutory approvals before their final detail, location or land requirement is confirmed. They are also yet to be prioritised for funding for delivery over the next 10-30 years.

NEW RAPID TRANSIT CORRIDOR

- 1 Rapid Transit corridor extending from Albany to Milldale via new growth area

NEW OR IMPROVED PUBLIC TRANSPORT CORRIDOR

- 2 Bus shoulder lanes from Albany to Silverdale (interim)
- 3 High frequency bus route connecting Orewa and Silverdale with the Rapid Transit corridor

NEW WALKING AND CYCLING CORRIDOR

- 4 Strategic walking and cycling corridors

NEW OR IMPROVED TRANSPORT CORRIDOR

- 5 Additional managed motorway capacity between Albany and Silverdale interchange
- 6 Signalisation of Silverdale Street and Hibiscus Coast Highway intersection (with safety treatment) and improvements to Waiwiri Road for buses
- 7 New connection between Milldale and Grand Drive
- 8 Upgrade Pine Valley Road, Waiwiri Road, Dairy Flat Highway and Bewden Road to urban standards including walking and cycling
- 9 Improved Silverdale interchange
- 10 New connection from Dairy Flat Highway to Penlink via Jackson Way
- 11 New connection between Bawden Road and SH1
- 12 New full interchange at Redvale (Penlink)
- 13 New SH1 crossing near Dairy Stream
- 14 New motorway interchange at Wilks Road
- 15 Upgrade East Coast Road from Silverdale to Redvale interchange
- 16 Upgrade southern section of Dairy Flat Highway

SAFETY IMPROVEMENTS

- 17 Safety improvements on Kahikatea Flat Road, Coatesville-Riverhead Highway, East Coast Road and Awahangi Road

OTHER PRIORITY PROJECTS

- 18 Penlink
- 19 New Argent Lane connection and Milldale to Highgate SH1 crossing



LEGEND

- New growth area (Future Urban Zone)
- Silverdale West Dairy Flat Industrial Area Structure Plan
- Existing urban area
- State Highway (SH)
- New or upgraded interchange
- New interchange - south facing ramps only
- New rapid transit corridor
- New public transport corridor
- Improved public transport corridor
- New walking and cycling corridor
- New transport corridor
- Improved transport corridor
- Safety improvements
- Other priority projects



New Zealand Government

Figure 2-1: North Indicative Strategic Transport Network recommended through the IBC

3 The Preferred North Network

The IBC Indicative Strategic Transport Network for North Auckland was progressed to the Detailed Business Case (DBC) stage in 2020-2023. This DBC recommended the North Network shown in Figure 3-1 and also recommended which projects should progress to route protection (i.e. the North Projects/NoRs which are the subject of this AEE and described in Section 1).

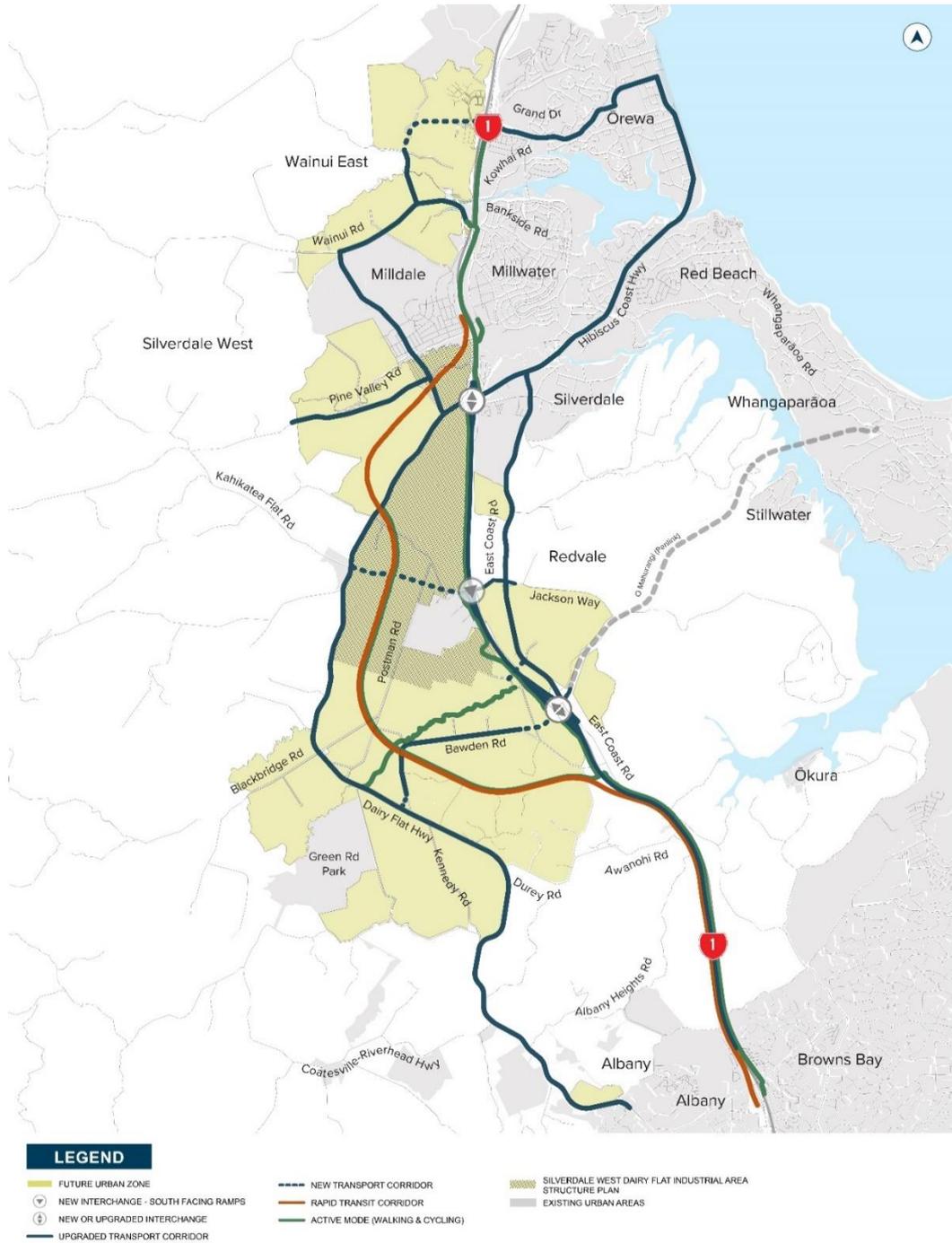


Figure 3-1 Recommended North Transport Network

Two projects shown on this map form part of the Preferred North Network but are not proposed for route protection and are therefore not part of the North Projects for which NoRs are sought. These are:

- Upgrade of Hibiscus Coast Highway and Grand Drive for public transport and active modes –to provide a high-quality strategic walking and cycling connection and public transport priority (bus lanes) through the growth areas of Ōrewa, Millwater and Silverdale. No route protection is required as the proposed upgrade will stay within the existing road reserve and has been designed to avoid impacts on external properties.
- Dairy Stream Active Mode Path – to provide a high-quality strategic walking and cycling connection through the growth area of Dairy Flat, which connects to the wider strategic active mode network. No route protection is proposed as the project follows a riparian corridor, which is unlikely to see build out from development of the FUZ area. The project is likely to be implemented as a greenway type project and therefore not by AT or Waka Kotahi.

The remainder of this AEE relates to the North Projects (the 13 NoRs for which route protection is sought), rather than this full Preferred North Network.

3.1 Purpose of the North Projects

The North Projects are intended to support growth in Northern future urban areas and without these projects, growth would be constrained. The purpose of the North Projects is to provide key infrastructure to enable anticipated growth to occur (refer Section 2.1 above). A number of the corridors involve the addition of walking and cycling infrastructure (active mode facilities) and urbanising of existing rural roads in anticipation of the growth. Route protection of the projects will prevent build out of the optimal transport corridors/stations, reduce future construction costs and deliver enhanced outcomes through integration with urban development.

The key problems identified in the North during the IBC and DBC phases and the benefits of addressing these problems are outlined Table 3-1 below. The North Projects will enable these problems to be addressed, which will mean a more accessible, reliable, resilient, safe and integrated transport network for the North in the future.

Table 3-1: Key reasons for the North Projects

Problem	Problem statement	Benefits of addressing problem
Access	The current form and function of corridors, lack of active mode facilities and missing transport connections does not support future growth and will constrain access to economic and social opportunities in the Northern growth area.	<ul style="list-style-type: none"> • Improved accessibility for local and interregional trips. • Improved access to economic and social opportunities for future communities. • Future urban growth is supported and not constrained.
Reliability / Resilience	As transport demand grows, without new and upgraded transport corridors network resilience will be limited and	<ul style="list-style-type: none"> • Improved public transport and freight reliability.

Problem	Problem statement	Benefits of addressing problem
	public transport, private vehicles and freight will experience unreliability.	<ul style="list-style-type: none"> Improved network reliability and resilience for the strategic transport network. Improved infrastructure resilience.
Travel choice	A lack of dedicated active mode facilities and public transport facilities will result in more private vehicle trips as growth occurs.	<ul style="list-style-type: none"> Reduced reliance on private vehicles with increased public transport and active mode share.
Safety	The lack of safe and attractive separated active mode facilities will result in use of inappropriate and unsafe alternatives as growth occurs in the Northern growth area.	<ul style="list-style-type: none"> Improved actual and perceived safety for active modes. Reduced occurrence of Deaths and Serious Injuries.
Integration	The existing transport corridors are not commensurate with the level of urban growth in this area limiting development potential and the quality of the urban environment.	<ul style="list-style-type: none"> High quality compact urban form with improved urban mobility. Integrated land use and transport outcomes.
Climate change	The current transport system has an over-reliance on private vehicles. This combined with limited low carbon transport alternatives will result in significant transport emissions which is incongruent with current climate change goals.	<ul style="list-style-type: none"> Contribution to the development of a low carbon transport network and associated reductions in transport emissions with increased public transport and active mode share.

3.2 Land use and transport integration

The required transport networks and infrastructure in the North will play a vital role in the success of new neighbourhoods by providing safe, accessible and sustainable travel choices that connect communities and encourage a transformational shift from private vehicles to public transport and active transport.

A key part of integrating land use and transportation is collaboration between Auckland Council, Auckland Transport and Waka Kotahi. In relation to the preparation of the North Projects this has involved:

- Partnership with Council during the option development and assessment phase of the North Projects, particularly the RTC and stations (as detailed in the Assessment of Alternatives in AEE Appendix A)
- Providing feedback on (and input into) Council's Silverdale West Dairy Flat Industrial Area Structure Plan⁷ which was adopted by Auckland Council in 2020, and its Draft Spatial Land Use Strategy for Silverdale Dairy Flat (2023). These plans are discussed further in Section 7.

⁷ <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-by-laws/our-plans-strategies/place-based-plans/structure-plans/Pages/silverdale-west-dairy-flat-industrial-area-structure-plan.aspx>

Ongoing collaboration will also be required in relation to subsequent structure plans and plan changes that Auckland Council and developers may progress to rezone land in the future urban areas.

The North Projects are intended to be implemented to support future urban growth and hence will be timed in accordance with the timing of urban development once that is confirmed in future. The staging of the North Projects is uncertain because the staging of urban growth is uncertain at this point in time. However indicative staging is set out in the North DBC and below based on the best available information on when areas will develop. The DBC considered the interdependency between each project and other external projects, land use and other projects within the Preferred North Network. The staging considerations included the following:

- Other network projects being developed separately in the North area that are complementary to the North Projects including Ō Mahurangi (Penlink), Northern Corridor Improvements, Waitematā Harbour Connections Business Case, Dairy Flat Highway safety improvements, Milldale Highgate Bridge, SH1 Optimisation Project, and the Dairy Flat Highway / The Avenue / Lucas Creek Upgrade (see Section 6.7)
- The likely timing of urbanisation, considering the FULSS (2017 – see **Error! Reference source not found.**3-2 below), as well as the following:
 - 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 EMME based traffic models (using MSM outputs)
 - I11v6 Population Growth Forecasts setting out residents and employments forecasts, with a 2048+ forecast year.

Table 3-2: North Projects modelled growth and indicative staging

NoR	FULSS staging	DBC indicative staging	Rationale for DBC staging
NoR 1: New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	2033-2037	2053	Delayed due to an expected delay in growth timing
NoR 2: New Milldale Station and Associated Facilities	2033-2037	2053	Delayed due to an expected delay in growth timing
NoR 3: New Pine Valley East Station and Associated Facilities	2033-2037	2053	Delayed due to an expected delay in growth timing
NoR 4: SH1 Improvements	2033-2037	2039	Broadly in line with FULSS timing as this project is likely to be implemented early as an interim upgrade
NoR 5: New SH1 crossing at Dairy Stream	2033-2037	2052	Delayed due to an expected delay in growth timing
NoR 6: New Connection between Milldale and Grand Drive	2033-2037	2041	Delayed due to an expected delay in growth timing

NoR	FULSS staging	DBC indicative staging	Rationale for DBC staging
NoR 7: Upgrade to Pine Valley Road	2033-2037	2046	Delayed due to an expected delay in growth timing
NoR 8: Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	2018-2022	2028 2051	Northern section is anticipated in line with the Structure Plan timing. Southern section is anticipated to be delayed
NoR 9: Upgrade to Dairy Flat Highway between Dairy Flat and Albany	2033-2037	2052	Delayed due to an expected delay in growth timing
NoR 10: Upgrade to Wainui Road	2033-2037	2036	Broadly in line with FULSS timing
NoR 11: New connection between Dairy Flat Highway and Wilks Road	2033-2037	2035	Broadly in line with FULSS timing
NoR 12: Upgrade and Extension to Bawden Road	2033-2037	2052	Delayed due to an expected delay in growth timing
NoR 13: Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange	2033-2037	2045	Delayed due to an expected delay in growth timing

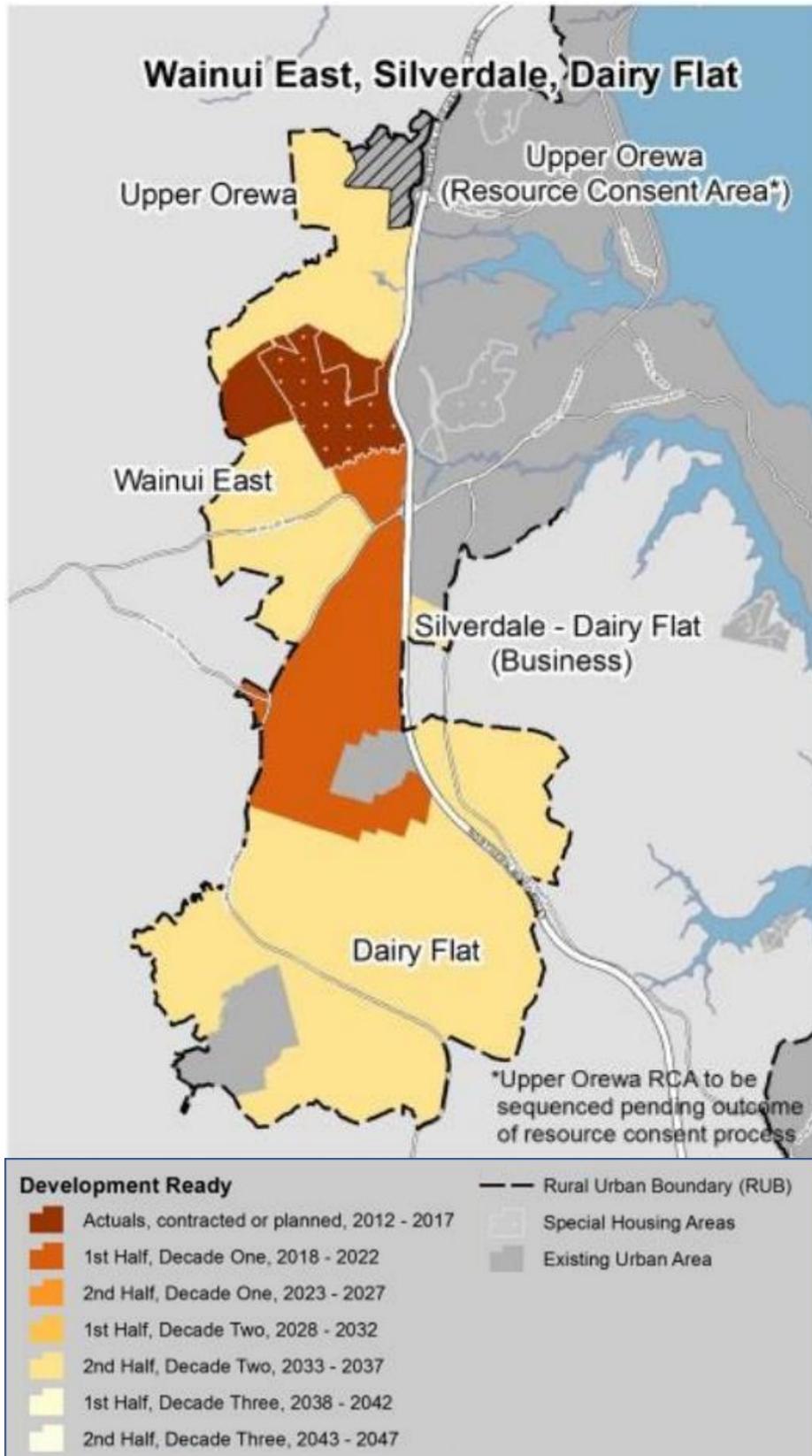


Figure 3-2: Indicative staging of future urban growth as set out in Council's Future Urban Land Supply Strategy (2017)

3.3 Project Objectives

The North project objectives have been developed to:

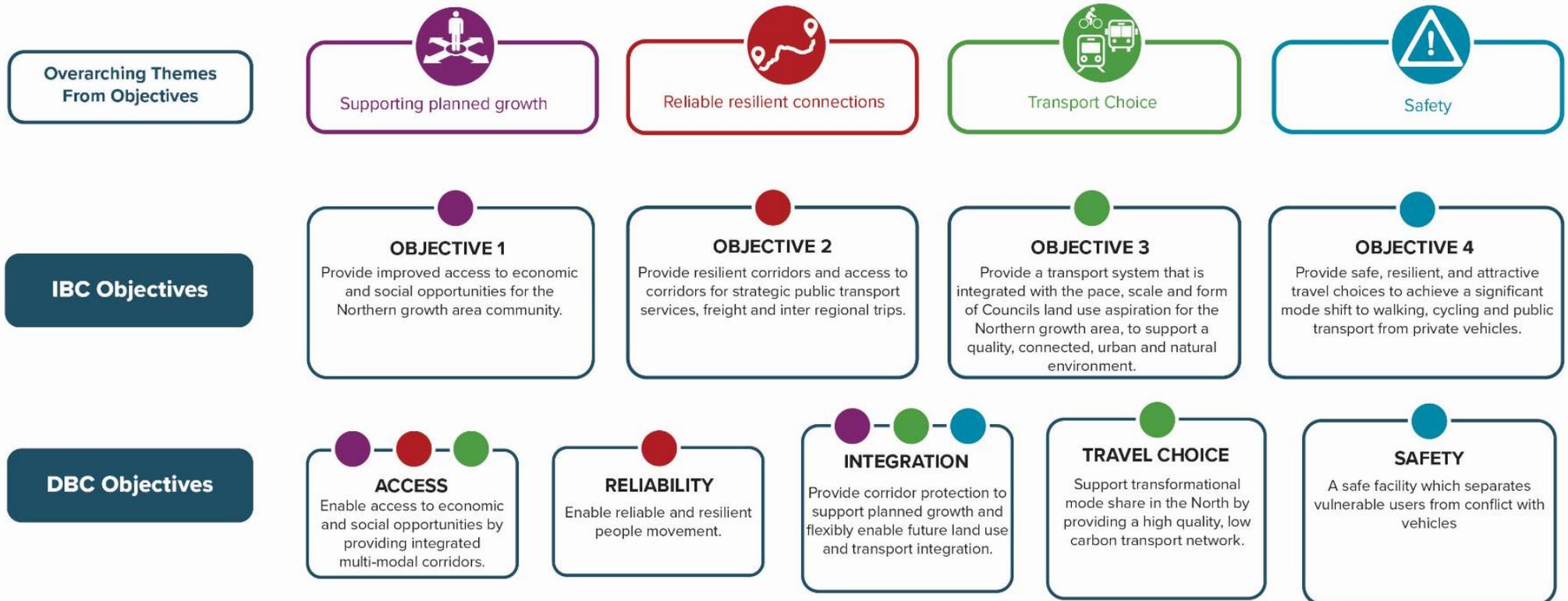
- a) Be outcomes focused and definitive of the Projects; and
- b) Provide a clear line of sight from the DBC investment objectives in a manner that reflects that the investment objectives and project objectives are developed for two different purposes.

Having regard to the above, the following project objectives have been developed. Figure 3-3 below illustrates the line of sight between the project objectives and the IBC/DBC investment objectives.

Note: The DBC objectives listed in the figure below are general themes across the North Projects.

The Project-specific investment objectives used in the option development and assessment are detailed in the Assessment of Alternatives in AEE Appendix A.

Figure 3-3: Line of Sight from IBC/DBC Investment Objectives to Project Objectives



Project Objectives

NOR 1: NEW RAPID TRANSIT CORRIDOR (RTC) BETWEEN ALBANY AND MILLDALE, INCLUDING NEW WALKING AND CYCLING PATH

Provide for a new public transport and active modes corridor between Albany, Dairy Flat and Milldale that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- d. Integrates with and supports planned urban growth.
- e. Supports a quality compact urban form.
- f. Integrates with and supports the existing and future transport network.
- g. Improves travel choice and contributes to mode shift.

NOR 2: NEW MILLDALE STATION AND ASSOCIATED FACILITIES

Provide for a new transport station and associated transport interchange in Milldale that:

- a. Improves connectivity.
- b. Is safe.
- c. Integrates with and supports planned urban growth.
- d. Supports a quality compact urban form.
- e. Provides accessibility to economic and social opportunities for the Northern growth area, as an integral component of the rapid transit corridor.
- f. Integrates with and supports the existing and future transport network.
- g. Improves travel choice and contributes to mode shift.

NOR 3: NEW PINE VALLEY EAST STATION AND ASSOCIATED FACILITIES

Provide for a new transport station and associated transport interchange in Pine Valley East that:

- a. Improves connectivity.
- b. Is safe.
- c. Integrates with and supports planned urban growth.
- d. Supports a quality compact urban form.
- e. Provides accessibility to economic and social opportunities for the Northern growth area, as an integral component of the rapid transit corridor.
- f. Integrates with and supports the existing and future transport network.
- g. Improves travel choice and contributes to mode shift.

NOR 4: SH 1 IMPROVEMENTS

Provide for an upgrade to the SH1 corridor between Albany and Ōrewa that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- d. Integrates with and supports planned urban growth.
- e. Provides for inter-regional and freight movements.
- f. Integrates with and supports the existing and future transport network.
- g. Improves access to SH1 from/to the Silverdale West future industrial area and from/to the Dairy Flat future urban area.
- h. Improves travel choice and contributes to mode shift.

Project Objectives



NOR 5: NEW SH1 CROSSING AT DAIRY STREAM

Provide for a new east-west crossing of SH1 between the future urban areas around Top Road and East Coast Road that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 6: NEW CONNECTION BETWEEN MILLDALE AND GRAND DRIVE

Provide for a new transport corridor between Milldale and SH1 at Grand Drive that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 7: UPGRADE TO PINE VALLEY ROAD

Provide for an upgrade to Pine Valley Road between the rural urban boundary and Argent Lane that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 8: UPGRADE TO DAIRY FLAT HIGHWAY BETWEEN SILVERDALE AND DAIRY FLAT

Provide for an upgrade to Dairy Flat Highway between Silverdale interchange and Durey Road that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.

Project Objectives



NOR 9: UPGRADE TO DAIRY FLAT HIGHWAY BETWEEN DAIRY FLAT AND ALBANY

Provide for an upgrade to Dairy Flat Highway between Durey Road and Albany village that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 10: UPGRADE TO WAINUI ROAD

Provide for an upgrade to Wainui Road between Lysnar Road and SH1 that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 11: NEW CONNECTION BETWEEN DAIRY FLAT HIGHWAY AND WILKS ROAD

Provide for a new transport corridor between Dairy Flat Highway and Wilks Road that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 12: UPGRADE AND EXTENSION TO BAWDEN ROAD

Provide for an upgrade and extension to Bawden Road between the SH1 Redvale interchange and Dairy Flat Highway that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.



NOR 13: UPGRADE TO EAST COAST ROAD BETWEEN SILVERDALE AND REDVALE INTERCHANGE

Provide for an upgrade to East Coast Road between Hibiscus Coast Highway and Redvale that:

- a. Improves connectivity.
- b. Is safe.
- c. Is efficient, resilient and reliable.
- 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.

3.4 Need for Route Protection

The need for route protection is driven by the expected significant future development in the North area and some timing uncertainty as to when this development will occur. The North growth area is anticipated to accommodate approximately 41,000 new dwellings, approximately 110,000 additional people, and approximately 22,000 new jobs. The North Projects are intended to support this anticipated growth with key transport infrastructure which is well integrated with, and positively informs, surrounding future urban land uses and urban form. The timing of the growth in the North is variable and could be subject to change for a number of reasons, including:

- Auckland Council has identified a need for industrial land in the North immediately and is progressing a plan change for the first phase of this area.
- Several developers are known to have land holdings in the North and have indicated a desire for development of the land within the next five years.
- Growth in and around Milldale is continuing at a faster rate than has been historically forecast. Te Tupu Ngātahi is aware of early structure planning underway (by a developer) for the Milldale North area.
- An outcome of policy changes (such as the National Policy Statement on Urban Development (NPS:UD)) may increase 'out of sequence' plan changes by third parties as has been the case in other areas in Auckland.
- The NPS:UD requires Auckland Council to prepare a draft Future Development Strategy. A draft FDS has recently been released which (at the time of preparing this AEE) proposes North growth areas (excluding Milldale and the future industrial area) are subject to 'further investigation', which continues the uncertainty around timing of development in the FUZ areas.
- Implementation of Ō Mahurangi (Penlink) has the potential to increase development pressure through improved accessibility for the eastern FUZ land adjoining this corridor.

The North Projects comprise the recommended transport network needed to support the full build out of the North growth areas, regardless of when this growth occurs. Given the scale and duration of the growth proposed, the early route protection of these critical transport corridors and infrastructure is necessary to provide the required certainty for AT, Waka Kotahi, stakeholders and the community. If the transport corridors in the North are not protected ahead of development, this may result in:

- Significant disruption to future communities (e.g., if the corridor is built into prior to delivery).
- Poorly integrated land use, including reduced ability to influence good urban form and land use integration, resulting in reduced access to social and economic opportunities.
- Reduced opportunities to maximise transport catchments to increase mode share for public transport and active modes.
- Compromised ability to deliver a comprehensive transport network which supports public transport and active modes.
- Decreased safety, including additional conflict between active modes and increasing traffic volumes.
- Reduced viability of industrial land.
- Uncertainty for private development investment.
- Reduced reliability of bus networks which will be delayed in congestion.

- Increasing growth in demand for private vehicle travel in the absence of reliable alternatives, resulting in increased congestion on the local network.
- Reliance on rural roads which are not fit for purpose, safe or efficient to accommodate increased traffic volumes or multimodal travel.
- Reduced resilience arising from limited access to SH1 and congestion at key interchanges as a result (such as Silverdale Interchange).

Route protection is the first and critical step to ensure the future transport network required to support future growth in the North can be provided when required - including in response to earlier-than-anticipated growth and development. Route protection ahead of development timing also facilitates better outcomes across land use integration, mode shift, safety, network resilience and reliability, economic and social outcomes.

Further discussion on the benefits of route protection via designations is provided at Section 4.3.



PART B - APPROACH

4 Assessment of Alternatives

4.1 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 the requiring authority:

- a) *Does not have an interest in the land sufficient for undertaking the work; or*
- b) *Where it is likely that the work will have significant adverse effects 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:

- a) The requiring authority should not act in an arbitrary or cursory manner;
- b) The process should be adequately transparent and robust, and clearly recorded so that it can be understood by others;
- c) An appropriate range of alternatives should be considered; and
- d) The extent of options considered, and the assessment of these options, should be proportional to the potential effects of the options being considered.

AT and Waka Kotahi do not have sufficient interest in all the land required for the North Projects and as such are required to give adequate consideration to alternatives. AT and Waka Kotahi have considered an appropriately broad range of possible alternative routes and other methods for undertaking the North Projects. A summary of the assessment of alternatives is provided below. AEE Appendix A sets out the assessment of alternatives for each NoR in detail.

4.2 Assessment of Alternatives Methodology

This section provides an overview of the assessment of alternatives methodology used to develop and assess route options for the North Projects and ultimately determine the preferred option(s). This methodology was applied to the assessment of options at both the Indicative Business Case (IBC) and the Detailed Business Case (DBC) stages. The assessment of alternatives from those two processes are part of the assessment of alternatives for the North NoRs. 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 AEE Appendix A).

The methodology used for the assessment of alternatives involved the following steps:

- a) Gap analysis of recommendation at each new phase of assessment (IBC to DBC);
- b) Development of the multicriteria assessment framework;
- c) Development of the Te Tupu Ngātahi GIS viewer including constraints mapping to inform option development;
- d) Option development;
- e) Pre-scoring of options;

- f) Interdisciplinary workshops;
- g) Analysis and testing of outcomes from workshops;
- h) Identification of technical preferred options;
- i) Engagement with partners and stakeholders;
- j) Analysis and testing of preferred options following feedback received through engagement and any new information;
- k) Recommendation by the Project Team;
- l) AT and Waka Kotahi Board decision on the recommended options.

An overview of the alternatives assessment process undertaken across the IBC, DBC and NoR phases is illustrated in Figure 4-1, below.

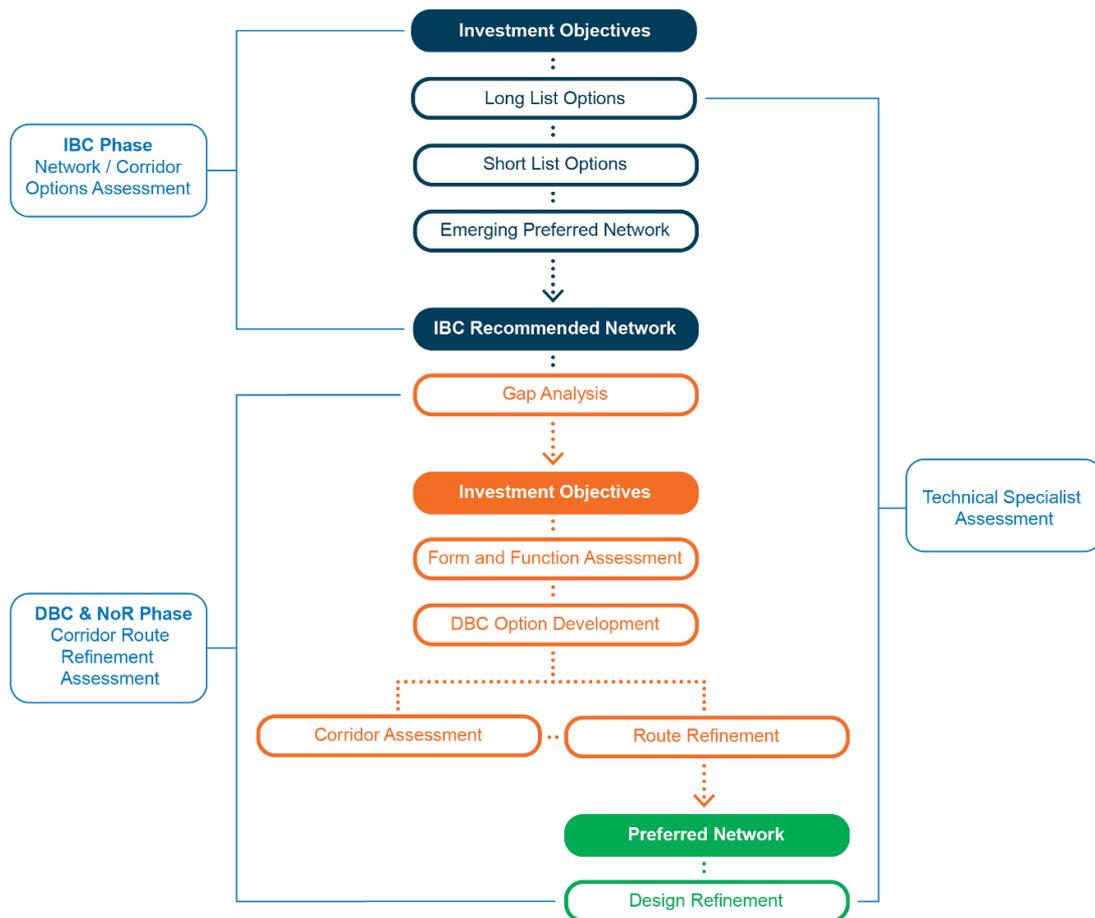


Figure 4-1: Alternatives Assessment Process

4.3 Consideration of Alternative Methods

As part of the consideration of alternatives, an evaluation of alternative methods for protection of the required land was undertaken during the Indicative Business Case (IBC), and again in the review of consenting mechanisms available for extended route protection timeframes, carried out in the Detailed Business Case (DBC) phase. These focused on a range of methods that enabled route protection and future implementation of the projects and were considered in light of a number of

contextual elements including project importance, urgency, and complexity. Methods considered included:

- a) Designations (including alteration to existing);
- b) Resource consents;
- c) Landowner/developer negotiations;
- d) Plan changes (initiated or submitted on, Strategic Transport Corridor Zone or new bespoke zone);
- e) Urban Development Act,
- f) Structure plans; and
- g) Traditional property acquisition.

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

Long term designations were generally identified as the preferred method for route protection of the North Projects as these are the most logical and effective method to protect a corridor in an evolving environment for the following reasons:

- a) A designation provides certainty to all parties including the community and affected landowners;
- b) 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 (PWA);
- c) It maximises flexibility for future implementation – in the North where much timing uncertainty is present, designations allow the provision of infrastructure to integrate with development timing;
- d) Negates the need for additional land use consents to implement works authorised under the district plan (s9(3) of the RMA);
- e) Will continually provide for future operation and maintenance requirements;
- f) Provides immediate route protection from the time an NoR is lodged;
- g) Enables compulsory acquisition of the land, where required; and
- h) Provides a mechanism (s176 of the RMA) to manage landowners’ interim use of the land to prevent compromise of the corridors, whilst at the same time limiting ‘planning blight’ (discussed at Section 5) as much as practicable.

Refer to Section 5 regarding the lapse period sought for each designation, and the rationale. The following methods were preferred for the North Projects:

Table 4-1: Preferred Methods for the North Projects

NoR	Project	Preferred Method
1	New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	NoR

NoR	Project	Preferred Method
2	New Milldale Station and Associated Facilities	NoR
3	New Pine Valley East Station and Associated Facilities	NoR
4	SH1 Improvements	Alteration to Existing Designations 6751, 6759, 6760 and 6761
5	New SH1 crossing at Dairy Stream	NoR
6	NoR 6 – New Connection between Milldale and Grand Drive	Partial NoR Partial developer agreement to deliver the length of the corridor running through the Ara Hills development and connecting to the Grand Drive SH1 interchange.
7	Upgrade to Pine Valley Road	NoR
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	NoR
9	Upgrade to Dairy Flat Highway between Dairy Flat and Albany	NoR
10	Upgrade to Wainui Road	Partial NoR Partial developer agreement to deliver the length of the corridor between Lynsar Road and the edge of the FUZ / RUB to the west.
11	New connection between Dairy Flat Highway and Wilks Road	NoR
12	Upgrade and Extension to Bawden Road	NoR
13	Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange	NoR

The other methods considered were discounted for the following reasons:

- **Resource consents** could be used to seek 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. It is also uncommon for resource consents to have long lapse dates that are necessary for the North Projects.

- **Landowner and developer negotiations** were considered; however where numerous owners are present this can be time prohibitive, and any route protection afforded by negotiations can be piecemeal if agreement cannot be reached with all parties. The route also remains unprotected during the period of negotiation. As noted in Table 4.1 above, there are two instances where developer agreements are appropriate to deliver parts of the network, given a single developer is involved in each instance and agreements are already in place.
- **Plan changes and structure planning** were considered; however, route protection would not become operative until the plan change was in place, which can be time prohibitive. A new bespoke zone would be required, as many of the North Projects do not fit the requirements of the Strategic Transport Corridor Zone. Structure planning in most of the North is generally not anticipated for some years, leaving routes vulnerable to buildout in the interim.
- **The Urban Development Act** was considered, however Kāinga Ora has not expressed any interest in the North to date. This is an untested pathway, which is unclear in relation to the property acquisition and compensation processes, and due to anticipated timeframes involved, this option leaves routes vulnerable to buildout in the interim.
- **Traditional property acquisition** is not appropriate for the North Projects 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. As the North Projects are not currently funded, traditional property acquisition cannot currently occur.

4.4 Summary

The sites, routes and methods chosen will achieve the overarching purpose, which is to identify the required strategic and local transport network needed to support planned growth in North Auckland. This will provide certainty to transport authorities, partners, infrastructure providers, the community and investors / developers of the location and form of the strategic and local transport network. It will also enable long term integrated planning and investment, and route protect the required land and corridors, enabling phased delivery in line with land release and funding.

The preferred option for each NoR has been based on a comprehensive and robust optioneering process considering specialist assessment, engagement with Manawhenua and feedback from stakeholders and landowners. As such, it is concluded that adequate consideration has been given to alternative sites, routes and methods for undertaking the work, satisfying the requirements of s171(1)(b) of the RMA.

5 Lapse Periods 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:

- a) It has been given effect to; or
- b) 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
- c) The designation specifies a different lapse period.

A key objective of the Te Tupu Ngātahi Supporting Growth Programme is to identify and protect land now for future transport networks and support future urban development. It is considered that an extended lapse period of up to 30 years is a method that is reasonably necessary to achieve this key objective as it provides statutory protection of the future transport corridors in a manner that enables a flexible and efficient infrastructure response to land use. As enabled by section 184(c) of the RMA, lapse periods of up to 30 years are required for the North Projects.

Table 5-1 sets out the proposed lapse periods for each of the North Project NoRs.

Table 5-1: Recommended Lapse Periods

Designation	Recommended lapse period
NoR 1 New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	30 years
NoR 2 New Milldale Station and Associated Facilities	30 years
NoR 3 New Pine Valley East Station and Associated Facilities	30 years
NoR 4 SH1 Improvements Package	N/A – Designations 6751, 6759, 6760 and 6761 have already been given effect to.
NoR 5 New SH1 crossing at Dairy Stream	30 years
NoR 6 New Connection between Milldale and Grand Drive (previously Upper Ōrewa Road Upgrade and Extension)	30 years
NoR 7 Upgrade to Pine Valley Road	30 years
NoR 8 Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	20 years
NoR 9	30 years

Designation	Recommended lapse period
Upgrade to Dairy Flat Highway between Dairy Flat and Albany	
NoR 10 Upgrade to Wainui Road	20 years
NoR 11 New connection between Dairy Flat Highway and Wilks Road (New Link Road)	25 years
NoR 12 Upgrade and Extension to Bawden Road	30 years
NoR 13 Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange	30 years

5.1 The Need for Extended Lapse Periods

As set out above, lapse dates of up to 30 years are sought for the North Projects. When considering an extended lapse period, it is appropriate to balance the need for that lapse period against the potential prejudicial or "blighting" effects, which are discussed in more detail at Section 20 of this AEE. In summary, during the pre-construction period, restrictions on development and owner decisions to reduce investment in properties can lead to a gradual deterioration, and the condition of 'planning blight'. This is characterised as *'the harmful effects of uncertainty about the likely restrictions on the types and extent of the future development in a particular area on the quality of life of its inhabitants and the normal growth of its business and community enterprises'*. Long lapses are also expected to have social effects, as assessed in Section 19.2.2.

The proposed lapses in Table 5-1 above, therefore, provide a balance between managing the planning and social effects of long-term designations and providing sufficient flexibility to implement the North Projects considering the uncertain timing of urban development in the FUZ areas in the North and the uncertain staging timing of the projects. For this reason, the proposed lapses do not always match the indicative staging identified in the North DBC and presented in Section 3.

In the context of the North Projects, extended lapse periods (long term designations) are considered necessary for the following reasons:

- The North Projects are required to support future urban growth in the North as detailed in Section 3.2.
- Long lapse periods provide flexibility to respond to a number of factors which are driving uncertainty around the timing of urbanisation in the North, including:
 - More recent regional growth forecasts suggest a slower development timeline than the FULSS for the majority of the FUZ land in the North.
 - Council is currently preparing a Future Development Strategy (FDS) which will eventually lead to an update to the FULSS timing indications. The FDS identifies the need for further consideration of growth within the North area and the desirable timing is uncertain.

- Development pressure is present in a number of areas, with plan changes (including both Council-led plan changes and developer-led plan changes) pending, along with fast-track consents and structure plans currently being progressed in some areas of the North.
- As a result, there is a need to protect parts of the certain transport corridors in the short term while also identifying how those aspects integrate with the wider network and with the remainder of the corridors (such as NoR1). This will provide certainty about the entirety of the network and the corridors.
- Therefore, long lapse periods are required, to provide flexibility to respond to the above factors.
- They provide 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.
- They support 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. If designations are already in place, infrastructure providers can respond more quickly to changes in land use and bring forward implementation of projects if necessary.
- They provide the Requiring Authorities sufficient time to:
 - Undertake the detailed design of the projects
 - Obtain the necessary resource consents
 - Procure funding
 - Undertake tendering / procurement
 - Undertake property and access negotiations and other processes associated with the Project construction
- They provide property owners, businesses and the community certainty on where transport routes will be located (i.e. within the designation boundaries) and generally within what timeframe (the limit or end lapse date).

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. In other words, if urbanisation were to be confirmed within the lapse period being sought it is likely that the designation will be implemented (subject to funding) 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 Southern Links (Waka Kotahi), Drury Arterials (AT), the Northern Interceptor Wastewater Pipeline (Watercare) and the Hamilton Ring Road (Waikato District Council, Hamilton City Council).
- Setting a shorter lapse period is not a mechanism to obtain earlier funding.
- Setting an unrealistically short lapse period will likely result in an inadequate suite of conditions to manage any uncertainty if the Requiring Authorities 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 prejudicial or 'blighting' effects on landowners. These effects are discussed at Section 19.2.2 of this AEE.

6 Design and Assessment Approach

As discussed above, it is anticipated that some of the North Projects will not be constructed for some time. As such the Te Tupu Ngātahi approach to design and assess effects has been developed in a manner that reflects the long term implementation of the upgraded and extended North Projects within environments that are likely to change significantly.

Detailed design, regional consent applications and Outline Plans of Works will be prepared prior to construction. As outlined in 6.5 below, the NORs and designations for the North Projects will only authorise matters which trigger a district plan consent requirement; they will not authorise matters subject to future regional consents. However, regional consent matters have been considered at a high level as part of Project design, the alternatives assessment of alignment options, and in determination of the spatial footprint that is reasonably necessary for each Project. The proposed North Projects alignments are included in the drawing set in Volume 3.

Indicative alignment designs have been developed with a level of detail sufficient to:

- Inform the proposed designation footprint, while providing the flexibility required due to uncertainty of the future urban environment;
- Assess an envelope of effects which includes:
 - Operation and maintenance requirements;
 - Potential construction areas;
 - Areas required to mitigate district plan matters, and regional stormwater matters that require space within the designation boundary.

In addition to the above, designation conditions have been formulated in such a way as to provide a robust framework for ensuring that potential adverse effects are appropriately addressed and in an integrated manner with the anticipated regional resource consent applications.

6.1 Approach to Design

The design of the North Projects has focused on developing indicative designs that are sufficient to inform the proposed designation footprints 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 NoR alignments are included in the drawing set in Volume 3. 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. Regional resource consents will also need to be applied for in the future.

It is understood that the final design of the North Projects (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. At the current stage of the approvals process, the focus has been on providing concept designs at a level sufficient to inform the proposed designation boundaries, and to assess an envelope of effects that includes

operational and maintenance requirements, potential construction areas, and areas required to mitigate effects of each project (focusing on district plan matters and land that may be required to manage stormwater effects, which are a regional matter).

The drawing set contained in Volume 3 for each Project provides a general arrangement plan, including the proposed designation boundary. Consistent with other Te Tupu Ngātahi projects, it is proposed that the drawing set in Volume 3 is not referenced in the conditions of the designations, but reference will be made to the project description and concept plan in schedule 1 to each NoR condition set.

While the design and effects assessment has focused on the ultimate form of the transport infrastructure, this does not preclude an interim step in the formation of part of the transport corridor to take place to support development. For example, providing two arterial lanes prior to four, preceding the full level of anticipated growth.

6.2 Urban design

An Urban Design Evaluation (UDE), included in Appendix J of Volume 4, has been completed for the North Projects based on the principles set out in the Urban Design Framework (appended to the UDE). The UDE provides urban design commentary on the concept designs of the North Projects and recommends how urban design opportunities and outcomes could be considered in future design stages of the projects. The opportunities and outcomes identified could be considered by AT, Waka Kotahi or other parties at future stages of design and development.

In summary, the urban design opportunities and outcomes for the North Projects include:

- The development of an Urban and Landscape Design Management Plan (ULDMP) which considers recommendations from the Assessment of Landscape, Natural Character and Visual Effects, the Assessment of Arboricultural Effects, the Assessment of Flooding Effects and the Assessment of Ecological Effects including:
 - street tree, stormwater raingarden and wetland planting;
 - construction compound and private property reinstatement and treatment of batter slopes;
 - integration of wetlands and riparian areas to enable an appropriate interface with adjacent natural features;
 - 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.
- Inviting Manawhenua as Partners to provide input into relevant cultural, landscape and design matters including how desired outcomes reflect their identity and values.
- Addressing potential conflicts between placemaking aspirations within local communities and the operating speed of the corridor.
- Identifying and addressing known or planned changes of land use and residential density that have the potential to alter the perceived scale and impact of the corridor functions.
- A modal integration strategy that addresses the movement and place function of the corridors that incorporates placemaking opportunities arising from adjacent land use.
- Demonstrating how any residual land portions following the construction of the North Projects are redefined and integrated with the expected future land use function.

- Providing clear, effective and legible connectivity between community and social functions with the corridors.
- Locating stations/stops and corridors within walking distance of higher density development to facilitate modal shift, support commercial and mixed-use centres and contribute to vibrant, active urban environments.
- Aligning the speed, type and scale of transport corridors and infrastructure with the environment that it moves through (appropriate scale to the context).
- Provide regular, safe, cross corridor connections, particularly for active mode users across transport corridors that are integrated with the future local network to provide access throughout the future urban zone and minimise potential severance effects.
- Providing tangible connectivity between identified activity nodes.
- Considering how the corridors can be clearly navigated and understood by users moving from place to place.
- Locating rapid transit interchanges within centres (local, town and metro) to support a mix of uses and providing modal choice to a larger number of users.

The measures to achieve the opportunities and outcomes listed above will be confirmed at the detailed design stage and form part of the ULDM as a condition on the designations.

6.3 Design Input and Standards

The design philosophy that informed the indicative designs for route protection is summarised in the following sections. As appropriate, the following key guidance documents were adopted in the development of the indicative designs for the North Projects:

- Transport Design Manual (TDM) – Auckland Transport.
- Austroads Guide to Road Design (AGRD).
- Auckland Unitary Plan (operative in part)
- NZTA P46 stormwater specification
- Guidance Document 2017/001 Stormwater Management Devices in the Auckland Region (GD01).

The Assessment of Alternatives in AEE Appendix A, also sets out how the preferred routes/sites for the transport corridors/stations were identified and key design refinements that occurred during the DBC/NoR preparation.

6.3.1 Designing the RTC

The RTC (NoR1) and associated stations (NoR2 and 3) have been designed to accommodate a rapid transit corridor for buses. The corridor/station designs and designation footprints are also future proofed for light rail in terms of geometrics and space, considering the future mode is uncertain and relies on decision in other parts of the wider Auckland transport network. A rapid transit system is designed to provide passengers with a convenient, comfortable and fast ride in a cost-effective manner with a series of stations linked by a road or railway.

There are no specific standards in New Zealand for rapid transit design, however design parameters from relevant projects (i.e.: Northern Busway, Eastern Busway and Auckland Light Rail) were considered as appropriate.

6.3.2 Designing the Arterial Corridors

The arterial corridors have been designed to cater to a range of modes. A form and function assessment for each corridor (or corridor segment) has informed the preferred design cross-section selected, as well as the future speed environment selected. More information on the design of each corridor is provided in the Assessment of Transport Effects (Volume 4) and the Assessment of Alternatives (AEE Appendix A).

6.3.3 Design Parameters

The indicative design of the North Projects was generally developed as per the design parameters summarised in Table 6-1.

Table 6-1: Summary of Design Parameters

Design Element	Approach to Design
Cross section	<p>Refer to section 8 of this report. Selection of corridor form and function including indicative cross-sections is described in the Assessment of Alternatives in Appendix A.</p> <p><u>Arterial roads</u> The standard cross sections generally incorporate AT's Urban Streets and Road Design Guide and Vision Zero design features, such as:</p> <ul style="list-style-type: none"> • Berm space and duct for utilities • Footpath and separated cycleway • Traffic lanes with a solid or flush median • Where relevant, bus lanes and space for bus stop facilities • Stormwater management <p>Final cross sections will be produced at detailed design and will be submitted as part of the relevant Outline Plans</p> <p><u>Rapid transit corridor and motorway</u> Bespoke cross sections developed for these corridors in agreement with Waka Kotahi</p>
Posted speed	<p>50km/hr – arterial roads, typical 60km/hr – arterial roads, selected 80km/hr – rapid transit corridor 100km/hr – motorway</p>
Design speed	<p><u>Arterial roads (consistent with AT Transport Design Manual)</u> 50km/hr – existing 60km/hr (desirable), 50km/hr (min.) – new</p> <p><u>Rapid transit corridor</u></p>

Design Element	Approach to Design
	<p>80km/hr – between Albany Station and Pine Valley East Station 60km/hr – between Pine Valley East Station and Milldale Station (terminus)</p> <p><u>Motorway</u> 110km/hr – mainline 80km/hr – service lane between Ō Mahurangi Penlink (Redvale) interchange and Wilks Road interchange</p>
<p>Horizontal alignment</p>	<p><u>Arterial roads</u> The horizontal alignment that best accommodated each corridor, taking into account the existing topography and future land use, was adopted in design. 3.0% adverse crossfall applied, consistent with Austroads GRD Part 3: Geometric Design</p> <p><u>Rapid transit corridor</u> Between Albany Station and the westward deviation from SH1: applies the existing (or near to) horizontal alignment of SH1. Between the westward deviation from SH1 to Milldale station (terminus): as required to provide a deceleration coefficient of 0.15.</p> <p><u>Motorway</u> Matches existing SH1.</p>
<p>Vertical alignment</p>	<p><u>Arterial roads</u> Grade – 8% (maximum grade as per AT Transport Design Manual without requiring specific treatment for pedestrian routes) The design minimises height of earthworks embankments where possible whilst considering cut / fill volume balance and other constraints. Road finished surface levels are designed above flood levels with minimum freeboard requirements achieved.</p> <p><u>Rapid transit corridor</u> Between Albany Station and the westward deviation from SH1: applies the existing (or near to) vertical alignment of SH1.</p>

Design Element	Approach to Design
	<p>Between the westward deviation from SH1 to Milldale station (terminus): as required to provide a deceleration coefficient of 0.15.</p> <p><u>Motorway</u></p> <p>Matches existing SH1, except on approach to new bridges where adjustments are applied.</p>
Intersections	<p>Selection of intersection form and function is explained in the Assessment of Alternatives (Appendix A, Part A).</p> <p>New intersections are located on straight road segments where possible or along large constant elements (e.g., single large horizontal radius curves).</p> <p>Intersection approach angles are limited to between 70° and 110° from the main alignment.</p> <p>Intersection layouts take into consideration the input from traffic modelling data to inform the lane configuration.</p> <p>Intersections are graded to match the road profile and longitudinal grade of the main through road.</p> <p>Tie-ins with side roads are as close to the intersection as possible whilst maintaining the safety to the road users. Vertically, the grade on the side road approach is between 0.5% and 8% to minimise earthworks and tie-in lengths.</p>
Interchanges	<p>Selection of interchange form and function is explained in the Assessment of Alternatives (Appendix A, for NoR 4).</p> <p>Interchanges are grade-separated intersections that provide access from the high speed and high volume motorway system to the local transport network.</p> <p>The requirements of Austroads GRD Part 4C: Interchanges and the Manual of Traffic Signs and Markings (MOTSAM) Part 3: Motorways and Expressways were applied for ramp design and geometric layout respectively.</p>
Active modes	<p><u>Grades:</u></p> <p>5% (desirable)</p> <p>8% (max.) where topography is challenging, to avoid excessive earthworks. For this grade, platforms / rest areas will be required and these can be accommodated within the designation footprint.</p>

Design Element	Approach to Design
	<p>The proposed designation footprints allow sufficient space for separated active mode facilities and active mode crossings at intersections.</p>
<p>Earthworks</p>	<p>The adopted batter slopes for earthworks listed below were set based on regional experience and long-term performance observations of earthworks in this area of Auckland.</p> <p>Later stages of design will be required to confirm adequate stability is achieved; informed by site-specific investigation and appropriate analyses.</p> <ul style="list-style-type: none"> • All fill slopes – adopt 1V:3H batter slope. • Cut slopes in Waitematā Group soils – adopt 1V:3H batter slope. • Cut slopes in Northland Allochthon soils and Tauranga Group soils – adopt 1V:5H batter slope. • Cuts within Waitematā Group rock and Northland Allochthon rock are not assessed as part of the indicative designs (i.e., all cuts are conservatively assumed to be made in soil).
<p>Retaining walls</p>	<p>At this concept level of design, retaining walls are only proposed at a limited number of locations, particularly where environmental constraints and topographic constraints need to be minimised / mitigated.</p> <p>Given the limited geotechnical information available, an experience-based approach to retaining walls was adopted (i.e., considered geology, topography, whether in a cut or fill situation and constructability).</p> <p>Final decisions around retaining wall locations and types will need to be made during later design stages once further ground investigations and survey are carried out.</p>
<p>Bridges</p>	<p>Bridge skew angles are limited to a maximum of 30° relative to the infrastructure being crossed to maximise future design options.</p>

6.3.4 Stormwater Design and Management

The approach to the indicative stormwater design and management has focused on identifying feasible stormwater treatment methods to inform the required designation footprint (see Table 6-2 below). This considered AUP:OP and industry standards (such as GD01), the existing stormwater infrastructure, future discharge and diversion, runoff quality, and flood hazard management.

Stormwater treatment for each Project will be further developed at detailed design alongside applications for any required resource consents. The Assessment of Flooding Effects (see Volume 4) provides a description of the stormwater method and preferred locations selected for each NoR. In general, stormwater treatment / attenuation devices are located at or near the low points along a corridor's alignment, since the stormwater systems in the indicative designs are gravity fed. Positioning at the low points also means that only short outlets from these devices to nearby natural watercourses are required.

Table 6-2: Stormwater design and management considerations

Element	Input considerations
Stormwater quality	The footprints allow for stormwater quality treatment in accordance with Auckland Council Guideline GD01 for all existing and future impervious areas, except where a corridor only consists of a pedestrian or cycle path. Generally, the indicative designs adopt treatment wetlands or swales, depending on the local conditions and topography.
Retention and detention	AUP:OP SMAF 1 design criteria for retention and detention measures has been allowed for each corridor that is within the FUZ / greenfield environments, where discharging to freshwater streams. Criteria are summarised as follows: <ul style="list-style-type: none"> • Provide retention (volume reduction) of at least 5mm runoff depth • Provide detention and a drain-down period of 24 hours for the difference between the pre- and post-development runoff volumes from the 95th percentile, 24-hour rainfall event minus the 5mm retention.
Flooding	Where required, attenuation storage to match pre-project peak flows to post-project peak flows for either or both the 10 year and 100-year rainfall events has been provided. Attenuation will be provided within devices which can be designed to detain larger storm events, including wetlands, ponds and swales. In some instances, diversions or provision of compensatory flood storage is provided. Resilience to flooding was applied through: <ul style="list-style-type: none"> • Setting the corridor vertical alignment above the 100 year Average Recurrence Interval (ARI) flood plain where practicable • Providing 0.5m freeboard for culverts between the headwater level and edge of the corridor • Providing freeboard to bridges in accordance with the Waka Kotahi Bridge Manual requirements.
Stream crossings	All existing stream crossings will be maintained through either culverts or bridges. Bridges are identified at selected locations within the indicative design where appropriate to manage effects on the environment. For these bridges, flood immunity is provided, considering Ministry for the Environment representative concentration pathway (RCP) 4.5. <p>The final form of stream crossings with consideration to upstream ponding, erosion protection and fish passage will be confirmed at the detailed design and regional resource consent phase.</p>

6.3.5 Design Elements Not Developed

A design exercise for each corridor has been undertaken to support the identification of the proposed designation boundary. Further design work for each corridor is anticipated at the detailed design stage where elements such as pavements, signs, road markings, bus stop locations, safety barriers, landscaping and urban streetscaping, traffic signals, lighting and other features will be confirmed.

6.4 Approach to Construction Methodology

An indicative construction methodology has been developed for the North Projects. This is a high-level overview, which details some general guidance and parameters in order to:

- Define work areas and thereby inform designation boundaries;
- Assist with assessing the potential effects on the environment;
- Assist with identifying measures to avoid, remedy or mitigate those effects, as appropriate and relevant to each NoR.

This methodology recognises that some of the North Projects are unlikely to be constructed for several decades, by which time the approach and means of construction may be quite different to that of today. The approach to construction methodology therefore strikes a balance in providing future flexibility, whilst at the same time providing enough detail to understand design rationale and how construction is likely to be undertaken. Typical areas required for construction - such as for batter slopes, bridges, retaining walls, stormwater treatment, temporary works, site facilities, and reinstating access - have been applied to inform the proposed designation boundaries of the North Project NoRs. These are included at AEE Appendix C – Construction Area Requirements. Site-specific considerations and constraints mean that in some instances, the designation boundary does not exactly follow the guidance parameters set out.

The construction methodology which has informed the proposed designation boundaries has been developed based on a concept design and the current land use / landform in which the corridors/stations are located. The actual construction of the North Projects will be influenced by many factors including the detailed design, timing of the North Projects, any measures to mitigate effects, the conditions of the proposed designation, any resource consents sought in the future and further land development that has or will have occurred along the Project corridors in the meantime. The actual construction detail will be confirmed at detailed design.

As such, Waka Kotahi and AT seek a degree of flexibility in construction methods to accommodate these factors and to retain opportunities to further refine the construction methodology in the future to reduce the impacts and duration of any adverse effects of construction.

The construction of the North Projects will be undertaken within a Management Plan framework. The conditions for each of the proposed designations and altered existing designations will be in place to manage the effects of the construction activities. Should the contractors wish to undertake construction activities in a manner which is not within the scope of the proposed designations, or any future resource consents, additional authorisations will need to be obtained at that time.

Management Plans form an integral part of the construction methodology for the North Projects, setting out how specific matters will be managed. A suite of Management plans are proposed for the North Projects. These are discussed later in this AEE, and include the following:

- Construction Environmental Management Plan (CEMP)
- Stakeholder and Communication Engagement Management Plans (SCEMP)
- Network Utilities Management Plan (NUMP)
- Construction Noise and Vibration Management Plan (CNVMP)
- Construction Traffic Management Plan (CTMP)

The management of any potential or actual effects arising from construction activities that relate to regional resource consenting matters will be provided for when these consents are sought, in the future.

The Management Plans and future Outline Plans required for the proposed designations will be submitted to Auckland Council prior to the commencement of construction. Following the Completion of Construction, the designation boundary will be reviewed and any land that is not required for the permanent work or for the ongoing operation, maintenance or mitigation of the North Projects will be reinstated in coordination with directly affected landowners or occupiers. Each NoR includes a condition which requires that, following completion of works, the Requiring Authority will review the extent of the designation to identify areas no longer required for ongoing operation, maintenance, or mitigation of effects, and to give notice to remove those areas from the designation.

The construction methodology includes:

- Indicative construction duration timelines;
- Construction area requirements – indicative land required for construction activities;
- Sequence and methodology – sequencing of the main construction activities;
- Identification of potential construction impacts.

Typical areas required for construction have been identified and applied to inform the proposed designation boundaries of the North Projects NoRs. These offsets and typical construction areas have been based on transport infrastructure projects which are similar in size and nature. AEE Appendix C sets out the main elements and the corresponding general parameters used to initially define work areas, and subsequent designation boundaries.

6.4.1 Sequence and Methodology

An indicative construction sequence and methodology is outlined below. The outline is based on a generic construction project and has not taken into consideration any project specific scope of works, constraints or staging requirements that may be applicable for each project. The indicative construction programme assumes a generally staged construction sequence starting with site establishment, advance works, main works and ending with finishing works and demobilisation. The indicative construction sequencing is set out in Figure 6-1.

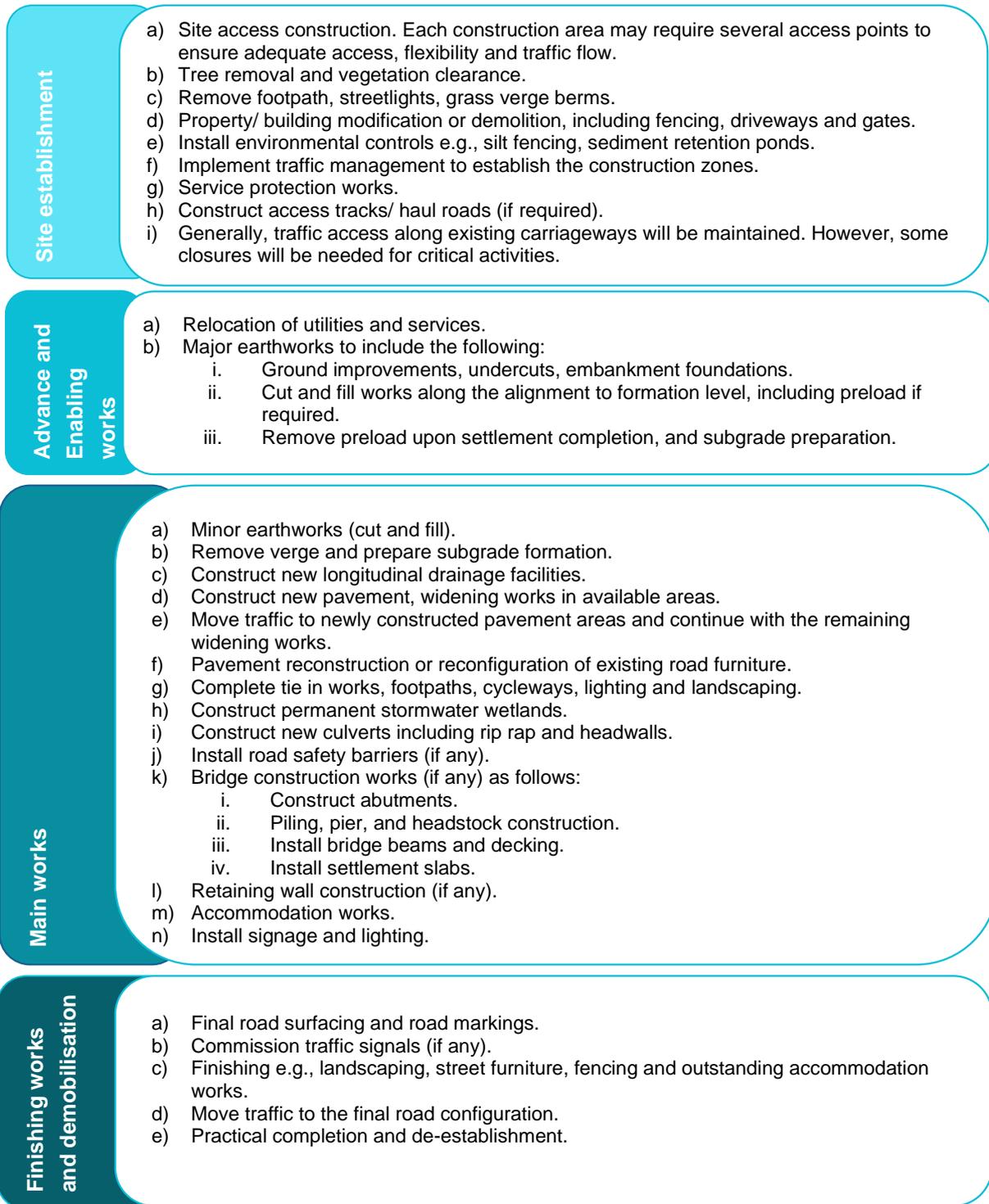


Figure 6-1: Indicative construction sequencing

6.4.2 Indicative Construction Durations

Based on a high-level estimate of similar transport projects, the indicative construction program timelines are provided below. As noted, the specific project durations will be dependent on a number of variables including detailed design, land acquisition, procurement methods, technological advances in construction methods, changes in design standards, availability of contractors and other resources

(materials, equipment, etc) and altered future network demands. The durations below are indicative only and assume that each Project will be constructed independently of each other.

Table 6-3: Indicative Construction Durations per NoR

NoR	Project	Indicative Duration
1	New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	5 – 6 years
2	New Milldale Station and Associated Facilities	2 – 3 years
3	New Pine Valley East Station and Associated Facilities	3 – 4 years
4	SH1 Improvements	4 – 6 years
5	New SH1 Crossing at Dairy Stream	2 – 3 years
6	New Connection between Milldale and Grand Drive	3 – 4 years
7	Upgrade to Pine Valley Road	3 – 4 years
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	3 – 4 years
9	Upgrade to Dairy Flat Highway between Dairy Flat and Albany	1 – 2 years
10	Upgrade to Wainui Road	1 – 2 years
11	New Connection between Dairy Flat Highway and Wilks Road	2 – 3 years
12	Upgrade and Extension to Bawden Road	2 – 3 years
13	Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange	3 – 5 years

6.5 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. NoRs 1 – 3 and 5 - 13 are for new designations.

The assessment of effects on the environment has been limited to matters that trigger a district plan consent requirement under the AUP:OP as these are the only activities authorised by the proposed designations and alteration to existing designations, pursuant to Section 9(3) of the RMA⁸.

Where National Environmental Standard (NES) or regional plan consenting requirements are triggered, these will not be authorised by the proposed designations and alterations to existing designations, and will require resource consents in the future. Notwithstanding this, relevant national and regional resource consent matters have been considered to inform the North Projects' design, the alternatives assessment process, and the proposed designation footprint.

⁸ Section 176(1)(a) – if a designation is included in a district plan then section 9(3) does not apply to a public work or project or work undertaken by a requiring authority under the designation.

Under section 181(2), those same matters (as section 171 (1)) are to be considered ‘with all necessary modifications’, in relation to a NoR for an alteration as if it were a NoR for a new designation. In the context of the North Projects, NoR 4 is an alteration to existing SH1 designations (Waka Kotahi designation numbers 6751, 6759, 6760 and 6761⁹), including a change to the boundary, conditions and purpose of the existing designations. The assessment is limited to the works proposed as part of the alteration only, as well as the change in purpose. As detailed in the Form 18 for NoR 4 in Volume 1, the change in purpose allows for provision of a ‘cycleway and/or shared path’, which applies to the full extent of these existing designations, as well as the altered boundary. The effects of the alteration are assessed throughout Sections 9 to 20 of this AEE, while the effects of the change in purpose are assessed in Section 21 of this AEE.

The assessment of district matters does not include works that could be undertaken within (or effects that are or could reasonably be generated by) the existing designations. In the future prior to construction, the North Projects 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 each 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.

Based on the above, the assessment of effects that has been undertaken to support the North Projects is limited to the following:

- Positive effects;
- Traffic and transportation;
- Māori culture, values and aspirations;
- Landscape and visual;
- Natural Hazards – Flooding;
- Ecology;
- Archaeological and built heritage;
- Construction noise and vibration;
- Traffic noise and vibration;
- Network utilities;
- Arboriculture;
- Community and Social Effects;
- Property, land use and business;
- Urban design evaluation.

In addition, high level assessment of relevant national and regional resource consent matters (e.g., stormwater, freshwater ecology, significant ecological area (SEA) vegetation removal) has been undertaken to inform the North Projects’ design, the alternatives assessment process, and the proposed designation footprints.

⁹ 6751 – Proposed motorway (Auckland/Waiwera Motorway State Highway 1) including planning, design, supervision, construction. 6759 – Motorway. 6760 – Motorway. 6761 – Motorway and limited access highway and associated interchange.

6.6 Approach to Assessing the Likely Receiving Environment

As set out above, a key purpose of these NoRs is to protect the necessary transport network that will support the future urbanisation in the North. Accordingly, it is anticipated that the network will not be constructed and operational until further urbanisation of the North growth areas has at least been confirmed, or development is underway.

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 corridors will be experienced. This assessment of effects considers both the existing environment and the likely future receiving environment at the time at which effects will likely occur. It is anticipated the North Projects will be constructed in up to 30 years or more from now. This means that the receiving environment – and in particular the land uses present - will differ significantly from what is present today.

Within the North Projects area there are a range of existing and future urban zoning patterns, which influence the likely future environment for assessment purposes. Project areas that are not identified for future urban growth (i.e., are not FUZ zoned) and which support existing urban uses or rural uses are not likely to materially change in the future. However, greater intensification is anticipated in some residential zones, centre zones (and future centres), and land adjacent to the proposed RTC stations, in line with Plan Change 78, the National Policy Statement on Urban Development (NPS:UD) and Medium Density Residential Standards (MDRS) - noting that the policy context may shift prior to construction. Refer to Table 6-4, below.

Those Project areas that are currently rural or urban zoned but have recently been live zoned or up-zoned for urban development are likely to experience material change because of the urbanisation contemplated by the operative planning provisions (e.g., Milldale, Silverdale, North Shore Airport Precinct, parts of Ōteha Valley). Areas zoned FUZ are also likely to experience material change. The following table sets out our understanding of the current land use zoning, its likelihood of change and its potential future zoning.

Table 6-4: Land Use Likelihood of Change Based on Current and Potential Future Zoning

Land Use Today	Zoning	Project Areas Affected (including in part)	Likelihood of Change for the environment (based on AUP:OP zoning/policy direction)	Likely Future Environment (based on AUP:OP zoning/policy direction)
Residential	Residential	NoR 1 in part, NoR 2, NoR 4 in part, NoR 9 in part, NoR 10 in part, NoR 11 in part, NoR 13	Low*	Urban
Business	Business	NoR 4 in part, NoR 8 in part, NoR 11 in part, NoR 13 in part	Low	Urban

Land Use Today	Zoning	Project Areas Affected (including in part)	Likelihood of Change for the environment (based on AUP:OP zoning/policy direction)	Likely Future Environment (based on AUP:OP zoning/policy direction)
Open Space	Open Space	NoR 1 in part, NoR 2, NoR 7 in part, NoR 9 in part, NoR 10 in part,	Low	Open Space
Special Purpose	Special Purpose	NoR 4 in part, NoR 1 in part, NoR 13 in part	Low	Special Purpose
Rural	Countryside Living	NoR 1 in part, NoR 4 in part, NoR 9, NoR 11 in part, NoR 13 in part	Low	Rural
	Mixed Rural	NoR 7 in part, NoR 8 in part	Low	Rural
	Rural Production	NoR 6 in part	Low	Rural
Greenfield / Rural	FUZ	NoR 1, 3, 4 in part, 5, 6, 7, 8, 9 in part, 10 in part, 11, 12, 13	High	Urban
Greenfield / Rural	Residential or Business	NoR 4 in part, NoR 10 in part, NoR 11 in part, NoR 13 in part	High	Urban

*other than likely intensification of residential areas as per MDRS, Plan Change 78, NPS:UD

Where Project areas are zoned future urban, it is anticipated the construction of the transport corridors 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 corridor are likely to occur, it is important to consider the likely future environment for each NoR.

While land within the FUZ may currently be used for a range of general rural activities, it is recognised as a transitional zone and the AUP policy framework signals a land use change to an urban form over time. The timing of this change is expected to occur in parallel or after the construction of the transport corridors, as the rezoning of FUZ would be dependent on the provision of infrastructure. The likely future environment of the FUZ during the operation of the transport corridors has, therefore, been assessed as an urban or a developing urban environment albeit without a confirmed urban land use pattern or form.

It is noted that Council structure planning for Dairy Flat and Pine Valley is not proposed to occur for approximately 15 years. This creates some uncertainty around the future land use form, and in particular the size and location of the future town centre in Dairy Flat.

Where relevant, the urban land use patterns outlined in Council's structure plans/spatial land use strategies for the North growth areas have been considered together with any proposed plan changes depending on how far advanced they are through the plan making process. For example:

- The Silverdale West – Dairy Flat Industrial Area Structure Plan envisages a future industrial area generally bounded by SH1 and Dairy Flat Highway (refer Figure 7-1, Section 7.1).

Auckland Council has prepared a Draft Spatial Land Use Strategy for Silverdale and Dairy Flat, which is draft and has not yet been adopted by Council's Planning, Environment and Community Committee. These documents are discussed further in Section 7.

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 unchanged or undeveloped in the future urban environment.

A summary of the receiving environment of each NoR is provided at Section 8 of this AEE.

6.7 Approach to the Interface Between the North Projects and Other Transport Projects

There are several other transport projects being developed across the North that will integrate with or affect the North Projects (refer Figure 6-2).

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

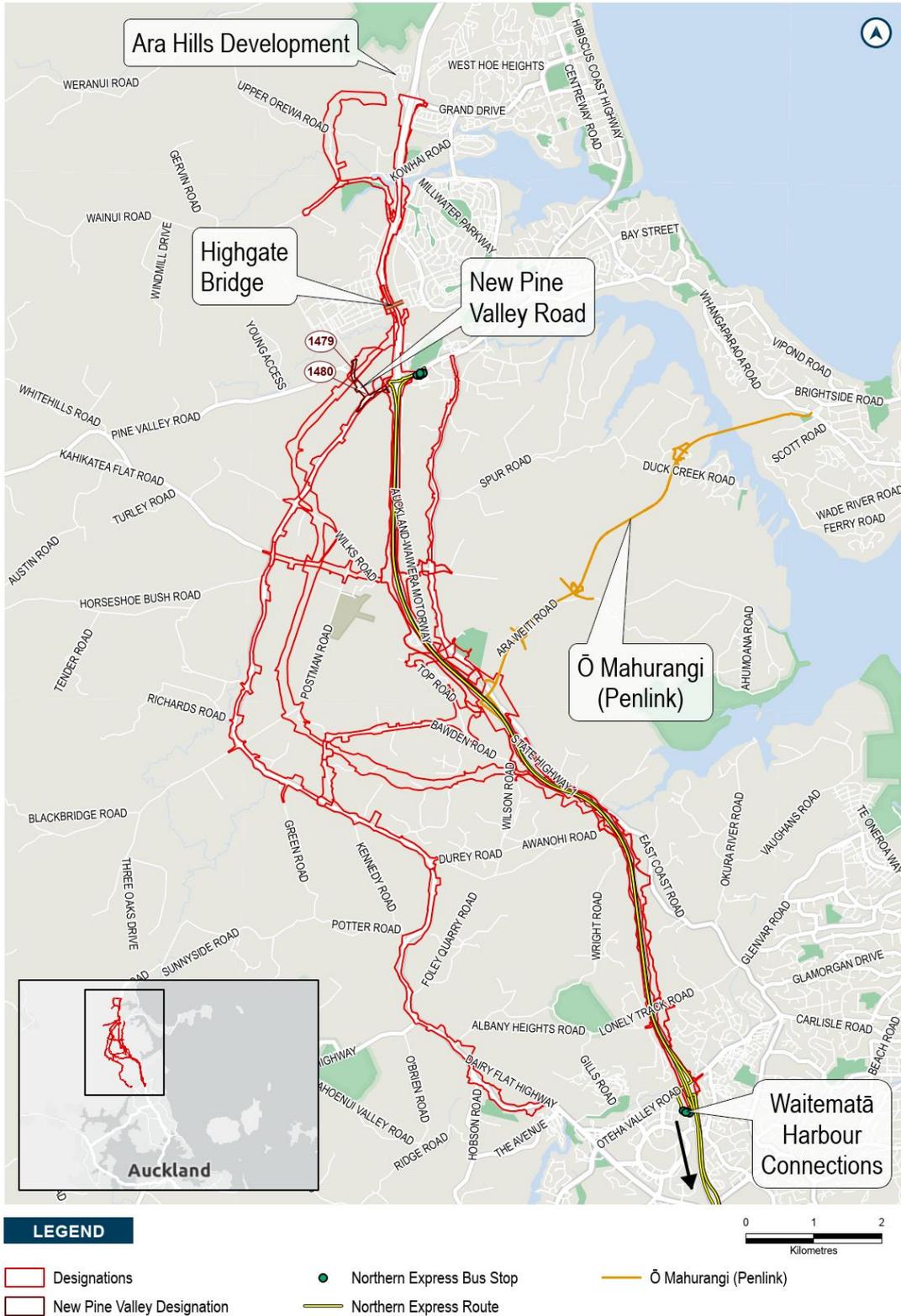


Figure 6-2: Transport Projects which the North Projects interface with

Table 6-5 summarises these projects and demonstrates how their delivery may affect the North Projects.

Table 6-5: Interface of the North Projects with other projects

Project	Interface with North Projects	Status and Agent
New Pine Valley Road Designation (Designations 1479, 1480)	<p>The designations provides for the upgrade of the existing Pine Valley Road from Dairy Flat Highway to the tie in point with the realigned part of Pine Valley Road and Argent Lane. It is expected to provide an ultimate four land future arterial corridor with cycleways and pedestrian paths. It also includes provision for a new intersection at Dairy Flat Highway / Pine Valley Rd, and upgrade of the Dairy Flat Highway to provide an additional eastbound lane between Pine Valley Road and the Silverdale Motorway interchange.</p> <p>The New Pine Valley Road Designation interacts with NoRs 1 and 3, with the proposed RTC alignment and the Pine Valley Station footprint crossing the road alignment. The road is expected to provide local public transport access to the station.</p> <p>The New Pine Valley Road Designation also interacts with NoRs 4 and 8, providing road and active mode tie-ins with Dairy Flat Highway (NoR 8) and the Silverdale Interchange (NoR 4). It interacts with NoR 7 – Upgrade to Pine Valley Road, which provides a tie-in with the New Pine Valley Road Designation at the eastern end.</p>	<p>AT</p> <p>Designated but not yet built</p>
Highgate Bridge	<p>Highgate Bridge is a two-lane transport connection proposed by AT from Milldale to Millwater/Highgate Business Park. The connection was consented in 2021 and will be implemented by Fulton Hogan as part of the Milldale development.</p> <p>The Highgate Bridge project interacts with NoRs 1, 2 and 4, with the crossing proposed at the location of Milldale Station, providing local public transport access to the station in future. The active mode facility (cycleway and / or shared path) proposed as part of NoR 4 – SH1 Projects will connect to Highgate Parkway, where the Highgate Bridge is located, providing greater active mode access to Milldale and Millwater. The consented location of the bridge is shown on the General Arrangement Drawings for NoR 2 in Volume 3.</p>	<p>AT</p> <p>Consented 2021, currently under construction</p>
Ō Mahurangi (Penlink)	<p>Ō Mahurangi (Penlink) is a new two-lane road with shared walking and cycling path which provides a transport link</p>	<p>Waka Kotahi</p>

Project	Interface with North Projects	Status and Agent
	<p>between Whangaparāoa and SH1, connecting at the new Ō Mahurangi Penlink Interchange which will provide south facing ramps (refer schematic of layout in Figure 6-4).</p> <p>Ō Mahurangi (Penlink) interacts with NoRs 4, and 13, which provide road and active mode tie-ins with Ō Mahurangi (Penlink). The scope of NoR 4 includes the provision of north facing ramps to the Ō Mahurangi Penlink (Redvale) Interchange, with the interchange also providing a connection through to NoR 12 – Upgrade and Extension to Bawden Road. Collectively, these new transport projects will provide improved east-west connectivity to and across SH1. See Figure 6-4, below.</p>	<p>Construction commencement expected 2023</p>
<p>Waitematā Harbour Connections Business Case</p>	<p>The Waitematā Harbour Connections business case is considering the future of the RTC network south of the study area. The emerging preferred option includes a 21km light rail tunnel from Wynyard Quarter, servicing the North Shore with six new stations and terminating at Albany Bus Station. The North RTC project (NoR 1) will interface with this project at the Existing Albany station and the decisions made on this corridor may influence the mode and operation of the North RTC project. The RTC (NoR 1) is assumed to be busbased for the purposes of this NoR and AEE; however the RTC's proposed cross-section width, geometrics and designation footprint are also futureproofed for light rail.</p> <p>See Figure 6-3, below.</p>	<p>Waka Kotahi Preferred option announced</p>
<p>SH1 optimisation study</p>	<p>Waka Kotahi are in the design phase for some short term improvements on SH1 to prioritise the existing bus services approaching Silverdale interchange. This work interfaces with NoR4 which looks to protect space along this corridor for a more comprehensive upgrade.</p>	<p>Waka Kotahi Design phase</p>
<p>Dairy Flat Highway / The Avenue / Lucas Creek upgrade</p>	<p>Auckland transport have developed a business case and design for upgrades on Dairy Flat Highway in the Albany area including the bridge across the Lucas Creek. This project interfaces with NoR 9 which ties into the western extent of this project.</p>	<p>Auckland Transport Business Case complete and awaiting funding</p>

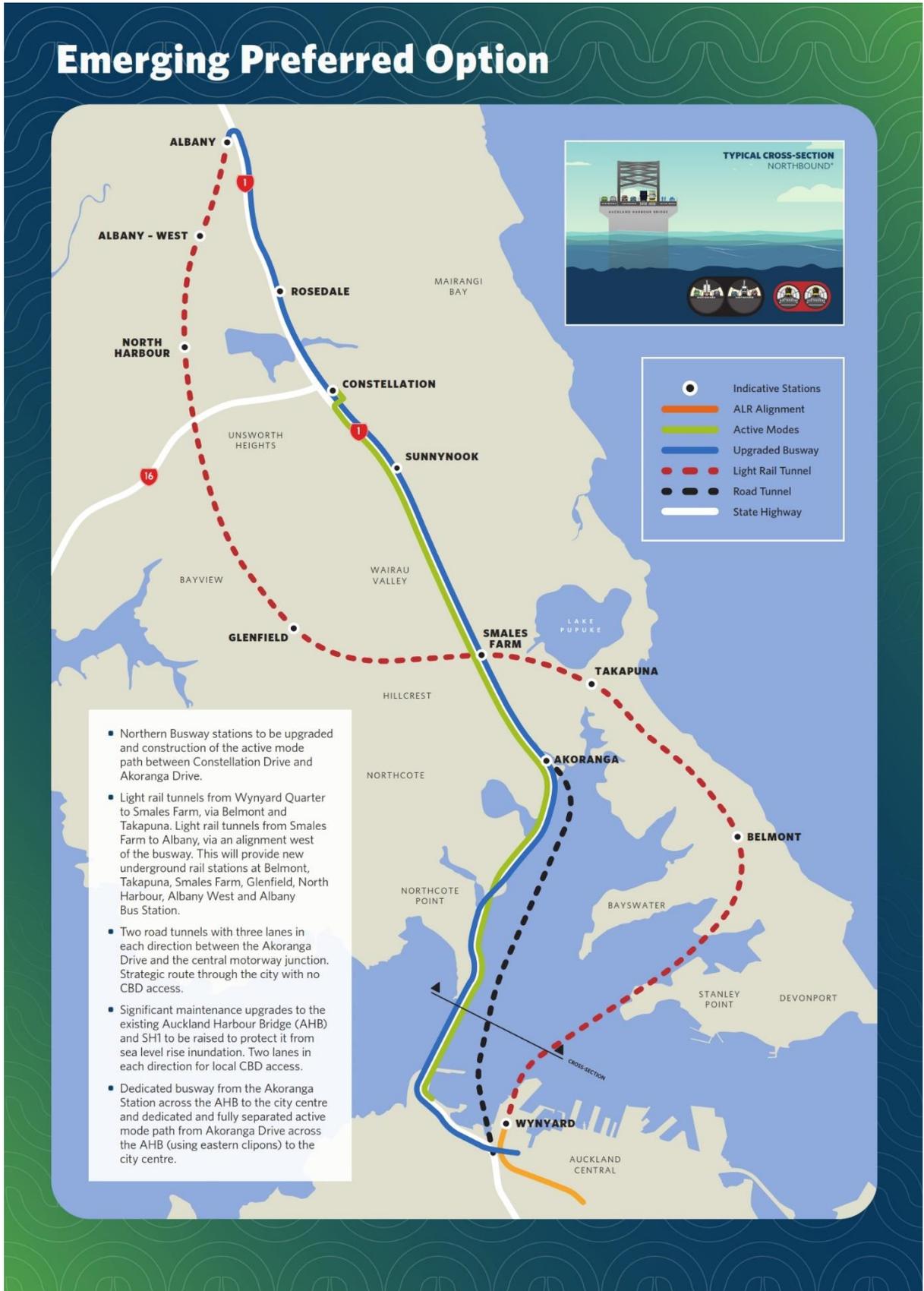


Figure 6-3 Additional Waitematā Harbour Crossing - Emerging Preferred Option, announced August 2023

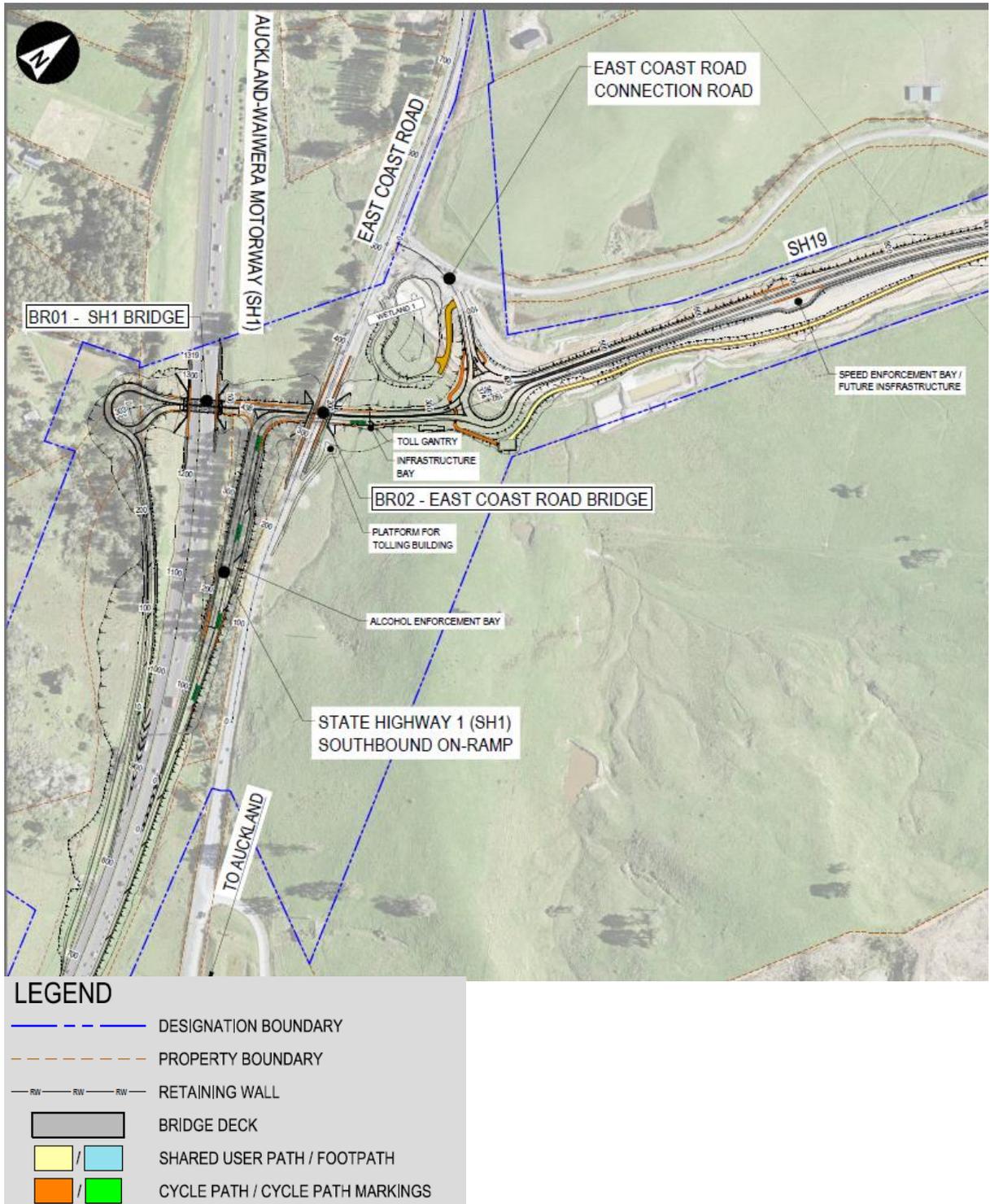


Figure 6-4: Schematic design of Ō Mahurangi (Penlink) where it overlaps with East Coast Road (NoR 13)(<https://www.nzta.govt.nz/projects/penlink/>)



PART C – PROJECT DESCRIPTIONS AND RECEIVING ENVIRONMENT

7 Planning and Environmental Context – across all NoRs

This section provides an overview of the existing and likely future planning and environmental context across the wider North Projects area. More NoR-specific context is provided in section 8. The focus of the Te Tupu Ngātahi programme is on long-term route protection of the transport systems required to support the planned growth areas. This focus on longer-term route protection for longer-term implementation means the assessment of effects at Sections 9 – 21 focuses more on the likely future urbanised environment, and potential effects of the North Projects on this, than on detailed analysis of the existing environment.

The North Projects are located in North Auckland, including Albany, Ōrewa, Wainui East (Milldale), Silverdale West, Redvale and Dairy Flat. Much of the area is yet to be developed rural land. Urbanisation is currently occurring or already present at the northern extent of the proposed network area, in Milldale and Upper Ōrewa. The timeframes for urbanisation in the central area of the network – excluding Silverdale West Dairy Flat Industrial Area - are estimated at up to 30 years or more. The Silverdale West Industrial area is anticipated for development now, with a Council led plan change being progressed. Little change is anticipated at the southern end of the network, north of Albany, where a number of constraints to urbanisation are present, and subsequently the land is not zoned to accommodate future urbanisation.

7.1 Existing and Likely Future Land Use Context

The majority of the North Projects will be constructed and will operate within (or immediately adjacent to) areas currently zoned as Future Urban Zone (FUZ). Some rural, residential, business and open space zoning is also present, predominantly at the southern and northern extents of the North Projects. See Figure 7-1, below.

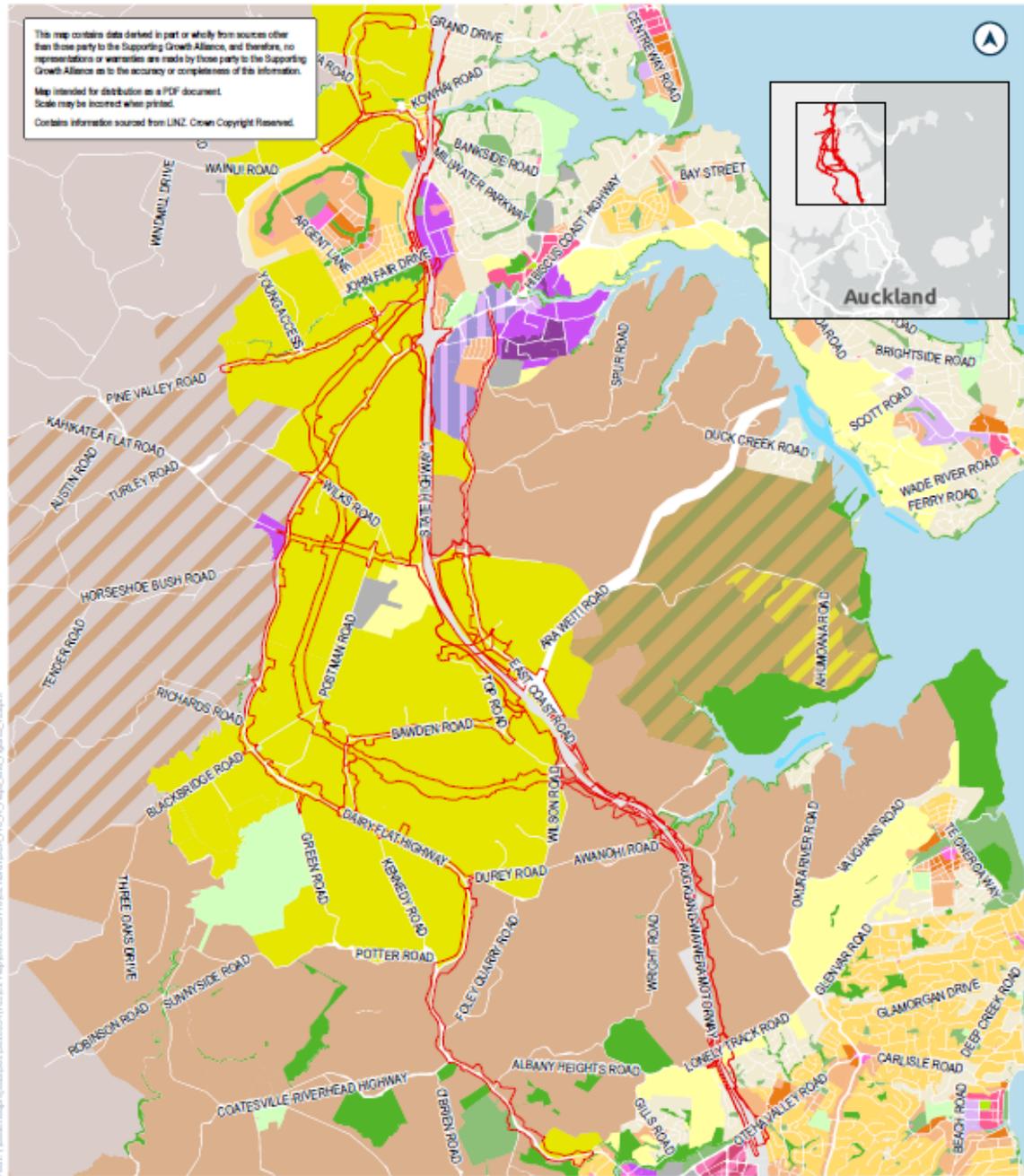


Figure 7-1: AUP:OP zoning environment for the North Projects

Areas which are 'live-zoned' for residential or business uses, and/or currently urbanising, include:

- Milldale, which is partly developed across the south eastern extent of the 'live zoned' area, with earthworks and road formation underway across the remainder;
- Ara Hills, Ōrewa, which is consented with earthworks and road formation underway;
- Ōrewa, to the east of SH1, and north of the Ōrewa River, is currently developing with residential uses;
- Silverdale, adjacent to East Coast Road, which is 'live zoned' for residential and business uses, is currently partly developed at the northern extent of the 'live zoned' area;
- Albany, which is currently developing with residential uses to the east and west of SH1, north of Ōteha Valley Road, and a metro centre south of Ōteha Valley Road;
- Future industrial development in Dairy Flat is discussed below.

At this point in time, land zoned FUZ is generally used for rural purposes, including agriculture, horticulture, and grazing, with low-rise large lot residential at a density in keeping with the Rural – Countryside Living Zone character. The zone provides for rural lifestyle activities including farmlets (hobby farms), horticultural sites, across mixed site sizes. The development of the majority of North FUZ land is anticipated to occur over the long term and has been planned to be sequenced in stages over the next 30 years or more as bulk infrastructure capacity allows. The greatest intensification is anticipated where FUZ is expected to be rezoned in future to residential zones and centre zones.

A high level of future intensification (6+ storeys) is also anticipated in future where land is within walkable catchments of future RTC stations (noting most station locations have not been confirmed), in line with the NPS:UD Policy 3. The NPS:UD will not trigger a plan change to enable this uplift until the RTC project is 'planned' (which by definition in the NPS:UD means funded under the Regional Land Transport Plan as per Council's interpretation).

While large tracts of FUZ in Upper Ōrewa, Pine Valley and Dairy Flat have not yet been structure planned by Auckland Council, Council's draft Spatial Land Use Strategy broadly suggests (as per Figure 7-2):

- A metropolitan / town centre in Dairy Flat, indicatively located adjacent to the Rapid Transit Corridor alignment (noting the Draft Spatial Land Use Strategy is draft only, and has not been confirmed or approved by Council)
- The potential for Terrace Housing and Apartment (THAB) zoning for 800m surrounding this metropolitan / town centre
- Two potential local centres in the Pine Valley area.

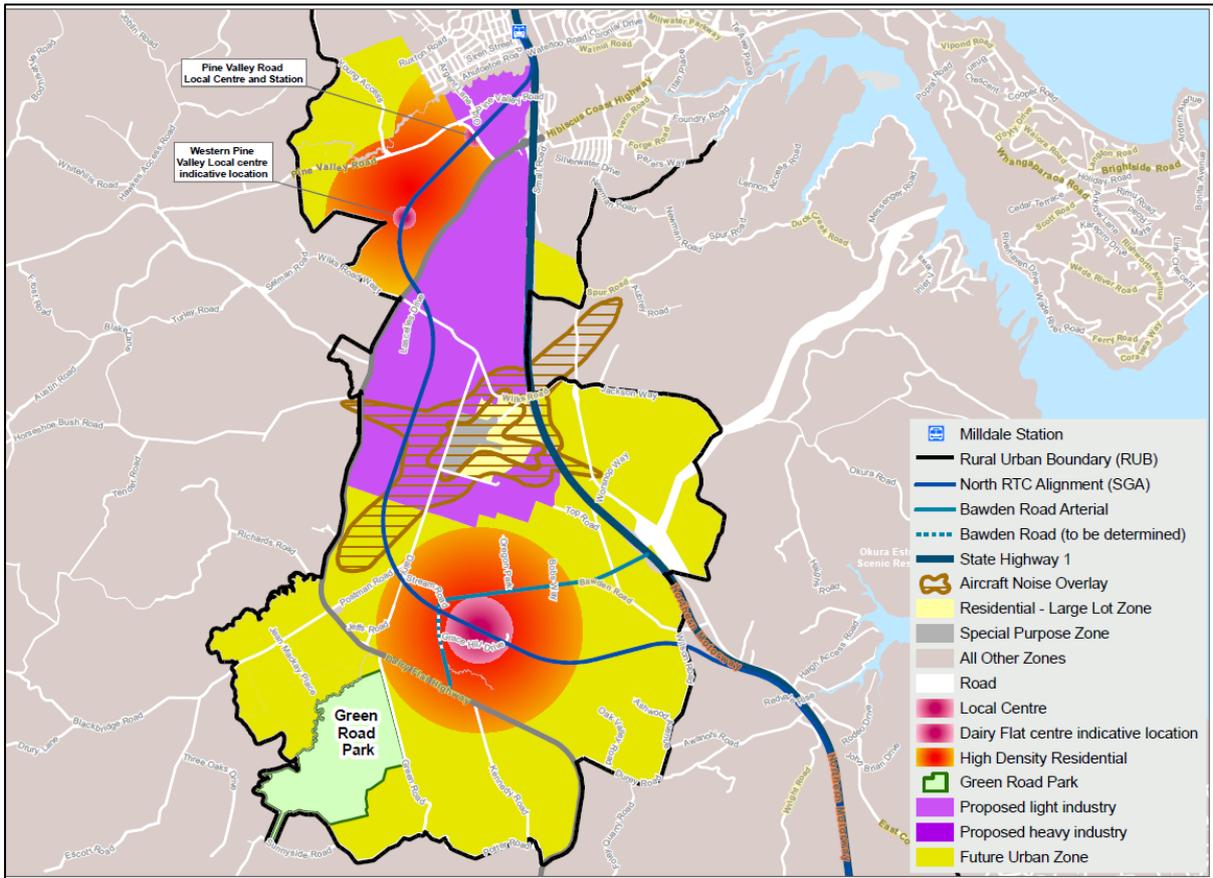


Figure 7-2: Draft Spatial Land Use Strategy Silverdale Dairy Flat (Draft 2023) (Draft Strategy is yet to be approved by Council’s Planning Committee)

In addition to future residential areas, a large industrial area within an area of FUZ predominantly between Dairy Flat Highway and SH1 is anticipated by the adopted Silverdale West - Dairy Flat Industrial Area Structure Plan (refer Figure 7-3 below). According to the FULSS this area is anticipated for development now, with Council in the process of pursuing a Council-led plan change for the first stage.

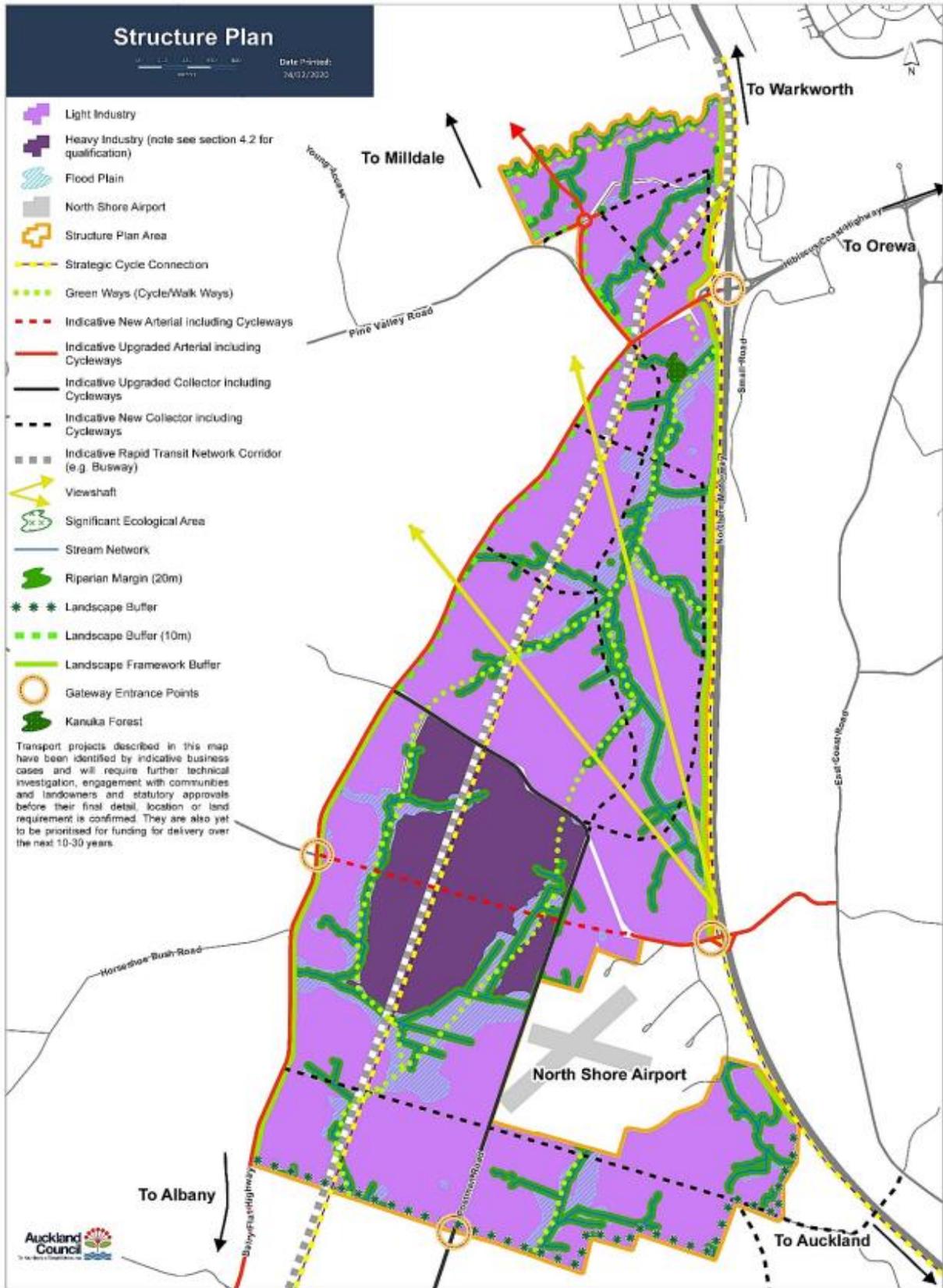


Figure 7-3: Silverdale West Dairy Flat Industrial Area Structure Plan

All areas of FUZ have a high likelihood of change in a planning and land use context. It is anticipated that the likelihood of change is low in areas which are not currently zoned FUZ, including in current business areas/zones, current open space areas/zones, current special purpose areas/zones, and countryside living areas/zones.

Within current residential areas/zones, including centre zones and future centres, and land adjacent the proposed RTC stations, greater intensification is anticipated, in line with recent policy changes including the introduction of the 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 (RMA-EHS) 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.

In the case of the North, much of the land within the study area is not live zoned and the MDRS changes will not take effect until plan changes to rezone future urban zone are undertaken. The MDRS will result in changes in already established areas such as Ōrewa, Silverdale, Millwater, Whangaparāoa and Milldale. The proposed changes as per Council Plan Change 78 are shown below in Figure 7-4 and Figure 7-5.

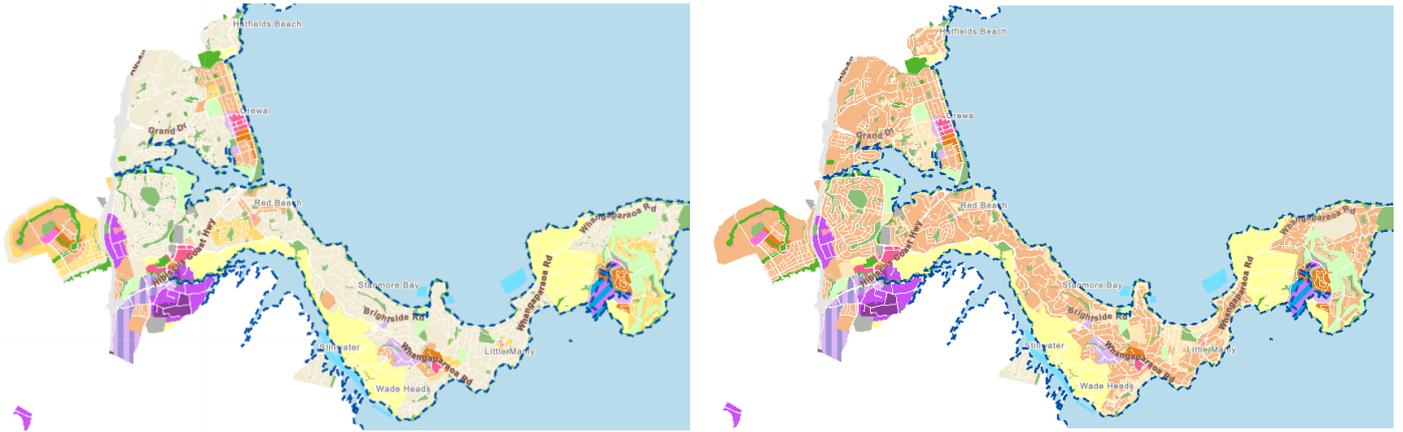


Figure 7-4: Existing Zoning and Future Zoning with MDRS in Milldale, Millwater, Ōrewa and Whangaparāoa

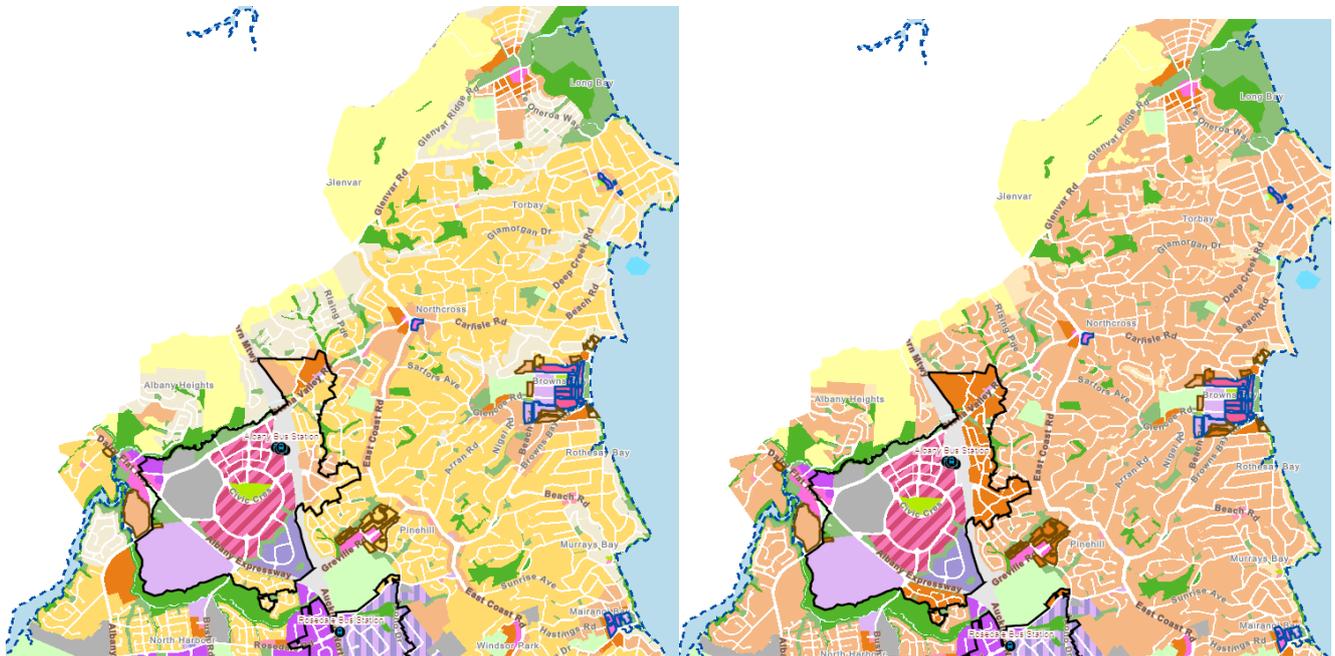


Figure 7-5: Existing Zoning and Future Zoning with MDRS in Albany and Long Bay

As shown, Plan Change 78 enables greater densities within the existing urban areas in the North with the predominant change being a shift from residential single house zone and mixed housing suburban zone changing to the mixed housing urban zone. This will allow for intensification of these areas for any developments within the area. The expected level of uptake for increased density in the areas shown is still unclear in the North area.

Much of the surrounding areas, like Millwater, parts of Milldale and Upper Ōrewa area have a relatively new housing stock and are less likely to be affected by changes in density rules. Other areas have potential for greater intensification including:

- Parts of Whangaparāoa – sites of larger sizes and the Ō Mahurangi (Penlink) Project provides an improvement to transport access.
- Remaining areas within Milldale Development – While a portion of the Milldale development has been constructed, subsequent stages could be implemented with higher densities.

- Remaining areas in Ōrewa Heights – Like Milldale, remaining development areas could increase in density following changes in legislation.
- Future Urban areas once lived zoned will enable greater density, particularly around the RTC corridor primarily as a result of the NPS:UD.

Currently, there are some known developers with large landholdings in the North, along with highly fragmented private land ownership. Within FUZ areas, it is anticipated that developers are likely to purchase and consolidate landholdings in future, for residential, town centre, and industrial uses. Some of the more significant surrounding plan changes and resource consents which are known at this time are set out in Table 7-1, below:

Table 7-1: Approved Surrounding Plan Changes and Resource Consents

Approved plan changes and resource consents that form part of the existing environment	
<p>Ara Hills</p>	<p>A residential development for around 500 dwellings, located adjacent to Grand Drive, just west of the SH1 interchange at Ōrewa. This development is consented with building works underway. An indicative masterplan image below shows the anticipated layout.</p>  <p>The masterplan diagram shows a residential development layout. A key in the top left corner lists the following features: 1. Village Centre, 2. Village Grid houses, 3. Hillside houses, 4. Hamlet houses, 5. Reconfigurated crossline open space, 6. Neighbourhood parks, 7. Creek crossing, 8. Village Centre park, 9. Pine trees in open space. The diagram shows a mix of these features, with a central village centre, grid houses, hillside houses, and hamlet houses. It also shows reconfigurated crossline open space, neighbourhood parks, a creek crossing, a village centre park, and pine trees in open space. The development is located adjacent to the Auckland-Waiwera Motorway and the Nukunua Scenic Reserve.</p>
<p>Milldale</p>	<p>A plan change has been approved for residential and town centre development. Initial stages to the west and south (stages 1, 2, and 3) have completed construction with residents now occupying dwellings. Consents for future stages are currently being sought. The images below show the indicative layout.</p>

Approved plan changes and resource consents that form part of the existing environment

<p>Snow Planet Snowdome Extension and Alpine Coaster</p>	<p>A Resource Consent Application to undertake an extension to the existing Snowdome at 91 Small Road was granted consent in October 2022. The application sought consent to carry out regional earthworks, including consent for an additional earthworks area to be used as an outdoor storage area.</p> <p>Snowplanet also holds resource consents allowing for an 'alpine coaster', Zorb facility, ropes park, comprehensive signage and groomer garage. These consents were recently granted an extension to 2028, to enable works to be completed.</p>
<p>Sculpture Park</p>	<p>A Resource Consent Application to develop a visitor park at 346 Pine Valley Road was granted consent in March 2020. Construction has begun and at the time of writing, the development is approximately 75% complete.</p>
<p>NZMCA Park</p>	<p>A Resource Consent Application to develop a New Zealand Motor Caravan Association Inc. (NZMCA) Park on the North Shore Vintage Car Club (NSVCC) site at 40 Masons Road was granted consent in 2014. The NZMCA did not proceed with developing the park in 2014 (and this consent may have lapsed), however at the time of writing, NZMCA and NSVCC have re-commenced lease discussions with plans to develop the park.</p>
<p>TRG Commercial</p>	<p>A Resource Consent Application to operate a car yard at 1738 Dairy Flat Highway was granted consent in October 2021. The application sought a variation to the existing resource consent for a storage shed consented in August 2016, which was granted an extended lapse period from August 2021 to August 2026.</p>
<p>Storage Facility, East Coast Road</p>	<p>A storage facility comprising 21 storage units is proposed at 2183 East Coast Road, Stillwater. Vehicular access is proposed to / from East Coast Road, with a new footpath along frontages to Tavern Road and East Coast Road. This resource consents is currently being processed and has not been determined.</p>

The approved consents set out in Table 13 are considered part of the existing environment for the purpose of this AEE.

Te Tupu Ngātahi is also aware of a number of smaller-scale consents at different stages of the process, which are located close to or in some instances within designation boundaries. Some of these have come to light during the engagement phase. These have been reviewed and considered in finalising indicative designs and/or indicative designation boundaries.

More NoR-specific existing and future land use context is provided in section 8.

7.2 Existing and Likely Future Transport Network

The existing transport network in the North Projects area is entirely roads-based and predominantly rural in nature, with higher speeds and limited walking and cycling (active mode) facilities. Intersections are predominantly priority-controlled, and there are limited strategic public transport offerings given the existing surrounding population density and current land uses.

State Highway 1 (SH1) runs generally north-south and caters to between 2 – 3 lanes of traffic in each direction, with no walking and cycling facilities. Limited bus services operate across the North Projects area, including:

- The NX1 and NX2 – Northern Express, which runs along SH1.
- The 986, which runs between Albany and Silverdale via Dairy Flat Highway.
- The 128, which runs between Silverdale and Helensville via Pine Valley Road and Kahikatea Flat Road.
- The 995, which runs between Silverdale and Warkworth via SH1.
- The 126, which runs between Albany and Westgate, via Dairy Flat Highway and Coatesville Riverhead Highway.

The North Projects comprise the future transport network in the North, in conjunction with a number of other transport projects which interface with the North Projects (which are not being progressed by Te Tupu Ngātahi, and which are summarised above at Section 6.7).

The existing transport network in the North is not fit for purpose to accommodate the anticipated level of growth and urbanisation as detailed in Section 3.1. Without the North Projects, but taking into account the anticipated growth, the future transport network context in the North would likely be characterised by:

- Missing transport connections, which would constrain access across the North growth area to jobs, education and other core services in and around the growth area
- Limited transport choice, with a lack of suitable walking and cycling facilities or reliable public transport options resulting in more private vehicle trips.
- Continued reliance on private, low occupancy vehicles resulting in congestion across the local road network and on SH1, particularly at key interchanges. This congestion will impact public transport, freight and private vehicles, resulting in unreliability.
- Additional conflict between active modes and vehicular traffic, given the increased traffic volumes and lack of separated active mode facilities, which would result in a lack of safe and attractive mode choice, and more private vehicle trips.
- Significant transport carbon emissions.
- A lack of integration between the transport network and the pace, scale and form of anticipated growth in the North, which will result in poor urban form and natural environment outcomes.

More NoR-specific existing and future transport context is provided in section 8.

7.3 Existing and Likely Future Ecological Context

As noted above, the majority of the North Projects are within, or immediately adjacent to, undeveloped greenfield areas (FUZ) which are planned for future urbanisation. These areas currently support grazing, horticultural and agricultural uses. In some areas, the North Projects are within, or immediately adjacent to existing urban areas, SEAs, and rural areas which are not expected to urbanise (i.e., Countryside Living Zone areas). Existing terrestrial habitats are highly modified, with the extent of remaining indigenous vegetation limited to large areas of SEAs to the north and south (Kathy's Thicket, and Albany Heights / Lucas Heights north of Albany), and to small fragments of regenerating vegetation following historical clearance. Native species of bat, birds and lizards are known to exist in the North Projects area – details are summarised for each NoR in Section 8.

As the FUZ within the North Projects area undergoes urbanisation, the ecological context is expected to differ significantly from what is present today, including:

- Mature trees associated with roadsides and shelterbelts are expected to be removed in the Future Environment, as removal is permitted under the AUP:OP and therefore these trees are unlikely to remain in an urbanised scenario. This excludes vegetation within riparian zones (see below), notable trees, and certain street trees.
- Streams, floodplains, wetlands, and riparian vegetation are likely to be retained and enhanced and protected within esplanade reserves and habitat enhancement.
- Fish passage is expected to improve with the removal of old culverts and pipes that historically blocked passage.
- A likely increase in natural wetland habitat due to requirements to restore and enhance degraded systems.
- Urbanisation will likely result in increased noise and light pollution effects on terrestrial fauna species.
- Future terrestrial vegetation is likely to include private amenity planting within residential, commercial and industrial sites, as well as street trees.
- Vegetation within SEAs is likely to remain in future.
- Existing Open Space Areas are likely to remain.
- Rural areas outside the FUZ are likely to remain, with vegetation cover, streams and wetland features likely to be relatively unchanged.

More NoR-specific existing and future ecological context is provided in section 8.

7.4 Existing and Likely Future Topographical Context

The topography within the North Projects area is predominantly flat or gently undulating, with some steeper terrain at the northern, eastern and southern extents of the network (refer Figure 7-6). In the south between Albany, Dairy Flat and the Ōkura River, some steeper terrain is present which is reflected in the absence of FUZ, given this land is constrained by slope (and other factors including SEA and notable trees), and is therefore not suitable for future intensification.

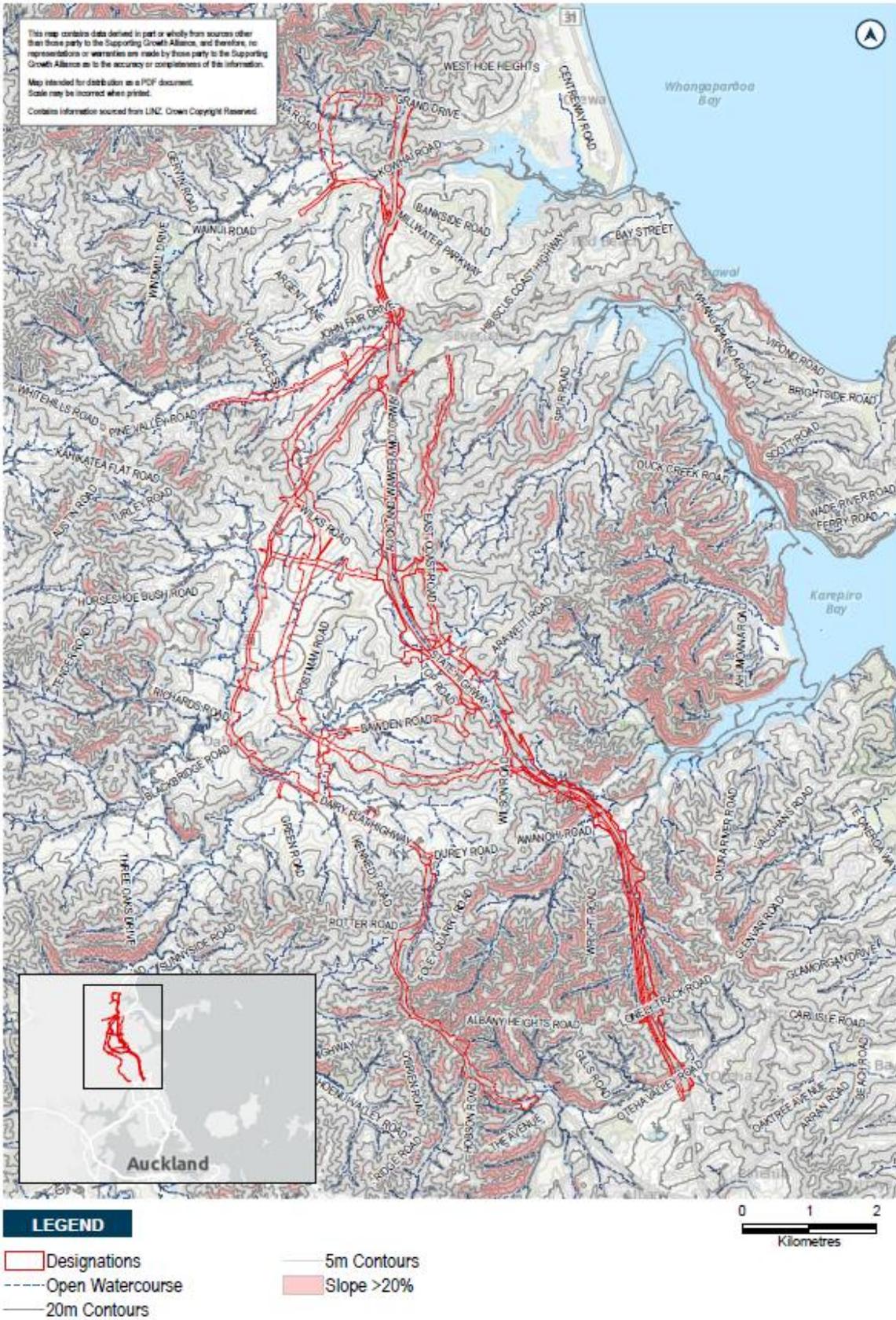


Figure 7-6: Topographical map for the North Projects

In the north, land to the north of Wainui Road features steep terrain, with valleys and ridgelines running generally east-west, interspersed with tributaries of the Ōrewa River in valleys. Dairy Flat between Durey Road and Wilks Road is generally flat or gently undulating. East Coast Road (NoR 13) generally follows a ridgeline running north-south between Silverdale and Huruhuru (Dairy Stream), with terrain falling away with steep slopes either side of the corridor.

7.5 Existing and Likely Future Hydrological and Flooding Environment

The North Projects area has several notable catchments/streams (refer to the Assessment of Flooding Effects included in Appendix E of Volume 4):

- The Wēiti River has tributaries running through Silverdale and Wainui, before connecting to the coast at Stillwater.
- The Ōkura Creek has tributaries running through Dairy Flat and Ōkura, before connecting to the coast at Karepiro Bay, north of Long Bay.
- The Ōrewa River has tributaries running through Wainui East and Ōrewa, before connecting to the coast at Ōrewa.
- Waiokahukura (Lucas Creek) runs through Albany alongside Ōteha Valley Road and through Albany township, before connecting to the coast in the Upper Waitematā harbour.
- Rangitōpuni Stream runs alongside the west side of Dairy Flat Highway, before connecting to the coast at Paremoremo
- Huruhuru (Dairy Stream) is a tributary of the Rangitōpuni Stream. It runs from SH1 / East Coast Road, and connects with the Rangitōpuni Stream south west of Dairy Flat Highway.

The North Projects area also has other, smaller waterbodies and wetlands, as detailed in the Assessment of Ecological Effects in Volume 4.

The protection and enhancement of existing watercourses and natural wetlands is provided in the AUP:OP and National Environmental Standard – Freshwater (NES-FW). Therefore, it is assumed the future urbanised scenario will largely retain significant permanent streams and rivers and associated natural wetlands, requiring these areas to be accommodated within the future urban environment.

Within the FUZ, realisation of the anticipated urbanisation will change the hydrology, terrain, and buildings exposed to flooding. Future developments are anticipated to take account of and address flood risk as part of their development as per the AUP:OP rules, not increasing the existing flood hazard environment. In the existing urban areas, the hydrological environment and natural hazard conditions are not expected to significantly vary as they are already significantly impervious.

7.6 Existing and Likely Future Geology and Productive Soils Context

7.6.1 Geology

The geology of Dairy Flat and its immediate surroundings consists of a variable distribution of two complexes of Northland Allochthon materials, Tauranga Group materials and, to a lesser extent, East Coast Bays Formation materials. The mapped geology, with the North Projects overlain for context, is presented in Figure 7-7.

The Tauranga Group materials and Northland Allochthon materials themselves are variable in terms of composition and strength and require special consideration in engineering, generally: consolidation settlement, slope stability and seismically induced strength loss (Tauranga Group) and slope stability (Northland Allochthon). As evidenced by the gently undulating landforms across Dairy Flat, these materials are most stable at shallow slope angles.

East Coast Bays Formation materials are typically considered competent for engineering purposes and typically only require consideration of slope stability.

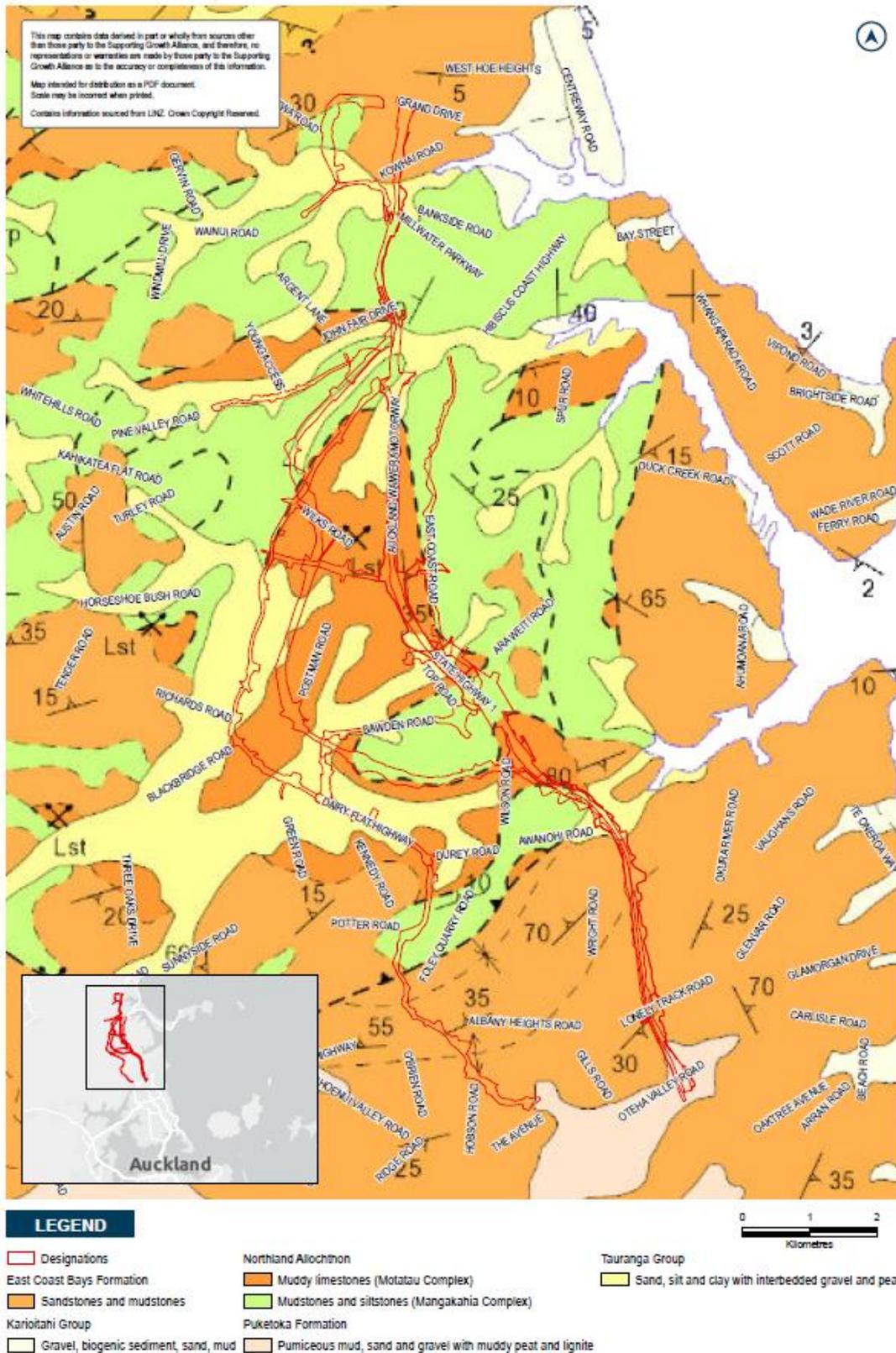


Figure 7-7: Geology of Dairy Flat and surrounds¹⁰, North Projects overlain

¹⁰ Edbrooke, S.W. 2001 Geology of the Auckland area : scale 1:250,000 Institute of Geological & Nuclear Sciences 1:250,000 geological map 3

7.6.2 Productive Soils

The Land Use Capability¹¹ system categorises land into eight classes according to its long term capability to sustain one or more productive uses. Soil classes include Elite (Class 1), Prime (Classes 2 and 3) and Other (Classes 4 – 8) - See key below.

Soil classes across the North Projects area are predominantly 'Other', including Class 4 – Arable, with significant limitations for arable use, and Class 6 – Non-arable, with slight to moderate limitations to pastoral use. There are some areas of Class 3 – Arable, with moderate limitations in Dairy Flat and Silverdale, and some Class 2 – Arable, described as very good multiple use land, with slight limitations, in Albany.

Under the National Policy Statement – Highly Productive Land (NPS-HPL), Rural Production Zone and Rural Mixed Use Zone land with a LUC classification of 1, 2, and 3 constitutes highly productive land. Across the North Projects, there are two instances where a NoR adjoins a Rural Production Zone (NoR 6) or a Rural – Mixed Use Zone (NoR 8), however the immediately adjoining land does not have a LUC 1, 2 or 3 classification and is therefore not classified as highly productive land. In both instances, the rural zoned land is adjacent to an existing road corridor which is being upgraded, rather than a new road alignment. Land zoned FUZ does not constitute Highly Productive Land. An assessment of the North Projects against the objectives and policies of the NPS-HPL is provided in Appendix D.

¹¹ https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/Iri_luc_main

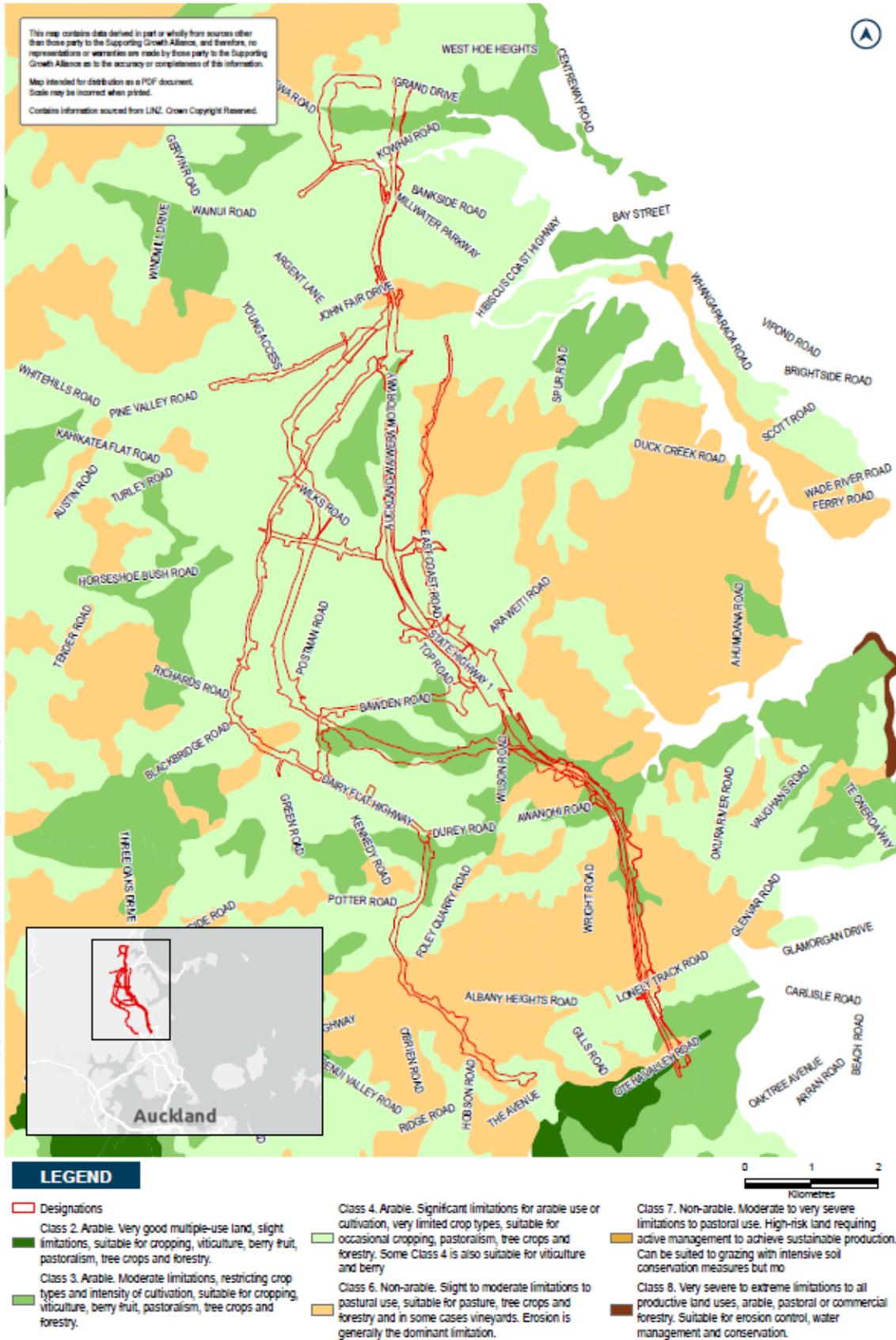


Figure 7-8: Soil Classes of Dairy Flat and surrounds, North Projects overlain

7.7 Manawhenua Cultural Values

This section presents a summary of the cultural areas of significance in the North. These are drawn from the AUP:OP, discussions with Manawhenua included at AEE Appendix F, and the joint Cultural Impact Assessment prepared by Te Kawerau ā Maki and Ngāti Manuhiri, included at AEE Appendix E.

There are no mapped Sites of Significance to Manawhenua identified under the AUP:OP within or in close proximity to the North Projects.

However, much of the North Projects area is within or in close proximity to Treaty Settlement Statutory Acknowledgement areas relating to both Te Kawerau ā Maki (parts of Albany, Albany Heights, Dairy Flat, Stillwater and parts of the Ōkura, Ōrewa and Wēiti Rivers) and Ngāti Manuhiri (parts of the Ōkura, Ōrewa and Wēiti Rivers). These areas are set out in full in Appendix 21.5 (Te Kawerau ā Maki) and Appendix 21.3 (Ngāti Manuhiri) of the AUP:OP. Riverhead Forest, which is nearby but beyond the North Projects area, forms a commercial redress for Te Kawerau ā Maki.

The North Projects area has significant historical and cultural significance to all Manawhenua with historical events and traditions tied to the waterways and the land. Te Kawerau ā Maki and Ngāti Manuhiri have set out matters significant to them in the joint Cultural Impact Assessment, including at AEE Appendix E.

Mapped archaeological sites are concentrated along the coastline and along the Ōrewa, Ōkura, Waiokahukura and Wēiti rivers / streams and their tributaries.

Key areas of cultural significance to Manawhenua include:

- The Wēiti River, a key portage route and with areas which are wāhi tapu.
- Streams, particularly Waiokahukura, Rangitōpuni, Ōkura, Huruhuru and Wēiti, and including the fauna they support.
- Areas of SEA and indigenous vegetation.
- Puke (high points in the landform).
- Historic ridgeline trails, kāinga and mahinga kai.

These sites and areas of cultural significance informed the option development assessment for the North Projects and the design refinement, with Manawhenua comprising partners in decision making (refer Appendix A Assessment of Alternatives and the Appendix F Manawhenua Engagement Summary).

8 Project Overviews and Receiving Environment

This section provides an overview of each North Project/NoR and the corresponding receiving environment (existing and future environment).

8.1 NoR 1 – New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path

8.1.1 Project Overview

A new 16km long Rapid Transit Corridor (RTC) is proposed as a long-term public transport and active mode spine for the North growth areas (refer Figure 8-1). The RTC corridor will run between Albany bus station (just south of Ōteha Valley Road) and Milldale, and will service future communities in Dairy Flat, Silverdale West and Pine Valley future urban areas. Waka Kotahi is the requiring authority.

The RTC will provide the opportunity for up to 5 – 6 stations in future (refer Figure 8-2 for potential locations), with two stations proposed to be designated now as part of the North Projects with Waka Kotahi as the requiring authority – see NoR 2 and NoR 3. The other station locations will be determined in future, as part of more detailed planning of these future growth areas.



LEGEND

-  State Highway (SH)
-  Route Option
-  Designation

0 1 2
Kilometres

Figure 8-1: NoR 1 Rapid Transit Corridor alignment through the North future growth areas between Albany and Milldale – indicative designation footprint

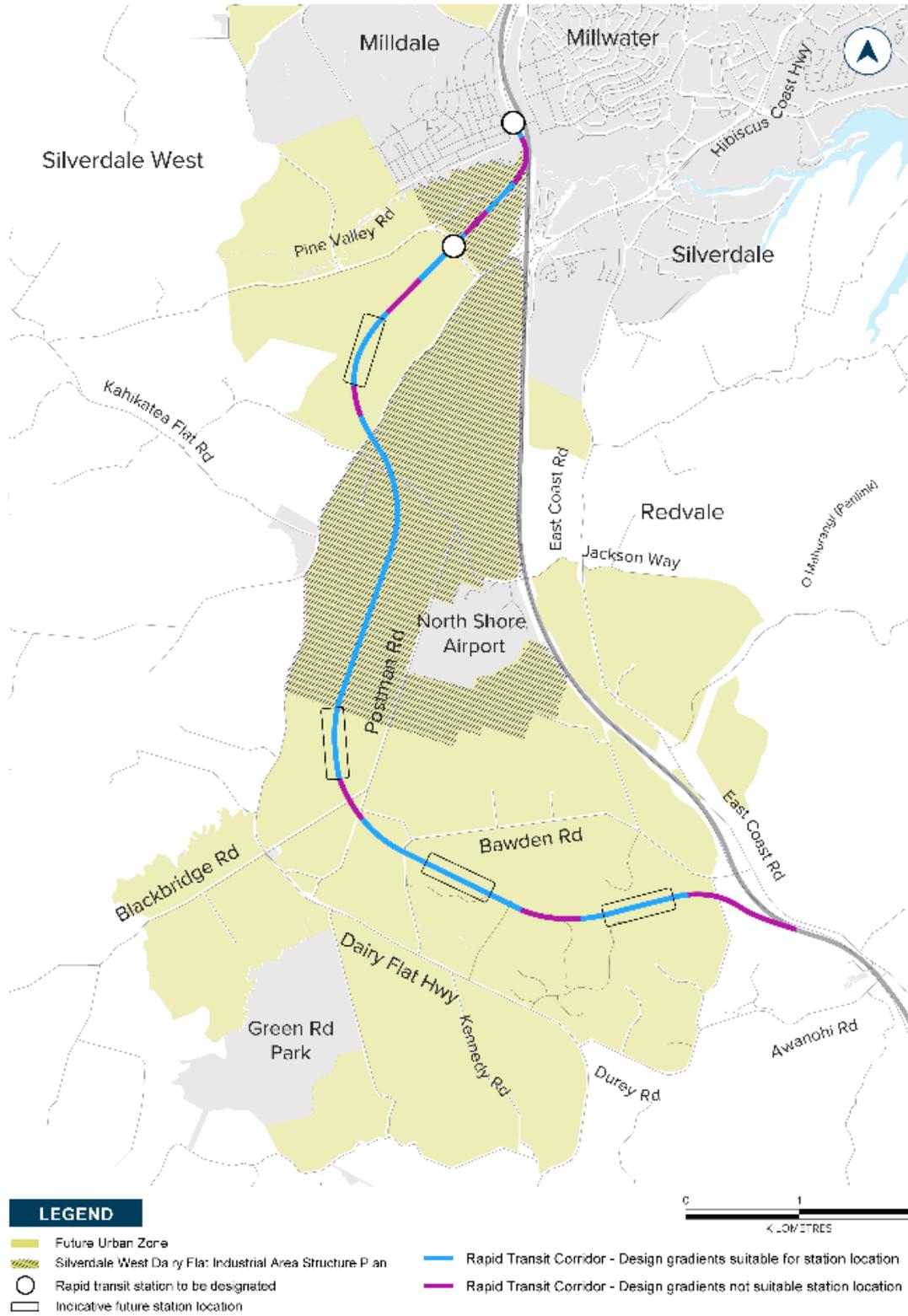


Figure 8-2: RTC proposed and potential future station locations

The Project is a strategic transport project for the North Network, which will improve travel choice and access to economic and social opportunities, and facilitate sustainable growth in the Future Urban area. As such, the Project will require a significant amount of third-party land through the future urban areas it seeks to service.

The RTC follows and partially overlaps the SH1 corridor between Albany and Bawden Road. The RTC corridor then tracks north-west through the Dairy Flat future growth area where it is proposed to connect to a likely future town centre. It then tracks north through the future industrial area between Dairy Flat Highway and Postman Road, crossing under Dairy Flat Highway just north of the current Wilks Road intersection, before passing through the Pine Valley future growth areas, connecting to a future urban residential area and a proposed station at Pine Valley East (NoR 3) and terminating at the proposed Milldale Station (NoR 2) beside SH1.

The RTC is intended to operate in an uninterrupted free-flowing manner with all road crossings grade separated.

The RTC is assumed to be busbased for the purposes of this NoR and AEE. The RTC's proposed cross-section width (refer below) will provide for a dedicated busway; however the geometrics and designation footprint are also futureproofed for light rail as the future mode is uncertain. The recent announcement of the preferred option for a 21km light rail tunnel running between Wynyard Quarter and Albany Bus Station as part of the Waitematā Harbour Connections project will interface with NoR 1 given it will terminate at the current Albany Bus Station. The RTC will also interface with the existing Northern Busway.

The cross-section provides for a separated active mode facility within the corridor for most of the length (from Bawden Road to Dairy Flat Highway), and connections to the wider proposed and existing active mode network (refer Figure 8-3 Figure 8-3: Indicative North Walking, Cycling and Micro Mobility Network).

The proposed designation footprint shows the envelope proposed to construct, operate and maintain the Project and its ancillary components, including construction areas, stormwater infrastructure, batter slopes, retaining walls, and road realignments (including cul de sacs) resulting from the RTC alignment.

Key features of the proposed new RTC corridor include the following:

- An 80km/hr design speed (other than around stations, and 60km/hr between Pine Valley East Station and Milldale Station);
- Grade separated crossings at intersections with other key transport corridors; and
- . Allowance for stormwater treatment/attenuation.

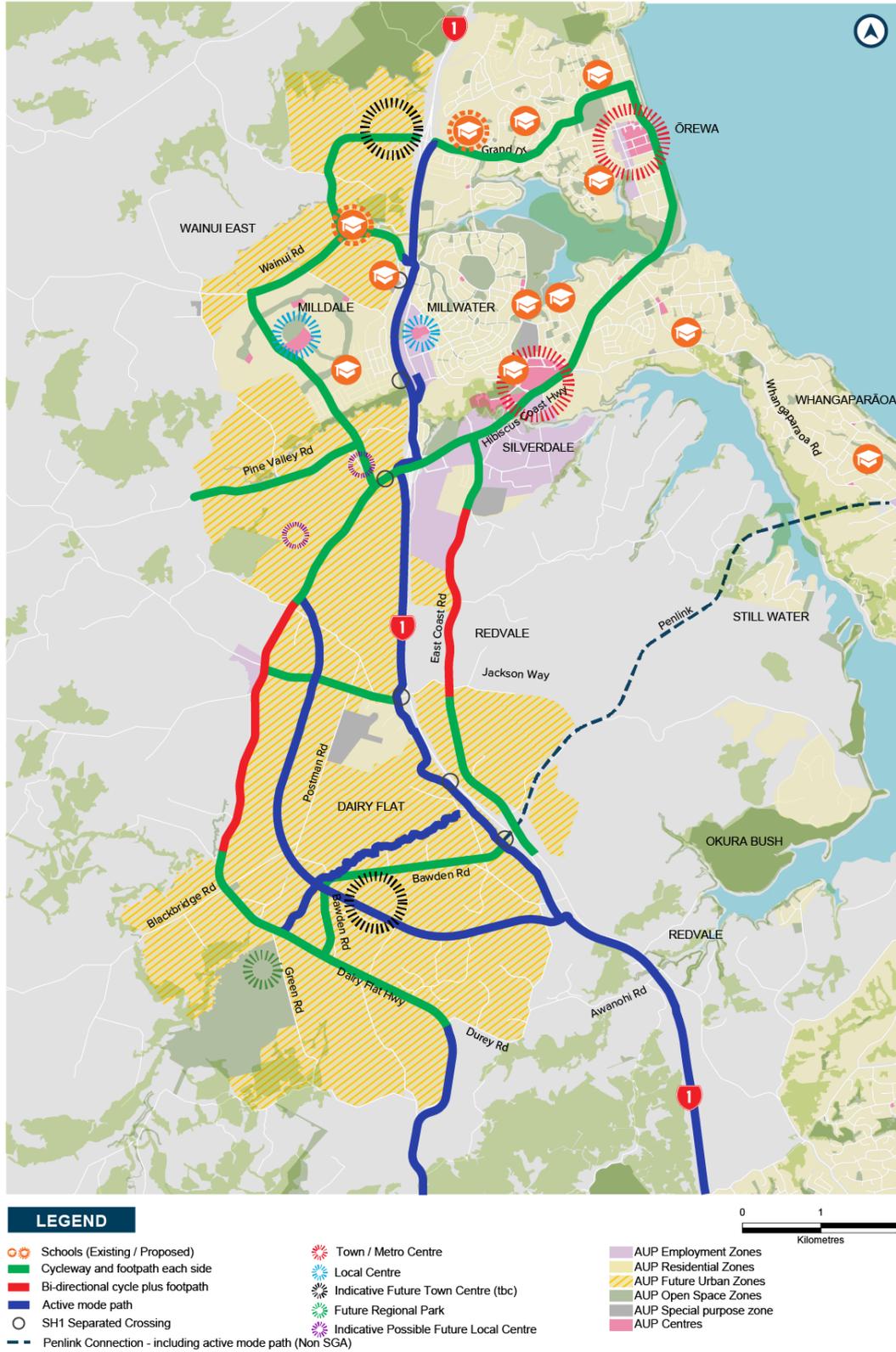


Figure 8-3: Indicative North Walking, Cycling and Micro Mobility Network

8.1.2 Indicative Cross Section

The indicative cross-section width is approximately 20 m for sections where the active mode facility is alongside the RTC and approximately 14m where it is separated. Refer to **Figure 8-4** and **Figure 8-5**, below. It is noted additional land will be required for construction purposes, earthworks batters and stormwater treatment ponds.



Figure 8-4: Rapid transit corridor – indicative 20m cross section



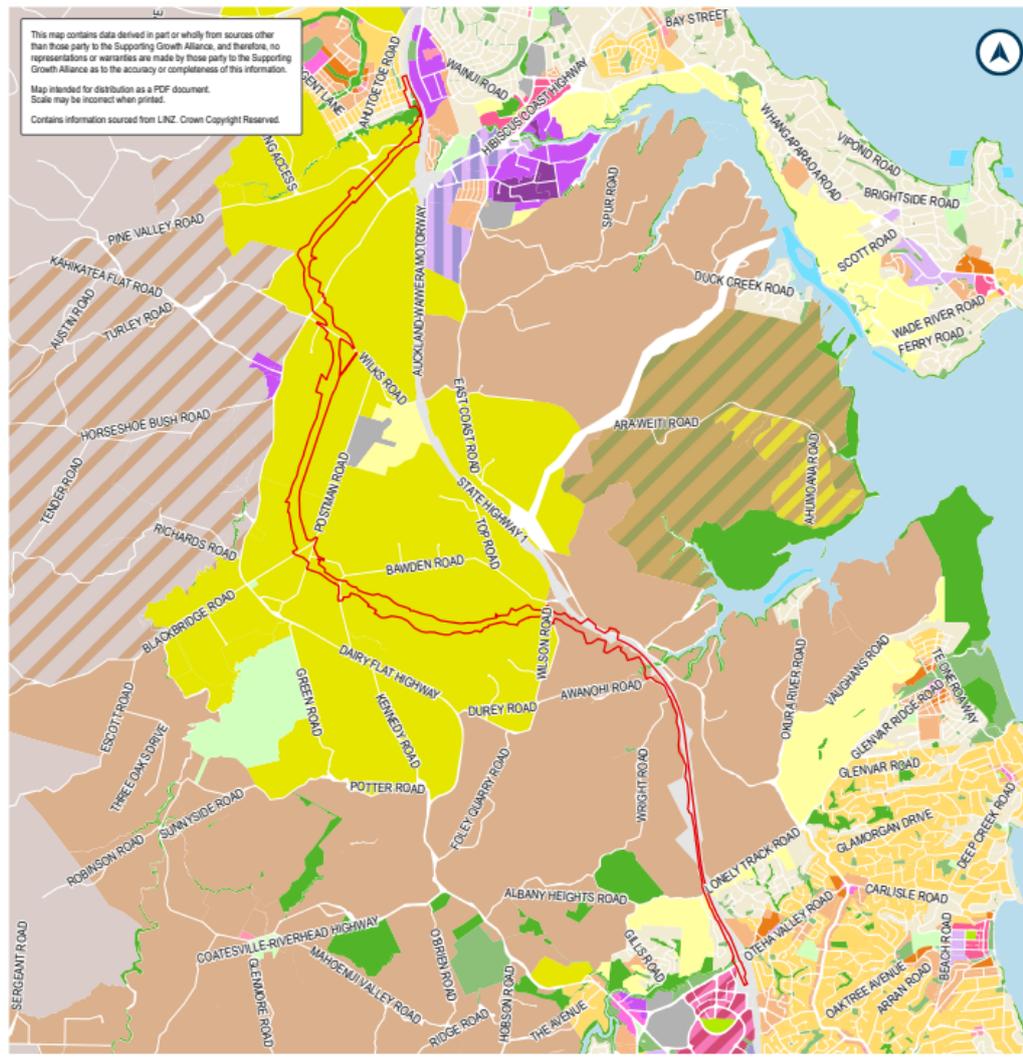
Figure 8-5: Rapid transit corridor – indicative 14m cross section

8.1.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the Project will be constructed, operated and maintained.

Planning Context Provision

Land use – Existing AUP:OP zoning



LEGEND			
	Designation		
	Residential - Large Lot Zone		Open Space - Informal Recreation Zone
	Residential - Rural and Coastal Settlement Zone		Open Space - Sport and Active Recreation Zone
	Residential - Single House Zone		Open Space - Community Zone
	Residential - Mixed Housing Suburban Zone		Business - Metropolitan Centre Zone
	Residential - Mixed Housing Urban Zone		Business - Town Centre Zone
	Residential - Terrace Housing and Apartment Buildings Zone		Business - Local Centre Zone
	Open Space - Conservation Zone		Business - Neighbourhood Centre Zone
			Business - Mixed Use Zone
			Business - General Business Zone
			Business - Business Park Zone
			Business - Heavy Industry Zone
			Business - Light Industry Zone
			Future Urban Zone
			Rural - Rural Production Zone
			Rural - Mixed Rural Zone
			Rural - Rural Conservation Zone
			Rural - Countryside Living Zone
			Strategic Transport Corridor Zone
			Special Purpose Zone
			Coastal - General Coastal Marine Zone [rcp]
			Coastal - Mooring Zone [rcp]
			Coastal - Coastal Transition Zone

Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ will likely be rezoned to urban residential, centre and industrial zones. Other zones are unlikely to change (with the exception of Plan Change 78).</p> <p>The RTC corridor passes through:</p> <ul style="list-style-type: none"> • The edge of the Business – Metropolitan Centre Zone at Albany • Areas of Single House and Large Lot Residential Zone in Albany • Area of Countryside Living Zone between Lonely Track Road, Albany and Awanohi Road, Dairy Flat • Areas of Future Urban Zone in Dairy Flat, Silverdale West and Wainui East • Areas of Single House Zone, Open Space-Conservation Zone and Strategic Transport Corridor Zone (SH1) between Albany and Bawden Road, and at its terminus at Milldale <p>The RTC corridor passes through the following precincts:</p> <ul style="list-style-type: none"> • I544 Wainui Precinct • I500 Albany 3 Precinct
AUP:OP Overlays	<ul style="list-style-type: none"> • Significant Ecological Areas – Terrestrial [rp/dp] • Airport Approach Surface • Airport Noise • National Grid Corridor
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads intersecting Pine Valley Road and Dairy Flat Highway, and along the southern extent of boundary with SH1 • Coastal Inundation 1 per cent AEP Plus 1m Control along Ōkura River • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] along southern end • Subdivision Variation Control along southern extent
Existing designations	<ul style="list-style-type: none"> • 1421, Albany Bus Station, Designations, AT • 6751, State Highway 1: Albany, Designations, New Zealand Transport Agency • 6775, State Highway 1 - Northern Busway Extension, Designations, New Zealand Transport Agency • 6760, State Highway 1 - Redvale to Silverdale, Designations, New Zealand Transport Agency • 1479, Pine Valley Road North, Designations, AT • 1480, Pine Valley Road South and Dairy Flat Highway, Designations, AT • 6759, State Highway 1: Silverdale, Designations, New Zealand Transport Agency

Table 8-1: NoR 1 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <p>The RTC alignment will pass alongside (south to north):</p> <ul style="list-style-type: none"> • Existing urban residential areas in Albany which are alongside SH1 between Ōteha Valley Road and Lonely Track Road, including Residential Single House Zone and Residential Large Lot Zone • A large vegetated (SEA) area is located along the west side the corridor between Albany and Stillwater, including within the existing SH1 road reserve / designation boundary • Areas of Countryside Living Zone, where dwellings occupy large countryside lots, between Lonely Track Road and Awanohi Road • After Awanohi Road, the RTC alignment deviates west from SH1, traversing further into Countryside Living Zone, and into rural areas which are zoned FUZ in Dairy Flat • Close to the intersection of Postman Road and Blackbridge Road, the RTC alignment swings north, and passes through Silverdale West which is currently rural but zoned FUZ. • The proposed terminus at Milldale is alongside SH1 and a recently developed residential area, comprising Residential - Mixed Housing Suburban and Residential - Single House Zone. • An area of indigenous forest (SEA called Kathy's thicket) runs alongside the Wēiti stream running east-west, to the south of the Milldale terminus. The RTC alignment is proposed to hug the SH1 alignment at this point, to avoid traversing the SEA and QEII Covenant. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • For the existing urban areas, Countryside Living Zoned land (outside of the proposed designation), and live zoned land in Milldale and Albany, a low level of change is anticipated other than intensification envisaged by Plan Change 78. • FUZ within the Silverdale West Dairy Flat Industrial Area Structure Plan will likely accommodate light and heavy industrial uses. • FUZ outside of the Silverdale West Dairy Flat Industrial Area Structure Plan will likely accommodate urban residential and town/local centre development.
Property	<ul style="list-style-type: none"> • Number of properties directly affected by designation – 241 (including legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Kathy's Thicket (Open Space – Conservation Zone), Milldale (partly within designation boundary) • Redvale Marginal Strip (Open Space – Conservation Zone), Redvale (partly within designation boundary)

	<ul style="list-style-type: none"> • Fantails Childcare Centre, Dairy Flat Highway, Silverdale (partly within designation boundary) • Hooton Reserve (partly within designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • Existing open space areas are expected to remain largely unchanged. • Preschools and childcare may shift or move but the activity is likely to remain in the area. • It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
<p>Watercourses/freshwater environment</p>	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Wēiti River, located at northern end within Kathy's Thicket • John Creek tributaries, located at northern end • Rangitōpuni Stream tributaries, located west of North Shore Airport • Huruhuru (Dairy Stream) and tributaries, located north of interface with Bawden Road (NoR 12) • Ōkura River and tributaries, located along extent south of interface with SH1 • Waiokahukura (Lucas Creek) tributary, located along southern end • Flood prone areas and potential natural wetlands <p>Existing and likely future flood prone areas from AC Geomaps are evident where overland flow paths and streams traverse the corridor. The modelling assumes a change in land use, as the land urbanises. See Controls, above.</p> <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • Refer Section 7.5.
<p>Vegetation and ecology</p>	<p><i>Existing Environment - Habitat</i></p> <ul style="list-style-type: none"> • Existing terrestrial habitats are highly modified, with the extent of remaining indigenous vegetation limited to large areas of SEAs to the north and south (Kathy's Thicket, and Albany Heights / Lucas Heights north of Albany), and to small fragments of regenerating vegetation following historical clearance. • The following terrestrial vegetation types are present within the designation boundary area: <ul style="list-style-type: none"> • Kahikatea Forest along the Wēiti Stream (ID N1-S1) • Kauri, Podocarp, Broadleaved Forest adjoining a tributary of Ōkura River (ID N1-S10a) and a tributary of Waiokahukura (Lucas Creek) (ID N4-S23) • Tawa, Kohekohe, Rewarewa, Hīnau, Podocarp Forest adjoining a tributary of Ōkura River (ID N1-S11) • Kānuka Scrub / Forest adjoining the margin of Ōkura River (ID N1-S9) and a tributary of Waiokahukura (Lucas Creek) (ID N4-S23) • Mānuka, Kānuka scrub adjoining the margin of a tributary of Ōkura River (ID N1-S10a) • Planted Vegetation including recent and mature natives and exotics along the corridor • Treeland – Exotic-Dominated adjoining Pine Valley Road and a tributary of Ōkura River (ID N1-S7)

- Low value Exotic Scrub adjoining a tributary of Waiokahukura (Lucas Creek) (ID N4-S23)
- A number of SEAs are present alongside or within 2km of the corridor:
 - SEA_T_2191, Terrestrial – located along SH1 north of Lonely Track Road Bridge and follows a tributary of Ōkura River (ID N1-S11)
 - SEA_T_2192a, Terrestrial – Kathy's Thicket, located south of Ahutoetoe Road and follows Wēiti Stream
 - SEA_T_2218, Terrestrial – adjacent to Awanohi Road and follows Ōkura River
 - SEA_T_8297, Terrestrial – adjacent to Ōteha Valley Road and follows a tributary of Waiokahukura (Lucas Creek)
- The freshwater habitat within NoR 1 includes six streams: Wēiti Stream, John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek), which have 17 stream branches (four identified as intermittent and 13 identified as permanent). Freshwater stream habitat values range from low to high.
- A total of 35 artificial and natural wetlands are located along the NoR 1 alignment, with 29 of these likely to support TAR species. Wetland ecological values range from low to moderate.

Existing Environment – Species

- Longtailed bat presence has been detected at 161 Ahutoetoe Road adjacent to Wēiti Stream, and at 422 Bawden Road immediately west of SH1.
- Potential bat habitat supporting potential bat roosting and foraging was identified at John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream) and Ōkura River.
- Potential habitat including mature and exotic forest and wetlands in proximity to the NoR 1 area were identified as potentially supporting high ecological value Threatened and At-Risk (TAR) bird species including North Island Kākā, Spotless Crake, Australasian Bittern, Brown Teal, Dabchick, Grey Duck and Long-Tailed Cuckoo.
- Five native lizard species are likely to be present in the NoR 1 area.
- Suitable habitat exists within the NoR 1 area for freshwater fish/invertebrates with potential to support 16 species including within the Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek). Of these, 5 species have high ecological value/TAR status, including:
 - Giant bully (Wēiti Stream and John Creek, Ōkura River),
 - Giant Kōkopu (Ōkura River),
 - Īnanga (Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream) and Ōkura River),
 - Koaro (Ōkura River),
 - Longfin eel (Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek).

Existing Environment – District Plan protected trees

- There are two District Plan protected groups of trees in an open space zoned area within the designation, located at R 259 Ōteha Valley Road (Group 101)

	<p>and 161 Ahutoetoe Road (Group 105). (Appendix A of the Assessment of Arboricultural Effects in Volume 4.)</p> <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>Two archaeological sites, one CHI site and one unrecorded building have been recorded within the proposed designation, as set out below. There are also two archaeological sites and one unrecorded building with potential heritage values present within 200m of NoR 1:</p> <ul style="list-style-type: none"> • R10/737 – Kelly Homestead and Sawyer’s Arms Inn. There is potential for material or remnants of this to be encountered during construction and affected by the works. • R10/949 – Midden, Ōkura River, near East Coast Road. This site is outside of the proposed designation, though it is possible that other unrecorded midden deposits are present along the Ōkura River, where the RTC will cross. • R10/1450 - Wade Junction Hotel, Wilks Road, Dairy Flat. The hotel was destroyed by fire in 1885, and its exact location has not been determined. If any subsurface archaeological material was present it has likely been destroyed without record. This site is outside of the proposed designation and will not be affected by any future construction related to the project. • R10/1472 – Catholic Cemetery, Pine Valley. It is likely that unrecorded burials extend beyond the contemporary fence. The northern edge of the proposed designation is 60 m from the southern fence of the cemetery, which is unlikely to represent the true extent of burials. • CHI ID #22186 – Wēiti Portage. This portage was the overland connection between the Hauraki Gulf and Kaipara Harbour. There is unlikely to be any physical evidence remaining related to the portage itself; however, there is potential for unrecorded subsurface archaeological sites related to pre-European Māori settlement as well as early European land-use in this area to be present. • NA584/260 90 Old Pine Valley Road. Historical aerial photography shows a farmstead in this location. Historical title details suggest the site was established in 1935. The NoR passes directly through the subject site. • 1603 Dairy Flat Highway. The NoR passes through this property, which contains an early 20th century projecting bay villa with verandah and rear gabled extension. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future; although some of the archaeological features may be lost as the surrounding area urbanises.
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport is discussed at Section 7.2.</p>

Areas of cultural value	Wēiti River (portage route), Ōkura catchment and Waiokahukura (Lucas Creek); SEA areas; Refer Section 11 and Appendices E and F.
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8.2 NoR 2 – New Milldale Station and Associated Facilities

8.2.1 Project Overview

The Milldale RTC Station will form the terminus of the RTC network and will have a focus on local access through active modes (refer Figure 8-6). This station is to be located between the SH1 corridor and existing residential areas at Milldale, north of Kathy’s Thicket (SEA), and provides access to the RTC for the Milldale community. The consented Highgate Bridge connection (bridge over SH1) between John Fair Drive and Highgate Parkway is also in close proximity. Waka Kotahi is the requiring authority.



Figure 8-6 Milldale Station indicative design footprint

The proposed designation footprint shows the envelope proposed to construct, operate and maintain the project and its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls (refer Figure 8-6 above). An indicative concept of the permanent station is provided below.

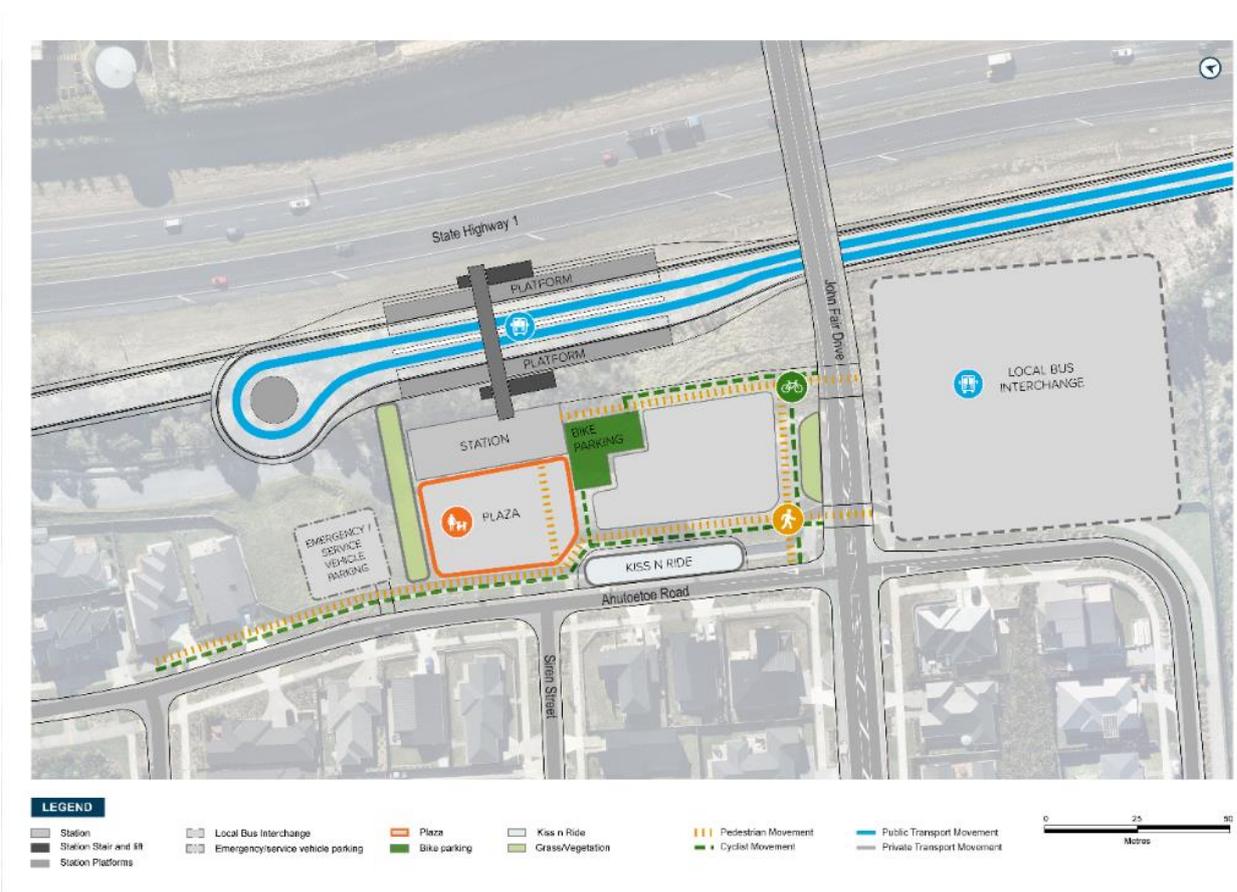


Figure 8-7: Milldale Station indicative concept

Key features of the Milldale Station include:

- Station building, with provision for customer service, public toilets, ticketing facilities, staff rooms and maintenance and equipment rooms (approximately 240m²)
- Transport interchange facilities including:
 - Bus layover area (~ approximately 5000m²)
 - Drop-off/pickup and accessible spaces
 - Cycle parking of approximately 500 cycle parking spaces
 - Local bus connection (busbays) - local bus drop-off (approximately 3X terminating and 2X through services)
 - Parking bays for on-demand vehicles and station operations/services
 - Parking spaces for emergency and maintenance vehicles
- Passenger platforms, including overbridge with universal access facilities
- Tie ins to existing network at John Fair Drive and Ahutoetoe Road, with walking and cycling access
- Retaining walls and batter slopes with associated cut and fill activities (earthworks)

- Vegetation removal within the footprint, as required
- Stormwater capture and treatment.

Other construction related activities required outside the permanent footprint including the re-grade of the site, construction traffic manoeuvring and construction laydown areas.

8.2.2 Indicative Cross Section

Figure 8-8 shows the indicative cross section, for further details see the drawings at Volume 3.

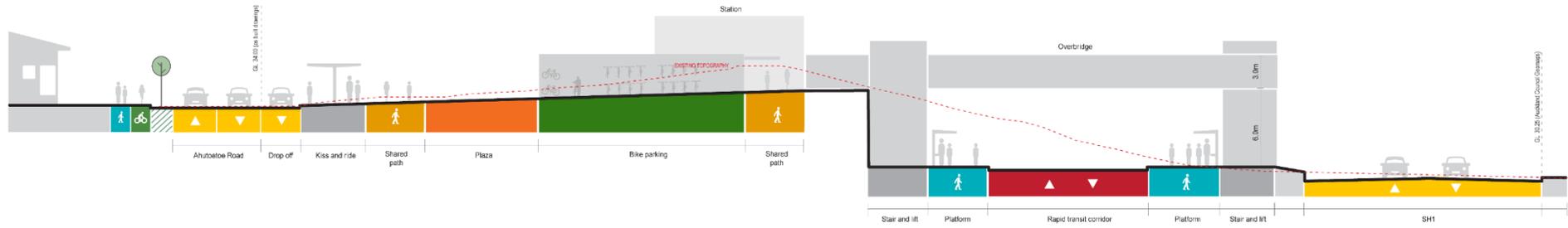


Figure 8-8: Indicative Cross Section of Milldale Station

8.2.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-2: NoR 2 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>The Milldale Station designation footprint is located in:</p> <ul style="list-style-type: none"> Residential – Mixed Housing Suburban Zone Residential – Single House Zone Open Space – Conservation Zone Strategic Transport Corridor Zone <p>The zoning is unlikely to change in future (with the exception of Plan Change 78 areas where existing residential zones are proposed to be intensified).</p> <p>The Milldale station designation footprint is located in the following precincts:</p> <ul style="list-style-type: none"> I544 Wainui Precinct
AUP:OP Overlays	<ul style="list-style-type: none"> No overlays identified
AUP:OP Controls	<ul style="list-style-type: none"> Macroinvertebrate Community Index
Existing designations	<ul style="list-style-type: none"> 6759, State Highway 1: Silverdale, Designations, New Zealand Transport Agency

Table 8-3: NoR 2 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> The proposed station is alongside a recently developed residential area and the SH1 corridor. An area of significant indigenous vegetation (Kathy’s Thicket) is immediately to the south. The zoning is Residential to the West, including Single House Zone and Mixed Housing Suburban, Open Space - Conservation Zone to the south, and Strategic Transport Corridor Zone to the east (SH1). <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> The existing environment as it relates to residential uses is likely to remain the same, other than intensification envisaged by Plan Change 78. However, the introduction of the NPS-UD supports more intensive residential development of 6+ storeys in station catchments, which may mean the newly developed residential area intensifies further in future as a result of the station. However this is considered unlikely in the short to medium term as the area is newly developed and a further plan change will not be triggered until the RTC is funded.

Features	Description
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 8 (including legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Kathy's Thicket Reserve (Open Space – Conservation Zone) (partly within designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Existing open space areas are expected to remain unchanged. It is likely additional community facilities will be provided within the FUZ to the south, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Wēiti River tributary located to the south, within Kathy's Thicket <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5, above.
Vegetation and ecology	<p><i>Existing Environment - Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Negligible value Planted Vegetation – Exotic and Native (amenity) One SEA is present alongside or within 2km of the corridor: <ul style="list-style-type: none"> SEA_T_2192a - Kathy's Thicket Open Space Reserve (QEII Covenant) No permanent streams have been identified within the NoR footprint. A tributary of the Wēiti is present within Kathy's Thicket, immediately to the south of the project area. No suitable bat habitat exists within the designation boundary, but a large area of SEA to the immediate south was identified as potential bat habitat. No artificial or natural wetlands are located within or alongside the project area. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> No suitable bat habitat was identified within the designation boundary, but a large area of SEA to the immediate south was identified as a habitat supporting potential bat roosting and foraging and assigned a very high ecological value. Potential habitat including native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 2 area were identified as potentially supporting Long-tailed Cuckoo. A total of five native lizard species are likely to occur within all NoR project areas, including the NoR 2 area. <p><i>Existing Environment – District Plan Protected trees</i></p>

Features	Description
	<ul style="list-style-type: none"> There are two District Plan protected groups of trees (Groups 106 and 107) in open space zoned areas affected by the designation, located at 97 Ahutoetoe Road. (Appendix A of the Assessment of Arboricultural Effects in Volume 4) <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
Historic heritage and archaeological values	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 2. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	Wēiti River (to south); Refer Section 11 and Appendices E and F.

8.3 NoR 3 – New Pine Valley East Station and Associated Facilities

8.3.1 Project Overview

The new Pine Valley East Station is located at Pine Valley Road on the border of the future industrial area and the Pine Valley FUZ area (refer Figure 8-9). An indicative concept of the main station is in Figure 8-10. Given the constrained designation footprint at Milldale, the Pine Valley East Station will operate in a ‘terminus station’ capacity.

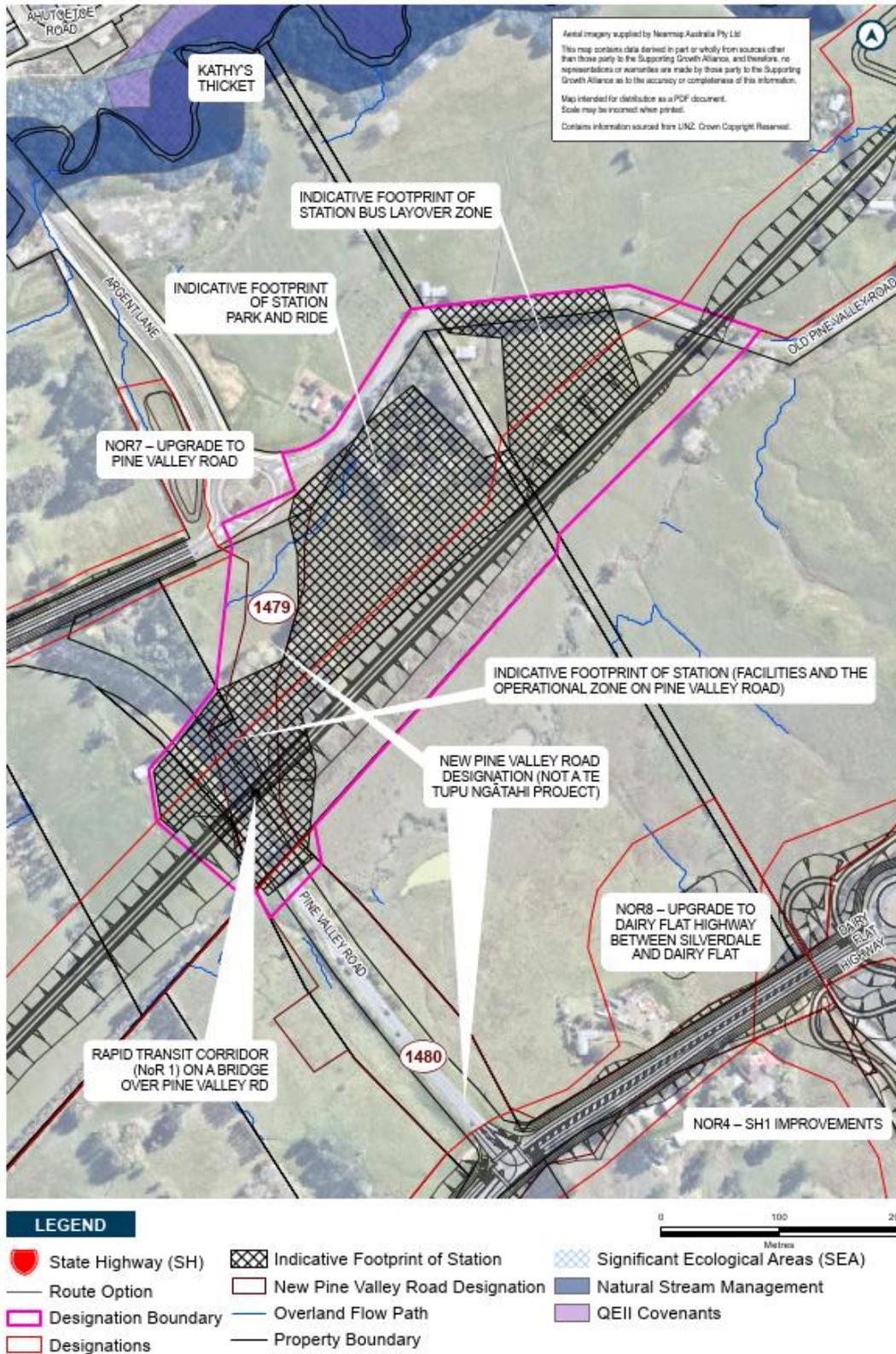


Figure 8-9 Pine Valley East Station indicative design footprint

The designation allows for a Park and Ride facility (approximately 500 cars) which will cater to those users to the west who are less well serviced by public transport options. The station will function as a

key frequent transit network (FTN) bus interchange with bus layover, thereby servicing a wider catchment than Milldale Station. Waka Kotahi is the requiring authority.



Figure 8-10: Indicative Pine Valley East Station concept (image excludes Park and Ride footprint)

It is anticipated that FUZ to the west of the New Pine Valley Road alignment (as designated by AT) will likely develop with high density, 6+ storey residential development (and potentially a local centre), whilst FUZ to the east and north will accommodate light industrial uses pursuant to the Silverdale West Industrial Structure Plan. The proposed station will provide access to the RTC for the Pine Valley and Silverdale West community.

The proposed designation footprint shows the envelope proposed to construct, operate and maintain the project and its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls.

Key features of the Pine Valley East Station project include:

- Station building, with provision for customer service, public toilets, ticketing facilities, staff rooms and maintenance and equipment rooms (approximately 240m²). The station building with associated station facilities is on structure over New Pine Valley Road with associated stairs and lift towers
- Transport interchange facilities including:

- Bus layover (approximately 5000m²) and turning space, with provision for electric charging for buses
 - Parking spaces for emergency and maintenance vehicles
 - Pick up and drop off bays for on demand travel (e.g. ride share, taxi)
 - Cycle parking of approximately 500 cycle parking spaces
 - Park and Ride provision of approximately 500 car parking spaces
 - Local bus connection (busbays) – local bus drop-off (approximately 1x terminating and 3x through services)
 - Parking bays for on-demand vehicles and station operations/services
-
- Passenger platforms, including overbridge with universal access facilities
 - Tie ins to the new Pine Valley Road alignment, with active mode access (via overbridge)
 - Batter slopes with associated cut and fill activities (earthworks)
 - Vegetation removal within the footprint, as required
 - Stormwater capture and treatment
 - Other construction related activities required outside the permanent footprint including the re-grade of the site, construction traffic manoeuvring and construction laydown areas.

8.3.2 Indicative Cross Section

Figure 8-11 shows the indicative cross section, for further details see the drawings at Volume 3.

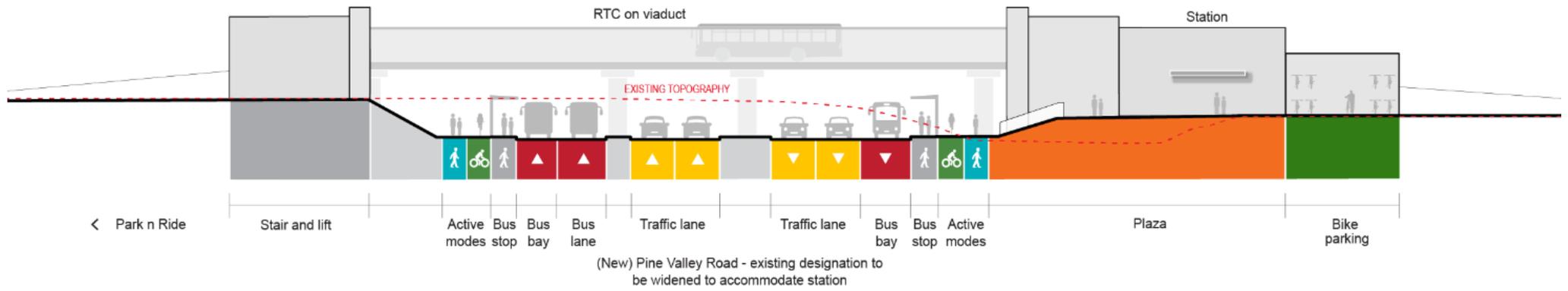
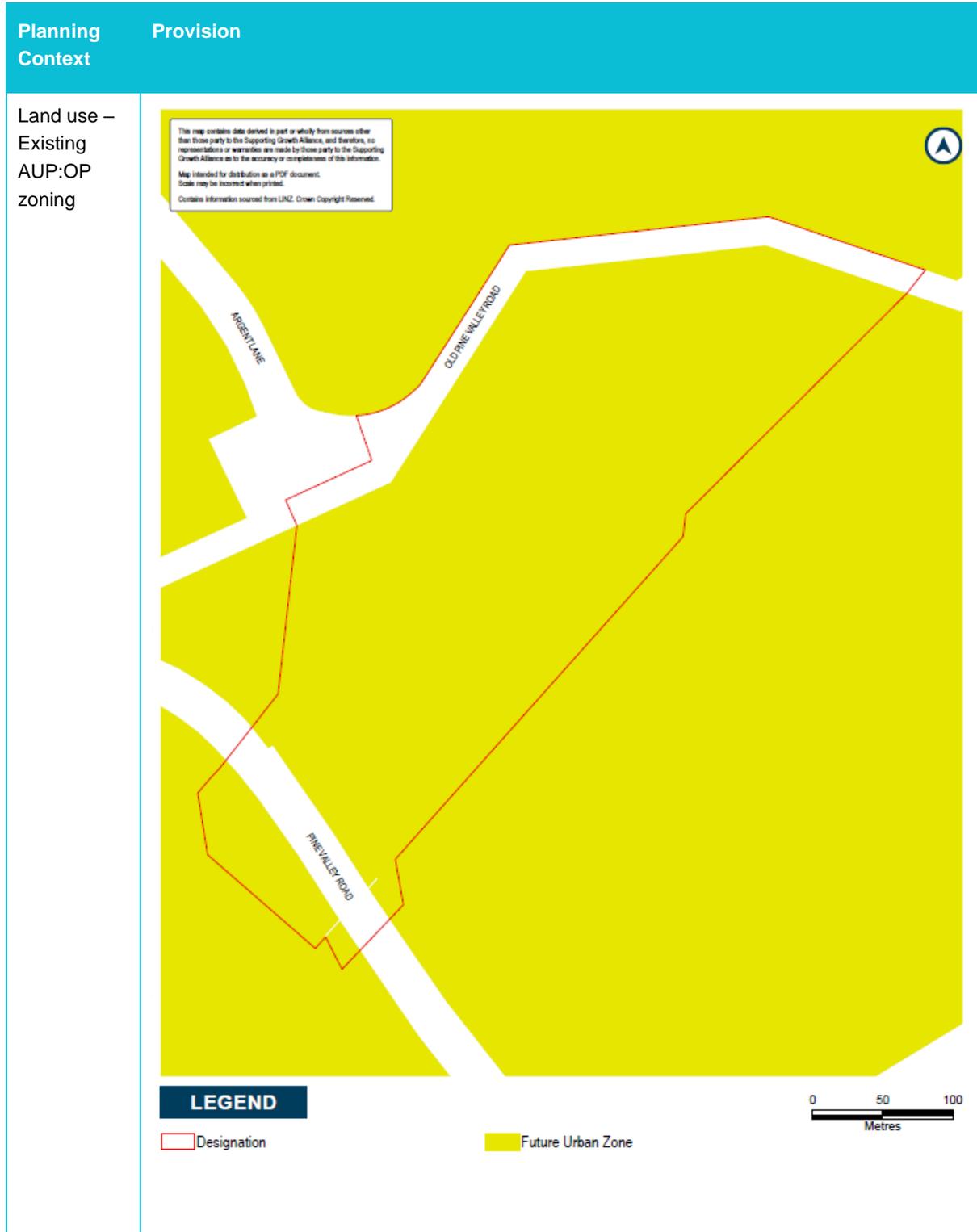


Figure 8-11: Indicative Cross Section of Pine Valley East Station

8.3.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-4: NoR 3 Planning Context



Planning Context	Provision
<p>Current and Likely Future Zoning</p>	<p>The Pine Valley station designation footprint is located in the FUZ, which will likely be rezoned to residential/local centre to the west of the station, and industrial to the east of the station.</p> <p>There are no precincts impacted by this designation footprint.</p>
<p>AUP:OP Overlays</p>	<ul style="list-style-type: none"> No overlays identified
<p>AUP:OP Controls</p>	<ul style="list-style-type: none"> Arterial Roads along Pine Valley Road Macroinvertebrate Community Index
<p>Existing designations</p>	<ul style="list-style-type: none"> 1479, Pine Valley Road North, Designations, AT 1480, Pine Valley Road South and Dairy Flat Highway, Designations, AT

Table 8-5: NoR 3 Receiving Environment Summary

Features	Description
<p>Land use and Urban Form</p>	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Rural land uses, with FUZ zoning. The station will be located between Pine Valley Road and Dairy Flat Highway, in a valley. Predominantly agricultural land, with one lifestyle property located at the northern end.

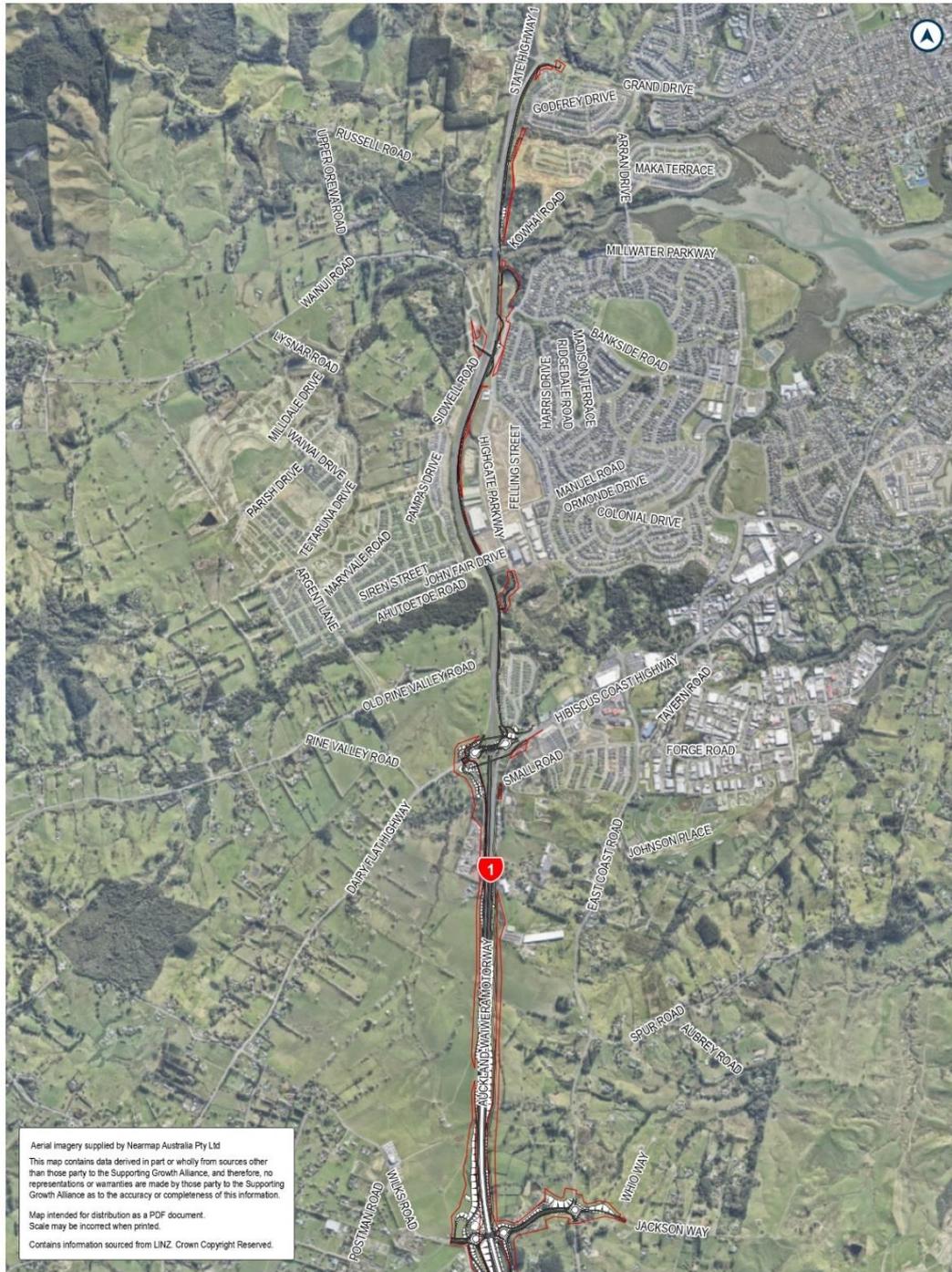
Features	Description
	<ul style="list-style-type: none"> A tributary of the Wēiti – John Creek – runs approximately east-west along the valley, slightly to the south of the proposed station and RTC alignment. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> To the west of the New Pine Valley Road alignment, residential /local centre zoning is anticipated. As per the NPS-UD, the presence of the station will likely enable residential development of 6+ storeys within the station walkable catchment. To the east and north of the New Pine Valley Road alignment, industrial zoning is anticipated as per the Silverdale West Industrial Structure Plan.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 15 (including legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> None identified. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> John Creek (Wēiti River tributary) located to the north Artificial wetlands- (see below) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer to Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Planted Vegetation – Native (recent) along Pine Valley Road Planted Vegetation – Exotic and Native (amenity) surrounding a wetland (ID N3-O1) Treeland – Exotic-Dominated along Pine Valley Road NoR 3 has one stream - Wēiti Stream tributary, which has one intermittent stream branch. Freshwater stream habitat values have been assessed as low. Two artificial wetlands are located within the NoR 3 footprint, with both likely to support TAR species. Both wetlands were assessed as having a low ecological value. There is a large floodplain associated with a tributary to the Wēiti Stream south of the boundary (south of the RTC).

Features	Description
	<p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> • Bat presence was not detected within the project area, however John Creek which is located within 100m to the south of the NoR was identified as a habitat with potential bat roosting and foraging habitat. • Potential bird habitat (such as wetlands) in proximity to the NoR 3 area was identified as potentially supporting high ecological value TAR species including Spotless Crake, Australasian Bittern, Brown Teal, Dabchick, Grey Duck and Long-tailed Cuckoo. • Five native lizard species are likely to be present within the NoR 3 area. <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>One CHI site has been recorded within the proposed designation, as set out below. There is also one unrecorded building with potential heritage values present within 200m of NoR 3:</p> <ul style="list-style-type: none"> • CHI ID #22186 – Wēiti Portage. Summarised in NoR 1. There is unlikely to be any physical evidence remaining related to the portage itself. • 90 Old Pine Valley Road. Summarised in NoR 1. This building is outside of the proposed designation. <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport is discussed at Section 7.2.</p>
<p>Areas of cultural value</p>	<p>John Creek (Wēiti River tributary); Refer Section 11 and Appendices E and F.</p>

8.4 NoR 4 – SH1 Improvements

8.4.1 Project Overview

The SH1 Improvements combine several projects (set out at Section 3.2, and below) into a single strategic transport package for the North Projects, under NoR 4 (refer Figure 8-12 and Figure 8-13). The projects will be facilitated via alterations to existing SH1 designations (6761, 6760, 6759, 6751), including alterations to the existing designation boundaries to allow for the proposed works, alteration of the existing designation purposes to allow for active modes (a cycleway and/or shared path), and the addition of new conditions (refer Volume 1 for further details). The projects will improve travel choice and access to economic and social opportunities, improve safety, and support sustainable growth in the Future Urban Zone. Waka Kotahi is the requiring authority.



LEGEND

- State Highway (SH)
- Route Option
- Designation

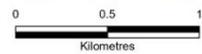


Figure 8-12: State Highway 1 Improvements indicative designation footprint – northern extent – Wilks Road to Grand Drive



Figure 8-13: State Highway 1 Improvements indicative designation footprint – southern extent – just south of Ōteha Valley Road to just south of Wilks Road

The existing corridor is not fit for purpose given the likely future growth, with predicted traffic volumes likely to exceed capacity, especially at the Silverdale Interchange. Increased travel times are likely to cause further congestion and delays, and the lack of walking and cycling connections will increase reliance on private vehicles. Given the likely future growth expected within the North growth areas, improvements to SH1 are necessary for maintaining the productivity and journey time reliability of the corridor between Albany and Silverdale. Enabling efficient and reliable operation of SH1 will reduce the potential for longer distance regional and sub-regional traffic to utilise local roads, supporting growth and improving land use integration in the adjacent FUZ and existing urban areas. Interchange improvements are necessary to provide safe and attractive east-west walking and cycling connections between existing and future communities, while supporting convenient access and reducing pressure on existing networks.

The SH1 improvements include the following:

- **Upgrades to SH1 (between Albany and Silverdale):** SH1 widening to enable three lanes to be provided continuously northbound and southbound between just south of Lonely Track Road and the Silverdale Interchange. This widening will provide an opportunity for interim bus lanes and long-term managed lanes (such as freight or high occupancy vehicle (HOV) lanes). This project shares a corridor with the RTC at the southern end, and with the New Walking and Cycling Path on SH1 along the whole length.
- **Replacement of existing bridges:** The upgrade includes a new bridge across SH1 at Lonely Track Road to allow for the widening (and for the RTC and New Walking and Cycling Path along SH1 to pass underneath), replacing the existing bridge, and part of Lonely Track Road is also realigned to connect into the replacement bridge. At Bawden Road, a replacement bridge is needed to allow for the additional lanes on SH1, and for the New Walking and Cycling Path along SH1 to cross from east to west and follow the RTC, and also pass underneath the bridge to continue North alongside the western side of SH1.
- **Upgrade to Ō Mahurangi Penlink (Redvale) Interchange:** This will add north facing ramps (south facing ramps are provided as part of the Ō Mahurangi Penlink project) and separated active mode bridge enabling access to the wider strategic active mode network on the western side of SH1
- **New Wilks Road interchange:** A new interchange at Wilks Road including new south facing ramps, as well as active mode connections separated from vehicle movements through the Interchange (both north-south and east west). This interchange is designed to service the future industrial area at Silverdale West, and connect freight to SH1. The upgrade includes an upgraded connection between SH1 and East Coast Road i.e. an upgrade to the existing Wilks Road alignment and intersection with East Coast Road and Jackson Way. The existing Wilks Road bridge will be replaced and the existing Wilks Road alignment to the east retained for access to properties in the Countryside Living zone to the north.
- **Upgrade to Silverdale Interchange:** An upgrade to this existing interchange is proposed to improve east-west connectivity, separate active modes add capacity to support likely future urban growth, in particular the future industrial area in Silverdale West. Two eastbound and westbound vehicle lanes will be provided across SH1, as well as active mode connections separated from vehicle movements through the Interchange (both north-south and east-west).
- **New walking and cycling path along SH1 (Albany to Ōrewa – approximately 16km):** This project is a strategic facility designed to contribute towards a transformational mode shift towards active mode journeys between where people live, work and play. It will also connect to the RTC

active mode facility at Bawden Road and a much broader local active mode network, including along arterial road upgrades proposed for protection. The project includes grade-separated SH1 crossings. The new walking and cycling path is located along one side of SH1 from Albany to Grand Drive, starting on the east of SH1 at Ōteha Valley Road (connecting to the existing active mode facility built as part of NCI). It then crosses to the west of SH1 around Bawden Road (on a new bridge) and then back to east around Silverdale interchange before continuing up to Grand Drive. At Grand Drive it will connect westwards to a proposed new east west path across SH1 (proposed by the developer) that connects to the Ara Hills development. To the east it will connect to the proposed Hibiscus Coast to Grand Drive Active Mode Connection, which forms part of the proposed wider North Network in the North DBC.

- **Silverdale to Highgate Active mode connection:** This is a new active mode connection between the New Walking and Cycling Path along SH1 at Silverdale and Highgate Parkway. Active modes will be able to then cross to Milldale Station on the consented Highgate bridge over SH1.
- **Grade separated active mode crossing of SH1 (new bridge) at the existing Wainui interchange.** Note: other crossings are proposed at Bawden Road and the motorway interchanges as described above.

The route protection for this package is proposed via alterations to existing SH1 designations (designations 6761, 6760, 6759, 6751), which have already been given effect to.

As noted, the RTC (NoR 1) will share a corridor with the SH1 improvements project (NoR 4) within the motorway corridor between Albany and just south of the current Bawden Road overbridge. The RTC will run on the west side of SH1, and the strategic cycleway on the east of SH1, through this segment. In addition to widening / 3-laning of the motorway through this segment, the motorway lanes will shift to the east, and the RTC will be constructed within the existing northbound shoulder and northbound lanes. Therefore, the general approach is that the effects of that part of the RTC corridor (NoR 1) will be assessed in tandem with the SH1 improvements (NoR 4).

The proposed designation footprint shows the envelope proposed to construct, operate and maintain the project and its ancillary components, including construction areas, stormwater infrastructure, batter slopes, retaining walls, and road realignments and cul de sacs resulting from the Project.

8.4.2 Indicative Cross Sections

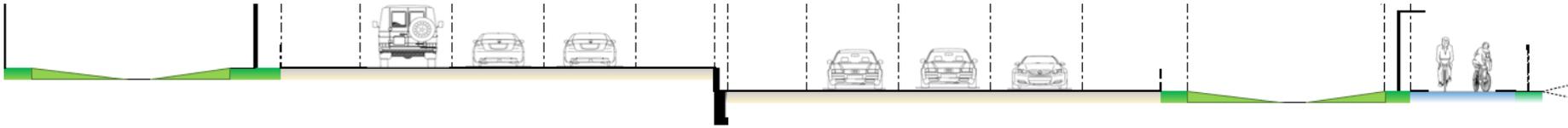


Figure 8-14: Indicative SH1 cross section – North of Lonely Track Road

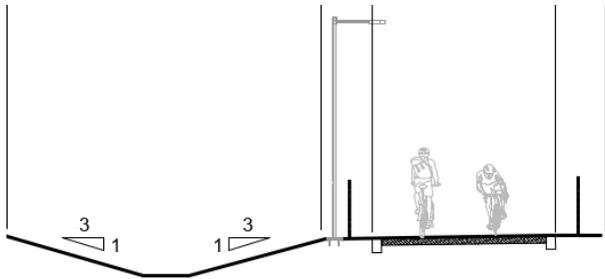
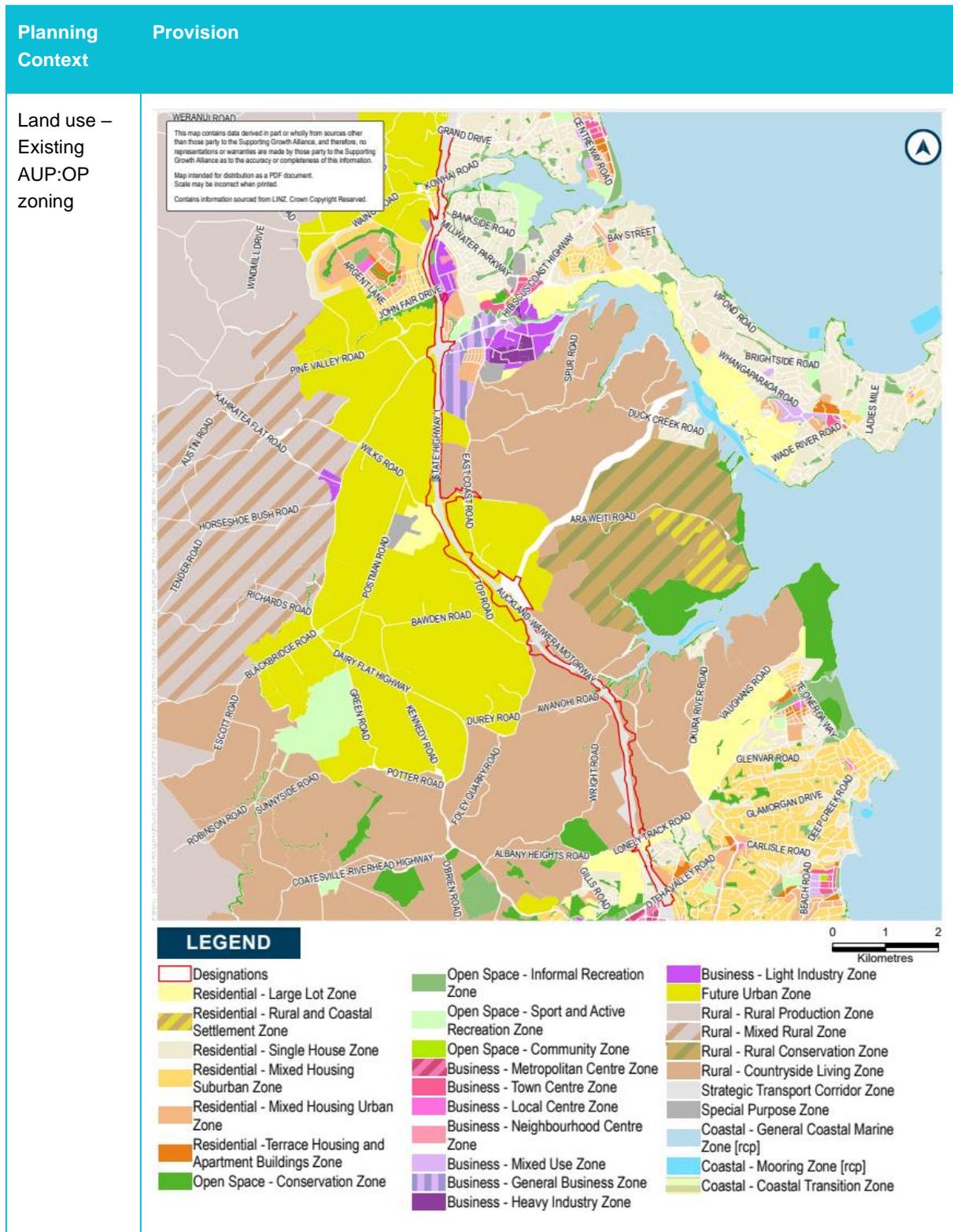


Figure 8-15: Indicative SH1 cross section – North of Silverdale Interchange (active mode facilities on the eastern side of existing SH1 corridor)

8.4.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the projects will be constructed, operated and maintained.

Table 8-6: NoR 4 Planning Context



Planning Context	Provision
<p>Current and Likely Future Zoning</p>	<p>FUZ along SH1 will likely be rezoned to residential and industrial zones. Other zones are unlikely to change (with the exception of Plan Change 78).</p> <p>The corridor passes alongside the following zones:</p> <ul style="list-style-type: none"> • Business – Light Industry Zone • Future Urban Zone • Rural - Countryside Living Zone • Residential - Single House Zone • Residential - Mixed Housing Urban Zone • Residential - Mixed Housing Suburban Zone • Residential - Large Lot Residential Zone • General Business Zone • Strategic Transport Corridor Zone • Conservation Zone. • Coastal – General Coastal Marine Zone <p>The SH1 corridor passes alongside the following precincts:</p> <ul style="list-style-type: none"> • I530 Ōrewa Precinct 2 • I544 Wainui Precinct • I500 Albany 3 Precinct • I536 Silverdale 2 Precinct • I547 Silverdale 3 Precinct • I506 Dairy Flat Precinct
<p>AUP:OP Overlays</p>	<ul style="list-style-type: none"> • Significant Ecological Areas – Terrestrial [rp/dp], Marine [rp] • Airport Approach Surface • Airport Noise • National Grid Corridor
<p>AUP:OP Controls</p>	<ul style="list-style-type: none"> • Arterial Roads • Vehicle Access Restriction Control – Motorway Interchange Control along Ōteha Valley Road • Coastal Inundation 1 per cent AEP Plus 1m Control from Ōrewa River in the northern end and Ōkura River in the southern end • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] • Subdivision Variation Control
<p>Existing designations</p>	<ul style="list-style-type: none"> • 6776, State Highway 1 and State Highway 18 Shared Use Path, Designations, New Zealand Transport Agency • 6751, State Highway 1: Albany, Designations, New Zealand Transport Agency • 6760, State Highway 1 - Redvale to Silverdale, Designations, New Zealand Transport Agency

Planning Context	Provision
	<ul style="list-style-type: none"> • 6777, Road - Wēiti Crossing, Designations, New Zealand Transport Agency • 6759, State Highway 1: Silverdale, Designations, New Zealand Transport Agency • 6763, State Highway 1 - Puhoi to Kaipara District Boundary and Silverdale Interchange improvements, Designations, New Zealand Transport Agency • 1480, Pine Valley Road South and Dairy Flat Highway, Designations, AT • 6761, State Highway 1 - Silverdale to Puhoi, Designations, New Zealand Transport Agency • 8914, Millwater Substation, Designations, Vector Ltd

Table 8-7: NoR 4 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <p>The SH1 Improvements pass alongside (south to north):</p> <ul style="list-style-type: none"> • Existing urban residential areas in Albany which are alongside SH1 between Ōteha Valley Road and Lonely Track Road, including Residential Single House Zone and Residential Large Lot Zone • A large SEA area is located along the west side the corridor between Albany and Stillwater, including within the existing SH1 road reserve / designation boundary • Areas of Countryside Living Zone, where dwellings occupy large countryside lots, between Lonely Track Road and Bawden Road • Between Bawden Road and Wilks Road, FUZ is the predominant zoning with the exception of some Residential – Large Lot Zone and Special Purpose Zone immediately south west of Wilks Road related to the North Shore Airport precinct. • Between Wilks Road and Silverdale Interchange, FUZ is present on the west of the SH1 alignment, while on the east side is Countryside Living Zone, and Business – General Business Zone closer to Silverdale. • North of Silverdale, FUZ is the predominant zone on the west side of SH1 with the exception of some Residential – Single House Zone and Open Space - Conservation Zone at Milldale. • North of Silverdale, on the east side of SH1, is a mix of Residential Zones (Single House Zone and Terrace Housing and Apartment Buildings Zone), and Business – Light Industry Zone. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • For the existing urban areas / live zoned land, a low level of change is anticipated, other than intensification envisaged by Plan Change 78. • FUZ within the Silverdale West Dairy Flat Industrial Area Structure Plan area will likely be rezoned to Business – Light Industry Zone and Business – Heavy Industry Zone, and will accommodate industrial uses.

Features	Description
	<ul style="list-style-type: none"> FUZ outside of the Silverdale West Dairy Flat Industrial Area Structure Plan will likely accommodate urban residential development.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 230 (including legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Goodson Scenic Reserve / Shaw's Reserve (adjoins designation) Meraki Montessori Primary (adjoins designation) Fairview Lifestyle Village (partly within designation boundary) Brainwaves Preschool (nearby) Hibiscus Coast Station (nearby) Silverdale Tennis Club (nearby) Baker Street Reserve (partly within designation boundary) Travis View Reserve (nearby) Millwater Parkway Bush Reserve (partly within designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Existing open space areas are expected to remain unchanged. Schools in the area are likely to remain, and could grow to support increased population It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Ōkura Creek and tributaries located along extent south of Bawden Road Wēiti River, located north of Silverdale Interchange within Kathy's Thicket Ōrewa River located along the northern end John Creek and tributaries located along extent between Silverdale Interchange and intersection with Wilks Road Huruhuru (Dairy Stream) tributaries located along extent between Wilks Road and interface with Bawden Road (NoR 12) Waiokahukura (Lucas Creek) tributaries located along southern end Flood prone areas and potential wetlands. See Controls, above. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Coastal environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Ōrewa River and intertidal area Ōkura tributaries (DoC Marginal Strip) <p><i>Likely Future Environment</i></p>

Features	Description
	<ul style="list-style-type: none"> The coastal environments above are not expected to change, with future development expected to take place outside of coastal environments.
Vegetation and ecology	<p><i>Existing Environment -Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Kauri, Podocarp, Broadleaved Forest adjoining John Creek (ID N4-S4) and tributary of Ōkura River (ID N4-S22) Tawa, Kohekohe, Rewarewa, Hīnau Podocarp Forest adjoining a tributary of Ōkura River (ID N1-S11) Kahikatea Forest adjoining Wēiti Stream (ID N1-S1) Kānuka Scrub / Forest adjoining Ōkura River (ID N1-S9), a tributary of Ōkura River (ID N4-S22) and a tributary of Waiokahukura (Lucas Creek) (ID N4-S23) Mānuka, Kānuka scrub adjoining tributaries of Ōkura River (ID N1-S10a, ID N4-S22) Exotic Forest adjoining the northern boundary (at intersection with Grand Drive), the proposed Ō Mahurangi Penlink (Redvale) intersection and Ōkura River (ID N1-S9) Planted Vegetation – Native (recent) adjoining intersection with Grand Drive, John Creek (N4-S5), tributary of Waiokahukura (Lucas Creek) (ID N4-S23) and wetlands (ID N4-O6, ID N4-O7, ID N4-O8) Planted Vegetation – Native (mature) adjoining a wetland (ID N4-O29) and the southern extent of SH1 Treeland – Native-dominated adjoining SH1 south of Lonely Track Road Bridge Treeland – Exotic-dominated adjoining a wetland (ID N4-W18), John Creek (ID N4-S6a), tributaries of Huruhuru (Dairy Stream) (ID N4-S13, ID N4-S14, ID N4-S15b, ID N4-S16a, ID N4-S18, ID N4-S19) and a tributary of Ōkura River (ID N1-S7) Exotic Grassland adjoining a tributary of Huruhuru (Dairy Stream) (ID N4-S15b) and a tributary of Waiokahukura (Lucas Creek) (ID N4-23) Exotic Scrub adjoining SH1 near a wetland (N4-W1B), south of Awanohi Road, a tributary of Huruhuru (Dairy Stream) (ID N4-S18), a tributary of Ōkura River (ID N4-S22) and a tributary of Waiokahukura (Lucas Creek) (ID N4-S23) Planted Vegetation – Exotic and Native (amenity) along the corridor Treeland – Mixed Native/Exotic surrounding a wetland (N4-O38) A number of SEAs are present alongside or within 2km of the corridor: <ul style="list-style-type: none"> SEA_T_2169, Terrestrial – located along Millwater Parkway and follows Ōrewa River SEA_T_2180, Terrestrial – located north of Johns Creek Crescent and follows John Creek SEA_T_2191, Terrestrial – located along SH1 north of Lonely Track Road Bridge and follows a tributary of Ōkura River (ID N1-S11) SEA_T_2192a, Terrestrial – located south of Ahutoetoe Road and follows Wēiti Stream

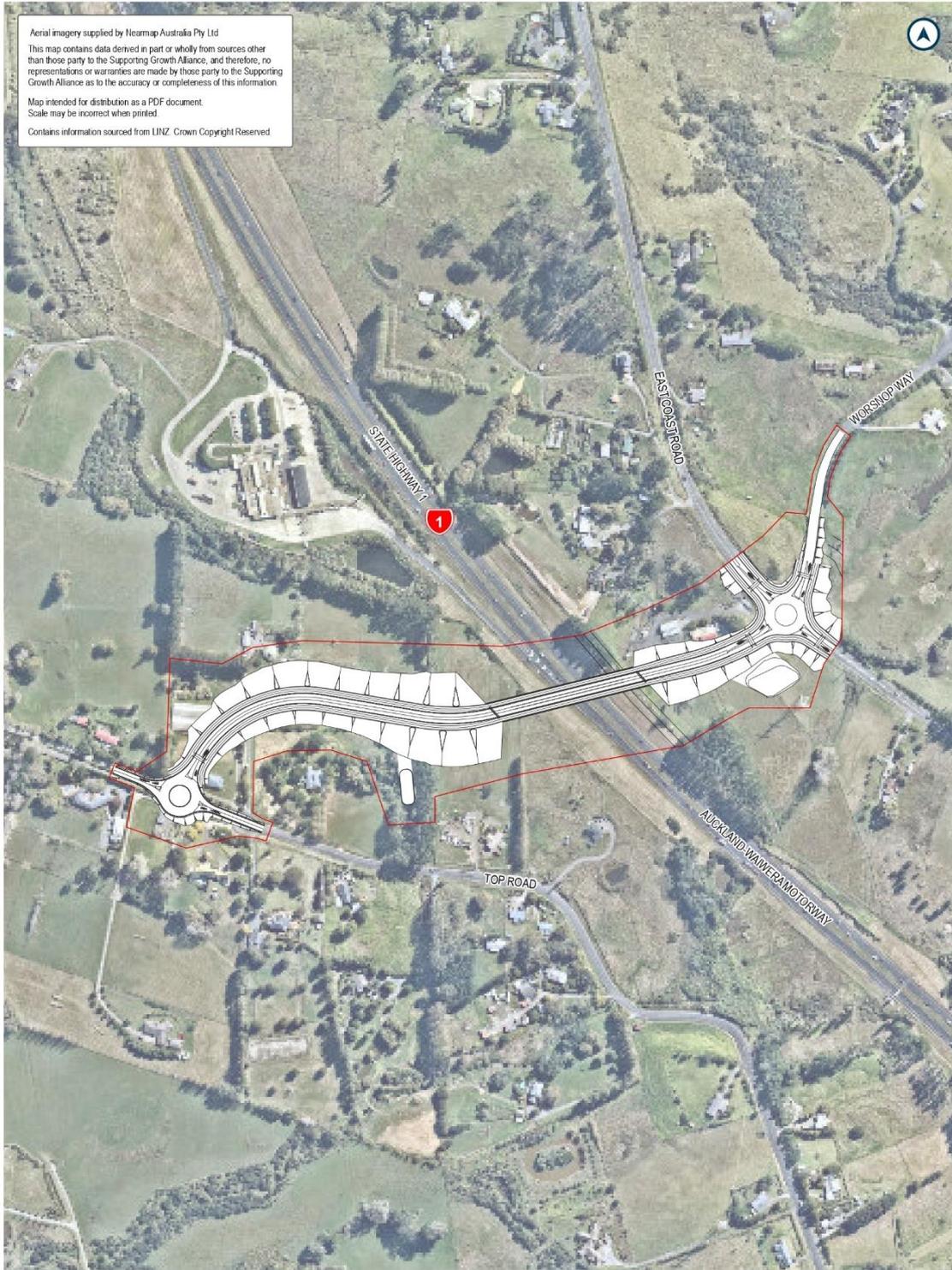
Features	Description
	<ul style="list-style-type: none"> • SEA_T_2218, Terrestrial – adjacent to Awanohi Road and follows Ōkura River • SEA_T_3590, Terrestrial – located along Kowhai Road and follows Ōrewa River • SEA_T_8297, Terrestrial – adjacent to Ōteha Valley Road and follows a tributary of Waiokahukura (Lucas Creek) <p>The freshwater habitat within NoR 4 includes six streams and their tributaries - Ōrewa River, Wēiti Stream, John Creek, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek), including 35 stream branches (four identified as intermittent and 31 identified as permanent). Freshwater stream habitat values ranged from low to high, with four identified as high value (N1-S1, N4-S2, N4-S22, N4-S24).</p> <ul style="list-style-type: none"> • A total of 53 artificial and natural wetlands are located along the NoR 4 alignment, with 45 of these likely to support TAR species. N4-W1b was the only wetland identified as high ecological value, with the remaining ranging from low to moderate ecological value. <p><i>Species</i></p> <ul style="list-style-type: none"> • Bat presence was detected at 161 Ahutoetoe Road adjacent to Wēiti Stream, 228 Wilks Road at the intersection between Wilks Road and SH1, 1722 East Coast Road immediately north of Ō Mahurangi (Penlink) interchange and at 422 Bawden Road immediately west of SH1. • Potential bat habitat supporting potential bat roosting and foraging was identified at Wēiti Stream, John Creek, Rangitōpuni Stream, Ōkura River, Waiokahukura (Lucas Creek) and large areas of SEA forest. • Potential bird habitat including wetlands, stormwater ponds, mature and exotic forest in proximity to the NoR 4 area were identified as potentially supporting TAR species including Banded Rail, Black Shag, Little Black Shag, Little Pied Shag, North Island Kākā, Pied Shag, Spotless Crane, Australasian Bittern, Brown Teal, Dabchick, Grey Duck, Long-tailed Cuckoo, and White Heron. • Five native lizard species are likely to be present within the NoR 4 area. • The NoR 4 area has the potential to support 16 fish species within the Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek). • Of these, 5 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> • Giant bully (Wēiti Stream and John Creek, Ōkura River) • Giant Kōkopu (Ōkura River) • Īnanga (Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream) and Ōkura River) • Koara (Ōkura River) • Longfin eel (Wēiti Stream and John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek)) <p><i>Existing Environment – District plan protected trees</i></p> <ul style="list-style-type: none"> • There are three District Plan protected groups of trees in an open space zoned area within the designation, located at R 21 Fairview Avenue (Group 102) and near Redvale Rise running parallel to Awanohi Road (Groups 103

Features	Description
	<p>and 104). (Appendix A of the Assessment of Arboricultural Effects in Volume 4)</p> <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>Two CHI sites have been recorded within the proposed designation, as set out below. There is also one archaeological site and two CHI items present within 200m of NoR 4:</p> <ul style="list-style-type: none"> • R10/949 – Midden. Summarised in NoR 1. This site is outside of the proposed designation. • CHI ID #13674 – Pillbox. There is a historically recorded Pillbox at 1268 East Coast Road. This WWII concrete structure was one of numerous similar features throughout the Auckland Area. The pillbox location lies inside the NoR boundary. It is not known whether any part of the recorded structure survives sub-surface. • CHI ID #16066 – Gum store. This is the location of a historic gum store of unknown age, located near SH1 where the ground has been highly modified. • CHI ID #22214 – Sainsbury Villa. This is an Edwardian villa located at 1744 Dairy Flat Highway. The villa lies within 200m of the proposed designation but is not within the designation boundary itself. • CHI ID #22215 – Small Homestead. This is a 20th century residential dwelling located at 1732 Dairy Flat Highway. <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future; although some of the archaeological features may be lost from private developers as the surrounding area urbanises.</p>
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport context is discussed at Section 7.2.</p>
<p>Areas of cultural value</p>	<ul style="list-style-type: none"> • Ōkura Creek, Wēiti River, Waiokahukura (Lucus Creek), Huruheru (Dairy Stream) and Ōrewa River • SEAs – indigenous vegetation on both sides of the corridor. (see Vegetation and Ecology table row, above) <p>Refer Section 11 and Appendices E and F.</p>

8.5 NoR 5 – New SH1 crossing at Dairy Stream

8.5.1 Project Overview

This project comprises an AT designation for a new two-lane urban arterial overbridge with separated active modes on both sides of the carriageway. The bridge will cross over SH1 and connect Top Road on the west to East Coast Road on the east at its intersection with Worsnop Way, approximately 1.2km south of Wilks Road. The new connection will assist in providing an all-mode network with improved east-west connectivity between social-economic opportunities and developing FUZ areas either side of SH1. The project also provides an opportunity to cross SH1 without needing to travel through the adjacent motorway interchanges (Ō Mahurangi Penlink (Redvale) Interchange) and Bawden Road), therefore reducing additional pressure on the existing network.



LEGEND

- State Highway (SH)
- Route Option
- Designation

0 0.1 0.2
Kilometres

Figure 8-16: New SH1 crossing at Dairy Stream indicative designation footprint

Key features of the proposed motorway crossing include:

- 24 m wide two-lane urban arterial connection from Top Road to East Coast Road, with the section where the road crosses SH1 being an 18 m wide motorway overbridge.
- Active mode facilities on both sides of the carriageway.
- The overbridge would cross six lanes of motorway, a two-lane link road and the new active mode facilities (cycleway and / or shared path) on SH1 (refer to NoR 4 above).
- Allowance for stormwater treatment/attenuation
- 50kph speed environment, controlled access, no parking.

The proposed designation footprint in Figure 8.16 shows the envelope required to construct, operate and maintain the New SH1 Crossing and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with Top Road and NoR 13 – Upgrade to East Coast Road.

8.5.2 Indicative Cross Section

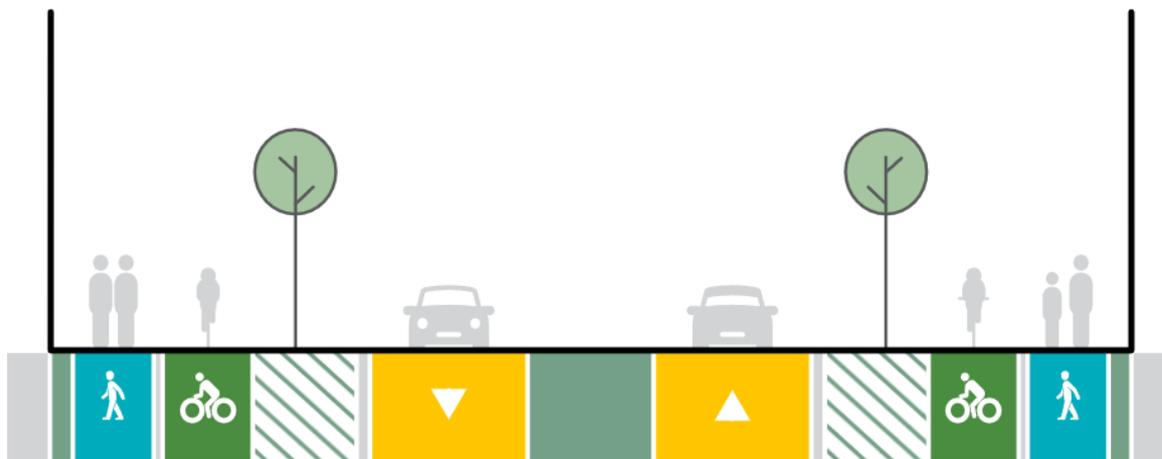


Figure 8-17: Two lane arterial – 24m cross section

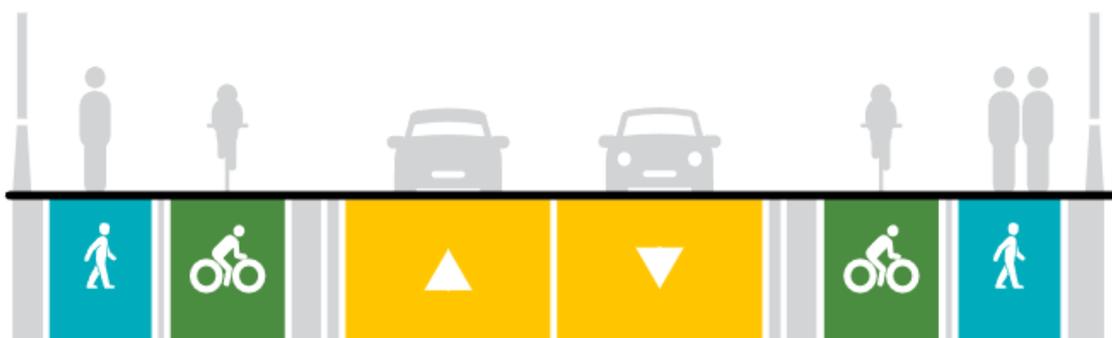
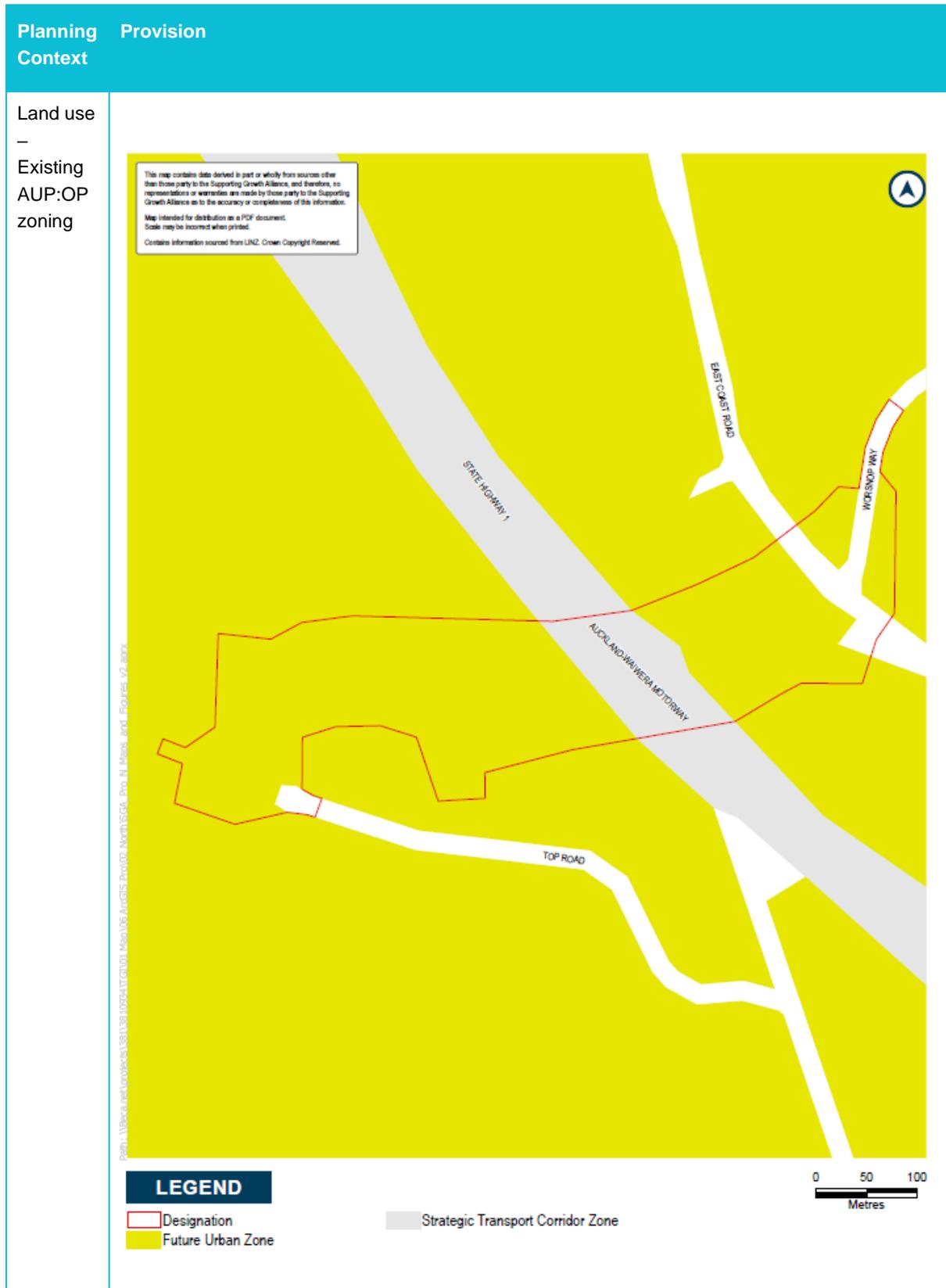


Figure 8-18: Two lane arterial – bridge – 18m cross section

8.5.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-8: NoR 5 Planning Context



Planning Context	Provision
<p>Current and Likely Future Zoning</p>	<ul style="list-style-type: none"> • FUZ will likely be rezoned to urban residential zones in future. • The Strategic Transport Corridor Zone is unlikely to change, though widening of the motorway corridor (NoR 4) may require widening of the Strategic Transport Corridor Zone into what is currently FUZ areas. • There are no precincts impacted by this designation footprint. • The Silverdale West Dairy Flat Industrial Area Structure Plan indicatively shows a collector road which would connect from Dairy Flat Highway and Postman Road to the New SH1 crossing at Dairy Stream. See image below, with the indicative east-west connection dashed black, and the location of NoR 5 circled in black. 
<p>AUP:OP Overlays</p>	<ul style="list-style-type: none"> • Airport Approach Surface • National Grid Corridor
<p>AUP:OP Controls</p>	<ul style="list-style-type: none"> • Arterial Roads • Macroinvertebrate Community Index
<p>Existing designations</p>	<ul style="list-style-type: none"> • 6760, State Highway 1 - Redvale to Silverdale, Designations, New Zealand Transport Agency • 6777, Ō Mahurangi (Penlink)

Table 8-9: NoR 5 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> FUZ land is currently accommodating rural uses, including lifestyle blocks. The Strategic Transport Corridor Zone allows for the Northern Motorway corridor. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> FUZ within the Silverdale West Dairy Flat Industrial Area Structure Plan, slightly to the northwest, will likely accommodate light and heavy industrial uses. FUZ outside of the Silverdale West Dairy Flat Industrial Area Structure Plan, will likely accommodate urban residential development. The Strategic Transport Corridor Zone is unlikely to change, although may be widened to accommodate a wider motorway corridor pursuant to NoR 4.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 28 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> There are no existing community facilities in the immediate area. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Huruhuru (Dairy Stream) tributaries located on both ends of the corridor Flood prone areas and artificial wetland. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Planted Vegetation – Exotic and Native (amenity) along both ends of the corridor Treeland – Exotic-Dominated along tributary of Dairy Stream (ID N4-S15b) Exotic Grassland near Top Road NoR 5 has one main stream - Huruhuru (Dairy Stream), which has five stream branches (one identified as intermittent and four identified as permanent). Freshwater stream habitat values have been assessed as low to moderate.

Features	Description
	<ul style="list-style-type: none"> One artificial wetland is located along the NoR 5 alignment north of the proposed intersection with East Coast Road (NoR 13), and is likely to support TAR species. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> Potential bat habitat supporting potential bat roosting and foraging was identified at Huruhuru (Dairy Stream), although no bat presence has been detected in the project area. Potential habitat including mature and exotic forest and wetlands in proximity to the NoR 5 area were identified as potentially supporting TAR species including North Island Kākā, Spotless Crake, Australasian Bittern, Brown Teal, Grey Duck, and Long-tailed Cuckoo. Five native lizard species are likely to be present in the NoR 5 area. The NoR 5 area has the potential to support seven fish species within the Huruhuru (Dairy Stream) including Īnanga and Longfin eel. <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
Historic heritage and archaeological values	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 5. There is potential for unrecorded sites to be present.</p> <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>
Traffic and Transport	Existing and likely future traffic and transport is discussed at Section 7.2.
Areas of cultural value	Huruhuru (Dairy Stream); Refer Section 11 and Appendices E and F.

8.6 NoR 6 – New Connection between Milldale and Grand Drive

8.6.1 Project Overview

This project comprises a new two-lane urban arterial with separated active mode facilities on both sides between Wainui Road in Milldale and the Ara Hills development in Upper Ōrewa (refer Figure 8-19). This will connect to a new developer-led urban arterial with separated active mode facilities through the Ara Hills development to connect to the Grand Drive interchange at SH1.

AT will be the requiring authority.



LEGEND

-  State Highway (SH)
-  Route Option
-  Designation

Figure 8-19: New Connection between Milldale and Grand Drive indicative designation footprint

Key features of the proposed new corridor include the following:

- Intersection upgrades at the Russell Road and Wainui Road intersections – design and designation boundaries allow for roundabouts but the intersection form will be confirmed through the future Outline Plan process.
- 50 kph speed environment, controlled access, no parking.
- Allowance for stormwater treatment/attenuation.

The new connection generally follows the existing north-south alignment of Upper Ōrewa Road until it intersects with Russell Road. North of the current Russell Road alignment, the proposed NoR 6 alignment tracks to the north-east, to tie-in with Grand Drive within the Ara Hills development. There are currently no footpaths along the section of Upper Ōrewa Road between Wainui Road and Russell Road.

The new connection will assist in providing an increased all-mode network with improved north-south connectivity through developing FUZ areas in the North, therefore providing direct access to the planned residential growth within Wainui and reducing reliance on the SH1 corridor. The new connection – in combination with NoR 10 – Upgrade to Wainui Road, NoR 7 – Upgrade to Pine Valley Road, and Argent Lane (not a Te Tupu Ngātahi project) – will provide a multi-modal alternative to SH1. The new connection will also assist and support the FTN in the north.

The proposed designation footprint in Figure 8-19 shows the envelope required to upgrade, operate and maintain the corridor, and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with Wainui Road, Russell Road, and the developer-led section of Grand Drive.

8.6.2 Indicative Cross Section

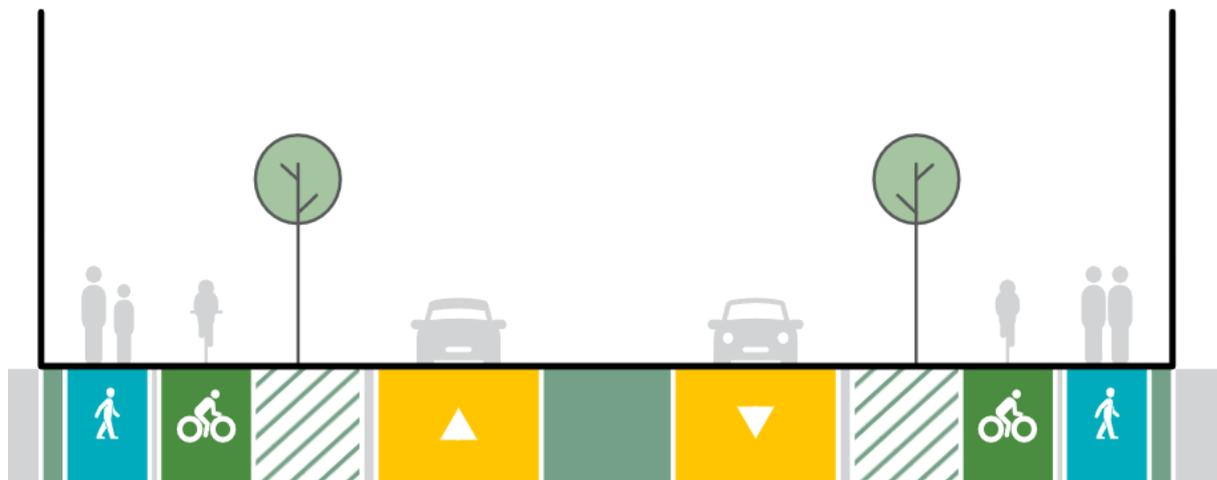
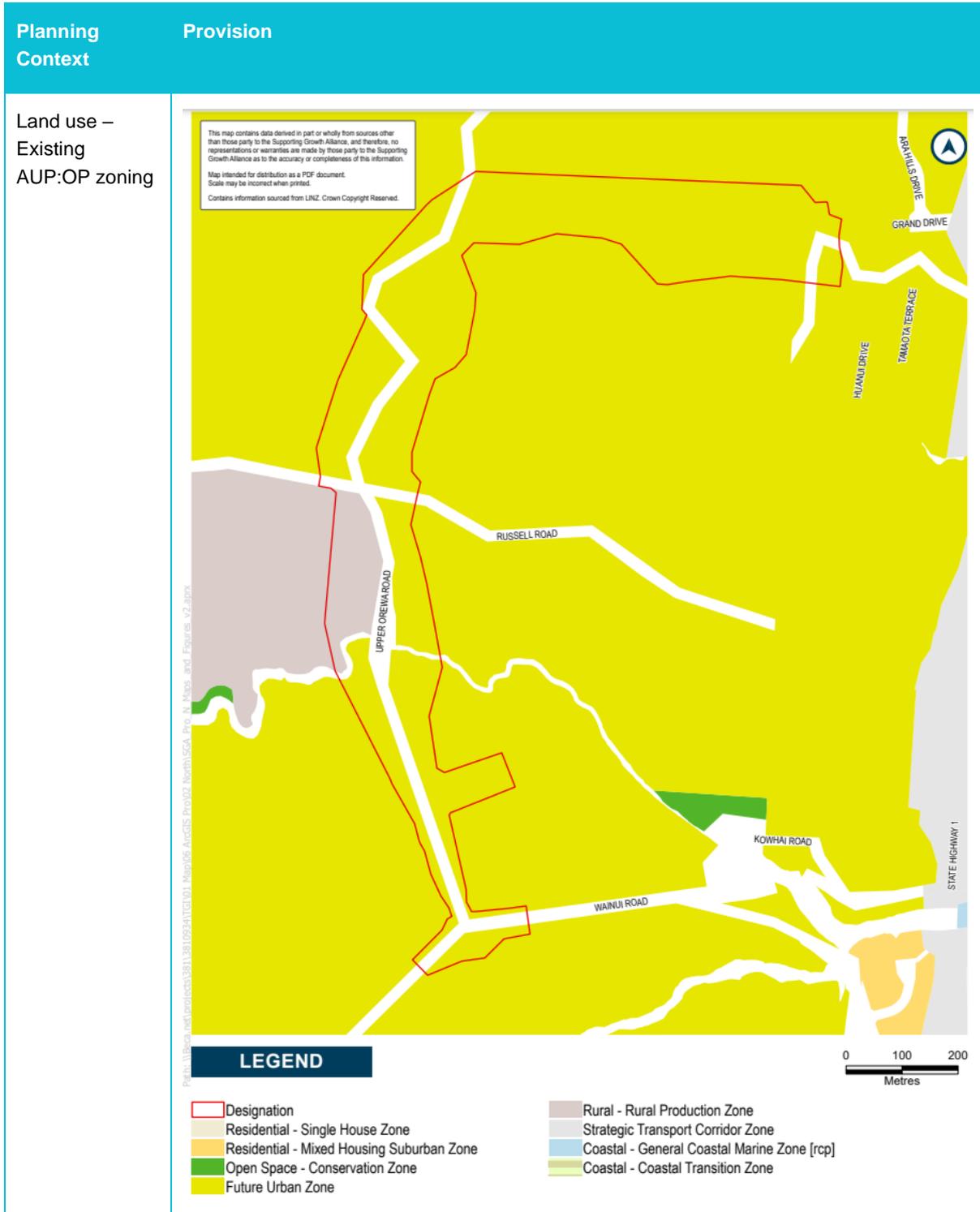


Figure 8-20: New connection between Milldale and Grand Drive indicative design – 24m cross section

8.6.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated, and maintained.

Table 8-10: NoR 6 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ areas will likely be rezoned to urban residential zones. Other zones are unlikely to change.</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • Future Urban Zone • Rural – Rural Production Zone (alongside western edge of current Upper Ōrewa Road alignment, mid-section only) <p>There are no precincts impacted by this designation footprint.</p> <p>The Ministry of Education is planning a future school at 29 Upper Ōrewa Road, Ōrewa. No designation has been lodged at this time.</p>
AUP:OP Overlays	<ul style="list-style-type: none"> • No overlays identified
AUP:OP Controls	<ul style="list-style-type: none"> • Macroinvertebrate Community Index
Existing designations	<ul style="list-style-type: none"> • This NoR does not directly interact with any existing surrounding designations.

Table 8-11: NoR 6 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Predominantly rural properties, including lifestyle and low-density residential development, and agricultural uses. • The Ara Hills residential development is consented for the development of approximately 500 dwellings, and is currently under construction at the north eastern extent of the corridor. • The land includes some steep topography, and the upper reaches of the Ōrewa River, with the alignment crossing two stream valleys <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • FUZ will likely accommodate urban residential development and likely a future school. • The draft Milldale North Structure Plan (developer led) anticipates a Neighbourhood Centre at the intersection of Wainui and Upper Ōrewa Roads. • Rural – Rural Production Zone will likely be retained as productive rural land pursuant to the NPS-HPL
Property	<ul style="list-style-type: none"> • Number of properties directly affected by designation – 23 (excluding legal roads)

Features	Description
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> The area is undergoing urban development. There are currently no community or recreation facilities. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Likely future Ministry of Education school, 29 Upper Ōrewa Road, Ōrewa (not yet consented/designated) Public schools in the wider area are expected to remain and could grow as the population in the area increases It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Ōrewa River and tributaries located along the extent of the corridor. Flood prone areas and potential wetlands. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Kānuka Scrub / Forest adjoining tributaries of Ōrewa River (ID N6-S4b, ID N6-S4a) Planted Vegetation – Native (recent) along margin of wetland (ID N6-W3) Treeland – Exotic-dominated adjoining margin of Ōrewa River (ID N6-S5), a tributary of Ōrewa River (ID N6-S6) and the eastern extent of proposed corridor Exotic Scrub along margin of Ōrewa River (ID N6-S5) Planted Vegetation – Exotic and Native (amenity) adjoining intersections with Wainui Road and Russell Road No SEAs are present alongside the corridor. There is one SEA further to the south east, within 2km of the corridor – SEA_T_2214 (terrestrial) NoR 6 has one main stream - Ōrewa River and nine stream branches (five identified as intermittent and four identified as permanent). Freshwater stream habitat values ranged from low to moderate, with one identified as high value (N6-S4b). Eight artificial and natural wetlands are located along the NoR 6 alignment, with six of these likely to support TAR species. N6-W3 was the only wetland identified as having high ecological value, with the remaining ranging from low to moderate. <p><i>Existing Environment – Species</i></p>

Features	Description
	<ul style="list-style-type: none"> • Potential bat habitat supporting potential bat roosting and foraging was identified at Ōrewa River although bat presence was not detected within the project area. • Potential habitat including wetlands and mature and exotic forest in proximity to the NoR 6 area were identified as potentially supporting TAR species including Banded Rail, Black Shag, North Island Fernbird, North Island Kākā, Spotless Crake, Australasian Bittern, Brown Teal, Grey Duck and Long-tailed Cuckoo. • Five native lizard species are likely to be present within the NoR 6 area. • The NoR 6 area has the potential to support 14 fish species within the Ōrewa River. Of these, 5 species have high ecological value/TAR status: <ul style="list-style-type: none"> • Giant bully • Giant Kōkopu • Īnanga • Longfin eel • Torrentfish <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 6. There is the potential for unrecorded sites to be present.</p> <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport context is discussed at Section 7.2.</p>
<p>Areas of cultural value</p>	<p>Ōrewa River tributaries. Refer Section 11 and Appendices E and F.</p>

8.7 NoR 7 – Upgrade to Pine Valley Road

8.7.1 Project Overview

An upgrade to Pine Valley Road within the FUZ is required to support likely future urban growth in the Pine Valley area (refer Figure 8-21). AT will be the requiring authority.

Pine Valley Road is an existing east-west road providing an east-west connection between Kaukapakapa and Waitoki in the west (via Pine Valley Road's connection with Kahikatea Flat Road), and with Dairy Flat Highway, SH1, Hibiscus Coast Highway and Silverdale in the east. There are no footpaths along the route.



Figure 8-21: Upgrade to Pine Valley Road indicative designation footprint

The upgrade will improve east-west connections for all modes between the end of the FUZ in the west, and the partially constructed Argent Lane/New Pine Valley Road connection in the east, which runs north-south through Milldale and will in future connect to Dairy Flat Highway to the south. NoR 1 – RTC and NoR 3 – New Pine Valley East Station are located just to the south of the current Pine Valley Road and Argent Lane roundabout, crossing the current alignment of Pine Valley Road. The corridor will therefore provide direct walking and cycling access to the RTC. The proposed active mode paths will also improve access for the future residential zoning, a potential local centre near Argent Lane and Dairy Flat Highway, helping to reduce reliance on private vehicles for short distance trips.

Key features of the proposed Upgrade to Pine Valley Road include:

- A 24m wide, two-lane carriageway with separated active mode facilities on both sides (refer below)
- 50 kph speed environment (reduced from 80 kph), controlled access, no parking.
- Intersection upgrade at the Young Access Road intersection– design and designation boundary allows for a roundabout but the intersection form will be confirmed through the future Outline Plan process
- Allowance for stormwater treatment/attenuation.

The proposed designation footprint in Figure 8-21 shows the envelope required to upgrade, operate and maintain the corridor and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with Pine Valley Road to the west beyond the FUZ, Young Access, and the Argent Lane roundabout.

8.7.2 Indicative Cross Section

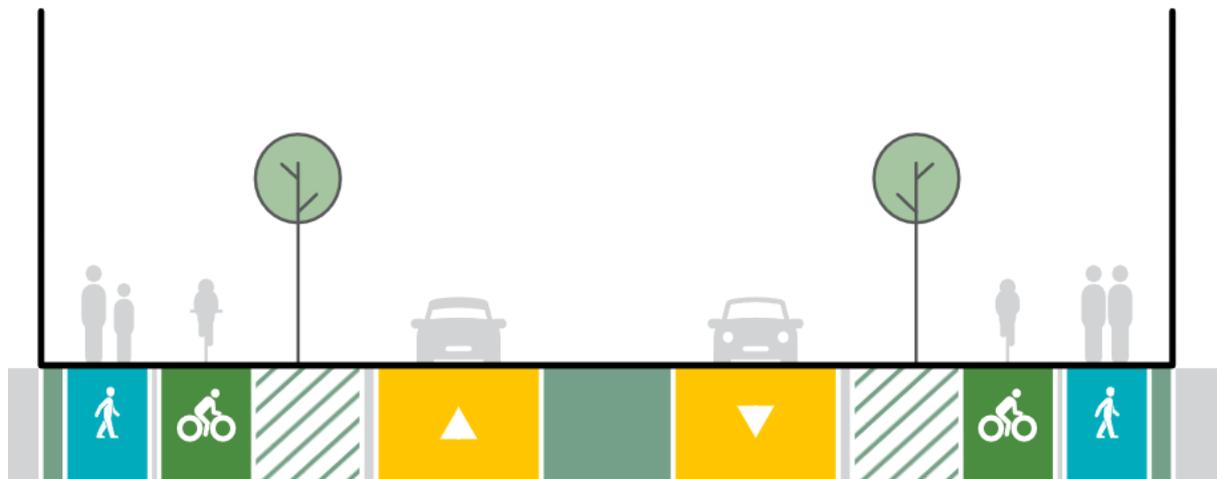
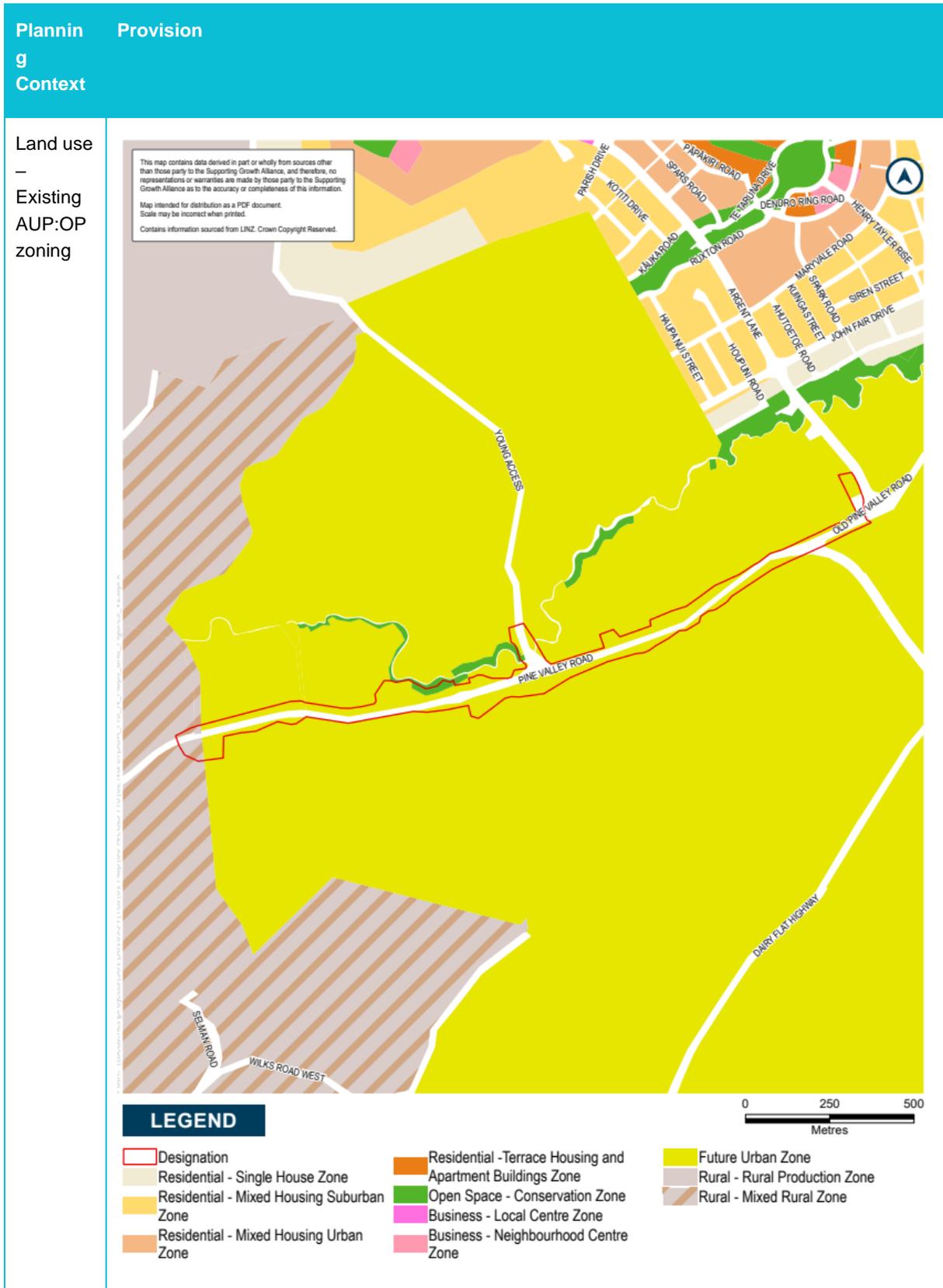


Figure 8-22: Upgrade to Pine Valley Road indicative design – 24m cross section

8.7.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-12: NoR 7 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • FUZ • Open Space – Conservation Zone • Rural – Mixed Rural Zone <p>FUZ will likely be rezoned to urban residential and industrial zones. Other zones are unlikely to change.</p> <p>There are no precincts impacted by this designation footprint.</p>
AUP:OP Overlays	<ul style="list-style-type: none"> • Significant Ecological Areas – Terrestrial [rp/dp]
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads • Macroinvertebrate Community Index
Existing designations	<ul style="list-style-type: none"> • 1479, Pine Valley Road North, Designations, AT

Table 8-13: NoR 7 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Rural land uses, with FUZ zoning, along the majority of the corridor. Predominantly lifestyle blocks and agricultural uses. The Wēiti Stream runs approximately east-west, along the north side of the corridor, with some riparian margins zoned Open Space – Conservation Zone and SEA. Tributaries to the Wēiti Stream run beneath the road from south to north. At the western extent of the corridor, the designation footprint is within the Rural – Mixed Rural Zone <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> FUZ will likely accommodate urban residential development, with some industrial zoning and uses at the eastern extent of the corridor to the east of Argent Lane and the New Pine Valley Road designation. The proposed Pine Valley East Station will be located adjacent the eastern extent of the Pine Valley Road corridor, south of where the corridor connects to the Argent Lane roundabout. This is likely to facilitate high density residential uses around the station (excluding the future industrial areas) as per the NPS:UD. The Draft Spatial Land Use Strategy Silverdale Dairy Flat indicates a Local Centre next to the future station (to west). Other zones - and the rural and open space uses they support - are unlikely to change.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 49 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> The Wēiti Stream, which is zoned Conservation Zone is located near the Project and provides walking tracks in native bush to the neighbouring Milldale community. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Wēiti Stream and tributaries, located along the extent of the corridor Flood prone areas and artificial wetlands. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer to Section 7.5.

Features	Description
	<ul style="list-style-type: none"> No change is anticipated to the vegetated riparian margin of the Wēiti Stream, which is zoned Conservation Zone, and is subject to an SEA
<p>Vegetation and ecology</p>	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Kahikatea Forest along margin of Wēiti Stream (ID N7-S1a) Kānuka Scrub / Forest adjoining Wēiti Stream (ID N7-S1a) Treeland – Exotic dominated along tributary of the Wēiti Stream (ID N7-S1b) Planted Vegetation – Exotic and Native (amenity) alongside the corridor One SEA is present alongside or within 2km of the corridor: <ul style="list-style-type: none"> SEA_T_5446, Terrestrial – located near Pine Valley Road intersection with Young Access and follows Wēiti Stream One stream will be crossed (Wēiti Stream), which includes four stream branches identified as permanent. Freshwater stream habitat values range from low to moderate. Potential bat habitat was identified within the project area at Wēiti Stream, John Creek (named tributary of Wēiti Stream), Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek). A total of four artificial wetlands are located along the NoR 7 alignment, with two of these likely to support TAR species. All wetlands were identified as low ecological value. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> Potential bat habitat supporting potential bat roosting and foraging was identified at Wēiti Stream, John Creek, Rangitōpuni Stream, Huruhuru (Dairy Stream), Ōkura River and Waiokahukura (Lucas Creek) however bat presence was not detected within the project area. Mature and exotic forest and wetlands in proximity to the NoR 7 area were identified as potentially supporting TAR species including North Island Kākā and Spotless Crake. Potential habitat including open water, stock water and stormwater ponds, wetlands, native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 7 area were identified as potentially supporting TAR species including Australasian Bittern, Brown Teal, Grey Duck, and Long-tailed Cuckoo. Five native lizard species are likely to be present in the NoR 7 area. The NoR 7 area has the potential to support nine species in the Wēiti Stream and John Creek. Of these, 3 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> Giant bully (Wēiti Stream and John Creek) Īnanga (Wēiti Stream and John Creek) Longfin eel (Wēiti Stream and John Creek) <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>

Features	Description
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>One archaeological site, one CHI item and one unrecorded building with potential heritage values have been recorded within the proposed designation, as set out below:</p> <ul style="list-style-type: none"> • R10/737 – Kelly Homestead and Sawyer’s Arms Inn. Summarised in NoR 1. NoR 7 passes through the northern extent of Kelly’s Homestead. Old plans show a stockyard associated with Kelly’s Homestead was located within the NoR boundary. • CHI ID #22186 – Wēiti Portage. Summarised in NoR 1. There is unlikely to be any physical evidence remaining related to the portage itself. • 158 Pine Valley Road. This is a modified Art Deco style weatherboard bungalow. The main dwelling lies just outside the designation boundary, while ancillary structures are within the NoR footprint. <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future; although some of the archaeological features may be lost as the surrounding area urbanises</p>
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport context is discussed at Section 7.2.</p>
<p>Areas of cultural value</p>	<ul style="list-style-type: none"> • Wēiti Stream. • SEAs – indigenous vegetation including Kahikatea on the north side of the road. (see Vegetation and Ecology table row, above) <p>Refer Section 11 and Appendices E and F.</p>

8.8 NoR 8 – Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat

8.8.1 Project Overview

This project comprises a new AT designation for an upgrade to the future urban section of Dairy Flat Highway between Silverdale interchange and Durey Road at the rural urban boundary in Dairy Flat (refer Figure 8-23). NoR 8 adjoins NoR 9 at Durey Road.

Dairy Flat Highway is an existing road providing a key north-south connection between Silverdale in the north through Hibiscus Coast Highway, and Albany in the south. It also provides a connection to Coatesville in the west through Coatesville Riverhead Highway. There are no footpaths along the route.

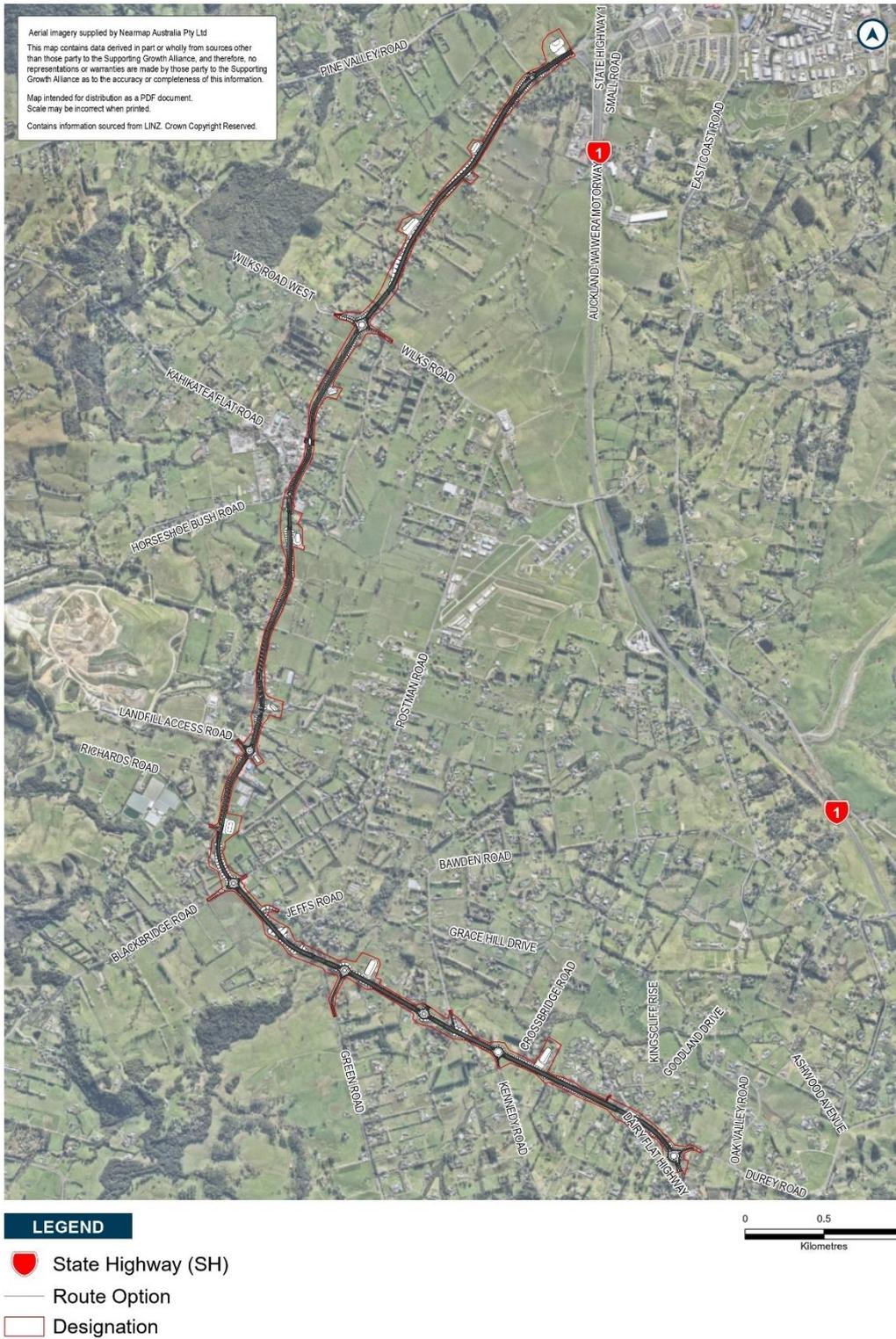


Figure 8-23: Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat indicative designation footprint

The upgrade to Dairy Flat Highway is required to support future urban growth through the FUZ area and provide resilience to SH1 by forming an alternative north-south link through the North area. The improved capacity and network options for all-modes will assist in facilitating safe and efficient access to Silverdale West, Pine Valley and Dairy Flat, as well as providing walking and cycling access to the proposed Pine Valley East Station. This project generally follows the existing road alignment.

Key features of the proposed upgraded corridor include:

- Upgrade to a four-lane arterial between Silverdale Interchange and Wilks Road, with one lane in each direction dedicated to public transport, and with separated walking and cycling on both sides. 50 kph speed environment (reduced from 80 kph).
- Upgrade to a two-lane arterial between Wilks Road and Richards Road, with separated walking and cycling on the east side (the FUZ side), and a swale on the west side (rural side). 60 kph speed environment (reduced from 80 kph).
- Upgrade to a four-lane arterial between Richards Road and Durey Road, with one lane in each direction dedicated for public transport, and with separated walking and cycling on both sides. An upgraded bridge over Huruhuru (Dairy Stream) is included. 60 kph speed environment (reduced from 80 kph).
- Allowance for stormwater treatment/attenuation
- Controlled access, no parking
- The corridor will intersect the proposed RTC alignment (NoR 1), which runs east-west between Wilks Road and Pine Valley Road. Design and designation boundaries allow for Dairy Flat Highway to bridge over the RTC alignment, however the grade separated crossover will be confirmed through the future Outline Plan process for both projects.

The proposed designation footprint in Figure 8-23 shows the envelope required to upgrade, operate and maintain the Dairy Flat Highway and its ancillary components, including construction areas, stormwater infrastructure, batter slopes, retaining walls and tie-ins with the northern end of NoR 9 – Dairy Flat Highway Upgrade, Durey Road, Goodland Road, Kennedy Road, NoR 12 – Bawden Road, Green Road, Jeffs Road, Blackbridge Road, Postman Road, Richards Road, Landfill Access Road, Horseshoe Bush Road, NoR 11 – New connection from Dairy Flat Highway to Wilks Road, Wilks Road West, Pine Valley Road and NoR 4 – SH1 Improvements.

8.8.2 Indicative Cross Sections



Figure 8-24: Silverdale interchange to Wilks Road; and Richards Road to Durey Road (4 lane urban arterial, 30 m)

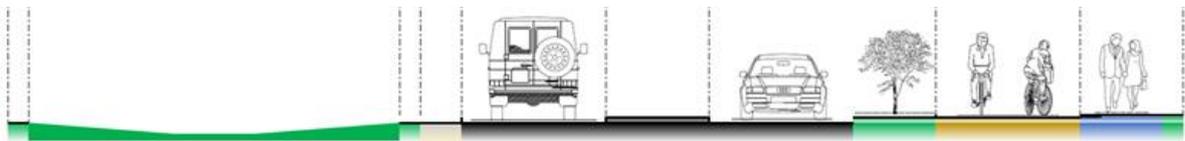
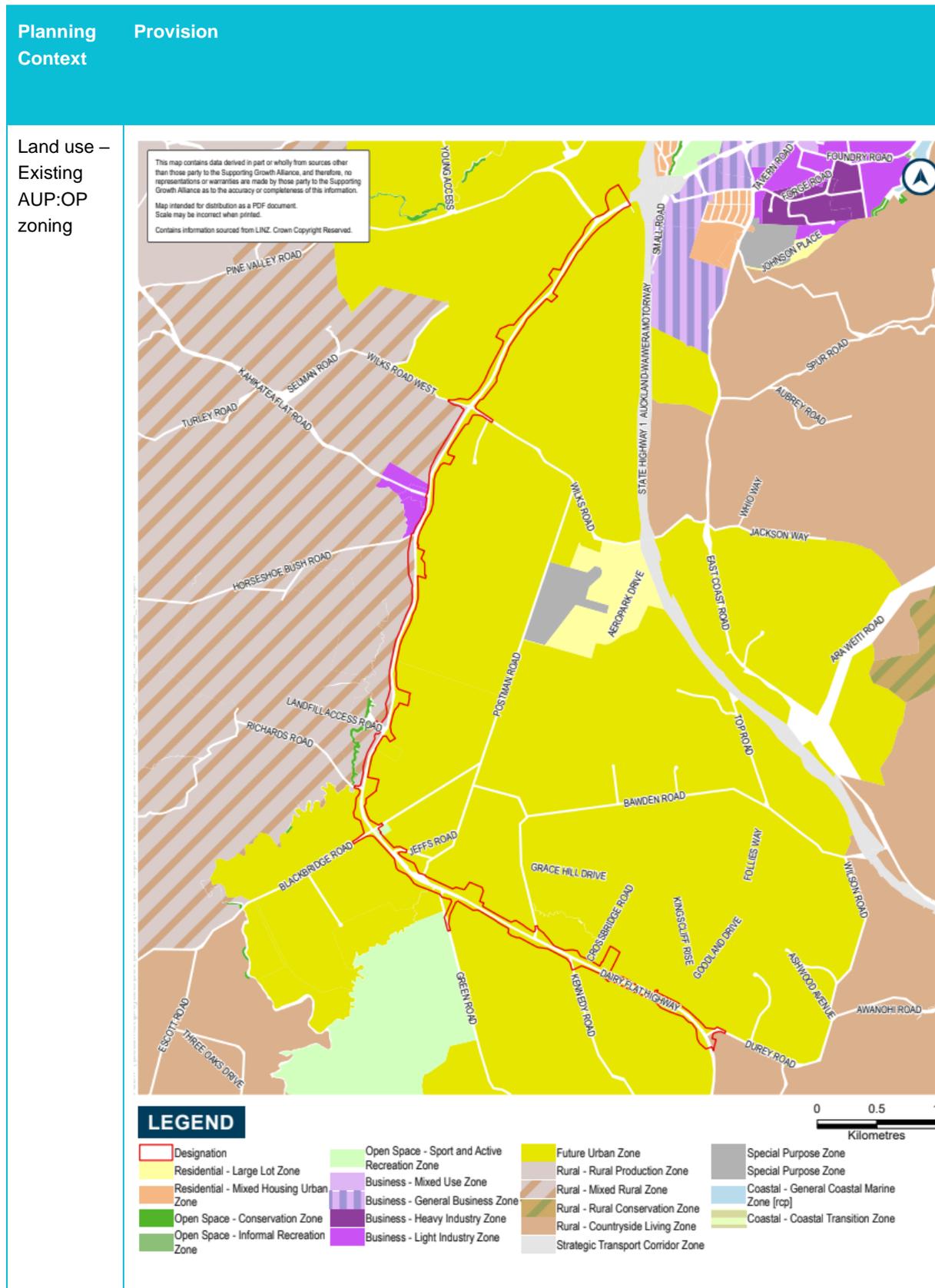


Figure 8-25: Wilks Road to Richards Road (2 lane rural arterial)

8.8.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-14: NoR 8 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ will likely be rezoned to urban residential and industrial zones. Other zones are unlikely to change.</p> <p>The corridor passes alongside the following zones:</p> <ul style="list-style-type: none"> • FUZ • Rural – Mixed Rural Zone • Rural – Countryside Living Zone (interface only at southern end) • Business – Light Industry Zone • Open Space – Sport and Active Recreation Zone (at Dairy Flat Tennis Club and interface only at Green Park) <p>There are no precincts impacted by this designation footprint.</p>
AUP:OP Overlays	<ul style="list-style-type: none"> • Airport Approach Surface • Aircraft Noise • Outstanding Natural Landscape Overlay (near Green Park)
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] at intersection of Dairy Flat Highway and Postman Road • Subdivision Variation Control along southern boundary
Existing designations	<ul style="list-style-type: none"> • 1480, Pine Valley Road South and Dairy Flat Highway, Designations, AT • 4563, Educational purposes – primary school years 0-8 (Dairy Flat School), Designations, Minister of Education (small corner affected)

Table 8-15: NoR 8 Receiving Environment Summary

Features	Description
Land use and Urban Form	<ul style="list-style-type: none"> Predominantly rural properties, including lifestyle and low-density residential development, and agricultural uses. Some light industrial/business uses present at the intersection of Kahikatea Flat Road and Dairy Flat Highway, and some open space areas, including Green Road Reserve.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 230 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Dairy Flat Tennis Club, 4 Postman Road, Dairy Flat and adjacent town hall. (partly within designation boundary) Dairy Flat Primary School, 1220 Dairy Flat Highway, Dairy Flat. (partly within designation boundary) Matea Trust (Residential Care, Vocational Skills), 1016 Dairy Flat Highway, Dairy Flat (partly within designation boundary) Green Road Park, Green Road, Dairy Flat (adjoins designation boundary) Sophia's Childcare, 20 Green Road, Dairy Flat (nearby) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Recreational activities and childcare may shift but the activities are likely to remain in the area. Public schools in the area are expected to remain and are likely to grow as the population in the area increases. Residential care facilities are likely to remain and could grow as the population in the area increases. The Green Park has a masterplan and Council intends to develop this into a regional facility with a variety of passive and active recreation uses to serve the future community. It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Huruhuru (Dairy Stream) tributaries, located along extent south of intersection with Postman Road John Creek tributary, located at northern end Rangitōpuni Stream, located along intersection with Richards Road, and tributaries located south of Kahikatea Flat Road Flood prone areas and potential wetlands. See Controls, above. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.

Features	Description
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Treeland – Mixed Native / Exotic along tributaries of Rangitōpuni Stream (ID N8-S2, ID N8-S3) Kānuka Scrub / Forest along tributary of Huruhuru (Dairy Stream) (ID N8-S5a) Mānuka, Kānuka Scrub along margin of Rangitōpuni Stream (ID N8-S4) Planted Vegetation – Exotic and Native (amenity) along the corridor Treeland – Exotic-Dominated along a tributary of Rangitōpuni Stream (ID N8-S2) and tributaries of Huruhuru (Dairy Stream) (ID N8-S5a, ID N8-S5b, ID N8-S6, ID N8-S8b, ID N8-S10) Exotic Grassland near proposed intersection with Bawden Road No SEAs are present alongside or within 2km of the corridor. The freshwater habitat within NoR 8 includes three streams and their tributaries that will be crossed (John Creek, Rangitōpuni Stream and Huruhuru (Dairy Stream)), including 13 stream branches (two identified as intermittent and 11 identified as permanent). Freshwater stream habitat values range from low to moderate. Potential bat habitat was identified within the project area at Rangitōpuni Stream and Huruhuru (Dairy Stream). A total of 17 artificial and natural wetlands are located along the NoR 8 alignment, with 13 of these likely to support TAR species. Wetland ecological values ranged from low to moderate. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> Potential bat habitat supporting potential bat roosting and foraging was identified at Rangitōpuni Stream and Huruhuru (Dairy Stream) however bat presence was not detected within the project area. Potential bird habitat including mature and exotic forest and wetlands in proximity to the NoR 8 area were identified as potentially supporting TAR species including North Island Kākā and Spotless Crake. Potential bird habitat including open water, wetlands, stock water and stormwater ponds, native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 8 area were identified as potentially supporting very TAR species including Australasian Bittern, Brown Teal, Dabchick, Grey Duck and Long-tailed Cuckoo. Five native lizard species are likely to be present within the NoR 8 area. The NoR 8 area has the potential to support 12 fish species within the Rangitōpuni Stream and Huruhuru (Dairy Stream). Of these, 2 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> Īnanga (Rangitōpuni Stream and Huruhuru (Dairy Stream)) Longfin eel (Rangitōpuni Stream and Huruhuru (Dairy Stream)) <p><i>Existing Environment – District Plan Protected Trees</i></p> <ul style="list-style-type: none"> There is one District Plan protected individual tree (Tree 805) and two groups of trees (Groups 806 and 807) in an open space zoned area within

Features	Description
	<p>the designation, located at 4 Postman Road. (Appendix A of the Assessment of Arboricultural Effects in Volume 4)</p> <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
Historic heritage and archaeological values	<p><i>Existing Environment</i></p> <p>Two archaeological sites, three CHI items and one unrecorded building with potential heritage values have been recorded within the proposed designation, as set out below. There is also one archaeological site present within 200m of NoR 8:</p> <ul style="list-style-type: none"> • R10/737 – Kelly Homestead and Sawyer’s Arms Inn. Summarised in NoR 1. The proposed NoR 8 designation passes alongside the central area of Kelly’s Homestead, where the highest concentration of buildings were. • R10/1450 – Wade Junction Hotel, Wilks Road, Dairy Flat. Summarised in NoR 1. This site is within the proposed designation boundary. • R10/1540 – Whare. A whare is marked in this location on an old survey from 1898. No surface evidence is visible. The site is outside of the proposed designation. • CHI ID #16094 – House. This site is a timber cottage / village with corrugated iron cladding at 1350 Dairy Flat Highway The cottage structure is located within the designation boundary. • CHI ID #16095 – House. This is an early 1900s villa with later extensions and modifications at 1338 Dairy Flat Highway. The main farmhouse building lies outside of the designation. The ancillary garages and other structures are located within the designation boundary. • CHI ID #22215 – Small Homestead. Summarised in NoR 4. The western boundary of the site is located within the designation boundary. • 1032 Dairy Flat Highway. Aerial photography indicates a ruinous house structure within the designation boundary. The structure is estimated to have been built in the early 1900s or late 1800s. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future; although some of the archaeological features may be lost as the surrounding area urbanises.
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	<ul style="list-style-type: none"> • Huruhuru (Dairy Stream) • Close proximity to the Rangitōpuni stream <p>Refer Section 11 and Appendices E and F.</p>

8.9 NoR 9 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany

8.9.1 Project Overview

This project comprises a new AT designation for an upgraded Dairy Flat Highway between Durey Road in Dairy Flat and Albany Village (rural section). An upgrade to Dairy Flat Highway is required to support future urban growth to the north and northwest of this corridor. The upgrade includes safety improvements (wire rope median and side barriers) and a separated cycling path on one side of the corridor only, due to the complex engineering and environmental constraints environment. The corridor is constrained by steep topography and SEAs.

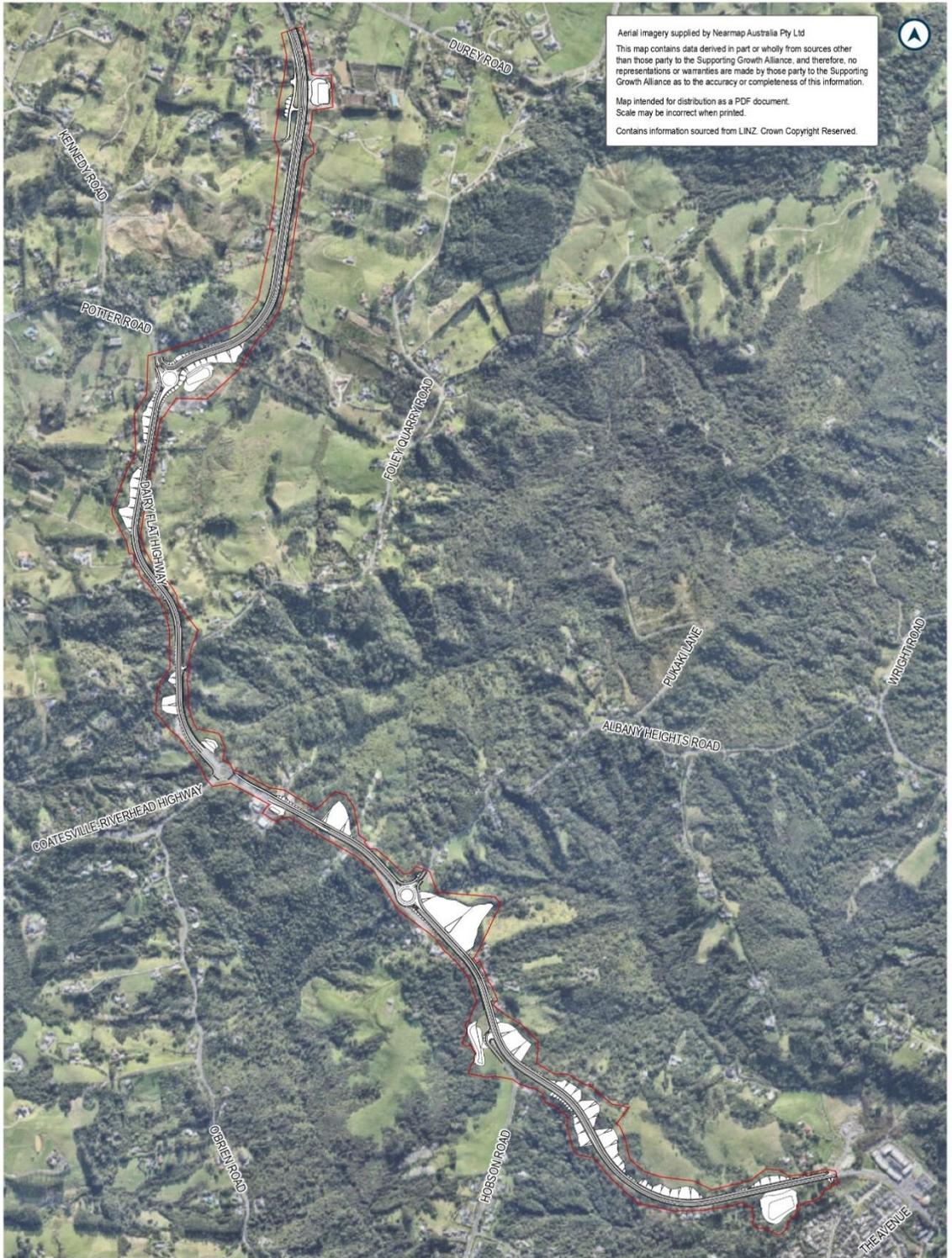


Figure 8-26: Upgrade to Dairy Flat Highway between Dairy Flat and Albany indicative designation footprint

As the corridor forms a key north-south link between the growth areas of Dairy Flat and Albany, adequate walking and cycling facilities are required to support and encourage active mode travel between future centres. Safety improvements are necessary given the road's existing safety record, with the corridor being identified as second ranked safety deficiency within AT's Future Connect.

Key features of the proposed upgraded corridor include:

- Widened road corridor of approximately 19.1 m in constrained sections, and to 25 m in unconstrained sections. A small amount of widening both sides is required for the safety improvements. Additional widening is required for the cycling path.
- Two lane corridor (one lane in each direction)
- The northbound crawler lane is retained but is shortened from its current length.
- Cycle path on western side of the carriageway between Durey Road and the Coatesville Riverhead Highway Roundabout and then on the eastern side between the Roundabout and Albany Village (although walking will be permitted, the key purposes of the facility will be for cycling)
- 60 kph speed environment (reduced from 80 kph), controlled access, no parking
- Upgrades to intersections at Potter Road, Foley Quarry Road, Coatesville-Riverhead Highway, Albany Heights Road and Hobson Road
- Allowance for stormwater treatment/attenuation.

The proposed designation footprint in Figure 8.26 shows the envelope required to upgrade, operate and maintain Dairy Flat Highway and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with Stevensons Crescent, Hobson Road, Albany Heights Road, Coatesville-Riverhead Highway, Foley Quarry Road, Potter Road, and NoR 8 – Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat.

8.9.2 Indicative Cross Sections

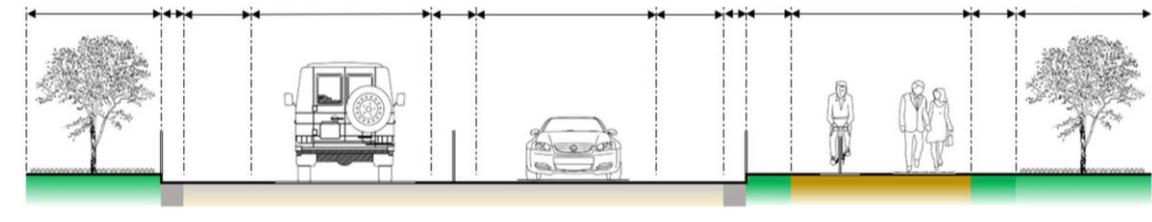


Figure 8-27: Dairy Flat Highway Upgrade – Potter Road to Albany (19.1m cross section – agreed with AT for constrained sections)

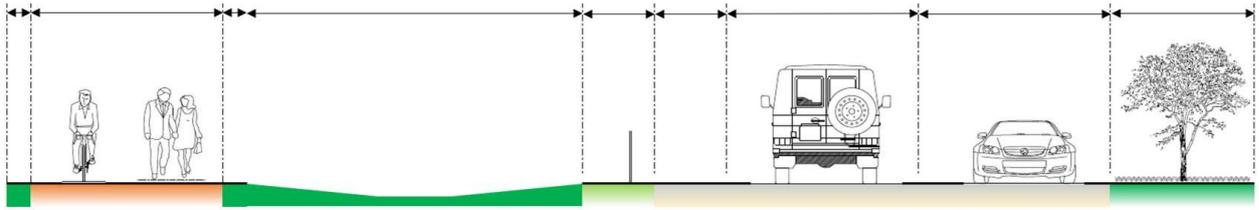
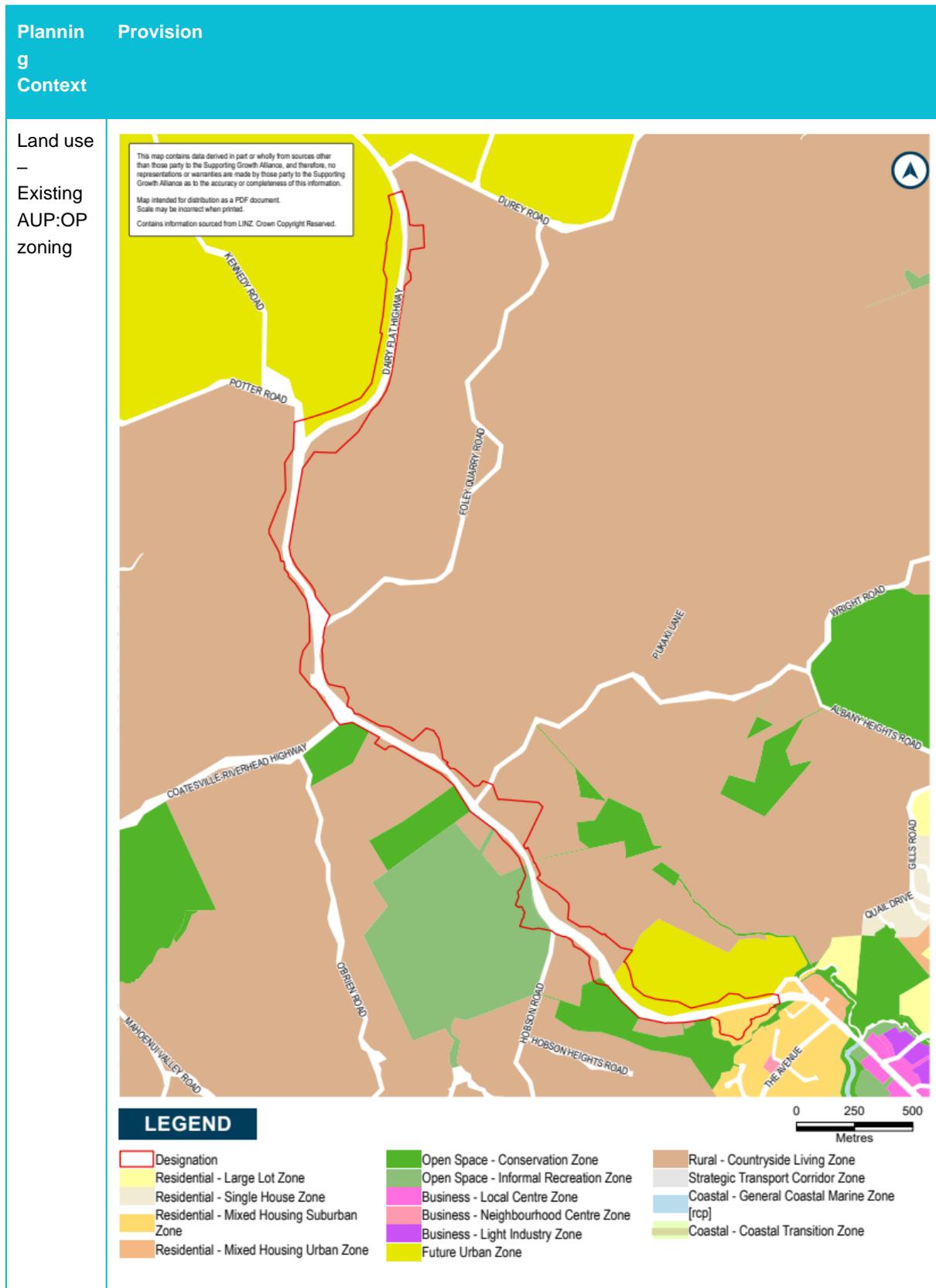


Figure 8-28: Dairy Flat Highway Upgrade – Durey Road to Potter Road (25m unconstrained cross section)

8.9.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-16: NoR 9 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ areas will likely be rezoned to urban residential zones. Other zones are unlikely to change.</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • Future Urban Zone • Rural – Countryside Living Zone • Open Space – Conservation Zone • Open Space – Informal Recreation Zone • Residential – Mixed Housing Suburban Zone <p>There are no precincts impacted by this designation footprint.</p>
AUP:OP Overlays	<ul style="list-style-type: none"> • Significant Ecological Areas – Terrestrial [rp/dp] • Notable Trees – Unverified position of tree • National Grid Corridor
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads • Coastal Inundation 1 per cent AEP Plus 1m Control along southern end • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] along southern end • Subdivision Variation Control
Existing designations	<ul style="list-style-type: none"> • 8904, Communications hut – radio, Designations, Vector Ltd

Table 8-17: NoR 9 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Rural, with steep topography and SEAs along much of the corridor. Predominantly rural properties, including lifestyle and low-density residential development, and agricultural uses. A small area of existing urban residential development is present at the southernmost extent of the corridor, in Albany. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> For the existing urban areas / live zoned land, a low level of change is anticipated, other than intensification envisaged by Plan Change 78. For the Countryside Living zoned land, a low level of change is anticipated. FUZ at the northern and southern extents of the corridor will likely support urban residential development. Existing open space areas are expected to remain unchanged.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 89 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Three Streams Scenic Reserve (adjoins designation boundary) The Landing Reserve (nearby) Hosking Reserve (partly within designation boundary) O'brien Reserve (nearby) O'brien Reserve North (adjoins designation boundary) Pukeatua (Albany Heights) West Reserve (partly within designation boundary) Serenity Reserve (nearby) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Existing open space areas are expected to remain unchanged for the most part. It is likely additional community facilities will be provided within the FUZ. Three Streams Scenic Reserve, Pukeatua (Albany Heights) West Reserve, Hosking Reserve and O'brien Reserve are included in the Upper Harbour Greenways Plan with aspirations to implement a trail network through these reserves for recreational purposes.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Huruhuru (Dairy Stream) tributaries, located along northern extent Waiokahukura (Lucas Creek) tributary, located along southern extent Potential wetlands.

Features	Description
	<p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Taraire, tawa, podocarp forest adjoining a tributary of Waiokahukura (Lucas Creek) (ID N9-S3) Kauri, Podocarp, Broadleaved forest adjoining a tributary of Waiokahukura (Lucas Creek) (ID N9-S3) and Dairy Flat Highway intersections with Coatesville Riverhead Highway and Hobson Road Kauri, podocarp, broadleaved, beech forest adjoining a tributary of Waiokahukura (Lucas Creek) (ID N9-S3) Kānuka Scrub / Forest adjoining the eastern boundary of Dairy Flat Highway near intersection with Coatesville Riverhead Highway Exotic Forest – Native understory adjoining a tributary of Waiokahukura (Lucas Creek) (ID N9-S3) Treeland – Mixed Native/Exotic adjoining a tributary of Huruhuru (Dairy Stream) (ID N9-S1) Treeland – Exotic-dominated adjoining a tributary of Huruhuru (Dairy Stream) (ID N9-S2) and the eastern boundary of Dairy Flat Highway near intersection with Coatesville Riverhead Highway Exotic Scrub adjoining a tributary of Huruhuru (Dairy Stream) (ID N9-S1) and the eastern boundary of Dairy Flat Highway near intersection with Coatesville Riverhead Highway Planted Vegetation – Exotic and Native (amenity) along the corridor There is one notable tree identified within NoR 9; the tree is a Kauri tree on the boundary of Dairy Flat Highway adjacent or within 19 Hobson Road A number of SEAs are present alongside or within 2km of the corridor as follows: <ul style="list-style-type: none"> SEA_T_6669, Terrestrial – located between Foley Quarry Road and Albany Heights Road SEA_T_8296, Terrestrial – located between Albany Heights Road and Stevensons Crescent SEA_T_8300, Terrestrial – Three Streams Reserve (QEII Covenant), Pukeatua (Albany Heights) West Reserve and Serenity Reserve SEA_T_8301, Terrestrial – located north of Pukeatua (Albany Heights) West Reserve SEA_T_8332, Terrestrial – located between Coatesville Riverhead Highway and Hobson Road The freshwater habitat within NoR 9 includes two streams and their tributaries that will be crossed including (Huruhuru (Dairy Stream) and Waiokahukura (Lucas Creek)), including three permanent stream branches. Freshwater stream habitat values range from moderate to high. Potential bat habitat was identified within the project area at Waiokahukura (Lucas Creek) and large areas of SEA forest. A total of three artificial and natural wetlands are located along the NoR 9 alignment, with all three likely to support TAR species. One wetland was

Features	Description
	<p>identified as low ecological value with the remaining being of moderate ecological value.</p> <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> • Potential bat habitat supporting potential bat roosting and foraging was identified at Waiokahukura (Lucas Creek) and large areas of SEA forest, although bat presence has not been detected within the project area. • Mature and exotic forest and wetlands in proximity to the NoR 9 area were identified as potentially supporting TAR species including North Island Kākā and Spotless Crane. • Open water, stock water and stormwater ponds, wetlands, native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 9 area were identified as potentially supporting Australasian Bitten, Brown Teal, Dabchick, Grey Duck, and Long-tailed Cuckoo. • Five native lizard species are likely to be present within the NoR 9 area. • The NoR 9 area has the potential to support nine fish species within the Waiokahukura (Lucas Creek). Of these, one species has high ecological value/TAR status which is the Longfin eel. <p><i>Existing Environment- District Plan Protected trees</i></p> <ul style="list-style-type: none"> • There is one District Plan protected individual tree (Notable Kauri tree – ID 1379) located adjacent to 19 Hobson Road (Tree 903), and two groups of trees, located adjacent to R 335 Dairy Flat Highway (Group 901) and R 357 Dairy Flat Highway (Group 902), affected by the designation. (Appendix A of the Assessment of Arboricultural Effects in Volume 4) <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>One CHI site has been recorded within the designation boundary, as set out below. There are also two archaeological sites and two CHI sites present within 200m of NoR 9:</p> <ul style="list-style-type: none"> • R10/1521 – “The Cottage”. This is a 19th century settler cottage located at 12 The Avenue, believed to have been constructed in approximately 1898-1903. The property is outside of the designation boundary. • R10/1554 – Old Kelly Homestead. This location is marked in an old survey plan from 1869 as “Kelly’s (old) homestead and orchardstead.” The site is outside of the designation. • CHI ID #13685 – Anti-tank ditch. This is the location of a WWII anti-tank ditch, recorded as part of the Kaipara anti-tank ditch, but the exact location of this site is unknown. There is potential that the site is located within the designation boundary. • CHI ID #13686 – Pillbox. This is a WWII medium machine gun post, located on the property at the intersection of Dairy Flat Highway and Foley Quarry Road. The pillbox is located within the designation boundary.

Features	Description
	<ul style="list-style-type: none"> CHI ID #19646 – Islington Homestead. This is a historical villa but is outside of the proposed designation footprint. <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future; although some of the archaeological features may be lost as the surrounding area urbanises.</p>
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	<ul style="list-style-type: none"> Three Streams Scenic Reserve, Notable Kauri Tree (ID 1379), Waiokahukura (Lucas Creek) and Huruhuru (Dairy Stream) SEAs – indigenous vegetation on both sides of the road. (see Vegetation and Ecology table row, above) <p>Refer Section 11 and Appendices E and F.</p>

8.10 NoR 10 – Upgrade to Wainui Road

8.10.1 Project Overview

This project comprises a new AT designation for an upgraded Wainui Road between Lysnar Road and the roundabout just south of the Gull service station adjacent SH1 (refer Figure 8-29). Wainui Road is an existing road providing an east-west connection between Wainui and Waitoki in the west, and SH1 and Hibiscus Coast Highway in the east. Wainui Road crosses SH1 via a bridge, and south facing ramps only are provided at the interchange. The section of Wainui Road which is the subject of NoR 10 does not have footpaths along the route.



Figure 8-29: Upgrade to Wainui Road indicative designation footprint

Wainui Road will be upgraded to a two-lane urban arterial route with separated walking and cycling facilities on both sides of the carriageway. The upgrade to Wainui Road is required to support current and future urban development in the Milldale and Wainui areas and improve safety and connectivity for all modes. The project scope includes the roundabout linking to NoR 6 – New Connection between Milldale and Grand Drive, given the likelihood that NoR 10 – Wainui Road construction will occur prior to NoR 6.

The section of Wainui Road from the edge of the FUZ land (Wainui Road / Gervin Road intersection) to Lysnar Road is subject to an agreement for road widening by the landowner / developer (Fulton Hogan) with AT.

Key features of the proposed new corridor include the following:

- Widened road corridor to 24 m.
- Separate, dedicated, walking and cycling facilities on both sides of the carriageway.
- Upgraded bridge over Waterloo Creek (tributary to Ōrewa River).
- 50 kph speed environment, controlled access, no parking
- Intersection upgrades at the Lysnar Road and Upper Ōrewa Road intersections – design and designation boundary allows for roundabouts but the intersection form will be confirmed through the future Outline Plan process.
- Allowance for stormwater treatment/attenuation.

The proposed designation footprint in Figure 8-29 shows the envelope required to upgrade, operate and maintain Wainui Road and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with the developer-led upgrade of Wainui Road, Lysnar Road, NoR 6 – New Connection between Milldale and Grand Drive, Kowhai Road, the Wainui Road SH1 overbridge, and Sidwell Road.

8.10.2 Indicative Cross Section

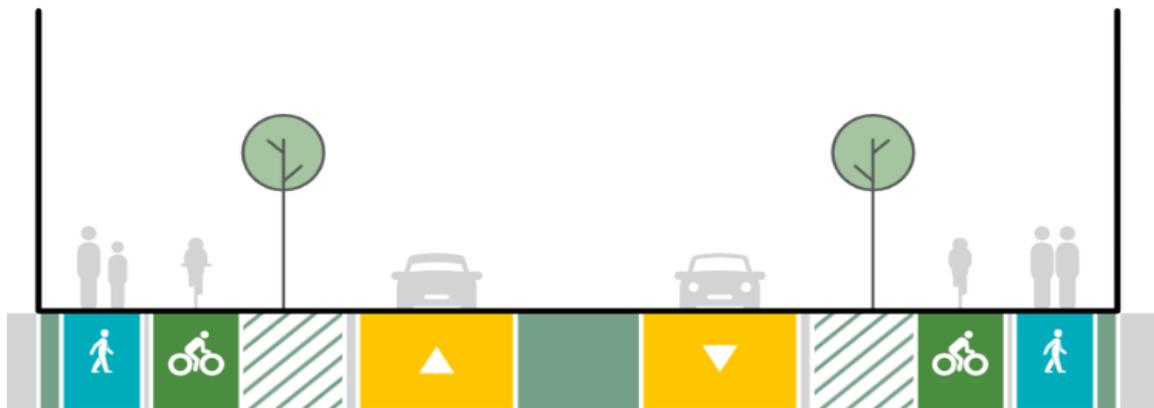
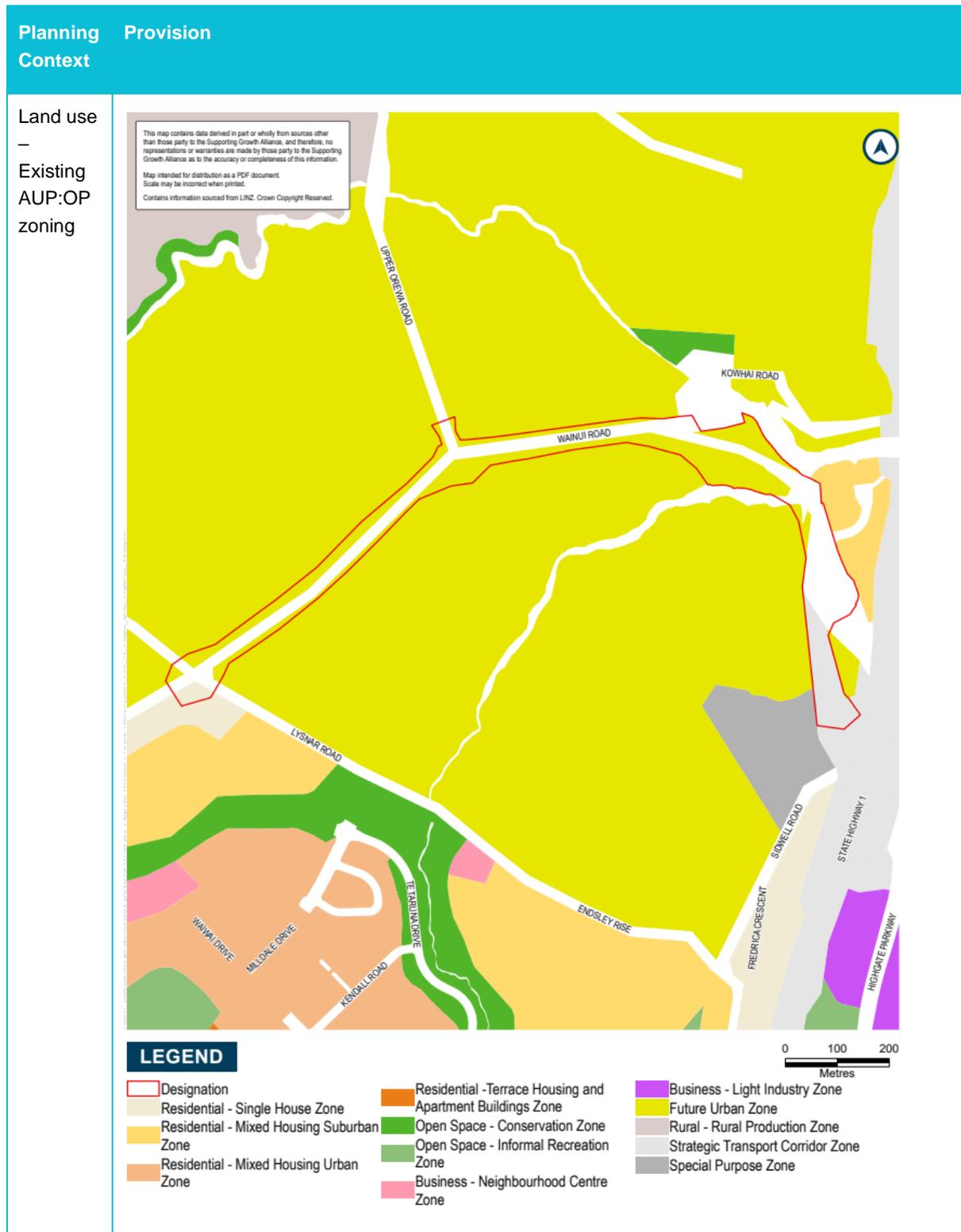


Figure 8-30: Two lane arterial – 24m cross section

8.10.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-18: NoR 10 Planning Context



<p>Current and Likely Future Zoning</p>	<p>FUZ will likely be rezoned to urban residential and other urban zones. It is understood a developer-led structure plan is under preparation for FUZ land in this area.</p> <p>Other zones are unlikely to change.</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • FUZ • Residential – Single House Zone (western edge only) • Residential – Mixed Housing Suburban Zone • Strategic Transport Corridor Zone • Special Purpose Zone – School Zone (interface only – Meraki Montessori Primary School) <p>The corridor passes through the following precincts:</p> <ul style="list-style-type: none"> • I544 Wainui Precinct
<p>AUP:OP Overlays</p>	<ul style="list-style-type: none"> • Significant Ecological Areas – Terrestrial [rp/dp] minor overlap
<p>AUP:OP Controls</p>	<ul style="list-style-type: none"> • Coastal Inundation 1 per cent AEP Plus 1m Control • Macroinvertebrate Community Index
<p>Existing designations</p>	<ul style="list-style-type: none"> • 6761, State Highway 1 - Silverdale to Puhoi, Designations, New Zealand Transport Agency • Proposed Ministry of Education school – Ahutoetoe School, Maryvale Road, Wainui. Designation 4664

Table 8-19: NoR 10 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Predominantly rural, particularly on the north side of the current Wainui Road alignment. Includes lifestyle and low-density residential development, and agricultural uses. • Residential development occurring south of Lynsar Road, in Milldale • Residential development at eastern end of the corridor off Puruatanga Road <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • For the existing urban areas / live zoned land, a low level of change is anticipated, other than intensification envisaged by Plan Change 78. • The draft Milldale North Structure Plan (developer led) anticipates a Neighbourhood Centre at the intersection of Wainui and Upper Ōrewa Roads. • MoE have a significant landholding at the intersection of Wainui and Upper Ōrewa Roads, which is likely to accommodate a school(s) catering to all year levels (unconsented)
Property	<ul style="list-style-type: none"> • Number of properties directly affected by designation – 22 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Fantails Childcare Centre, 411 Wainui Road, Wainui (partly within designation boundary) • Meraki Montessori Primary School (adjoins designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • Likely future Ministry of Education school, 29 Upper Ōrewa Road, Ōrewa (not consented/designated). • Proposed Ministry of Education school – Ahutoetoe School, Maryvale Road, Wainui. Designation 4664 • Public schools in the area are expected to remain and are likely to grow as the population in the area increases. • Childcare and private schools may shift or move but the activity is likely to remain in the area. • It is likely additional community facilities will be provided within the FUZ in response to likely future growth.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Waterloo Creek (tributary to the Ōrewa River), located to the east • Potential natural wetland. See Controls, above. <p><i>Likely Future Environment</i></p>

Features	Description
	<ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Treeland – Exotic-dominated along Ōrewa River (ID N10-S1) Mānuka, Kānuka scrub along Ōrewa River (ID N10-S1) Low value Planted Vegetation – Exotic and Native (amenity) along the corridor. One SEA is present alongside or within 2km of the corridor: SEA_T_3590, Terrestrial – located along Kowhai Road and follows Ōrewa River The freshwater habitat within NoR 10 includes one stream that will be crossed (Ōrewa River), including one stream branch identified as permanent. Freshwater stream habitat values were identified as moderate value (N10-S1). Potential bat habitat was identified within the project area at Ōrewa River. One natural wetland is located along the NoR 10 alignment and is likely to support TAR species. The wetland was identified as high ecological value (N4-W1a). <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> Potential bat habitat supporting potential bat roosting and foraging was identified at Ōrewa River, however bat presence was not detected within the project area. Potential bird habitat including wetlands and stormwater ponds in proximity to the NoR 10 area were identified as potentially supporting TAR species including Banded Rail, Black Shag, Little Black Shag, Little Pied Shag, Pied Shag. Potential bird habitat including wetlands, native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 10 area were identified as potentially supporting TAR species including Long-Tailed Cuckoo and White Heron. Five native lizard species are likely to be present within the NoR 10 area. The NoR 10 area has the potential to support 14 fish species in the Ōrewa River. Of these, 5 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> Giant bully Giant Kōkopu Īnanga Longfin eel Torrentfish <p><i>Existing Environment – District Plan Protected trees</i></p> <ul style="list-style-type: none"> There are two District Plan protected individual trees (Trees 1011 and 1012) within the designation, located at the corner of Wainui Road and Lysnar Road. (Appendix A of the Assessment of Arboricultural Effects in Volume 4)

Features	Description
	<p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
Historic heritage and archaeological values	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 10. There is potential for unrecorded sites to be present.</p> <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	<ul style="list-style-type: none"> Waterloo Creek (tributary to the Ōrewa River) SEAs – indigenous vegetation on the north side of the road. (see Vegetation and Ecology table row, above) <p>Refer Section 11 and Appendices E and F.</p>

8.11 NoR 11 – New Connection between Dairy Flat Highway and Wilks Road

8.11.1 Project Overview

The new connection between Dairy Flat Highway and Wilks Road will connect Dairy Flat Highway (from the Kahikatea Flat Road intersection) to Wilks Road. It will provide an improved east-west connection through the centre of Silverdale West – Dairy Flat Industrial Area to SH1 and connect the future industrial area to SH1 at the new Wilks Road SH1 interchange. This will enable future industrial traffic to connect to SH1 at the new Wilks Road interchange (part of NoR 4), forming a strategic freight route and facilitating access to social and employment opportunities within the industrial land use adjacent to the corridor.



Figure 8-31: New Connection between Dairy Flat Highway and Wilks Road indicative designation footprint

Key features of the proposed corridor include the following:

- Segment 1 (Kahikatea Flat Road to Postman Road Segment) will feature a 2-lane urban arterial (24 m wide corridor) with separated walking and cycling facilities on both sides.
- Segment 2 (Postman Road to SH1) features a 4-lane urban arterial (30 m wide corridor) with separated cycling and walking facilities, two lanes of general traffic and two lanes where priority may be given to freight traffic.
- A 50kph speed environment, controlled access, no parking
- Intersection upgrades at the Kahikatea Flat Road and Postman Road intersections – design and designation boundary allow for roundabouts but the intersection form will be confirmed through the future Outline Plan process. The Wilks Road connection to this new road will be closed, with allowance for a cul de sac provided.
- Allowance for stormwater treatment/attenuation.
- The Wilks Road alignment will intersect the proposed RTC alignment (NoR 1), which runs north-south between Dairy Flat Highway and Postman Road. Design and designation boundaries allow for Wilks Road to bridge over the RTC alignment, however the grade separated crossover will be confirmed through the future Outline Plan process for both projects.

Wilks Road is an existing road providing an east-west connection across SH1 between Dairy Flat Highway and East Coast Road. It does not have an interchange providing a connection to SH1, and is not fit for purpose considering the expected growth anticipated in the area. In particular, the lack of connection to SH1 would likely constrain the viability of the future industrial development anticipated via the Silverdale West Dairy Flat Industrial Area Structure Plan. There are no footpaths along the route. At the western end, the current Wilks Road alignment connects to Dairy Flat Highway approximately 830m north of the intersection of Dairy Flat Highway and Kahikatea Flat Road. The proposed NoR 11 alignment provides a more direct east-west connection to the intersection of Kahikatea Flat Road and Dairy Flat Highway.

The proposed designation footprint in Figure 8-31 shows the envelope required to upgrade, extend, operate and maintain Wilks Road and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes, and tie-ins with Dairy Flat Highway, Postman Road, and Runway Rise.

8.11.2 Indicative Cross Sections

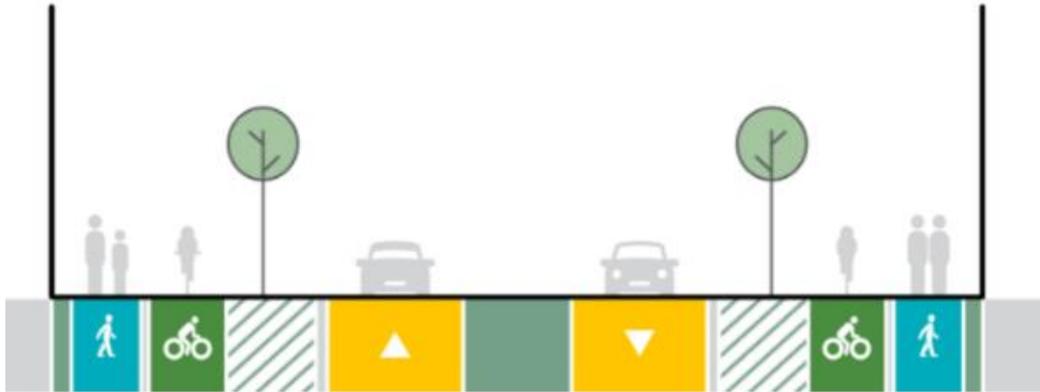


Figure 8-32: Indicative design between Kahikatea Flat Road and Postman Road – 24m cross section

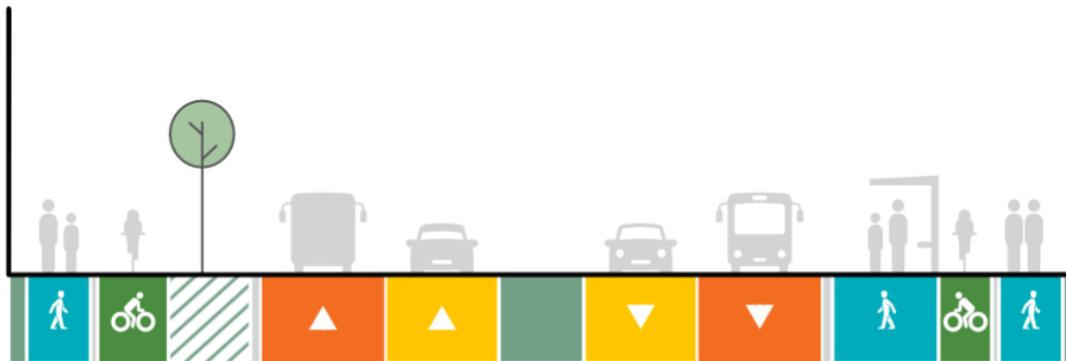
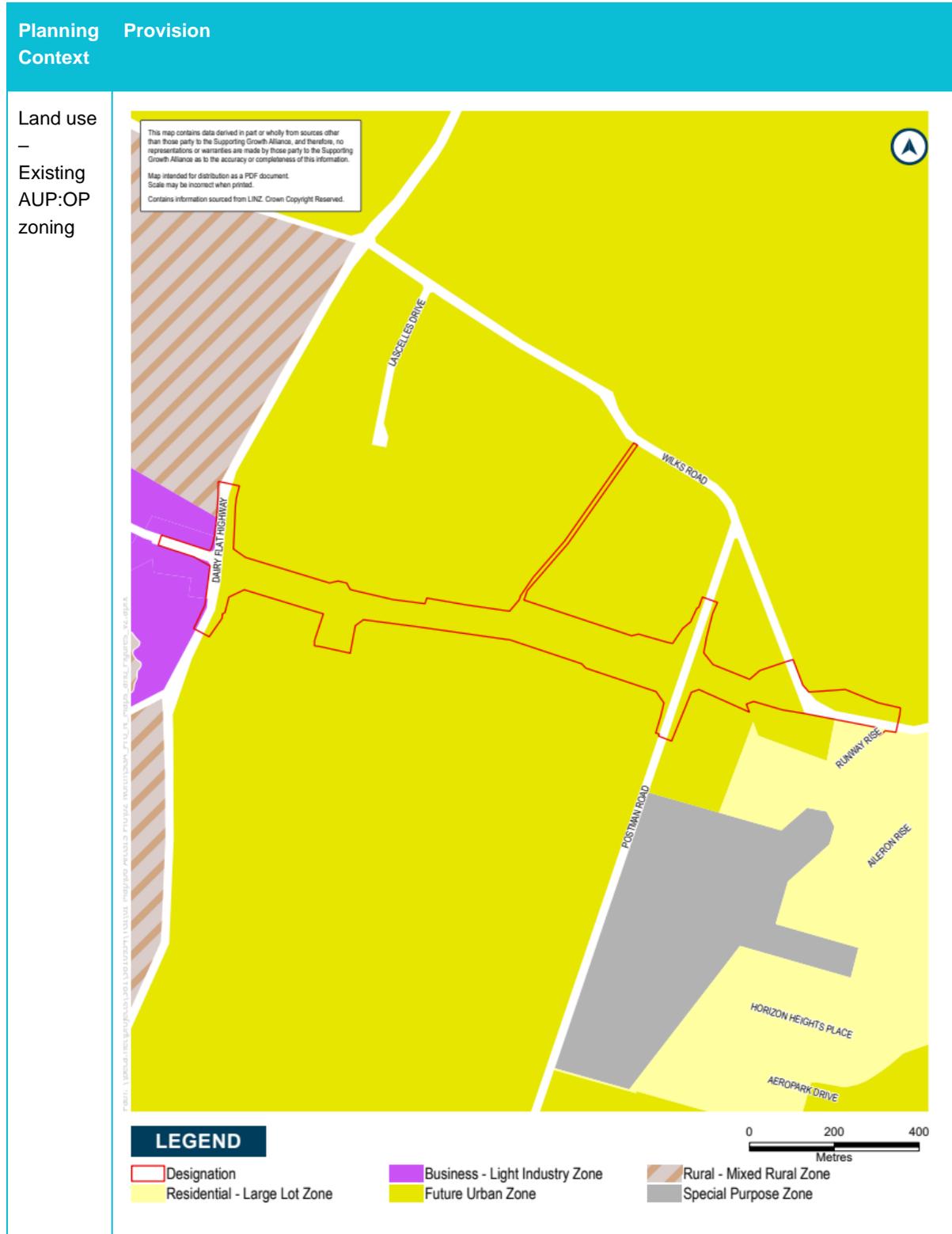


Figure 8-33: Indicative design between Postman Road and the new Wilks Road Interchange – 30m cross section

8.11.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-20: 8NoR 11 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ will likely be rezoned to industrial zones. Other zones are unlikely to change.</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • FUZ • Residential – Large Lot Residential Zone (eastern end) • Rural – Mixed Rural Zone (western end) • Business – Light Industry Zone (western end) <p>The corridor passes through the following precincts:</p> <ul style="list-style-type: none"> • I506 - Dairy Flat Precinct (North Shore Airfield)
AUP:OP Overlays	<ul style="list-style-type: none"> • Airport Approach Surface • Aircraft Noise
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Road along Dairy Flat Highway • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] along eastern boundary
Existing designations	<ul style="list-style-type: none"> • This NoR does not directly interact with any existing surrounding designations.

Table 8-21: NoR 11 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Rural land uses, with FUZ zoning, along the majority of the corridor. Predominantly lifestyle blocks and agricultural uses. Residential Large Lot Zone and Special Purpose Zone associated with North Shore Airport. Business – Light Industry Zone at the western end of the corridor, on the west side of Dairy Flat Highway at the existing intersection of Dairy Flat Highway and Kahikatea Flat Road. Rural – Mixed Rural Zone beyond the Business Zone, to the west of Dairy Flat Highway. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> FUZ will likely accommodate industrial development. Zoning and land uses associated with North Shore Airport are unlikely to change. Business and Rural Zones are unlikely to change.
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 33 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> North Shore Airport, 270/2684 Postman Road, Dairy Flat (nearby) Small cluster of light industrial uses at the intersection of Dairy Flat Highway and Kahikatea Flat Road, including a petrol station, café, bakery, automotive mechanic, and other agricultural-focused businesses. (some business premises are partly within the designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> The North Shore Airport is expected to remain, and the airport has aspirations to expand to the southwest. It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Rangitōpuni Stream tributaries, located east of Dairy Flat Highway and west of Postman Road Flood prone areas and potential wetlands. See Controls, above. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p>

Features	Description
	<ul style="list-style-type: none"> • The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> • Planted Vegetation – Exotic and Native (amenity) along the corridor • Treeland – Exotic-dominated near proposed intersection with Postman Road • No SEAs are present alongside or within 2km of the corridor. • The freshwater habitat within NoR 11 includes one stream (Rangitōpuni Stream), including two stream branches identified as permanent. Freshwater stream habitat values were identified as having moderate value. • Potential bat habitat was identified within the project area at Rangitōpuni Stream. • A total of three artificial and natural wetlands are located along the NoR 11 alignment, with two of these likely to support TAR species. All wetlands were identified as low ecological value. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> • Potential bat habitat supporting potential bat roosting and foraging was identified at Rangitōpuni Stream, however bat presence was not detected within the project area. • Potential bird habitat including mature and exotic forest and wetlands in proximity to the NoR 11 area were identified as potentially supporting TAR species including North Island Kākā and Spotless Crake • Potential bird habitat including open water, wetlands, stock water and stormwater ponds, native and exotic forest, scrub, farmland and urban areas in proximity to the NoR 11 area were identified as potentially supporting very TAR species including Australasian Bittern, Brown Teal, Grey Duck, Long-Tailed Cuckoo. • Five native lizard species are likely to occur within the NoR 11 area. • The NoR 11 area has the potential to support 11 fish species including the Rangitōpuni Stream. • Of these, 2 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> • Īnanga • Longfin eel <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 11. There is the potential for unrecorded sites to be present.</p> <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>

Features	Description
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	<ul style="list-style-type: none"> Huruhuru (Dairy Stream) Refer Section 11 and Appendices E and F.

8.12 NoR 12 – Upgrade and Extension to Bawden Road

8.12.1 Project Overview

An upgrade and extension to Bawden Road is required to support future urban growth in the area, and to provide a connection between Dairy Flat Highway and the Ō Mahurangi Penlink (Redvale) Interchange in the east (NoR 4), which connects through to Ō Mahurangi (Penlink) (refer Figure 8-34). The corridor will also connect to a likely future town centre in the centre of Dairy Flat next to the RTC alignment.

Bawden Road will be upgraded to a four-lane road (30 m wide), with two lanes for general traffic and two lanes for a frequent transit network. It will be extended at the eastern end to connect through to the Ō Mahurangi Penlink (Redvale) Interchange (part of NoR 4). Walking and cycling facilities are proposed on both sides. The corridor will assist in providing an all-mode network with improved connectivity to the planned growth within Dairy Flat, facilitating access to the land use adjacent to the corridor as well as the strategic motorway network via the Ō Mahurangi Penlink (Redvale) Interchange (part of NoR 4) located at the eastern end of Bawden Road.

Bawden Road is an existing road with two lanes (one in either direction), which is not considered fit for purpose in light of the anticipated growth expected to occur in the area. There are no footpaths along the route. The road forms a key east-west connection across SH1, but does not currently provide a connection onto SH1.

Key features of the proposed upgrade/extension include:

- Road intersects with the RTC. The road is likely to go under the RTC (grade separated crossing).
- Revised alignment of Bawden Road at southern end to move the intersection with Dairy Flat Highway out of the floodplain. Large bridge assumed over Huruhuru (Dairy Stream) for flood resilience.
- Upgrades to the intersections at Dairy Flat Highway, Dairy Stream Road and Top Road.
- Allowance for stormwater treatment/attenuation
- 50kph speed environment, controlled access, no parking.

The proposed designation footprint in Figure 8-34 shows the envelope required to upgrade, extend, operate and maintain Bawden Road and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes, and tie-ins with Dairy Flat Highway, Grace Hill Drive, Dairy Stream Road, Oregon Park, Bobs Way, Top Road, and the eastern extent of the existing Bawden Road alignment.

8.12.2 Indicative Cross Section



Figure 8-35: Indicative design – 30m four lane cross section

8.12.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-22: NoR 12 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ will likely be rezoned to urban residential and town centre zones with high density of six storeys or more around the future RTC station and future town centre in this area (as per NPS:UD direction).</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • FUZ <p>There are no precincts impacted by this designation footprint.</p>
AUP:OP Overlays	<ul style="list-style-type: none"> • Airport Approach Surface • National Grid Corridor
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads along Dairy Flat Highway • Macroinvertebrate Community Index
Existing designations	<ul style="list-style-type: none"> • 6777, Road - Wēiti Crossing, Designations, New Zealand Transport Agency • 6760 State Highway 1 - Redvale to Silverdale, Designations, New Zealand Transport Agency

Table 8-23: NoR 12 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Rural land uses, with FUZ zoning, along the majority of the corridor. Predominantly rural properties, including lifestyle and low-density residential development, and agricultural uses. <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> • FUZ will likely accommodate urban residential development • The future Dairy Flat town centre is likely to be located just to the south of the alignment, close to the RTC corridor
Property	<ul style="list-style-type: none"> • Number of properties directly affected by designation – 84 (excluding legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> • Southstar Equestrian Facility <p><i>Likely Future Environment</i></p>

Features	Description
	<ul style="list-style-type: none"> It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Huruhuru (Dairy Stream) tributaries located towards the eastern boundary with NoR 4 and southern boundary with NoR 8 Flood prone areas and potential natural wetlands <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment</i></p> <p><i>Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Exotic Forest near proposed intersection with Top Road Exotic Scrub adjoining margin of a tributary of Huruhuru (Dairy Stream) (ID N4-S18) Planted Vegetation – Exotic and Native (amenity) along the corridor Treeland – Exotic-dominated adjoining tributaries of Huruhuru (Dairy Stream) (ID N12-S1a, ID N12-S4a) NoR 12 has one main stream – the Huruhuru (Dairy Stream), which has eight permanent stream branches. Freshwater stream habitat values range from low to moderate. Ten artificial and natural wetlands are located along the NoR 12 alignment, with eight of these likely to support TAR species. All wetlands are assessed as having low ecological value. <p><i>Species</i></p> <ul style="list-style-type: none"> Potential habitat which could support bat roosting and foraging was identified at Huruhuru (Dairy Stream), however bat presence was not detected within the project area. Potential bird habitat including mature and exotic forest and wetlands in proximity to the NoR 12 area were identified as potentially supporting TAR species including North Island Kākā and Spotless Crake Australasian Bittern, Brown Teal, Dabchick, Grey Duck and Long-tailed Cuckoo. Five native lizard species are likely to be present in the NoR 12 area. The NoR 12 area has the potential to support seven fish species within Huruhuru (Dairy Stream) including Īnanga and Longfin eel. <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>

Features	Description
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological sites or historic areas, structures or buildings within the extent or within 200m of NoR 12. There is the potential for unrecorded sites to be present.</p> <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p>
<p>Traffic and Transport</p>	<p>Existing and likely future traffic and transport context is discussed at Section 7.2.</p>
<p>Areas of cultural value</p>	<p>Huruhuru (Dairy Stream) Refer Section 11 and Appendices E and F.</p>

8.13 NoR 13 – Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange

8.13.1 Project Overview

An upgrade to East Coast Road is proposed, between the Hibiscus Coast Highway at Silverdale in the north, and the Ō Mahurangi Penlink/Redvale in the south (just north of where East Coast Road intersects with Bawden Road). East Coast Road will be upgraded and remain a two-lane arterial, with provision for separated walking and cycling on both sides within urban areas, and on one side (west side) in the central rural section.

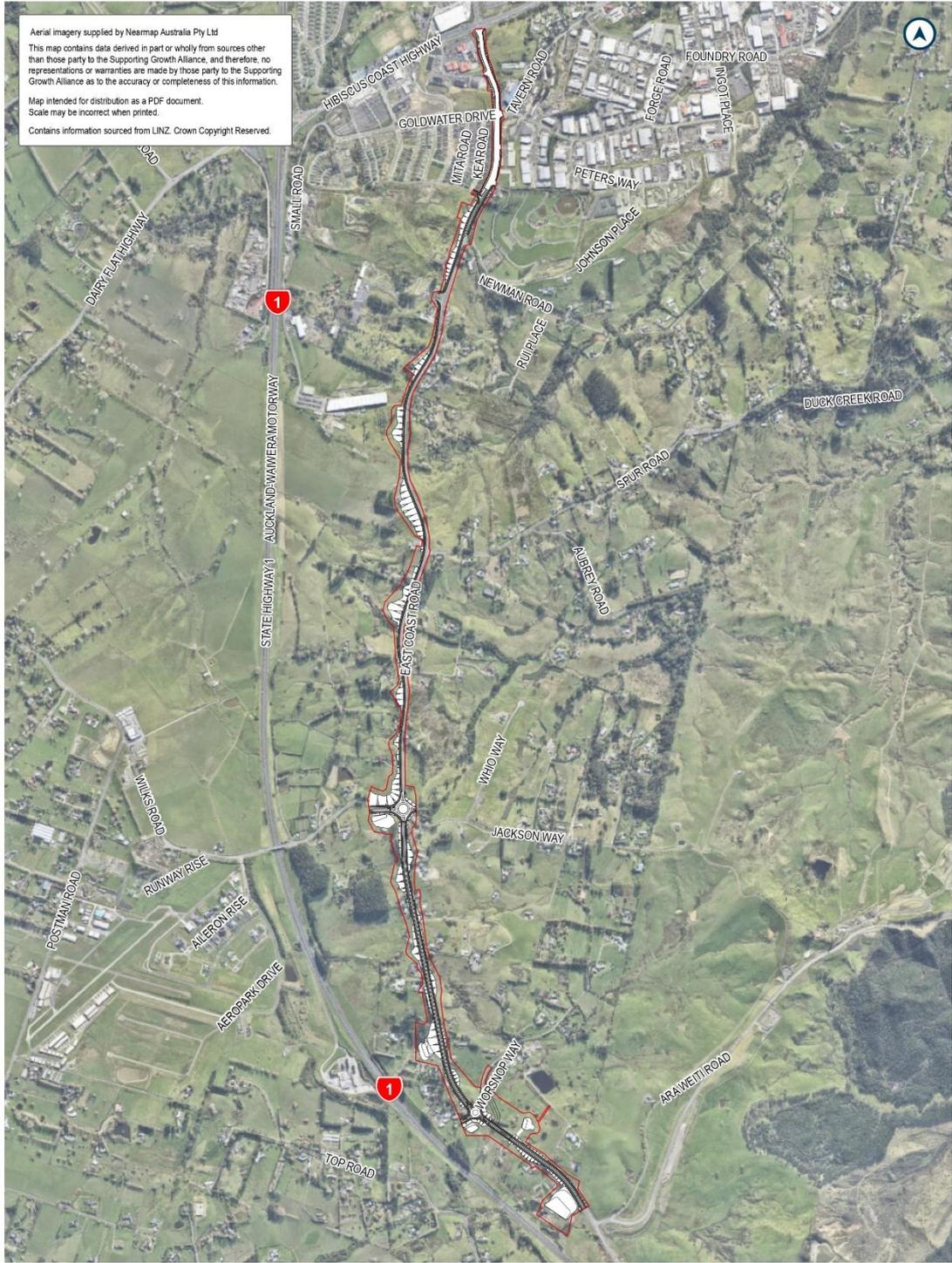


Figure 8-36: Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange indicative designation footprint

The upgrade is required to support future and currently occurring urban growth in the area and to provide resilience to SH1, forming an alternative corridor and providing connectivity to SH1 in a number of locations (including the interchanges at Wilks Road and Ō Mahurangi Penlink (Redvale)). It will also provide a high-quality safe and direct active mode connection between Silverdale and Redvale. AT will be the requiring authority.

This project is split into three segments for design purposes. Key features of the proposed upgrade include:

- Upgrade to the footpath on the west side and new footpath on east side between Hibiscus Coast Highway and Silverwater Drive.
- Segment 1 (from Silverwater Drive to Newman Road) features a two-lane urban arterial upgrade (24 m) with separated walking and cycling facilities on both sides. 50 kph speed environment (reduced from 80 kph).
- Segment 2 (from Newman Road to Jackson Way, where one or both sides are rural) has a shared path to the west only, with no works to the existing carriageway and no swales. 60 kph speed environment (reduced from 80 kph).
- Segment 3 (from Jackson Way to the end of the FUZ) features a 24 m wide cross section with walking and cycling on both sides. 50 kph speed environment (reduced from 80 kph).
- Upgraded intersections at Hibiscus Coast Highway, Forge Road, Newman Road, Spur Road, Wilks Road, Jackson Way, Worsnop Way and Ō Mahurangi (Penlink).
- Allowance for stormwater treatment/attenuation – Segments 1 and 3.

East Coast Road is an existing road providing a key north-south connection between Silverdale in the north, and Redvale in the south. It also provides a connection to Stillwater in the east and Dairy Flat in the west. There are no footpaths along the route.

The proposed designation footprint in Figure 8-36 shows the envelope proposed to upgrade, operate and maintain East Coast Road and all its ancillary components, including construction areas, stormwater infrastructure, batter slopes and retaining walls, and tie-ins with NoR 4 – SH1 Improvements, Silverwater Drive, and Hibiscus Coast Highway (Active Mode Path).

The proposed designation overlaps with the new Wilks Road interchange designation at the East Coast Road/Wilks Road roundabout, which is also part of NoR 4.

8.13.2 Indicative Cross Sections

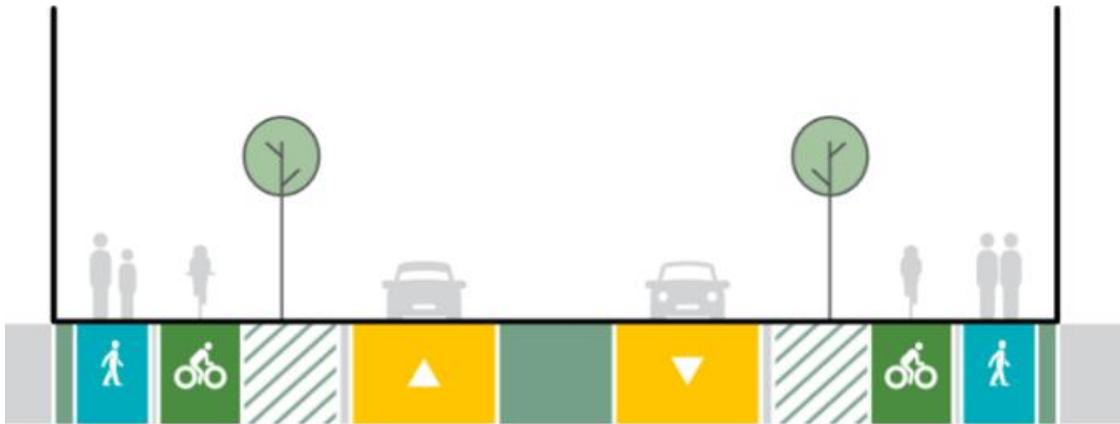


Figure 8-37: Between Silverwater Drive and Newman Road and Between Jackson Way and Ō Mahurangi (Penlink) Interchange (24m)

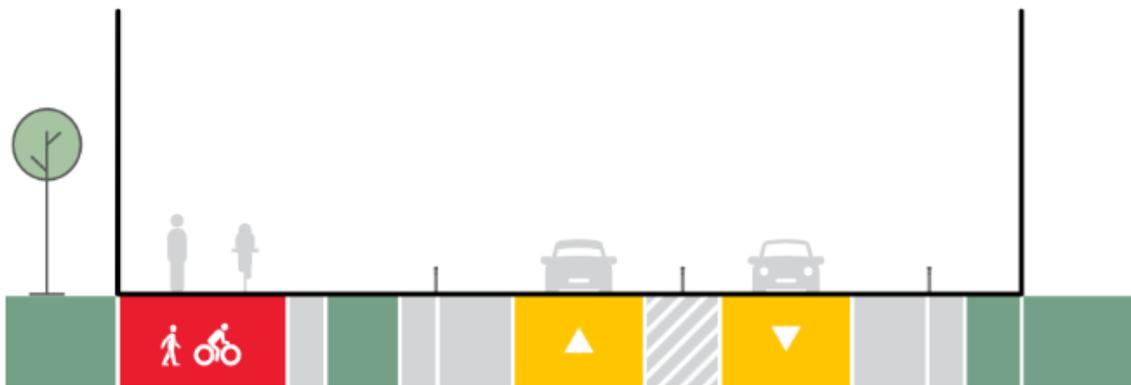
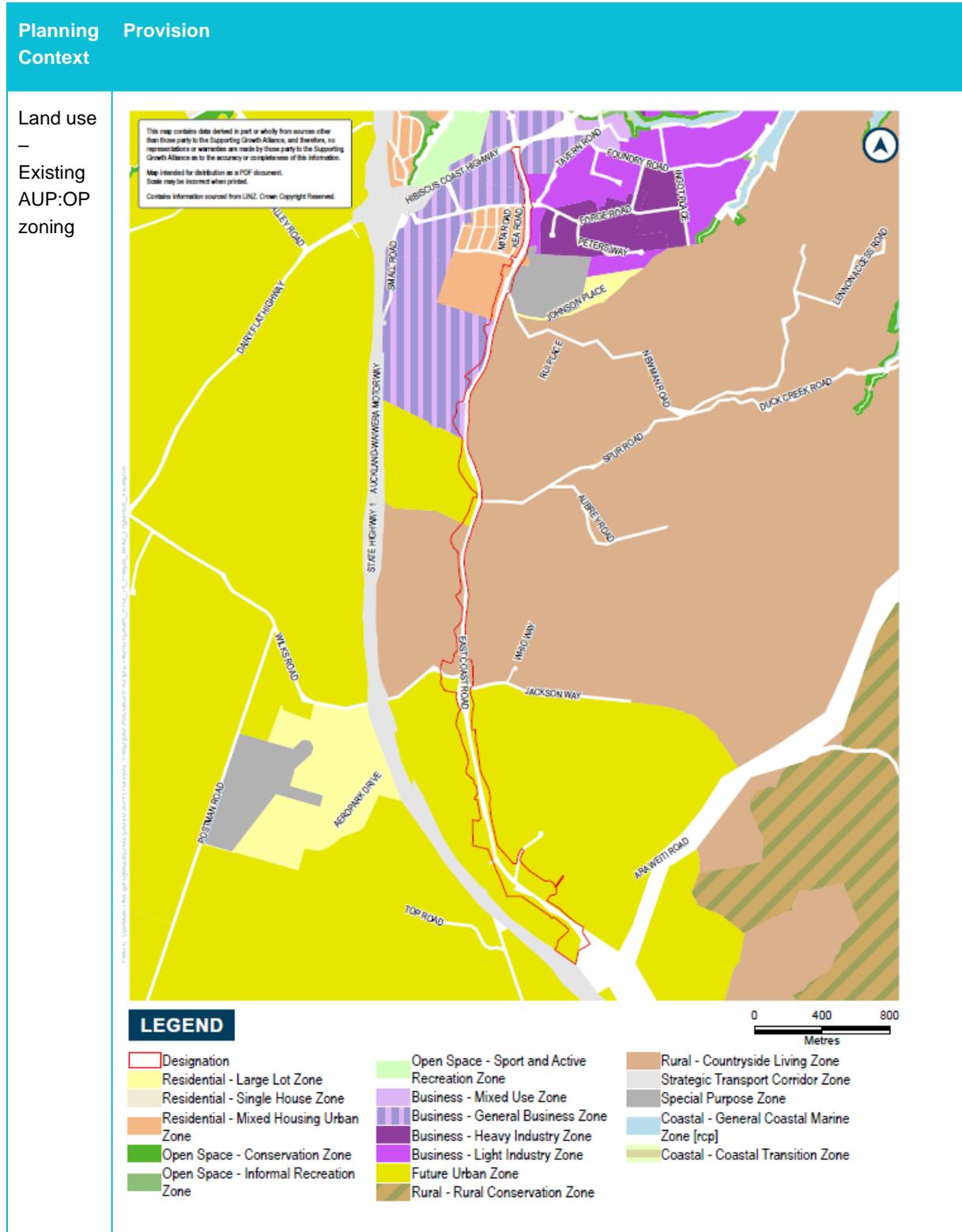


Figure 8-38: Between Newman Road and Jackson Way

8.13.3 Existing and Likely Future Environment

This section provides a summary of the relevant receiving environment features within which the project will be constructed, operated and maintained.

Table 8-24: NoR 13 Planning Context



Planning Context	Provision
Current and Likely Future Zoning	<p>FUZ will likely be rezoned to urban residential zones. Other zones are unlikely to change.</p> <p>The corridor passes through the following zones:</p> <ul style="list-style-type: none"> • Business – General Business Zone in Silverdale • Business – Light Industry Zone in Silverdale • FUZ in Silverdale and Stillwater • Residential – Mixed Housing Urban Zone in Silverdale • Rural – Countryside Living Zone in Silverdale and Stillwater • Special Purpose Zone in Silverdale, related to Auckland Memorial Park and Cemetery <p>The mid section of the existing alignment of East Coast Road is located outside the Rural Urban Boundary (RUB).</p> <p>The corridor passes through the following precincts:</p> <ul style="list-style-type: none"> • I536 – Silverdale 2 – Snowplanet • I537 – Silverdale 3 – Hibiscus Coast Gateway
AUP:OP Overlays	<ul style="list-style-type: none"> • Airport Approach Surface • Aircraft Noise • National Grid Corridor
AUP:OP Controls	<ul style="list-style-type: none"> • Arterial Roads • Macroinvertebrate Community Index • Stormwater Management Area Control – Flow 1 [rp] along northern extent • Subdivision Variation Control
Existing designations	<ul style="list-style-type: none"> • 6777, Road - Wēiti Crossing, Designations, New Zealand Transport Agency • 6760 State Highway 1 - Redvale to Silverdale, Designations, New Zealand Transport Agency • 8895, Substation, Designations, Vector Ltd

Table 8-25: NoR 13 Receiving Environment Summary

Features	Description
Land use and Urban Form	<p><i>Existing Environment</i></p> <p>The existing East Coast Road alignment passes through a mix of land uses and topography, including:</p> <ul style="list-style-type: none"> • A mix of residential, business and industrial uses are present at the northern extent of the corridor. • The existing corridor generally follows the ridgeline, with steep topography falling away on both sides, through the northern portion of the alignment.

Features	Description
	<ul style="list-style-type: none"> An electricity substation is present to the west of the existing corridor, close to the intersection with Spur Road Future Urban and Countryside Living Zones currently support rural uses <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> For the existing urban areas / live zoned land, including Countryside Living Zone, a low level of change is anticipated, other than intensification envisaged by Plan Change 78 (Refer Section 7.1) FUZ will likely accommodate residential development
Property	<ul style="list-style-type: none"> Number of properties directly affected by designation – 86 (excludes legal roads)
Community and recreational facilities	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Snowplanet, Small Road, Silverdale (partly within designation boundary) Auckland Adventure Park, East Coast Road, Stillwater (partly within designation boundary) Auckland Memorial Park and Cemetery, East Coast Road, Silverdale (partly within designation boundary) Adventure Kids Early Learning Centre, 2104A East Coast Road, Stillwater (partly within designation boundary) <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> The existing cemetery is expected to remain. Preschools and childcare may shift or move but the activity is likely to remain in the area. It is likely additional community facilities will be provided within the FUZ, in response to likely future growth.
Watercourses/Freshwater environment	<p><i>Existing Environment</i></p> <ul style="list-style-type: none"> Wēiti River tributaries Ōkura River tributaries Huruhuru (Dairy Stream) tributaries, located at southern end Flood prone areas and potential wetlands <p><i>Likely Future Environment</i></p> <ul style="list-style-type: none"> Refer Section 7.5.
Vegetation and ecology	<p><i>Existing Environment – Habitat</i></p> <ul style="list-style-type: none"> The following terrestrial vegetation types are present within the project area: <ul style="list-style-type: none"> Exotic Scrub near Spur Road Planted Vegetation – Exotic and Native (amenity) along the corridor Treeland – Exotic-dominated near proposed intersection with Wilks Road and adjoining a tributary of Huruhuru (Dairy Stream) (ID N5-S1c)

Features	Description
	<ul style="list-style-type: none"> • No SEAs are present alongside or within 2km of the corridor. • The freshwater habitat within NoR 13 includes one stream that will be crossed (Huruhuru (Dairy Stream)), including five permanent stream branches. • The streams were assessed as having moderate value. • Potential bat habitat was identified within the project area at Huruhuru (Dairy Stream). • A total of four artificial and natural wetlands are located along the NoR 13 alignment, with all four likely to support TAR species. All wetlands were identified as low ecological value. <p><i>Existing Environment – Species</i></p> <ul style="list-style-type: none"> • Area wide bat surveys have been undertaken and bat presence was detected 1722 East Coast Road immediately north of Ō Mahurangi (Penlink) interchange. • Potential bat habitat supporting potential bat roosting and foraging was identified at Huruhuru (Dairy Stream). • Potential bird habitat including mature and exotic forest and wetlands in proximity to the NoR 13 area were identified as potentially supporting TAR species including North Island Kākā, Spotless Crane, Australasian Bittern, Brown Teal, Grey Duck and Long-tailed Cuckoo. • Five native lizard species are likely to be present in the NoR 13 area. • The NoR 13 area which has the potential to support seven fish species in the Huruhuru (Dairy Stream). • Of these, 2 species have high ecological value/TAR status, including: <ul style="list-style-type: none"> • Īnanga • Longfin eel <p><i>Existing Environment – District Plan Protected trees</i></p> <ul style="list-style-type: none"> • There are seven District Plan protected individual trees (4 Manuka and 3 Gum trees) and three groups of trees within the designation boundary, located adjacent to 2200 East Coast Road and 31 Blanc Road (Trees 1305 and 1306), 2118-2150 East Coast Road (Group 1301), 2086 East Coast Road (Group 1309) and 2076/2086 East Coast Road (Group 1310). (Appendix A of the Assessment of Arboricultural Effects in Volume 4) <p><i>Likely Future Environment</i></p> <p>Refer Section 7.3 – Planning and Environmental Context - Ecology</p>
<p>Historic heritage and archaeological values</p>	<p><i>Existing Environment</i></p> <p>There are no recorded archaeological or historic areas, structures or buildings within the extent of NoR 13. One archaeological site is present within 200m of NoR 13:</p>

Features	Description
	<ul style="list-style-type: none"> R10/1126 – Stables. This site is a late 19th century or turn of the century house that was demolished in the 1990s. This site is outside of the proposed designation boundary. <p><i>Likely Future Environment</i></p> <p>The existing environment as it relates to historic heritage and archaeological values is likely to remain the same in the future, except where there are future discoveries of unrecorded archaeology.</p> <p>The indicative alignment of East Coast Road (NoR 13) and Wilks Road (NoR 4) has sought to minimise alteration of existing contours in the vicinity of a puke identified by Manawhenua.</p>
Traffic and Transport	Existing and likely future traffic and transport context is discussed at Section 7.2.
Areas of cultural value	<ul style="list-style-type: none"> Culturally important landforms (puke) near Wilks Road and East Coast Road intersection. <p>Refer Section 11 and Appendices E and F.</p>



PART D - ASSESSMENT OF EFFECTS

The scope of this assessment of effects under s171 and s181(2) of the RMA is set out at Section 6.5.

9 Positive Effects of the North Projects

The North Projects will play a vital role in the success of new neighbourhoods by providing safe, accessible and sustainable travel choices that connect communities and encourage a substantial shift from private vehicles to public transport and active modes. The early protection of these strategic transport corridors coupled with the development of the North Projects, will provide for the following outcomes at a network-wide level:

- **Supporting and responding to planned growth:** identifying and designating improved and new transport corridors/stations will support Auckland Council's growth aspirations for the North growth areas of Auckland, including intensification and density of growth, resulting in more efficient urban land development.
- **Improved access to economic and social opportunities and resilience of the strategic transport network:** Protecting improved and new transport corridors/stations will:
 - improve travel choices and connectivity, providing access to the critical economic and social needs of the existing and future communities
 - reduce an over-reliance on existing strategic transport corridors
 - better align the form and function of existing transport corridors with the planned urban form, and
 - support local and inter-regional freight movements.
- **Substantial Mode Shift:** The North Projects will support mode shift from private vehicles to public transport and active modes, which will provide for greater people moving capacity and greater travel choice for those that will live in the North as the area grows; with associated benefits in terms of a slight overall decrease in vehicle kilometres travelled (VKT) when compared to the Do Minimum¹² scenario.
- **Land use and transport integration:** Integrating transport solutions with Council's aspirations for land use and urban form can provide for growth in a way that delivers high quality urban outcomes, placemaking and enhanced liveability - including the desire for a quality, connected, compact urban environment which is well serviced by public transport and active transport options.
- **Improved safety:** Protecting improved and new transport corridors will help to address existing and increasing safety risks on transport corridors as growth areas urbanise, including:
 - improved safety for all transport modes, including urbanisation of existing corridors with a drop in speed, and intersection upgrades
 - provision of dedicated space for cyclists and pedestrians to safely accommodate these modes
 - specific safety improvement projects, such as the upgrade to Dairy Flat Highway between Dairy Flat and Albany village which includes median and side safety barriers

¹² The 'Do Minimum' scenario is defined as the least effort to maintain the existing transport system, including maintenance and operation of the existing transport system. The assumption includes the same quantum of land use development.

- a reduction in private vehicle travel as a result of mode shift towards public transport and walking and cycling.
- **Sustainable outcomes:** Protecting improved and new transport corridors will support the Government's policy shift towards more sustainable outcomes. This includes a reduction in greenhouse gas emissions (when compared to the Do Minimum scenario) and improved climate change resilience - through effective land use and transport integration and supporting mode shift towards more sustainable travel choices such as public transport and walking and cycling.
- **Infrastructure integration:** Integrating the transport response with the needs and opportunities of network utility providers to provide a better whole of system outcome, as Te Tupu Ngātahi will provide space for utility provision within its conceptual design.

More details of positive effects are provided in the following sections of this AEE.

10 Traffic and Transport Effects and Mitigation

The potential effects of the North Projects on traffic and transportation have been assessed in the Assessment of Transport Effects report provided in Volume 4. The effects are considered in this section and should be read in conjunction with that report. Effects that are common across all the NoRs are summarised first in section 10.2. NoR-specific are then summarised in section 10.3.

Traffic noise and vibration effects are considered separately at Section 16.

10.1 Methodology

The transport assessment considered potential effects on the transport system both during construction as well as effects once the North Projects are operational. The focus of the Te Tupu Ngātahi programme is on long-term route protection of the transport systems required to support the planned growth areas. This means that implementation of the North Projects is not imminent and would be preceded by updated implementation investment and design processes. This focus on longer-term route protection for longer-term implementation means that the assessment focused less on detailed analysis of the existing environment and more on the likely future (urbanised) environment and potential effects of the North Projects.

The North Projects have been designed as an overall integrated system, but in general, individual projects can typically be delivered separately. As such the assessment considers the North Projects individually – with commentary on interdependencies where appropriate.

Based on the indicative construction methodology (refer Section 6.4 and AEE Appendix C) an assessment of construction effects was completed for the North Projects sufficient to support each NoR. This considered:

- An overview of key considerations including speed, potential impacts to pedestrians and cyclists and property access.
- Identification of any works that should not occur at the same time.
- Assessment of potential conflict areas with vulnerable road users that will need specific mitigation within a Construction Traffic Management Plan (CTMP).

Potential operational transport effects were assessed using:

- Transport planning assessment of expected outcomes and effects.
- Transport modelling to inform demands and network performance.
- Alignment with various policy documents.

10.2 Traffic and Transport Effects across all NoRs

10.2.1 Positive Traffic and Transport Effects

Te Tupu Ngātahi has identified a network that provides for a comprehensive transport solution that responds to planned growth in the North. The purpose of the North Projects is to enable a network of transport corridors that can be implemented progressively (under separate NoRs) in coordination with surrounding land use development, to collectively enable:

- Long term development of a low carbon transport system to support future growth and facilitate mode shift from private vehicles to public transport and active modes to reduce greenhouse gas emissions.
- A slight overall reduction in VKT when compared to a 'do-minimum' (no network) approach to servicing the anticipated level of growth in the North.
- Transport corridors which maximise opportunities for walk-up catchments to public transport interchanges and a high frequency local bus network.
- Increased reliability for public transport and additional resilience via urbanised alternative routes.
- Real travel choice facilitating mode shift, with high quality, attractive alternatives to the private vehicle. This includes a contiguous, legible active mode network that connects people to key destinations and encourages active mode trips within the compact urban area.
- An area-wide focus on safety through a holistic set of measures including Road to Zero safety principles, fully separated cycling facilities, well designed intersections and sufficient space for all modes to interact safely.
- Desired urban form, particularly in the form of land use integration surrounding transit stations, to achieve a well-functioning, compact urban form which aligns with the Auckland Council's aspirations for more efficient urban intensification which is well serviced by public transport and active transport options.
- Improved connectivity and access via a network which enables good accessibility for all users between housing, employment, education and community services, and natural spaces, via all modes.

Therefore, all of the proposed transport corridors will have positive operational effects overall on the transport network. In particular, the network is proposed to result in significant positive transport effects on walking, cycling and public transport. Further details of positive operational effects are identified at Section 10.2.3.

10.2.2 Construction Traffic and Transport Effects

The majority of works required for the North Projects will likely occur adjacent to or on live carriageways. This means that temporary traffic management will be required during the construction phase. The scale of temporary traffic management to delineate live traffic away from the construction zones is largely dependent on the various stages and requirements of the construction activities. It is expected that short term temporary road closures for nights or weekends may be required for some specific activities, such as bridges and viaducts, road surfacing, traffic switches and gas relocation. Other activities may require stop/go or contraflow traffic management, such as drainage, utility relocation, survey and investigation work. These temporary construction effects are expected to be managed via the New Zealand Temporary Traffic Management Guide (NZTTMG).

The CTMP prepared for each of the North Projects will confirm the most appropriate management measures based on the future traffic environment on each specific corridor and the adjacent road network, including the likely effects of traffic management methods. This will take into account the level of growth that has occurred in the North, the availability of the alternative routes, and any additional sensitive land use activities. In particular, careful planning will need to be applied to manage construction disruptions to SH1, including from upgrades to SH1 and its interchanges, and the adjacent construction of the RTC corridor. It is noted that similar scale construction works have been carried out across the Auckland region previously, and the CTMPs prepared for these projects closer to the time of construction will appropriately manage construction effects.

The construction of the North Projects will each require significant earthworks. Final cut and fill volumes will be confirmed following detailed design, prior to construction, and will also be subject to regional consents. The construction traffic movements to accommodate the earthworks will likely result in an increase of traffic volumes on construction routes used during the construction period of each of the North Projects.

The staging of the North Projects has yet to be determined, and subsequently there is uncertainty associated with any predicted construction methodology and associated traffic routes.

Notwithstanding this, it is considered that given the connectivity to the strategic network and the available capacity in the network, construction traffic will be able to be readily accommodated. It is noted that access to compound sites / laydown areas and construction zones for construction vehicles, plant and materials will be via site access points identified as part of future CTMPs. It is anticipated that the routes for construction traffic will likely be limited to arterial corridors/SH1 and intersections with the provision of adequate vehicle tracking.

10.2.2.1 Speed Limits

To maintain the safety of all road users, implementation of a safe and appropriate temporary speed limit will be required during the construction period within the extent of the works, and along the construction routes if needed. This should be in accordance with the latest traffic management standards at the time of construction. These recommended measures and other measures highlighted in the CTMP are expected to reduce the potential safety risks that may be associated with construction traffic.

10.2.2.2 Pedestrians and Cyclists

The existing provision for pedestrians and cyclists is variable across the network. It is likely that the demand for these modes will increase if urbanisation occurs prior to construction, but future parallel collectors could also be used as an alternative route. Therefore, prior to construction when a greater level of detail is available about surrounding facilities and land use activities, a CTMP will be prepared for each stage of work. Residents and stakeholders should be kept informed of construction times and progress, and general observations of pedestrian and cyclist activity will be used to inform appropriate traffic management measures in the CTMP.

10.2.2.3 Property Access for Residents and Businesses

During the time of construction, there will be temporary traffic management controls such as temporary concrete or steel barriers. Existing driveways that remain during construction will be

required to have temporary access provision. It is anticipated that the contractor should undertake a property-specific assessment of any affected driveways and provide temporary access arrangements if required. The temporary access should ensure the ability for residents to safely access and exit the property. These requirements should be captured in the conditions of each NoR.

10.2.2.4 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. It is anticipated that the contractor will undertake a detailed assessment of any affected parking and, if necessary, provide alternatives, particularly for mobility parking or loading spaces. The loss of any general public parking will need to consider the duration of effects and the impact on specific businesses. Where temporary alternatives are necessary, this should ensure the ability for the public to safely access these spaces. These requirements should be captured in the CTMP.

10.2.2.5 Parallel Construction Projects

The anticipated timing of each of the North Projects varies, is uncertain, and will depend on when urbanisation occurs. There is the potential that some of the corridors may be constructed at the same time, depending on later implementation decisions. This would likely affect the amount of construction traffic on the network. Where necessary, it is considered that this could be adequately managed through the well-established CTMP processes of Waka Kotahi and AT, once more detailed staging of construction works is known and through the Network Integration Management Plan (NIMP) which is a requirement in the conditions. Construction in parallel could potentially provide some efficiencies by enabling combined compound sites / laydown areas or reducing transport of spoil (including further efficiencies in cut and fill transport across multiple sites).

10.2.2.6 Land Use Activities that will need Further Consideration in the CTMP

Significant land use change is expected across much of the North area, with the exception of the rural sections of Dairy Flat Highway (NoR 9) and East Coast Road (NoR 13), and adjacent SH1 near Albany (NoRs 1 and 4). As such, traffic management controls will be confirmed prior to works to reflect the land use considerations at that time.

Table 10-1, below, provides a summary of the key land uses or activities that have the potential to be sensitive to construction transport impacts, and that are currently located adjacent to the transport corridors. These will need specific consideration during the development of the CTMP, which will also consider other land uses that have been established at the time of development of the CTMP. This could include restricted truck movements during school pick up and drop off, or additional controls at key access locations.

Table 10-1: Sites for specific consideration within future CTMP

NoR	Corridor	Sites for Specific Consideration
1	New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling	<ul style="list-style-type: none"> • Business premises located along the corridor • New Zealand Equestrian Association

NoR	Corridor	Sites for Specific Consideration
	path between Bawden Road and Dairy Flat Highway	
2	New Milldale Station and Associated Facilities	<ul style="list-style-type: none"> • Highgate Business Park area • Milldale residential area
3	New Pine Valley Station and Associated Facilities	<ul style="list-style-type: none"> • No specific sites identified
4	SH1 Improvements including new walking and cycling path between Albany and Grand Drive (alteration to Designations 6751, 6759, 6760, 6761)	<ul style="list-style-type: none"> • Business premises located along the corridor • Fairview Lifestyle Village • SH1 Northbound Motorway Service Centre • Meraki Montessori Primary School
5	New SH1 crossing at Dairy Stream	<ul style="list-style-type: none"> • No specific sites identified
6	New connection between Milldale and Grand Drive	<ul style="list-style-type: none"> • Future school to be located near the intersection of Upper Ōrewa Road and Wainui Road
7	Upgrade to Pine Valley Road	<ul style="list-style-type: none"> • No specific sites identified
8	Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	<ul style="list-style-type: none"> • Dairy Flat Primary School • Commercial Properties at Kahikatea Flat Road intersection • Dairy Flat Community Hall
9	Upgrade to Dairy Flat Highway between Dairy Flat and Albany	<ul style="list-style-type: none"> • No specific sites identified
10	Upgrade to Wainui Road	<ul style="list-style-type: none"> • Future school likely to be located near the intersection of Upper Ōrewa Road and Wainui Road
11	New connection between Dairy Flat Highway and Wilks Road	<ul style="list-style-type: none"> • North Shore Airport Precinct
12	Upgrade and Extension to Bawden Road	<ul style="list-style-type: none"> • No specific sites identified
13	Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) interchange	<ul style="list-style-type: none"> • Auckland Memorial Park and Cemetery • Local business premises

10.2.3 Operational Traffic and Transport Effects

As noted in Section 10.2.1, all of the North Projects have been assessed to have positive operational effects on the transport network. Specific operational effects (positive and adverse) are summarised below:

10.2.3.1 Corridor Safety Effects

The design of all Projects has been undertaken with consideration of the latest safety guidance. This includes AT's Vision Zero and Waka Kotahi's Road to Zero. The new and upgraded corridors are expected to result in positive effects on safety due to the:

- New walking and cycling facilities (including separation), resulting in improved protection for vulnerable road users.
- New walking and cycling crossing facilities (crossing the arterials/motorways) at key intersections, resulting in a significantly safer environment for all road users.
- Appropriate urban speeds on the upgraded and new arterials and consequential reductions in the risk of death or serious injuries.

It is anticipated walking and cycling demands will increase significantly as the North urbanises and develops. Given the expected traffic volumes along the corridors, there will be a safety risk for active mode users travelling along the corridors without appropriate facilities. Therefore, the projects have been designed to 50 – 60km/h posted speeds and provide segregated walking and cycling facilities to reduce the likelihood and severity of a potential crash.

The indicative designs are well aligned with the transport safety principles from AT and Waka Kotahi. They will provide safe transport corridors and reduce the risk of deaths and serious injuries occurring, and, as such, no adverse road safety effects have been identified.

10.2.3.2 Walking and Cycling Effects

Each transport corridor includes separated active mode facilities and includes sufficient space to provide dedicated pedestrian and cycle crossing facilities. The majority of the North Projects are proposed to have separated walking and cycling paths (together comprising active mode facilities) on both sides of the corridor, which connect with expected future adjacent active mode facilities. Some corridors indicatively propose to have alternative active mode facilities for walking and cycling – such as active mode facilities delivered as shared walking/cycling paths rather than separated walking and cycling paths - due to environmental, zoning, and engineering constraints.

Overall, the transport corridors will have a number of significant positive effects on walking and cycling as they will:

- Significantly reduce the likelihood and exposure to potential crashes as the active mode facilities will enable safe movement for vulnerable road users along and across the corridors.
- Improve integration with the future active mode network, resulting in improved east-west and north-south walking and cycling connectivity.
- Lead to environmental and health benefits as a result of increased active mode trips and reduced reliance on vehicle trips.

- Support growth adjacent to the corridors and significantly improve safety and access to employment and social amenities.

10.2.3.3 Public Transport Effects

The provision of the RTC (NoR 1) will support substantial mode shift across the North Projects area, through provision of a safe, high-quality, frequent, well-connected and reliable public transport system which connects the North growth areas with Albany, North Shore, and Auckland's Central City. The positive effects of the RTC will be augmented through a frequent transit network operating on the new and upgraded corridors, widening ridership catchment across the wider North Projects area and extending many of the same benefits of the RTC to the wider Northern catchment. The RTC in conjunction with the wider network will provide improved access to employment and social amenities, and support for a quality, compact urban form adjacent the public transport network (in particular in centres and adjacent stops and stations).

Widening of SH1 (as part of NoR 4) to provide additional lanes between just south of Lonely Track Road and Silverdale Interchange will provide an opportunity for interim bus lanes and long-term managed lanes.

The design of each corridor is intended to support public transport by providing sufficient capacity for public transport, and additional lanes on some key public transport corridors where higher volumes of traffic are anticipated.

No adverse public transport effects have been identified.

10.2.3.4 Effects on Access

All Waka Kotahi corridors within the North Projects (NoRs 1 and 4) are expected to be limited access corridors in future, while all AT corridors (NoRs 5-13) are expected to have controlled access. As the North urbanises, it is expected that future vehicle access to the network will be facilitated primarily by collector road networks within the urbanised area adjacent to each corridor. The collector network is expected to be indicatively identified by Auckland Council through structure planning; and it is expected that these will be subject to change and refinement as developers progress these connections through plan change processes. These will be assessed by standard planning and approval processes through Council.

In terms of existing properties, the overarching design philosophy for the North Projects has been to maintain driveway access where practicable and minimise impacting land for access purposes other than where necessary to re-instate driveways. Where access cannot be maintained, properties have generally been included within the designation footprint, unless they are FUZ zoned where property boundaries and access requirements are likely to change as land urbanises.

NoR-specific access effects and potential mitigation measures for a number of properties are set out at Table 10.2, Section 10.3.

10.2.3.5 General and Freight Traffic Effects

The RTC and the frequent transit network operating on the corridors will contribute to reducing the future traffic demand on all road corridors and SH1, which will improve the effectiveness and reliability of these corridors.

Based on the objectives of the projects, the indicative design of each corridor provides appropriately for the forecast traffic demands associated with the predicted growth in the North. The network of corridors will provide increased resilience across the network, whilst reducing current and future reliance on existing unsuitable rural roads as alternative arterial routes that are not designed for increased volumes of traffic.

The improved corridor capacity as a result of the SH1 Improvements (NoR 4) will result in improved journey times and reliability for existing and future freight. The corridor will be able to better accommodate freight movements with minimal interfaces with the local network, other than at key locations, improving freight reliability. A new SH1 interchange connects with the New Connection between Dairy Flat Highway and Wilks Road (NoR 11), which is expected to be a strategic freight route in future, given planned industrial land use adjacent this corridor. The upgrades to the Silverdale and Ō Mahurangi Penlink (Redvale) interchanges provide further connections from the planned industrial land use adjacent the corridor, to SH1. The designation allows potential for specific freight provisions (i.e., freight lanes) to be implemented to allow freight to travel easily between the industrial land use and SH1. Other corridors are not expected to be key strategic freight routes in future; however over-dimension and overweight routes are expected to be further reviewed by Waka Kotahi and relevant stakeholder groups in alignment with the implementation of individual corridor upgrades and further land use certainty in the future.

10.3 NoR-Specific Traffic and Transport Effects

The following table provides a summary of traffic and transport effects identified to date. In the future detailed design phase, further effects may be identified which can be addressed via the detailed design process. The table sets out suggested NoR-specific mitigation measures in relation to both construction and operational effects. In general, where additional space within the designation boundary can allow for mitigation of property access effects, the additional space within the designation boundary has been provided and is captured in the drawings contained at Volume 3. Refer to The Assessment of Transport Effects, included in Volume 4, for details on all effects and suggested mitigation measures for all NoRs.

Table 10-2: NoR-Specific Construction and Operation Effects and Proposed Mitigation Measures

Type of Effect	Permanent Effects	Suggested Mitigation	Relevant to NoRs:
Property Access	Three properties on Dairy Flat Highway (1595, 1599 and 1603) may need to obtain access to Pine Valley Road, via a property with	Legal access via a property on Pine Valley Road will need to be obtained. If legal access cannot be obtained, a new access road can be provided within the	NoR 1

Type of Effect	Permanent Effects	Suggested Mitigation	Relevant to NoRs:
	existing access to Pine Valley Road	designation to connect to Dairy Flat Highway.	
Property Access	One property on Pine Valley Road (46 Old Pine Valley Road) will need to obtain access via Dairy Flat Highway	A new access road can be provided within the designation.	NoR 1, NoR 8
Property Access	Several properties on the southern end of Wilson Road (61 and 63 Follies Way; 356, 400, 404 and 408 Bawden Road off Follies Way) will no longer be able to access Bawden Road, once the RTC is in place.	A new road can be formed within the existing paper road reserve between the southern end of Wilson Road and Ashwood Avenue (which then connects to Awanohi Road). Legally, this would need to be completed prior to the construction of the RTC, unless future development within FUZ (following structure planning / plan changes) has already enabled a public road connection to the southern section of Wilson Road.	NoR 1
Property Access	Changes to eastbound travel from Aeropark Drive, due to proximity to the new Wilks Road Interchange.	The implementation of the new Wilks Road interchange will likely become necessary when development of stage 2 of the Silverdale West Industrial Structure Plan occurs and the new east-west connection is provided between Dairy Flat Highway and Wilks Road. That new connection will include a roundabout at Postman Road, which will enable people turning left out of Aeropark Drive to turnaround and travel east to the interchange or at East Coast Road. It is considered that this would address effects on access for Aeropark Drive. However, if this Postman Road roundabout is not in place, then it is recommended that alternative means of providing access for Aeropark Drive will need to be provided.	NoR 4
Property Access	Turning movements to and from three properties (223, 225 and 227 Pine Valley Road) will be impacted by the proposed roundabout at Young Access.	Access can be maintained to these properties through rerouting on the wider road network and turning at Argent Lane.	NoR 7

Type of Effect	Permanent Effects	Suggested Mitigation	Relevant to NoRs:
Property Access	One property (1546 Dairy Flat Highway) has been identified to have effects on access as a result of the bridging to facilitate a stream crossing of the RTC.	Additional designation space has been provided to ensure access can be provided to Dairy Flat Highway.	NoR 8 and NoR 1
Property Access	Six properties (430, 438, 442, 444, 448 and 452 Dairy Flat Highway) have been identified to have access effects as a result of NoR 9.	These driveways may need to be relocated and potentially consolidated to provide safe access. The proposed designation footprint allows for this to occur.	NoR 9
Property Access	Right turn movements will be restricted to and from properties along the corridor on Dairy Flat Highway, as a result of the project.	Movements will need to be facilitated via the proposed roundabout intersections at Durey Road, Potter Road, Albany Heights Road, Coatesville Riverhead Highway (existing), and The Avenue (outside of Supporting Growth scope).	NoR 9

10.4 Recommended measures to avoid, remedy or mitigate potential adverse traffic and transport effects

10.4.1 Construction Phase

It is considered that potential temporary construction traffic effects can be accommodated and adequately managed via a CTMP which is to be developed closer to the time of construction. As set out in the proposed conditions, a CTMP is proposed to be prepared prior to the start of construction. Any potential construction traffic and transport effects shall be reassessed prior to construction taking into account the specific construction methodology and traffic environment at the time of construction. The objective of the CTMP is to avoid, remedy or mitigate, as far as practicable, adverse construction traffic effects. To achieve this objective, the CTMP should include:

- 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
- Site access routes and access points for heavy vehicles, the size and location of parking areas for plant, construction vehicles, and the vehicles or 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
- Methods that will be undertaken to communicate traffic management measures to affect road users (e.g. residents / public / stakeholders / emergency services).

Auditing, monitoring and reporting requirements relating to traffic management activities shall be undertaken in accordance with Waka Kotahi's New Guide to Temporary Traffic Management.

10.4.2 Operation Phase

As summarised above, the North Projects will have significant positive effects on the wider transport network in the North. Where property access is affected, in some cases, new access roads for properties will be necessary and can be provided within the designation footprint to enable access to the public road network. Specific property access effects and suggested mitigation measures are set out in Table 10.2 at Section 10.3. It is noted however, that the majority of these properties are within the FUZ and may be provided with access as future development in the FUZ occurs (in advance of the RTC being in place). As the FUZ area develops, it is expected that urban local and collector roads will facilitate vehicle access to the strategic network.

10.5 Summary of Traffic and Transport Effects

Based on the assessment of effects, as summarised above, the North Projects will provide considerable positive effects on the operation of the transport system, in particular improved safety, connectivity, resilience and contribution to mode shift. Adverse effects have been identified and have been demonstrated to be appropriately managed through mitigation measures identified. In some cases, this has included providing sufficient space within the designation boundary to mitigate effects on property access.

In terms of construction traffic effects, it is considered that there is sufficient network capacity to enable construction traffic. To address the potential construction effects identified, a CTMP will be prepared prior to the start of construction.

11 Māori culture, values and aspirations

This section draws on engagement that has been undertaken with all Manawhenua in the North, and summarises inputs provided by Manawhenua representatives during the preliminary design of each corridor/station. Twelve Manawhenua groups were engaged with, including Te Ākitai Waiohua, Ngāti Whanaunga, Te Runanga o Ngāti Whātua, Ngāti Maru, Te Patu Kirikiri, Ngāti Whātua o Kaipara, Ngāti Manuhiri, Te Kawerau ā Maki, Ngāti Tamaterā, Ngai Tai ki Tāmaki, Ngāti Paoa Iwi Trust and Ngāti Paoa Trust Board. A Manawhenua engagement summary is included in Appendix F.

A joint Cultural Impact Assessment (CIA) prepared by Te Kawerau ā Maki and Ngāti Manuhiri, is included in AEE Appendix E (noting some confidential aspects have been redacted). The joint CIA documents Te Kawerau ā Maki and Ngāti Manuhiri's cultural values, interests, and associations with the North Projects area and its natural resources, and the potential impacts of the North Projects on these. The CIA also provides recommendations on measures to avoid, remedy and mitigate any potential cultural effects.

In developing the North Projects, recognition has been given to both the relationship of Tangata Whenua to their lands, culture and traditions in the North area and to the commitment to partnership between Manawhenua, Waka Kotahi and AT (as representatives of the Crown) founded through Te Tiriti o Waitangi.

11.1 Methodology

Only Manawhenua can speak to the impact that a project may have on their cultural values, heritage and aspirations. The methodology for assessing effects has been to engage with Manawhenua representatives and seek input on the potential impacts of each Project.

Te Tupu Ngātahi maintains a Manawhenua forum, which includes specific discussion on the future network proposed for the North area. This has involved presenting to Manawhenua on a regular basis, seeking input on the Project alternatives and preliminary design development and potential effects on cultural values. This has informed the corridor alignments and the mitigation measures proposed. At the beginning of the Te Tupu Ngātahi Programme, all iwi representatives were involved. As specific projects developed, iwi interests became more focused. In late 2022, Te Tupu Ngātahi invited CIAs to be prepared, and this was accepted by Te Kawerau ā Maki and Ngāti Manuhiri in the form of a joint CIA. Te Kawerau ā Maki and Ngāti Manuhiri are both Manawhenua iwi of wider Tāmaki Makaurau (Auckland) but particularly the northern half of the region.

11.2 Manawhenua Feedback

The project team engaged with Manawhenua on the North Projects from the beginning of the business case phase (in 2018) and through the NoR phase, primarily through the Te Tupu Ngātahi Manawhenua forum / regular hui, with Manawhenua also attending Project workshops.

Manawhenua highlighted to the project team a number of considerations, including:

- The Wēiti River has significant cultural value, with a preference to avoid any further crossings of this awa.

- Interactions with intertidal areas, wetlands and freshwater are particularly sensitive.
- Futureproofing for climate change is essential, including longevity of assets in relation to stormwater and flooding.
- Ideally, impacts to highpoints, knolls / puke should be avoided, and if earthworks do occur the readability of the landform should be maintained.
- Generally supportive of the use of corridor alignments along ridgelines in reference to historical travel patterns / networks, and upgrades to existing corridors.
- Loss of habitats, and biodiversity was a particular concern.
- Impacts from sediment discharge, erosion, dust, emissions and light pollution were a particular concern.

These issues/cultural constraints were considered by the Project Team in the development of the North Projects and decisions on options were made in partnership with Manawhenua as detailed in AEE Appendices A – Alternatives Assessment and F – Manawhenua Engagement Summary. A key example is the route for the proposed Silverdale to Highgate Active Mode Connection (part of NoR 4), which avoids a connection or new crossing of the Wēiti through the SEA near Curley Avenue. This was a change from the IBC option and was a direct response to Manawhenua feedback.

Within the CIA, Te Kawerau ā Maki and Ngāti Manuhiri reiterated their concerns around the urbanisation contemplated by FUZ zoning as applied under the AUP in 2016 due to effects on the cultural landscape. In relation to the RTC, they note they are not opposed to the project in principle. However their position is that if the RTC is *responding* to urbanisation in the North, rather than *facilitating* it, they are supportive of the alignment and do not oppose the RTC.

The Manawhenua Engagement Summary, provides a broader overview of engagement with and feedback received from all iwi involved over the course of the Te Tupu Ngātahi programme to date. Generally, North Manawhenua involved in the engagement process are supportive of the selected Project alignments.

11.3 Manawhenua Treaty Areas and Sites of Significance

The North Projects do not directly affect any identified properties or land currently being negotiated under Treaty settlements, land returned under a Treaty settlement, marae, Māori freehold lands, Tūpuna Maunga Affected Areas, Tangata Whenua Management Areas, or Sites of Significance under the AUP:OP.

The North Projects do interact with Treaty Settlement Statutory Acknowledgement areas relating to both Te Kawerau ā Maki (parts of Albany, Albany Heights, Dairy Flat, Stillwater and Ōkura, Ōrewa and Wēiti Rivers) and Ngāti Manuhiri (Ōkura, Ōrewa and Wēiti Rivers). These areas are set out in full in Appendix 21.5 (Te Kawerau ā Maki) and Appendix 21.3 (Ngāti Manuhiri) of the AUP:OP. These areas have significant historical and cultural significance to Te Kawerau ā Maki and Ngāti Manuhiri, tied to the whenua and awa. Riverhead Forest, a commercial redress for Te Kawerau ā Maki is located outside the North Projects area, but nearby. Mapped archaeological sites are concentrated along the coastline and along the Ōrewa, Ōkura, Waiokahukura and Wēiti rivers / streams and their tributaries.

A very limited overlap occurs between one of the North Projects (NoR 4) and the coastal environment under the Marine and Coastal Area (Takutai Moana) Act 2011. This is in relation to the new active mode bridge within the existing SH1 designation where it crosses the Ōrewa River. Therefore, customary rights would need to be considered at the resource consent stage.

11.4 Cultural Impact Assessment

Key issues identified in the joint CIA in AEE Volume 2 are summarised below.

11.4.1 Positive Cultural Effects

A number of potential positive cultural effects were identified, including:

- Potential to daylight streams through the removal of culverts, including for NoRs 5, 6, 7, 8, 12, and 13.
- Potential to provide bridges rather than culverts to assist with flood resilience.
- The potential to enhance terrestrial ecology along corridors, including for NoRs 1, 4, 8, 9 and 13.
- Potential to provide and enhance cultural interpretation including of the Wēiti, Ōrewa, Huruhuru, Waiokahukura, Rangitōpuni streams and Ō Te Ha, Pukeatua, Te Wharau, Pukekauere and Ara Pukekauere along corridors, including for NoRs 1, 2, 4, 8, 9, and 13.
- Provision of more efficient transport linkages for manuhiri (tauiwi).
- Provision of active transport modes for manuhiri.
- Potential to include iwi in future procurement.
- Potential to contribute towards protection of sites and/or inter-site visibility.
- Potential to reduce private vehicle emissions through more efficient transport or multi-modal transport options.
- Potential economic and wellbeing outcomes for people in the catchment linked to improved transport options.
- Potential to contribute to protection of sites and or inter-site visibility.
- Potential to reduce private vehicle emissions through more efficient transport or multi-modal transport options.
- Potential positive economic and wellbeing outcomes for people in the catchment linked to improved transport options.

11.4.2 Construction and operational effects in the CIA

In summary, key potential construction and operational effects identified in the CIA include:

- Erosion from vegetation clearance, and loss of moderate productive soils
- Traffic congestion and associated emissions during construction, and discharges
- Embedded construction emissions
- Depositing of soil into landfill or cleanfill, and quarrying of materials
- Further demarcation of local ecological catchments through new corridors that may act as barriers to species movement
- Partial enablement of further urban development across the catchment (acknowledging the FUZ) and the linked changes to landscape and risks to streams and from flooding

- Further modification of the contours or 'face' of Papatūānuku through bulk earthworks, loss of topsoil and removal of whenua.
- Discharge to waterways.
- Changes to the character of the cultural landscape.

11.5 Recommended Measures to Avoid, Remedy or Mitigate Adverse Cultural Effects

General: Manawhenua groups will be invited to prepare a Cultural Advisory Report in advance of the detailed design (as provided for in the conditions). This will assist in understanding and identifying taonga which may be affected by the Projects and inform their management and protection.

Cultural design and expression: Manawhenua will be invited to participate in the development of the ULDMP to input into relevant cultural landscape and design matters on each corridor / project. This includes the management of potential effects on cultural sites, landscapes and values, how corridor/project features will integrate with the corridor as a whole, including any proposed mitigation, and how the transport corridors / projects can contribute to or reduce effects on the relevant cultural landscape. The UDLMP is provided for via a condition on each NoR.

Risk of archaeological discovery: A Cultural Monitoring Plan will be prepared prior to the start of construction works or enabling works. These plans will be prepared in collaboration with Manawhenua so that effects are managed appropriately, including where features may be discovered by accident. Archaeological mitigation will be in line with the recommendations of the Assessment of Archaeological Effects included at Volume 4, and at Section 15 of this AEE.

Construction environment controls: Construction works and the associated potential impacts of sediment on rivers, streams and wetlands will be considered through the CEMP, and future regional consent processes. The construction methodology and environmental controls are discussed in Section 6.4 and AEE Appendix C. Detailed design will provide the opportunity to reduce earthworks extents, where practicable.

Impacts on biota: Construction and operational impacts on lizards, birds and bats and their habitats have been considered through the Assessment of Ecological Effects included at Volume 4, and at Section 14 of this AEE. An Ecological Management Plan (EMP) is provided for via a condition on each NoR, which will include pre-construction ecological surveys and measures to manage effects on birds and bats where potential adverse effects have been identified for these species. Freshwater ecological effects (e.g. fish) are a regional matter which will be the subject of a future consenting phase.

SEA vegetation: Effects and mitigation for impacts on vegetation within SEAs will be considered at the future resource consenting and detailed design stage, for those corridors which may have an impact on SEAs. Where there is a known impact on SEAs, consideration has been given to space required for future mitigation/offset.

Engagement: A Stakeholder Communication and Engagement Management Plan (SCEMP) will be prepared prior to the start of construction works or enabling works. This plan will include details of the specific methods for engaging with Manawhenua, with these methods to be developed in consultation with Manawhenua.

The CIA suggests a number of additional measures which are in relation to issues which are beyond the scope of the North Projects designations (refer to the CIA in Volume 4). It is noted that AT and Waka Kotahi maintain ongoing discussions with Manawhenua in regard to the North Projects.

11.6 Summary of Effects on Māori Cultural, Values and Aspirations

Te Tupu Ngātahi has engaged with Manawhenua since the commencement of the Te Tupu Ngātahi programme, through corridor identification, development and NoR preparation. Manawhenua have provided direct feedback to the assessment of alternatives, and in places the route choice has been directly affected by that feedback. Generally, North Manawhenua involved in the engagement process are supportive of the North Projects' alignments.

It is noted that while Te Kawerau ā Maki and Ngāti Manuhiri (authors of the CIA) are not supportive of the FUZ zoning across the North and the future urbanisation it contemplates, they are supportive of the North Projects themselves, including the RTC on the basis that it will respond to, rather than facilitate, urbanisation.

The upgraded and new transport corridors and stations do not directly impact on any AUP:OP mapped sites of significance. However, there is the potential for impacts on cultural values to the natural environment and cultural landscape context, identified within the joint Te Kawerau ā Maki and Ngāti Manuhiri CIA and via direct engagement with Manawhenua. It is considered that the recommendations above are appropriate to adequately manage these impacts.

12 Landscape and Visual Effects and Mitigation

The potential effects on landscape character, natural character and visual effects associated with the North Projects have been assessed in The Assessment of Landscape and Visual Effects (LNCVA), provided in Volume 4. The assessment below should be read in conjunction with this report. Effects that are common across all the NoRs are summarised first in section 12.2, including recommended measures to avoid, remedy and mitigate effects. NoR-specific effects and mitigation are then summarised in section 12.3.

12.1 Methodology

The LNCVA was undertaken using the best practice guidance for landscape assessment as provided by 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022 (Te Tangi a te Manu).

The methodology used is best aligned with an area-based landscape assessment, which is typically a policy-driven assessment as opposed to a proposal-driven assessment. Area-based assessments are higher level assessments which assess the potential effects of generic activities, where specific project details are absent. As the LNCVA considers specific locations for corridors as proposed for each NoR, the methodology includes a degree of proposal-based assessment with respect to those proposed locations. This includes, where appropriate, visual assessment.

It is also important to reiterate the focus on the likely future urbanised environment across the North growth areas, and the subsequent assessment of effects on this, given the longer-term likely implementation timeframe of the North Projects. While SEAs and natural character have been considered as forming part of the likely future environment and contributing to landscape and natural character values, it is acknowledged that consideration of effects on SEAs, waterbodies, wetlands and some trees, will be considered during future regional consent phases.

The New Zealand Institute of Landscape Architects' seven-point scale of effects was used to assess the potential landscape effects arising from the North Projects. The effects scale ranges from 'Very Low' to 'Low' to 'Low-Moderate' to 'Moderate' to 'Moderate-High' to 'High' to 'Very High', as shown in Table 12-1, below.

Table 12-1: New Zealand Institute of Landscape Architects Scale of Effects Rating Table

Very Low (V-L)	Low (L)	Low- Moderate (L-M)	Moderate (M)	Moderate- High (M-H)	High (H)	Very High (V-H)
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12.2 Landscape and Visual Effects across all NoRs

12.2.1 Positive Landscape and Visual Effects

Positive effects in relation to landscape and visual elements are primarily associated with the provision or improvement of urban and landscape design and amenity associated with the transport corridors/stations and / or specific mitigation measures implemented.

A number of positive landscape and visual effects are anticipated as a result of the construction and operation of the new and upgraded transport corridors, including:

- Natural wetland areas and tributaries can provide opportunities for enhanced natural character values.
- Land within the designation can be planted to provide visual amenity within what is anticipated to be an urbanised area, as well as provide an ecological function.
- Potential for new storm-water detention areas to become attractive focal points through considered planting and wetland construction which increase landscape amenity and value.
- Increased walkability and cycle connectivity along the network can contribute to the enjoyment of landscape amenity, and pleasantness, including where active transport routes are integrated with stormwater wetlands and amenity planting.
- Visually, planting within a designation provides both a pleasant outlook, and screening.
- The works can create a net increase in canopy cover associated with the Project areas resulting from the planting of fill batters, planting in berms, green stormwater infrastructure such as vegetated swales and planted stormwater wetlands.
- Potential for the transport corridors to provide elevated views towards the rural landscape and vegetated areas, both within and beyond the Rural Urban Boundary (RUB).
- Local place identity can be enhanced through integration of Manawhenua cultural values and narratives relating to Te Ao Māori.
- Hard landscaping measures can reflect and reinforce local character elements.

12.2.2 Construction Landscape, Natural Character, and Visual Effects

This section discusses the temporary potential landscape and natural character and visual effects which could arise during construction of the North Projects. 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 considered and assessed in detail, and mitigation measures will be confirmed. It is acknowledged that there is overlap in the consideration of the landscape, natural character and visual effects of these activities between the district and regional plan provisions of the AUP:OP.

It is anticipated that activities during construction of the upgraded or new transport corridors/stations 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 North area urbanises.

Some fixed and occupational vantage points, both public and private within and adjacent to the North Projects 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.

Construction Footprint Effects

Potential adverse landscape, visual, and natural character effects could arise from the following construction activities:

- The construction works footprint, with the footprint expected to be somewhat wider than each of the finished Projects. This may result in vegetation clearance or pruning (see below), and temporary landform modification outside of the operational footprint of the proposed transport corridors.
- In turn, if vegetation is removed outside the permanent corridor, this may result in a change in rural and landscape character (in rural areas not anticipated to urbanise) including in respect to matters of national importance under RMA s6(b) in relation to the ONL adjacent Dairy Flat Highway (discussed further, below).
- Construction machinery will be present (including heavy vehicles), which may require access tracks. This may result in temporary landform modification and compaction of soil.
- If riparian vegetation is removed, this will likely have implications for landscape and natural character.

Effects on Waterbodies

The optioneering process and indicative designs have sought to avoid and minimise effects on waterbodies as much as practicable, and the future detailed design and regional consenting will also address these matters in more detail to further mitigate potential effects (noting that regional consents will be required for works within waterbodies). It is anticipated that work will be undertaken near waterways and wetlands, potentially resulting in effects on natural character through changes to hydrology, removal of riparian vegetation, construction of bridge piers, fill within waterways, and temporary stream diversion. Potential effects on waterbodies are applicable to landscape character but relate predominantly to natural character.

Earthworks Effects

Exposed earthworks can result in visual landscape effects during construction.

Noise, Dust and Lighting Effects

During the construction phase, adjacent residents and users of existing transport routes which are undergoing upgrades as part of the North Projects are likely to experience noise, dust, and lighting effects, as well as visual effects caused by the presence of construction activities.

Effects on ONL

There is one ONL which overlaps with the western designation boundary of NoR 8. The section of the designation boundary which overlaps the ONL is required to enable construction activities. The specific area of the ONL within the proposed designation is highly modified, with landform influenced

by the formation of Dairy Flat Highway, with a high degree of invasive weed species covering the landscape. There is potential for adverse natural character effects which may be caused by vegetation removal, construction operation, exposed earthworks and accidental discharge into waterways. Therefore construction activities may affect landscape character values with respect to matters of national importance under RMA s6(B).

Construction effects on the ONL without mitigation are anticipated to be **'Moderate-High'**,

Magnitude of Effects

Construction effects of the North Projects without mitigation vary across the NoRs and are anticipated to be between **'Low'** and **'Moderate-High'**.

12.2.3 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Construction Effects

Landscape and visual mitigation measures for all construction activities and built elements will be incorporated into the ULDMP or Construction Environmental Management Plan (CEMP) as appropriate, which are proposed as conditions of each NoR, as outlined in Volume 1.

The LNCVA recommends a number of measures to be considered in the future preparation of these management plans across all NoRs, including:

- Consider opportunities for topsoil stripping and stockpiling for re-use, ensuring that topsoil is suitable for landscape purposes.
- Where appropriate, select visually discrete locations for the placement of construction yards and material storage. Consider screening of construction yards as mitigation for temporary visual effects.
- Reinstatement construction yards in a manner appropriate for the anticipated future use of the land.
- Where practicable, avoid piers in the beds of waterways and wetlands, minimise piers on riverbanks, and minimise fill over waterbodies (noting that detailed responses to waterway and natural wetland treatment will be detailed in future regional resource consenting stages).
- Minimise earthworks and retaining walls as far as practicable by following the natural topography of the land. Where earthworks are required, integrate cut and fill by merging smoothly with surrounding corridors.
- Salvage and re-use plants that are removed, where practicable, including through seed sourcing, habitat creation and landscape features.
- Where practicable, and appropriate, retain indigenous vegetation cover along waterways.
- Early (prior to construction) and regular communication with the community on the construction program and duration of works.

NoR specific measures are covered in section 12.3. With implementation of the recommended measures through the ULDMP and/ or CEMP, the construction effects are expected to reduce to **'Very Low'** to **'Moderate'** (NoR 9 only).

12.2.4 Operational Landscape, Natural Character, and Visual Effects

Landscape Character Effects

For the corridors/stations or sections of corridors located in currently greenfield and/or rural FUZ areas it is anticipated that the built outcomes of the land adjacent to the corridors will be in character with the planned urbanisation and intensification of the areas, with roads and stations being essential elements of urban areas. As such, amenity effects on planned residential areas and dwellings will be limited. This is also consistent with the objectives and policies of the NPS-UD (in particular, Policy 6) which state that planned urban built form may involve significant changes to an area, and those changes may detract from amenity values appreciated by some people but improve amenity values appreciated by other people, communities and future generations.

For corridors/stations or sections of corridors located in existing residential zones or rural areas where a low level of change is anticipated (other than via intensification envisaged by Plan Change 78), it is possible there will be amenity effects. Where existing residential properties and dwellings in these areas are directly adjacent the designation boundaries, possible amenity effects may include loss of privacy, compromised views, reduced buffers between houses and transport corridors, reduced section size, and increased traffic noise and light disturbance (e.g. from car headlights and streetlights).

The UDLMP condition directs the integration of the North Projects with future surrounding land uses. At completion, the upgraded and new transport corridors will resemble that of urban arterial roads on account of the active modes of transport, structured planting, integrated stormwater management, and engineered roading elements that have an inherently urban landscape aesthetic.

Changes to Landform

The rolling sequence of hills and valleys in the North defines the landscape and divides it into discrete sub-catchment areas contained by larger surrounding landforms. This landform context will limit the visual effects of the North Projects, likely resulting in relatively localised effects. Where proposed designations are for upgrades to existing road corridors, the natural topography has already been altered with cut and fill, benching, terracing, drainage swales and retaining walls. Where proposed designations sit within rural landscapes, the natural topography has already been altered to improve productive land. It is anticipated that future urbanisation of the North will be sensitive to the topography of the broader landscape, however earthworks are anticipated at a finer scale to form development platforms as part of the urbanisation process.

While the North Projects generally avoid prominent spurs and ridgelines, portions of some alignments follow locally distinctive ridgelines (particularly NoRs 12 and 13). Some portions of some alignments cross elevated landforms (particularly NoRs 1, 4, 6, 12 and 13). There is the potential for cut and fill required as part of the construction of the North Projects to result in visual effects due to loss of vegetation, visibility of new transport corridors and stations on elevated landforms, and changes in the topography of the landform. However, it is anticipated that the North Projects will be absorbed into the adjacent land as far as practicable through contouring of cut and fills and planting.

The integration of the North Projects within the future landform and future urbanisation will be enabled through the proposed NoR conditions, noting the UDLMP condition directs the integration of the North Projects with future surrounding land uses.

Effects on Vegetation

Indigenous vegetation and mature exotic vegetation (including roadside vegetation, hedge rows and shelter belts, stock shade trees and garden planting within private properties) are attributes of the North area landscape, which contributes to the landscape, natural and rural character of the area. As the FUZ areas transition to an urbanised environment, it is anticipated that these vegetation patterns, and the subsequent character in the North, will change significantly.

The North Projects will result in the removal of some vegetation, which may potentially include mature indigenous species. The alignments/sites of the proposed designations have sought to avoid (where practicable) and minimise effects on SEAs and QEII Covenant areas, however the proposed designations cross several sections of SEAs. Where riparian vegetation is affected, it is likely that there will be effects on the natural character of these areas.

Effects on Rural Character

A diversity of rural character exists across the North Projects area, including steeper bush-clad hills, smaller lifestyle blocks in peri-urban areas, and broader productive and pastoral land, overlaid with waterway and vegetation patterns. Whilst urbanisation of FUZ land will change this character in future, it is expected that some rural landscape characteristics will contribute to the rural landscape character where a Project's alignment allows views to rural land beyond the RUB / FUZ (NoRs 1, 4, 6, 8, 9 and 13), and also where proposed bridge crossings allow views to native bush which is often near waterways (NoRs 1, 4, 6, 8, 9 and 13). It is generally anticipated that areas of native vegetation which provide ecological benefits, around waterways, and connect to cultural heritage will be retained as the areas develop, maintaining rural character in the peri-urban landscape.

In some localised instances, the location of the proposed designations may result in a loss in established planting and shelterbelts, reduced lot sizes and reduced buffers between rural-residential dwellings and the corridor alignment.

Effects on Protected Landscape Features

Protected landscape features include QEII covenants, heritage trees, and street trees in limited areas which are specific to some NoRs.

Effects on Outstanding Natural Landscapes

There is one ONL which overlaps with the western designation boundary of NoR 8. The proposed designation upgrades the existing road corridor and has a functional need to remain in this location. The proposed designation has been developed to avoid permanent operational areas within the ONL, whilst also providing a new bridge over Huruhuru (Dairy Stream) for increased flood resilience. The section of the designation boundary which overlaps the ONL is required to enable construction activities. The specific area of the ONL within the proposed designation is highly modified, with landform influenced by the formation of Dairy Flat Highway, with a high degree of invasive weed species covering the landscape. The area affected is not representative of the combination of high value landscape qualities associated with the rest of the ONL. There is potential for a further reduction in natural character values during operation of the upgraded transport corridor further modifying the natural water course. However, due to the proposed bridging of Huruhuru at this location, it is

anticipated that modification of the waterway within the ONL will be minimised. (Refer to Section 12.2.5).

Effects from Light and Structures

Associative values of rural amenity, such as a sense of remoteness and dark nighttime skies, can be adversely affected by light pollution. The long hours of operation of lighting around RTC stations may have potentially adverse visual effects on surrounding residential environments.

As the transport network is developed, it is anticipated that the quantity of structures required for efficient movement through the transport network – such as new intersections, bridges, retaining walls, barriers, gantries and signage - would increase. These features add to the visual complexity of the landscape, and can further reduce visual amenity over and above the presence of a road surface in a landscape.

Magnitude of Effects

Operational effects of the North Projects without mitigation are anticipated to be between ‘Low’ and ‘High’. Areas of High operational effects without mitigation are:

- Rural sections of NoR 9 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany, in relation to landscape character, natural character, and visual and associative effects
- Green Road ONL adjacent NoR 8 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany, in relation to natural character.

12.2.5 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Operational Effects

The operational, landscape and visual effects of the North Projects will be mitigated through the implementation of best practice urban design principles. These considerations are outlined in the UDE provided in Volume 4 and summarised in Section 6.2 and will be implemented through a ULDMP, which is provided as a condition in Volume 1.

Key considerations of the ULDMP, and recommended measures within the ULDMP, may include the following recommendations in the LNCVA relating to operational effects of all NoRs:

- Planting appropriate locations within the designation to provide visual amenity within what is anticipated to be an urban zone, as well as providing an ecological function.
- Designation design can allow for aesthetically pleasant new stormwater detention areas which increase landscape amenity and value.
- The new designations allow space for active travel including paths for pedestrians and cyclists. Increased walkability and cycle connectivity along the network contributes to the enjoyment of landscape amenity, and pleasantness.
- The works could create a net increase in canopy cover associated with the Project areas resulting from the mass-planting of fill batters, planting in berms, green stormwater infrastructure such as vegetated swales and planted stormwater wetlands.
- Enhancement of local place identity through integration of Manawhenua cultural values and narratives relating to Te Ao Māori.

- Incorporation of the Urban Ngahere strategies in the ULDMP, including an outcomes-based approach to mitigation rather than a quantitative approach.

NoR specific measures are covered below. It is noted that detailed responses to waterway and natural wetland treatment will be detailed in the future regional consenting stages of the North Projects. Measures which should be considered to reduce effects from future works which are subject to regional consents include:

- Wetland areas and tributaries provide opportunities for enhanced natural character values.
- Avoiding works in riverbeds and on riverbanks, where practicable.
- Revegetating existing natural wetlands and watercourses, where loss of vegetation is likely to occur.
- Minimising sedimentation of waterbodies using appropriate erosion controls and limiting the extent of exposed earthworks at any one time, and revegetating earth-worked areas, where practicable.
- Retaining existing natural watercourses as far as practicable.
- Designing stream diversions and stormwater treatment wetlands to appear 'natural' with a variety of habitats, e.g. irregular shape with curved boundaries, varying depths, and islands.

With implementation of the recommended measures through the ULDMP operational effects are expected to reduce to **'Very Low'** to **'Low Moderate'** (NoRs 1-8 and 10-13) and **'Moderate'** (NoR 9 only). In regards to the ONL (NoR 8), operational effects are expected to reduce to **'Low-Moderate'**, reducing further over time to **'Low'** (5-10 years post completion) and then to **'Very Low'** (20+ years post completion). Residual landscape, natural character and visual effects across the whole North Projects are expected to further reduce over time with the establishment and maturing of vegetation and other proposed mitigation implemented through the ULDMP.

12.3 NoR-Specific Landscape and Visual Effects Measures

The following measures are suggested as NoR-specific measures that could be implemented to mitigate construction and operational effects. These measures are for future consideration as part of the ULDMP and CEMP preparation and the future regional consenting/detailed design phase (refer to the LNCVA, included in Volume 4, for details on all effects and suggested mitigation measures for all NoRs). The ULDMP will be prepared prior to construction, which will enable consideration of the existing environment at the time the North Projects are to be implemented, and the specific mitigation that should be implemented to mitigate NoR specific effects. These measures may include:

- Minimise the footprint of construction areas where possible, to avoid or limit intrusion into the driplines of SEAs, ONLs, open space reserves, and where adjacent streams and waterbodies (applicable to NoR 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13).
- Minimise adverse visual and associative effects during construction for adjacent residents by using screening, including fast-growing screening planting, and through retention of existing established rural and amenity planting within the designation where practicable (applicable to NoR 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13).

- Minimise removal of existing native revegetation at 85 Upper Ōrewa Road (rural zone) to create a visual buffer to construction activities for rural properties to the east (applicable to NoR 6).
- Maximise retention of vegetation alongside SH1 (adjacent NoR 2 Milldale Station and Associated Facilities) where practicable, to minimise adverse visual effects for transient users of SH1 (applicable to NoR 2, 4).
- Prior to removing any vegetation around the Motorway Service Centre site, confirm the existing consent requirements for screening of this site, and provide mitigation of construction works in addition to existing consent requirements (applicable to NoR 4).
- Give particular consideration of screening of construction activities on prominent ridgelines or knolls where visual and associative effects may be experienced by a wider visual catchment (applicable to NoR 13).
- Mitigation screen planting (including indigenous and fast-growing natives) or physical barriers as appropriate within the designation to minimise visual operational effects on existing residential and rural dwellings (applicable to NoR 1, 2, 3, 4, 8, 9, 13).
- Mitigation planting of large-scale specimen trees to visually break up the form and bulk of the RTC stations in the landscape (applicable to NoR 2, 3).
- Establish buffer planting (including indigenous and fast-growing natives) along SEAs, QEII area, riparian corridors, and stands of Kauri and/or Notable Trees to minimise effects on the edge of existing vegetation (applicable to NoR 2, 8, 9, 13).
- Mitigation planting should seek to adjoin and/or link areas of indigenous vegetation to enhance natural character and landscape values (applicable to NoR 6, 10, 12).
- Revegetate significant earthworks to lessen visual dominance and minimise visual effects over time (applicable to NoR 1, 4, 8, 12).
- Minimise removal of existing native vegetation within the road corridor next to Meraki Montessori School (293 Wainui Road) and along Wainui Road, and Dairy Flat School, to provide screening of construction activities to minimise adverse visual and associative effects on the school and contemporary residential areas (applicable to NoR 8 and NoR 10).
- Improve the landscape and natural character of the coastal environment at/near the active mode bridge crossing of the coastal marine area at Ōrewa River, through consideration of coastal character, form and materiality of the multi-modal path in this location (applicable to NoR 4).
- Retain aspects of existing rural character (in rural zone) through retention of vegetation such as shelterbelts and tree planting and ensuring corridor users have views to surrounding vegetation and stormwater ponds where practicable (applicable to NoR 6).
- To mitigate rural character effects, where the transport corridor adjoins the RUB, ensure detailed design responds to the defining edge of rural and urban land uses. Where the corridor crosses the RUB, ensure the transition from rural to urban is a graduation rather than a hard delineation (applicable to NoR 6, 7, 8, 9).
- Integrate proposed landscape planting with vegetation proposed as part of the Silverdale West Dairy Flat Industrial Structure Plan Area to link blue and green networks with the wider landscape (applicable to NoR 11).
- In regards to the ONL and surrounds (NoR 8), the following measures are suggested:
 - Minimise intrusion of the construction footprint into the ONL.

- Take a holistic approach to improving the natural qualities and provide a high-quality outcome consistent with the values of the ONL.
- Minimise potential intrusion into waterways where Dairy Flat Highway crosses Huruhuru Stream, and where indigenous wetlands are identified in the vicinity of the ONL.
- Consider the proposed bridge design to improve landscape connectivity.
- Consider re-vegetation of significant earthworks between Green Road and Blackbridge Road to lessen their visual dominance.

12.4 Summary of Landscape and Visual Effects

Overall, adverse landscape and visual effects are able to be appropriately managed and reduced over time in relation to the urbanisation of the surrounding landscape. The proposed designations will upgrade and introduce new transport corridors and stations in the North, with the potential for large areas of fill, disruption to waterways and wetlands, and vegetation removal. However, the North Projects will result in a number of positive landscape and visual effects, including the opportunity to extend areas of indigenous vegetation, provide new views over the natural environment, and views over the wider rural landscape – both within and beyond the RUB.

With mitigation measures in place, the landscape, natural character and visual construction and operational effects across the North Projects range between **Very-Low** to **Moderate**. Residual landscape, natural character and visual effects across the whole North Projects are expected to further reduce over time with the establishment and maturing of vegetation and other proposed mitigation implemented through the ULDMP.

13 Natural Hazards – Flooding Effects and Mitigation

The Assessment of Flooding Effects, included in Volume 4, assesses the potential effects of the proposed transport network during its construction and operational phases on the flood extents and levels in the surrounding area. The assessment below should be read in conjunction with this report.

Stormwater quantity, quality and effects on streams will be considered as part of a future regional consent process. This assessment focuses on flood hazard effects which is a district plan matter under the AUP: OP. Effects that are common across all the NoRs are summarised first in section 13.2, including recommended measures to avoid, remedy and mitigate effects. NoR-specific effects and mitigation are then summarised in section 13.3.

13.1 Methodology

The assessment of flooding effects involved the following steps:

- Desktop assessment to identify potential flooding locations using the Auckland Council and Te Tupu Ngātahi GIS and flood model results.
- Flood modelling of the pre-development (base case) scenario using either existing Auckland Council models or updating of the models using the latest AC LiDAR, WK and AT asset data.
- Inspection and review of flood maps at key locations such as proposed bridges, culverts, wetlands and major earthworks.
- Modelling of the concept design for areas that are identified as having the greatest flood hazard risk, to confirm the designation boundary is sufficient to meet the flood hazard outcomes in the designation conditions i.e. State Highway Improvements (NoR 4), Upgrade to Pine Valle Road (NoR 7), Upgrade to Dairy Flat Highway (NoR 8) and Upgrade and Extension to Bawden Road (NoR 12).
- Reviewing flooding information gathered from the community during DBC engagement.

The assessment follows an outcomes-based approach:

- The stormwater and flooding considerations are based on an indicative design designation boundary which incorporates flexibility for design changes to respond to the future environment. The effects assessment is based on being able to meet the requirements of the proposed designation conditions and provide required mitigation within the designation boundary.
- Where outcomes can be achieved through alternative measures outside of the designation such as flood stop banks, flood walls and overland flow paths, this may be agreed with the affected property owner and Auckland Council.
- This assessment identifies where flood effects require consideration and the types of mitigation measures that could be implemented to address the effect.

The pre-development (base case) scenario relates to the existing network model without the North Projects:

- With future development impervious allowances and no controls.
- AC 2016 LiDAR terrain.
- Larger existing pipes or bridges.
- 1% Annual Exceedance Probability (AEP) return period for future storms including climate change scenarios of 2.1 and 3.8° temperature increases. The 2.1° of temperature increase for climate change relates to a 16.8% increase over the existing 1% AEP rainfall, whilst the 3.8° of temperature increase relates to a 32.7% increase of rainfall.

The future development imperviousness is based on the AUP: OP zonings plus the maximum impervious allowance as per Auckland Council Healthy Waters September 2019 memorandum.

The base case scenario provides water levels and flow paths to be able to complete concept design of the formations (existing raised and widened plus new formations) allowing for freeboard for roads, culverts and bridges. Apart from NoRs 4, 7, 8 and 12, the post-development scenario with the North Projects design added to the model has not been assessed at this stage and is proposed to be done at the later detailed design and modelling stage. This is because the North Projects are not being built anytime soon (some 10 to 30 years + in the future) and the flood standards may well change (e.g. 1% AEP event rainfall and climate change).

While stormwater effects apart from flooding are not assessed (as they are a regional matter), provision is made for the future mitigation of potential stormwater effects (stormwater quantity, stormwater quality and in-stream structures) by identifying the space required for stormwater management devices (for example, drainage channels and ponds) and incorporating land for that purpose into proposed designation footprints. These devices have been designated to attenuate the 100-year Average Recurrence Interval (ARI) storm using 10% of the total impervious road catchment area in accordance with Auckland Council and Waka Kotahi guidance^{13,14}.

Flooding effects will be subject to further consideration at the detailed design and modelling stages. It is expected that coordination and integration of corridor design with FUZ developments will be undertaken to confirm and address potential future adverse effects.

13.2 Flooding effects across all NoRs

13.2.1 Positive Effects on Flooding

General positive effects associated with the North Projects include:

- The widened and improved transport corridors and stations are proposed to be above the predicted future flood plains, particularly existing overtopping roads, improving the management of flood hazards.
- The corridors have the ability to convey flows without worsening flooding impacts upstream or downstream of the works.
- The NoRs provide an opportunity (through the proposed swales and wetlands) to add water quality treatment and attenuation of the total transport corridor impervious area as opposed to

¹³ Auckland Council's Stormwater Management Devices in the Auckland Region, Guideline Document 2017/001 (December 2017)

¹⁴ Waka Kotahi NZTA's Stormwater Design Philosophy Statement (May 2010)

just the additional area for upgraded widened roads. This reduces potential flood effects for road users and improvements in stormwater quality.

13.2.2 Construction Effects on Flooding

The following construction works can result in flooding effects if not managed appropriately:

- 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.
- Construction can require installation of diversion drains or realignment of existing overland flow paths or natural streams, as a last resort.
- Construction of new attenuation wetlands or upgrading of existing attenuation wetlands
- Temporary use of lay down and construction areas can block flow paths and create upstream flooding if not managed.
- 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.
- 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.

There is potential for the above effects to occur during the construction of all of the Projects, however effects may vary based on the location of works (e.g. whether there are overland flow paths or known floodplains or flood prone areas in the vicinity).

13.2.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

Flood hazard risks for the construction phase will be addressed through the Flood Hazard Condition and the CEMP condition (as outlined in Volume 1 for all projects). The CEMPs will include measures to mitigate flood hazard effects such as siting stockpiles out of floodplains, minimising obstruction to flood flows and actions to respond to warnings of heavy rain. In preparing the CEMP, key issues to consider include:

- Considering the effects of temporary works, earthworks, storage of materials, temporary diversion and drainage on flow paths, flow levels and velocities;
- Regular monitoring of predicted rainfall, particularly extreme events with high volume or intensity in order to prepare for impact;
- Locating lay down areas outside of predicted overland flow paths and flood plains, where possible;
- Managing the overland flow paths to make sure flows are not diverted toward existing buildings or properties;
- Siting construction yards and stockpiles outside the predicted flood plains;
- Diverting overland flow paths away from area of work;
- Minimising the physical obstruction to flood flows at the road sag points; and
- Staging and programming to provide new drainage prior to raising road design levels and carry out work when there is less risk of extreme flood events.

The following additional considerations should be made for the construction of new and existing culvert crossings and stormwater wetlands, where practicable. These will be assessed through a future regional consenting process:

- Existing culvert extensions should be done prior to commencement of bulk earthworks to allow for the passage of clean water across the site. Pipe extensions can affect pipe capacity by increasing pipe length which could raise the upstream water level;
- Installing temporary diversions to allow flows to be maintained while new culverts and wetlands are constructed;
- For larger embankments requiring a longer duration of works or for overland flow paths with more regular and higher flow rates; diversions should be installed prior to works commencing;
- Where no diversion is required a 6m working clearance between any earthworks and designation boundary should be adopted to accommodate access and materials;
- For larger diameter pipes (> 600mm in size) a working clearance of $\pm 20\text{m}$ from the upstream extent and $\pm 15\text{m}$ from the downstream extents should be provided.

13.2.4 Operational Effects on Flooding

There are a range of potential operational effects that are common to all NoRs, particularly from proposed road crossings (formations, bridges and culverts).

For the North Projects the assessment of operational flooding effects considered:

- New culverts (≥ 600 mm diameter) and bridge crossings;
- Areas where the new road embankment encroaches onto predicted flood plains and flood prone land;
- Potential bridge and culvert sizing to convey flows and not increase flood levels upstream and downstream of the bridge or culvert in the future 100yr 2.1° temperature increase scenario
- Land requirements for stormwater wetlands;
- Conveyance through deep cuttings which can be improved with top of cutting cut of drains and bench drains; and
- The potential for flooding on existing habitable floors of buildings due to the new project corridor.

The potential operational effects include:

- Increasing impervious areas potentially resulting in increased runoff, flows and flood levels;
- Altering existing overland flow paths resulting in flows being redirected to a different alignment;
- Lengthening existing culverts on the same grade and alignment which can increase upstream water levels and reduce conveyance capacity;
- Obstructing an existing overland flow path resulting in ponding at existing low points or newly created depressions along the corridor;
- Improving flows under the road reducing upstream flood levels and increasing flood levels at properties further downstream;
- Reducing cutting conveyance requirements at the toe of the cutting through bench and cut off drains conveying flows to either end of the cutting; and

- Increasing impervious area to treat for attenuation, treatment or both and pond locations.

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 construction.

13.2.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Additional flood modelling will be carried out at the detailed design stage and measures implemented to achieve the following flood hazard outcomes (proposed as a designation condition for all projects as outlined in Volume 1).

Mitigation measures which may be implemented to meet these outcomes include:

- Optimising bridges, culverts and wetlands to assess cumulative effects of upstream designations on downstream designations;
- Creating new overland flow path diversions to discharge to nearby overland flow paths or streams to mitigate ponding and decrease flood levels at affected properties;
- Designing culverts for the 1% AEP event and checking to ensure that there is no increase in water level upstream or downstream of culverts. Checks should also be made of capacity reduction at detailed design stage to understand overland flow paths and water level impacts of this capacity reduction;
- Upgrading culverts by adding additional culverts to create a balance between the flood level differences upstream and downstream, particularly for existing road sites that overtop and are to be raised and existing culverts that are lengthened;
- Installing drains at the toe of the embankment sloping towards the culverts to allow for additional storage to decrease the velocity and peak flow through the culvert crossings; and
- Installing treatment wetlands in optimum locations to reduce conveyance to and treatment areas to the wetlands. Fewer optimised wetlands can reduce future maintenance costs along with pipe networks to convey flows to the wetlands.

13.3 NoR-specific Flooding Effects

Error! Reference source not found. provides a summary of NoR-specific operational and construction flooding effects and associated suggested mitigation. It is recommended these measures are considered at detailed design, CEMP preparation and outline plan stage, once additional flood modelling has been confirmed in future.

Table 13-1: NoR specific flooding effects

Type of Effect	Effect	Suggested Mitigation	Relevant to NoRs:
Construction effect	Very large upstream catchments (>200Ha) can create large flows (>40m ³ /s). New bridges and piers must be built over existing rivers and will therefore be exposed to the flood risk. Large flows passing through the bridge construction site could cause scour and temporary works to be washed away or could be obstructed by temporary works and cause upstream flooding. Major diversions are not feasible. Works require controls to reduce the risk.	A construction methodology will be developed and followed to reduce the risk of construction related flooding as part of CEMP preparation. This also ties in with construction contingency planning for and warning systems for larger events as part of the plan.	NoRs 1, 4, 5, 6, 8, 10, 12
Operational effect	Existing flood plain storage volume loss with new embankments in flood plains could increase flood levels at culverts/bridges. Flood plain levels upstream and downstream of new formations may not achieve flood mitigation targets unless conveyance beneath the formation (bridges or culverts) is optimised.	Detailed modelling at the time of detailed design to confirm the best option to meet Flood Hazard condition requirements for upstream and downstream water levels.	NoRs 1, 4, 5, 6, 7, 8, 10
Operational effect	Raising existing roads above the predicted 100yr future flood levels could increase upstream flood levels. Greater protection of the road to flooding will require increased flow capacity beneath the road with the aim of flood neutrality upstream and downstream of the raised road formation.	Optimisation of bridge or culverts through later detailed modelling and design to confirm achievement of flood hazard conditions.	NoRs 1, 7, 8, 10

13.4 Summary of Effects on Flooding

The Assessment of Flooding Effects for the transport corridors/stations was based on an indicative design of the new transport network. Positive effects include the raising of transport corridors to be above predicted flood levels, and the anticipated additional treatment and attenuation that will be provided through proposed stormwater ponds and wetlands.

NoRs 1, 4, 5, 6, 8, 10 and 12 have very large upstream catchments (>200Ha) which can create large flows (>40m³/s) during rainfall events. New bridges and piers must be built over existing rivers and will therefore be exposed to the flood risk. Large flows passing through the bridge construction sites could cause scour and temporary works to be washed away or could be obstructed by temporary works and cause upstream flooding. For those areas where there is an increased risk during construction, mitigation measures such as the implementation of a CEMP during construction, will be appropriate to manage potential effects. As per the conditions, these CEMPs will include measures to mitigate flood hazard effects such as siting stockpiles out of floodplains, minimising obstruction to flood flows and actions to respond to warnings of heavy rain.

The potential operational effects include the risk that flooding could be exacerbated by altering or obstructing overland flow paths, reductions in flood storage capacity in flood plains from the construction or widening of embankments, increases in water levels upstream of culverts and bridges, and increased impervious areas. During the detailed design phase of the Projects, detailed flood modelling of the final corridor designs (including bridge and culvert locations/sizes) will be undertaken to meet NoR flooding consent condition requirements and optimise bridges, culverts and wetlands. This will also allow for confirmation of the cumulative effects of upstream NORs on downstream NORs. Based on the findings and recommendations of the Assessment of Flooding Effects, adverse effects of the new and/or upgraded transport corridors associated with flood hazards will be appropriately managed.

14 Ecology Effects and Mitigation

The Assessment of Ecological Effects, included in Volume 4, assesses the potential ecological effects of the North Projects on the environment that are subject to district plan controls in the AUP:OP. The assessment below should be read in conjunction with this report, and the Alternatives Assessment, included at AEE Appendix A, which outlines the process adopted to avoid or minimise effects on areas with ecological value. Effects that are common across all the NoRs are summarised first in section 14.2. NoR-specific effects are then summarised in section 14.3. Recommended measures to avoid, remedy and mitigate effects are covered in Section 14.4.

The assessment focused on district plan matters in relation to terrestrial ecology. For ecological effects that relate to regional plan and / or NES-FW matters, these will be assessed and resource consents sought through a future consenting process. Mitigation required by future regional plan or NES-FW approvals, will be identified as part of that future approval process. Whilst not assessed in detail, the potential ecological effects relating to future regional resource consents and / or wildlife permits have been considered to inform the alignments and the proposed designation boundaries for each North project / corridor, including areas required for potential offset measures that may be required to address direct effects on SEAs.

14.1 Methodology

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 and evaluate the magnitude and level of potential effects that each of the North Projects could have on these features. The key EIANZ assessment stages are outlined in Figure 14-1 below.

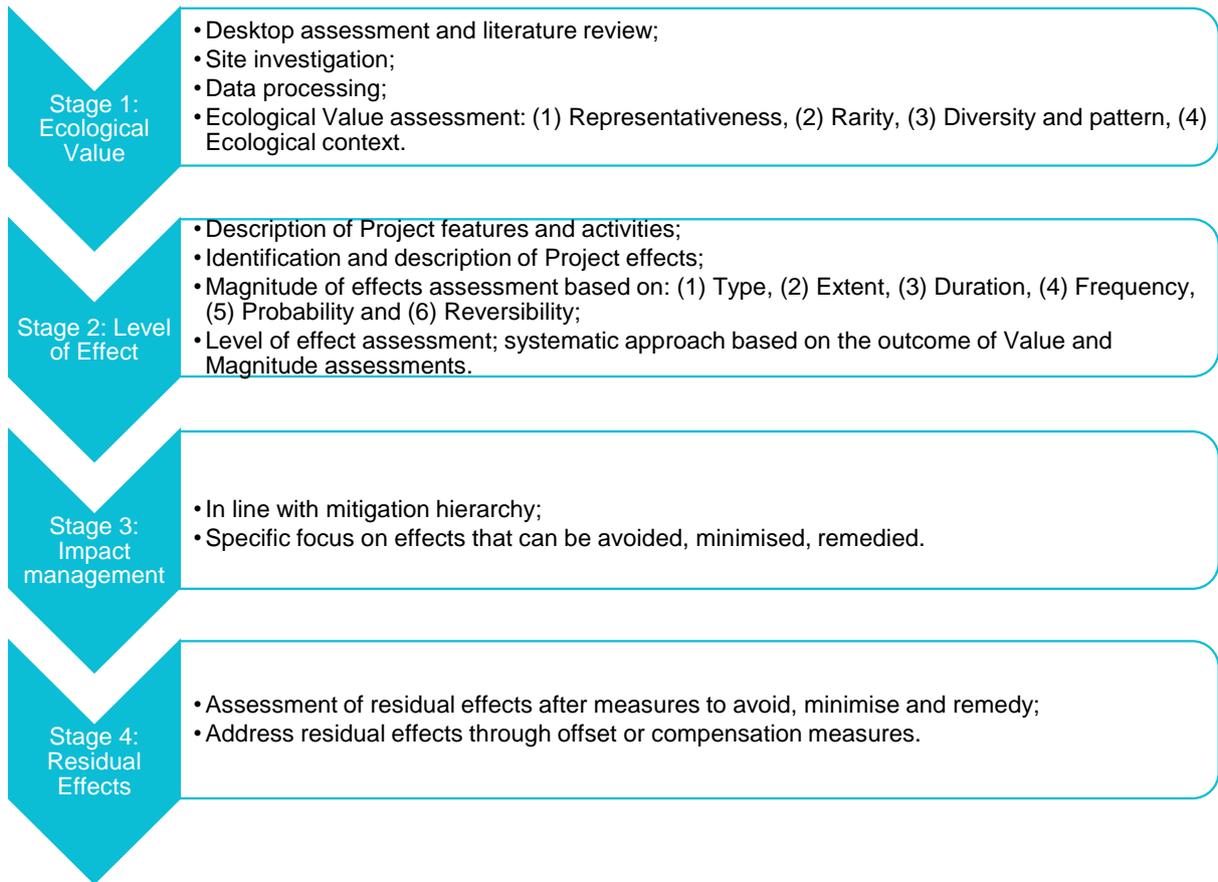


Figure 14-1: Ecological assessment approach process

The EIANZ Guidelines provide guidance to assist with the assessment of the likely future ecological environment in this report. The guidelines state:

“The ecologist needs to consider the permitted baseline in order to describe the potential “future ecological environment and to assess the effects at that time and should discuss this with the project planner or legal advisor if in any doubt”.

Considering the above, the ecological assessment has been informed by:

- The permitted baseline: the AUP:OP permits certain activities which provide for infrastructure, and as such would not require resource consent. These activities include vegetation clearance and the removal of trees, excluding protected trees (notable trees and street trees in urban or open space zones).
- The likely future environment: This takes account of the permitted activities for future infrastructure, but also the planned urbanisation of the FUZ land in the North growth areas. This is because assessing the effects on the environment solely as it exists today would not provide an accurate reflection of the environment in which ecological effects, resulting from the construction and operation of each of the proposed transport corridors, will be experienced, i.e. existing greenfields on FUZ land will be urbanised in the future.

The ecological assessment has been informed by site visits to key ecological features (identified from a desktop screening exercise), where features were accessible. Two rounds of bat surveys were carried out which confirmed the presence of bat activity in the broader landscape / along stream corridors.

14.2 Ecology Effects across all NoRs

14.2.1 Positive effects on ecology

The following general positive effects were identified for the North Projects:

- Improved blue/green infrastructure (stormwater wetlands, swales) and associated landscaping (which will be indigenous species).
- Mass revegetation of sloping berms, batters, and embankments to connect with retained forest remnants/mature trees.
- Proposed bat and bird mitigation in association with the revegetation and stormwater wetlands mentioned above, which will have positive ecological outcomes for native fauna.
- Proposed landscape planting will tie into stream and riparian corridors. Riparian vegetation will be retained (where practicable) and enhanced (weeds control and indigenous vegetation planted).

14.2.2 Construction effects on ecology

The Assessment of Ecological Effects (in Volume 4) focuses on district plan matters relating to ecology. Effects and mitigation for impacts related to vegetation alteration and removal within SEAs (which is a regional matter) will be considered at the detailed design stage and as part of regional consenting, for those corridors which have an impact on SEAs. Where there is a known impact on SEAs, consideration has been given to the potential land required for future mitigation/offset. However, the extent and details of those mitigation measures will be confirmed as part of future regional consents.

Construction activities associated with each new or upgraded transport corridor/station have the potential to cause adverse effects on ecological features within or adjacent to the North Projects, without mitigation. Potential adverse effects that relate to the construction activities are:

- Habitat removal that is subject to district controls, including native fauna (bats, birds and lizards) effects (mortality injury, roost/nest loss/disturbance).
- Disturbance and displacement to roosts/nests, and bats, birds, and lizards (and their movement) due to construction activities (noise, light, dust etc.). It is assumed that this effect will occur after vegetation clearance (subject to regional consent controls) has been implemented and is therefore likely to happen in habitats adjacent to the Project footprints/designations or underneath structures such as bridges.

The following sections explain the above adverse construction effects in more detail as they relate to bats, avifauna and herpetofauna.

Bats

The ecological value of bats is assessed to be very high. The following potential construction related effects to long-tailed bats have been identified within and adjacent to all the NoRs:

- Disturbance and displacement of long-tailed bats and/or their roosts due to construction activities leading to a change in population dynamics¹⁵. It is assumed that this effect will occur after vegetation clearance (subject to regional consent controls) has been undertaken and is therefore likely to happen in habitats adjacent to the Project footprints/designations or underneath structures such as bridges.
- Additionally, bats may be impacted by removal of district plan vegetation through loss of foraging habitat, roost loss and mortality or injury to bats.

During construction of the North Projects, the following specific activities are anticipated to contribute to the above adverse effects on bats:

- Night works (when required) and site compounds that may be lit overnight. There is potential that these works will modify the behaviour of bats if they are foraging within this area or roosting in nearby isolated stands of mature trees.
- Construction noise and vibration. This can affect the behaviour of bats roosting nearby.

NoR-specific effects are discussed further in section 14.3.2.

Avifauna

The following potential construction related effects to native birds within and adjacent to all the NoRs have been identified:

- Disturbance and displacement of native birds and/or their nests due to construction activities leading to a change in population dynamics. It is assumed that this effect will occur after vegetation clearance (subject to regional consent controls) has been implemented and is therefore likely to happen in habitats adjacent to the Project footprints/designations or underneath structures such as bridges.
- Additionally, birds may be impacted by removal of district plan vegetation (through loss of foraging habitat, nest loss and mortality or injury to birds).

During construction of the North Projects, the following specific activities are anticipated to contribute to the above adverse effects on birds:

- Construction noise and vibration. This can affect the behaviour of birds roosting in the immediate vicinity of construction works (up to 100 m from designation boundaries).

NoR-specific effects are discussed further in Section 14.3.2.

Herpetofauna

The following potential construction related effects to herpetofauna (*Arboreal gecko spp* and *Ground skink spp.*) within and adjacent to all the NoRs have been identified:

- Disturbance and displacement of herpetofauna due to construction activities leading to a change in population dynamics. It is assumed that this effect will occur after vegetation clearance (subject to regional consent controls) has been implemented and is therefore likely

¹⁵ Long-tailed bat population dynamics refers to fluctuations and changes in the population size and structure of long-tailed bats over time. This may include factors such as birth rates, death rates, migration patterns, habitat availability, and environmental conditions that influence the abundance and distribution of long-tailed bats.

to happen in habitats adjacent to the Project footprints/designations or underneath structures such as bridges.

During construction of the North Projects, construction activities controlled by district plan provisions (i.e.: construction noise, vibration and dust) of the AUP:OP are not anticipated to contribute to the above adverse effects on lizards. The magnitude of effects of disturbance and displacement due to noise and vibration for native herpetofauna is considered negligible across all NoRs, both within the current and likely future ecological environment. As the ecological value of all herpetofauna species is High, the overall level of effect is assessed as Low prior to mitigation, and impact management concerning construction activities such as noise, vibration and dust is not required. The level of effect within the likely future ecological environment is expected to remain the same as the baseline.

The removal of district plan trees (and their associated habitat values for lizards) concerning NoR 1,2, 4, 9 and 13 is discussed further in Section 14.3.2.

14.2.3 Operational effects on ecology

The operational activities associated with each new or upgraded transport corridor/station have the potential to cause adverse effects on ecological features within or adjacent to them, without mitigation. Potential adverse effects that relate to the operational activities are:

- Loss in connectivity for indigenous fauna (e.g., bats, birds, herpetofauna) due to light, noise, and vibration effects from the operation of the transport corridors/stations, leading to fragmentation of habitat.
- Disturbance and displacement of indigenous fauna and their nests/roosts (e.g., bats, birds, herpetofauna) due to light, noise, and vibration effects from the operation of the transport corridors and stations. It is assumed that the habitat features (such as wetlands and riparian margins) will retain the same value as for the ecological baseline for at least a portion of the initial operation.

The following sections explain the above adverse operational effects in more detail as they relate to bats, avifauna and herpetofauna.

Bats

Loss in connectivity could lead to an overall reduction in size and quality of bat foraging habitat. This has the potential to impact on bat movement in the broader landscape and could potentially disturb nearby bat roosts (including maternity roosts). Lighting spillage from street lighting could also disturb commuting and foraging bats at night and adversely affect insect prey populations. NoR-specific effects are discussed further in section 14.3.3.

Birds

The loss of connectivity through the presence of the transport corridors and associated disturbance, such as operational noise/vibration and light, could lead to an overall reduction in size and quality of bird foraging habitat, and has the potential to impact on bird movements in the broader landscape.

The level of effect on birds due to operational impacts associated with loss or decrease in connectivity has been assessed in the context of habitat suitability, the existing degree of fragmentation and the likely fragmentation in the future urban environment. NoR-specific effects are discussed further in section 14.3.3.

Connectivity effects are assessed as being low. This is however dependent on the ecological value of the species which could be reduced to having a negligible effect. Therefore, impact management is not required.

Herpetofauna

Potential operational effects on herpetofauna across the NoRs from the operation of new transport corridors, stations and upgrading / widening of existing roads include:

- Loss in connectivity due to the presence of the transport corridor/station (including light and noise effects from the road/station, leading to fragmentation of terrestrial, wetland and riparian habitat and a change in population dynamics due to the presence of the infrastructure)
- Disturbance and displacement of herpetofauna leading to a change in population dynamics due to light, noise, and vibration from the transport corridor/station.

Suitable habitat was identified within all NoRs which could potentially support both native geckos and/or skinks. Native geckos and skinks require vegetated corridors to facilitate natural dispersal, although they are a relatively resident species and do not require migration or large-scale movement to support reproduction, refuge and feeding. It is not uncommon to identify lizard populations within proximity to road corridors on both side of the road, indicating that there is potential for successful migration between the two fragmented habitats.

The magnitude of effects of loss in connectivity and disturbance to native herpetofauna is considered negligible across all NoRs, both within the current and future environment considerations. As the ecological value of all herpetofauna species is high, the overall level of effect is assessed as low prior to mitigation, and such impact management is not required. The level of effect within the likely future ecological environment is expected to remain the same as the baseline.

14.3 NoR Specific Effects on Ecology

This section summarises NoR specific effects on terrestrial ecology.

14.3.1 Positive effects on ecology

Specific positive effects are summarised in Table 14-1 below.

Table 14-1: Project positive terrestrial ecology effects

Positive Effect	Ecological Feature	Relevant NoR
Existing infrastructure upgrades will include new bridge structures to replace culverts at some locations. This will improve habitat connectivity for freshwater and terrestrial species, including improved fish passage and riparian habitat connectivity.	Dairy Stream Tributary (N4-S16a)	NoR 4
	Wēiti Stream (N7-S1a)	NoR 7
	Dairy Stream Tributary (N4-S16b)	NoR 13
	Dairy Stream Tributary (N8-S10)	NoR 8
	Rangitōpuni Tributary (N8-S3)	NoR 8
	Rangitōpuni Tributary (N8-S2)	NoR 8

14.3.2 Construction effects on ecology

Bats

The effect of habitat removal on long-tailed bats (specifically relating to mortality/injury and roost loss/disturbance) has been considered for protected district plan trees located in NoRs 1, 2, 4, 9 and 13. Only the tree groups in NoRs 1, 4 and 9 have the potential to be bat habitat (including tree roost potential in the likely future ecological environment). Long-tailed bats have very high ecological value and the magnitude of effect is considered to be low, with the overall level of effect assessed as moderate prior to mitigation. As such impact management is required and is described in Section 14.4 below.

Disturbance and displacement to roosts (existing) due to construction activities (such as noise, light, vibration and dust etc.) has been considered for potential adverse effects on bats. The magnitude of effect on bats (very high ecological value) is considered to be low, with the overall level of effect assessed as moderate prior to mitigation for NoRs 1,2, 3, 4, 5, 6, 7, 8, 9, 10, 12 and 13. As such impact management is required and is described in Section 14.4 below.

Avifauna

The effect of habitat removal on native birds (specifically relating to mortality/injury and nest loss/disturbance) has also been considered for the district plan trees located in NoR 1, 2, 4, 9 and 13 (refer Section 14.2.2). All of these groups of trees have the potential for non-TAR native bird habitat. Non-TAR birds are assessed as having Low ecological value and the magnitude of effect is considered to be low, with the overall level of effect assessed as low prior to mitigation. Impact management will be required under the Wildlife Act to prevent killing or injuring of native birds (refer section 14.4 below).

NoR-specific disturbance effects on birds during construction are summarised in Table 14-2, for NoRs where the level of effect is assessed as moderate or higher. The effects assessment has considered two scenarios – the current ecological baseline and ‘the likely future ecological environment’. The level of effect for the current baseline and the ‘likely future ecological environment’ were the same for both assessments.

Table 14-2: Summary of disturbance to native birds and nests, resulting in changes to population dynamics, (Moderate level of effect or higher) during construction

Effect Description		Risk of disturbance to native birds and nests (existing) adjacent to construction activities (noise, light, dust, vibration etc.) resulting in changes in population dynamics			
Bird Type	Species	Ecological Value	NoR	Magnitude	Level of Effect (pre-mitigation)
Cryptic Wetland Birds	Spotless crane	High	NoR 1, 4, 6, 7, 8, 9, 12, 13	Low	Moderate
	North Island fernbird	High	NoR 6	Low	Moderate

Effect Description		Risk of disturbance to native birds and nests (existing) adjacent to construction activities (noise, light, dust, vibration etc.) resulting in changes in population dynamics			
	Banded rail	High	NoR 4, 6, 10	Low	Moderate
	Australian bittern	Very High	NoR 1, 4, 6, 7, 8, 13	Low	Moderate
Open Water Wetland Birds	Brown teal, dabchick, grey duck	Very High	NoR 1, 4, 8, 9, 12. NoR 6, 7, 11, 13 (excl. dabchick)	Low	Moderate
Coastal Birds	Black shag, little black shag, little pied shag, pied shag	High	NoR 4, 10	Low	Moderate
	White heron	Very High	NoR 4, 10	Low	Moderate
Forest Birds	Long-tailed cuckoo	Very High	NoR 3, 6, 7, 10	Low	Moderate

Herpetofauna

The effect of habitat removal on lizards (specifically relating mortality/injury) has also been considered for the district plan trees located in NoR 1, 2, 4, 9 and 13. The groups of trees in NoRs 4 and 9 have the potential for lizard habitat which should be confirmed during pre-construction surveys. Lizards (all potential species identified) are considered high in ecological value and the magnitude of effect is low, with the overall level of effect assessed as moderate prior to mitigation. As such impact management is required and is described in Section 14.4 below.

14.3.3 Operational effects on ecology

Bats

Table 14-3 details the NoR-specific effects on longtailed bats during operation. Only NoRs where the level of effect is Moderate or higher are presented, with associated impact management presented in Section 14.4 below.

The level of effect within the likely future ecological environment across all NoRs is expected to remain the same as the baseline.

Table 14-3: Summary of effects on long-tailed bats (moderate level of effect or higher) during operation

Activity	Effect Description	NoR	Ecological value	Magnitude	Level of Effect (pre-mitigation)
Presence of the transport corridor	Loss in connectivity due to the presence of the transport corridor (including light and noise effects from the transport corridor, leading to fragmentation of terrestrial, wetland and riparian habitat) resulting in changes in population dynamics.	NoR 1, 4, 7, 8, 9, 10, 13	Very High	Low	Moderate
		NoR 6	Very High	Moderate	High
	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration (operational)	NoR 1, 4, 7, 10	Very High	Low	Moderate

Avifauna

Noise, vibration, and lighting disturbance caused by the presence of the transport corridors could potentially displace native birds from suitable nesting and foraging habitat within and adjacent to the NoRs. Table 14-4. below summarises the NoR-specific operational disturbance effects (where assessed as moderate and higher) for birds related to disturbance.

Table 14-4: Summary of disturbance to native birds and nests, resulting in changes to population dynamics, (Moderate level of effect or higher) during operation

Effect Description: Disturbance and displacement of birds (new and existing) and nests due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics					
Bird Type	Species	Ecological Value	NoR	Magnitude	Level of Effect (pre-mitigation)
Cryptic Wetland Birds	Spotless crane	High	NoR 1, 6	Low	Moderate
	Banded rail	High	NoR 10	Low	Moderate
	Australian bittern	Very High	NoR 6	Low	Moderate
Coastal Birds	Black shag, little black shag, little pied shag, pied shag	Very High	NoR 10	Low	Moderate
	White heron	Very High	NoR 10	Low	Moderate

Herpetofauna

No NoR-specific effects on lizards have been identified.

14.4 Recommended Measures to Avoid, Remedy or Mitigate Construction and Operational Effects

Pre-construction ecological surveys and Ecological Management Plans (EMP) will be prepared for each Project prior to construction. The pre-construction ecological surveys will inform the detailed design of the EMP by confirming whether the identified species of value are still 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 specific measures detailed in Table 14-5 below.

With the implementation of the EMPs, and the associated mitigation measures, the residual adverse operational and construction effects on bats, avifauna and herpetofauna are assessed as being negligible to low post mitigation.

Table 14-5: NoR-Specific Mitigation Measures for Construction and Operation Effects on Terrestrial Ecology

Item / Action	Effects	Suggested Mitigation	Relevant to NoRs:
Construction	Long-tailed bat habitat removal (mortality/injury and roost loss/disturbance)	<p>Bat Management Plan/measures which should also include:</p> <ul style="list-style-type: none"> a) Surveys prior to construction to confirm presence/likely absence. Surveys to confirm bat roost locations if activity is confirmed. b) Confirmation of maternity roosts may require a seasonal restriction on construction activity (no or restricted construction during Dec-Mar). c) Siting of compounds and laydown areas to avoid mature forest types. d) Lighting design to reduce light levels and spill from construction areas. e) Restriction of nightworks around mature forest types. f) Bat management should be incorporated with any regional consent conditions (i.e., BMPs) that may be required for regional compliance. g) Consideration to the provisions of the Wildlife Act including the implementation of a vegetation removal protocol (Bat Roost Protocol v2 DOC, 2021 or equivalent version at time of removal) (NoRs 1, 4 and 9 only). 	NoR 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12 and 13.

Item / Action	Effects	Suggested Mitigation	Relevant to NoRs:
	TAR birds (disturbance and displacement)	<p>Avifauna Management Plan/measures which should also include:</p> <ul style="list-style-type: none"> a) Preconstruction surveys to confirm presence and guide further management. b) Where practical, construction works near wetland habitat should commence prior to the bird breeding season (September to February) in order to discourage bird nesting. c) Bird management should be consistent with any regional consent conditions that may be required for regional compliance. d) Consideration of the provisions of the Wildlife Act including timing vegetation removal to avoid the key nesting period (September to February) or where this is not possible, pre-clearance inspections undertaken prior to vegetation removal (NoR 1, 4 and 9 only). 	NoR 1, 3, 4, 6, 7, 8, 9, 10, 11, 12 and 13
	Lizards (disturbance and displacement)	<p>Lizard Management Plan/measures which should also include:</p> <ul style="list-style-type: none"> a) Preconstruction surveys and/or habitat potential surveys to confirm (potential) presence and guide further management. b) Timing of the implementation of the LMP. c) A description of methodology for survey, trapping and relocation of lizards rescued. d) A description of the relocation site(s). e) Monitoring methods. f) A post-vegetation clearance search for remaining lizards. g) A suitably qualified and experienced ecologist/herpetologist approved to oversee the implementation of the Lizard Management Plan (LMP) shall certify that the lizard related works have been carried out according to the certified LMP within two weeks of completion of the vegetation clearance works. h) Lizard management should be consistent with any regional consent conditions (and the Wildlife Act 1953) that may be required for regional compliance. 	NoR 1, 4 and 9
Operational	Long-tailed bat (connectivity)	Bat Management Plan/measures which should also include:	NoR 1, 4, 6, 7, 8, 9, 10 and 13

Item / Action	Effects	Suggested Mitigation	Relevant to NoRs:
		<ul style="list-style-type: none"> a) Lighting design to minimise light levels and light spill along the transport corridors. b) Noise management to minimise noise disturbance at indicative bat mitigation areas. c) 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. 	
	Long-tailed bat (disturbance)	Bat Management Plan/measures which should also include: <ul style="list-style-type: none"> a) Buffer planting and retention of existing mature trees between the road alignment and features with potential for bat roosts. b) Lighting design to minimise light levels and light spill along the transport corridors. c) Noise management through design. d) Future presence of roosts within the alignment (placement of flaps on features with high roost potential). 	NoR 1, 4, 7, 9 and 10
	TAR birds (connectivity)	Avifauna Management Plan/measures which should also include: <ul style="list-style-type: none"> a) Retention of vegetation near wetland habitat, where practicable. b) Buffer planting between the road alignment and suitable habitat adjacent to the road. 	NoR 1, 6 and 10

Effects and mitigation for regional matters such as freshwater impacts and impacts on vegetation within SEAs will be considered at the future resource consenting and detailed design stage. Where there is a known impact on SEAs, consideration has been given to potential land required for future mitigation/offset. This high level assessment has confirmed there is likely to be sufficient space within the proposed and existing SH1 designations for the expected mitigation and offset, with additional opportunity for offset available in nearby public land if required (as detailed in the Assessment of Ecological Effects in Volume 4).

14.5 Summary of Effects on Ecology

Overall, with the implementation of pre-construction ecological surveys and EMPs for each Project prior to construction, adverse terrestrial ecological effects (as they relate to district plan matters within the AUP:OP) are anticipated to be negligible to low. Regional plan matters, and the potential adverse effects encompassed within these matters, will be managed during the future resource consenting phase prior to Project implementation.

15 Archaeology and Built Heritage Effects and Mitigation

An Assessment of Archaeology and Heritage Effects is included in Volume 4. The report assesses the potential effects on any identified recorded historic heritage sites and unidentified subsurface archaeological remains that might be exposed during future construction. The assessment below should be read in conjunction with this report. Effects that are common across all the NoRs are summarised first in section 15.2, including recommended measures to avoid, remedy and mitigate effects. NoR-specific effects and mitigation are then summarised in section 15.3.

15.1 Methodology

There are two main pieces of legislation in New Zealand that control work affecting heritage and archaeological sites. These are the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA) and the RMA, both have been relied upon in the assessment of effects. The assessment criteria assess first the archaeological values within the site context (condition, rarity / uniqueness and information potential), and second the archaeological values between sites (archaeological landscape / contextual value, amenity value, cultural association).

The assessment of effects on built heritage is based on standard international practices for Environmental Impact Assessment. The methodology has been aligned to regional values assessment criteria for Auckland set out in the AUP:OP Regional Policy Statement (RPS) Statement B5.2.2.1 Identification and evaluation of historic heritage places. The archaeological and heritage assessment for the North Projects included desktop research using a variety of resources as well as a field assessment.

15.2 Archaeology and Built Heritage Effects across all NoRs

15.2.1 Positive Effects on Archaeology and Built Heritage

Positive effects on historic heritage and archaeological sites may occur where the disturbance of sites as part of the Project works lead to an enhanced knowledge of those sites and the broader archaeological/historical context.

15.2.2 Construction Effects on Archaeology and Built Heritage

The proposed designations largely follow existing roads and otherwise run through areas that are currently undeveloped pasture, often crossing or running alongside several free-flowing streams. Where specific archaeological sites are recorded and have potential to be impacted by the proposed works, these are discussed in section 15.3.

Across the proposed designations as a whole, there is a risk for unrecorded archaeological sites to be encountered by future works and subsequently damaged or destroyed. The types of subsurface archaeological sites most likely to be encountered when works begin could be pre-European Māori sites, such as middens or artefact finds, or colonial sites such as rubbish pits and glass or ceramic artefacts from old homesteads, or material related to construction and industry in the area.

15.2.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

Prior to works starting, an authority to damage or destroy recorded sites (R10/737, R10/1450, R10/1472), unrecorded archaeological sites and any other archaeological features that may be encountered within the identified works areas should be applied for from Heritage New Zealand Pouhere Taonga (HNZPT) under Section 44 of the Heritage New Zealand Pouhere Taonga Act (HNZPTA) for each Project. As part of the authority application process, archaeological assessments focused individually on each Project / NoR will be required. These will require further archaeological survey and will provide an opportunity to gather additional information prior to any earthworks taking place – for example, all above ground sites and locations with built heritage values within the proposed designations can be recorded in detail.

No authority should be applied for without prior consultation with the appropriate tangata whenua authorities. Evidence of consultation and views expressed will be required by HNZPT and will be taken into account when making a decision about the granting of the authority.

When works begin, archaeological monitoring will take place in higher-risk areas and around known archaeological and heritage sites, which will be identified in a Historic Heritage Management Plan (HHMP), as outlined in the conditions for the North Projects. Where the risk of encountering archaeology or evidence of post-1900 heritage is increased, topsoil stripping can be carried out in advance of major earthworks under supervision of the archaeologist to ensure adequate time to fully record any archaeological or heritage site is available. If any unrecorded archaeological or heritage material is encountered during the Project, it will be recorded, sampled, and analysed as appropriate in order to mitigate any damage to archaeology following standard archaeological best practice. Appropriate tikanga (protocols) should be followed during works – Manawhenua may make recommendations outlining these.

In the event of kōiwi (human remains) being uncovered during any future construction, work should cease immediately and the appropriate tangata whenua authorities should be contacted so that suitable arrangements can be made. As archaeological surveys cannot always detect sites of traditional significance to Māori, or wāhi tapu, the appropriate tangata whenua authorities should be consulted regarding the possible existence of such sites, and the recommendations in this report.

NoR-specific mitigation measures are covered in Section 15.3.

15.2.4 Operational Effects

On completion of earthworks there are no expected effects on archaeological or heritage sites associated with the operation of the North Projects, noting that vibration effects as a result of North Projects have been considered at Section 16 – Noise and Vibration. Therefore, operational effects or measures to avoid, remedy or mitigate operational effects are not discussed further.

15.3 NoR-Specific Construction Effects

15.3.1 NoR 1 – New Rapid Transit Corridor (RTC)

Two archaeological sites have been recorded within the proposed designation and have potential to be impacted by future construction. These are the Kelly Homestead (R10/737), and a historic cemetery (R10/1472). In addition to this there are two homes with potential historic heritage values that have low potential to be affected by works. These are at 90 Old Pine Valley Road and 1603 Dairy Flat Highway.

For NoR 1, it is recommended that further investigation is carried out in the proposed designation area near R10/1472 (cemetery) during the future detailed design stage prior to designs being finalised, in order to ensure that any burials associated with this site are avoided by future works. This is provided for in the HHMP condition for this NoR.

15.3.2 NoR 4 – SH1 Improvements

Three items recorded in the Auckland Council CHI have potential to be affected by proposed additions to the existing SH1 designations between Albany and Grand Drive Ōrewa. These are the site of a WWII pillbox (13674), an old gum store (16066), and the Small Homestead (22215).

15.3.3 NoR 7 – Upgrade to Pine Valley Road

One archaeological site has been recorded within the proposed designation and has potential to be impacted by future construction. This is the Kelly Homestead (R10/737). In addition to this there is a home with potential historic heritage values that has some potential to be affected by works, at 158 Pine Valley Road.

15.3.4 NoR 8 – Upgrade to Dairy Flat Highway, Silverdale to Dairy Flat

Two archaeological sites have been recorded within the proposed designation and have potential to be impacted by future construction. These are the Kelly Homestead (R10/737), and the Wade Junction Hotel (R10/1450). In addition to this, a potential unrecorded historic farmstead (1032 Dairy Flat Highway) and three items recorded in the Auckland Council CHI, including two houses (16094 and 16095) and a Small Homestead (22215), are located within the proposed designation and have potential to be affected by works.

The exact location of the Wade Junction Hotel, near Wilks Road, Dairy Flat has not been determined following the hotel's destruction by fire in 1885. Due to the uncertainty of the location, the Wade Junction Hotel is not scheduled under the AUP:OP. Future construction work in relation to NoR 1 may assist in determining the location of the Hotel through exposing subsurface archaeological remains relating to the Hotel; although it is noted that at the most likely site of the Hotel, at 9 Wilks Road, significant earthworks (cut) and paving over the site has occurred some time after June 2021, and any archaeological material that may have been present has likely been destroyed without record.

15.3.5 NoR 9 – Upgrade to Dairy Flat Highway, Dairy Flat to Albany

A WWII pillbox (13686) recorded in the Auckland CHI has potential to be affected by future works within the proposed designation.

15.3.6 NoR-specific mitigation measures

Table 15-1 provides a summary of recommended NoR-specific mitigation measures in relation to construction effects. NoRs 1, 4, 7, 8 and 9 have potential for specific archaeological or heritage impacts on recorded sites.

Table 15-1: NoR-Specific Construction Effects and Mitigation Measures on Historic Heritage and Archaeology

Heritage / Archaeological Item	Effect	Suggested Mitigation	NoR
R10/737 (Kelly Homestead)	Potential damage to archaeological site from construction within NoR 1, 7 and 8	Field survey, archaeological authority and monitoring	NoR 1, 7, and 8
R10/1450 (Wade Junction Hotel)	Potential damage to archaeological site from construction within NoR 8	Field survey, archaeological authority and monitoring	NoR 8
R10/1472 (Cemetery)	Potential damage to archaeological site from construction within NoR 1	Field survey and GPR survey, archaeological authority and monitoring	NoR 1
13674 (Pillbox)	Potential damage to historic site from construction within NoR 4	Field survey and archaeological monitoring	NoR 4
13686 (Pillbox)	Potential damage to historic site from construction within NoR 9	Field survey and archaeological monitoring	NoR 9
16066 (Gum store)	Potential damage to historic site from construction within NoR 4	Field survey and archaeological monitoring	NoR 4
16094 (House)	Potential damage to historic site from construction within NoR 8	Field survey and archaeological monitoring	NoR 8
16095 (House)	Potential damage to historic site from construction within NoR 8	Field survey and archaeological monitoring	NoR 8

Heritage / Archaeological Item	Effect	Suggested Mitigation	NoR
22215 (House)	Potential damage to historic site from construction within NoR 4 and 8	Field survey and archaeological monitoring	NoR 4 and 8
90 Old Pine Valley Road (House)	Potential damage to historic site from construction within NoR 1	Field survey and archaeological monitoring	NoR 1
158 Pine Valley Road (House)	Potential damage to historic site from construction within NoR 7	Field survey and archaeological monitoring	NoR 7
1032 Dairy Flat Highway (House)	Potential damage to historic site from construction within NoR 8	Field survey and archaeological monitoring	NoR 8
1603 Dairy Flat Highway (House)	Potential damage to historic site from construction within NoR 1	Field survey and archaeological monitoring	NoR 1

15.4 Summary of Archaeology and Built Heritage Effects

While the North Projects have avoided any direct impacts on scheduled heritage sites within the AUP:OP, there is potential across the North Projects area for unrecorded archaeological and heritage sites to be encountered during construction, particularly in undeveloped paddocks and alongside any streams or waterways. There are also several recorded archaeological and heritage sites within the proposed NoR areas which have potential to be partly damaged by works, including three archaeological sites (R10/737 – Kelly Homestead, R10/1450 – Wade Junction Hotel, R10/1472 - Cemetery), six CHI sites (13674 - Pillbox, 13686 - Pillbox, 16066 – Gum Store, 16094 – House at 1350 Dairy Flat Highway, 16095 – House at 1338 Dairy Flat Highway, 22215 – House at 1732 Dairy Flat Highway), and four unrecorded buildings with potential heritage values (90 Old Pine Valley Road, 158 Pine Valley Road, 1032 and 1603 Dairy Flat Highway).

With mitigation in place, adverse effects on heritage and archaeology associated with the North Projects are able to be appropriately managed.

16 Noise and Vibration Effects and Mitigation

An Assessment of Construction Noise and Vibration, and an Assessment of Traffic Noise and Vibration, are included in Volume 4. These reports assess the potential noise and vibration effects as a result of the construction and operation of the North Projects. The assessment below should be read in conjunction with these reports. Effects that are common across all the NoRs are summarised first, followed by NoR-specific effects and mitigation.

16.1 Construction Noise and Vibration

The Assessment of Construction Noise and Vibration Effects, included in Volume 4, contains predictions for construction noise carried out using the method recommended in NZS6803 in accordance with the AUP:OP, and with the Waka Kotahi State Highway Construction Noise and Maintenance Noise and Vibration Guide, which has been applied to all North Projects (consistent with the wider Te Tupu Ngātahi approach). The assessment below should be read in conjunction with this report.

16.1.1 Methodology

The Assessment of Construction Noise and Vibration Effects, included in Volume 4, was based on a worst-case scenario and utilised the following methodology:

- Reviewing noise and vibration emission data for construction equipment and construction tasks;
- Predicting the noise and vibration levels from construction based on relevant standards and guidelines; and
- Determining setback distances where compliance with the relevant standards can be achieved.

The Assessment also relies upon:

- The indicative construction methodology summarised in Section 6.4 and AEE Appendix C.
- The assumption that all existing buildings inside the designation areas will be removed or will contain non-noise sensitive uses (i.e. not dwellings).
- The understanding that construction of the North Projects will occur in the long term, meaning the receiving environment will differ significantly from what is present today.
- The assumption that no concurrent Project works will occur (and any receivers that may be impacted by more than one Project would be reassessed at the time of construction as part of the Construction Noise and Vibration Management Plan (CNVMP)).

Construction noise setback distances and vibration emission radii have been determined (based on assumptions of construction activities and equipment) for each of the transport corridors/stations. These were then used to identify any potentially affected receivers and determine where any potential construction noise and vibration exceedances of the relevant criteria could occur.

Potential effects of construction noise and vibration have then been assessed and construction management and mitigation measures identified where appropriate. To avoid and / or minimise exceedances of construction noise and vibration criteria, Best Practicable Option (BPO) mitigation and management measures will be utilised.

16.1.2 Construction Noise and Vibration effects across all NoRs

Potential Adverse Construction Noise Effects

Construction noise levels are expected to be within the permitted levels for the majority of the construction works. Some minor exceedances associated with high noise generating activities or night-time works may breach the permitted levels.

Construction noise 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.

Expected construction phases for each of the North Projects range from 1-2 years to 5-6 years. Predictions have therefore been assessed against the noise criteria for greater than 20 weeks “long-duration” under NZS 6803:1999. It is expected that the majority of the works will be carried out between 7am – 6pm Monday to Saturday. There may be extended hours during summer earthworks season (e.g. 6am – 8pm, Monday to Sunday). There is also the possibility of night works for critical activities (e.g. SH1 works, culvert construction and road surfacing).

Various construction activities and pieces of equipment will act as noise sources on site during construction works. An indicative construction equipment list was assumed to assess the noise and vibration effects. Given construction will occur in the future, the current methodology may not be inclusive of all equipment used nearer the time of construction. Confirmation of potential construction noise sources will need to be undertaken nearer the time of preparation of the CNVMP.

Potential Adverse Construction Vibration Effects

Construction vibration can be mitigated and managed to comply with the applicable limits for the majority of the works.

The daytime Category A vibration amenity criteria could be exceeded in existing or future buildings if they are occupied during the works and within 21 m of high vibration generating equipment, as set out in the Assessment of Construction Noise and Vibration Effects, included in Volume 4. The effect on receivers would be subject to their respective proximity to the works but could include steady vibration from the roller compactor or a small jolt from a digger which could rattle crockery and glassware.

Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration and where there is effective prior engagement. Where an exceedance is predicted at any receiver that exists at the time of construction, the effects will be mitigated and managed through the CNVMP and Schedules.

With the CNVMP in place, it is considered that effects will generally be reasonable for the majority of activities for the construction of all Projects.

16.1.3 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Construction Noise and Vibration Effects

The Construction Noise and Vibration Assessment outlines the implementation of a Construction Noise and Vibration Management Plan (CNVMP) as the most effective way to control construction noise and vibration impacts. The CNVMP will provide a framework for the development and implementation of Best Practicable Options (BPOs) to avoid, remedy and mitigate the adverse effects on receivers of noise and vibration resulting from construction. The information required to be submitted as part of the CNVMP is included in the condition set in Volume 1 and includes: the identification of receivers where noise and vibration standards apply, management and mitigation options, methods for noise and vibration monitoring, and procedures for maintaining contact with stakeholders.

16.1.4 NoR-Specific Construction Noise and Vibration Effects

NoR-Specific Construction Noise Effects

Existing receivers are located at varying distances from all designation boundaries along all corridors (listed at Appendix A of the Assessment of Construction Noise and Vibration Effects, Volume 4). Given the length and surrounding context of NoRs 1, 4, 8, 9 and 13, these corridors have the most receivers predicted to receive noise levels which exceed the relevant daytime criteria. It is noted that as the predominant zoning across the North Projects area is FUZ and the Projects are long term, existing receivers may not be present at the time of construction.

With mitigation measures in place, the number of existing receivers experiencing noise levels which exceed the daytime noise criterion is likely to reduce for each corridor and impact only the closest receivers in each instance.

It is unlikely that significant night-time works will be required for NoRs 1, 2, 3 given these Projects can be constructed generally offline. For NoRs 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 where critical activity may need to be carried out during the night-time in close proximity to existing residential receivers, consultation and mitigation measures will be essential. Night-time works are likely to be limited in duration and can be managed through the CNVMP.

NoR-Specific Construction Vibration Effects

Vibration levels may exceed the Category B criteria at some residential dwellings and commercial buildings near NoRs 2, 4, 8, 9, 11 and 13 (listed at Appendix B of the Assessment of Construction Noise and Vibration Effects, Volume 4) prior to mitigation being implemented, if high vibration generating equipment such as the compactor roller is used on the construction boundary at the closest position to the receiver.

Without mitigation, at these receivers, there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to avoid potential cosmetic damage.

Once the compactor is 8m away from dwellings and 4m away from commercial buildings, the Category B criterion would be met. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to avoid potential cosmetic damage.

Where vibration levels are predicted to exceed the Category B criteria, and where the construction methodology cannot be changed to reduce vibration levels, building condition surveys are recommended.

16.1.5 Summary of Construction Noise and Vibration Effects

Construction noise levels are expected to be within the permitted levels for the majority of the construction works. Some minor exceedances associated with high noise generating activities or night-time works may breach the permitted levels. Construction vibration may result in some cosmetic damage to neighbouring buildings; however, this is expected to be able to be avoided with mitigation measures in place. Construction noise and vibration will be managed through the implementation of a CNVMP as outlined above. Any future buildings will need to be assessed at the time of construction and mitigation and management determined through the CNVMP. With the CNVMP in place, it is considered that effects will generally be reasonable for the majority of activities for the construction of all Projects.

16.2 Operational Noise and Vibration

The Assessment of Operational Noise and Vibration Effects, included in Volume 4, assesses operational noise from road, RTC and station operations, and road vibration, against relevant standards and guidelines.

16.2.1 Methodology

The assessment contains predictions of road traffic noise carried out using the method recommended in New Zealand Standard – Acoustics – Road traffic noise – New and altered roads (NZS 6806) in accordance with the AUP:OP. In addition, Waka Kotahi's 'Guide to assessing road-traffic noise using NZS 6806 for state highway asset improvement projects' V1.1, was utilised. Station noise (vehicles and other sources) has been assessed against the underlying zone noise limits of the AUP:OP. Vibration effects have also been considered.

The assessment of effects considers both effects in accordance with NZS 6806 and in relation to the predicted noise level changes comparing the future traffic noise levels with and without the new and upgraded corridors. The assessment methodology takes account of the different noise sources across the different corridors which includes road traffic noise (including bus rapid transit), stations and active mode transport (e.g. walking and cycling).

Road traffic noise (both for general traffic and rapid transit bus lanes, and for both new and altered roads) is assessed against NZS 6806. Active mode transport (e.g. walking and cycling) does not cause any significant noise levels that are noticeable adjacent to the integrated major transport corridors and therefore has not been assessed in detail. Noise from station operations (e.g. PA systems and Park-and-Ride facilities) needs to be controlled to comply with the relevant AUP:OP noise limits.

Noise effects of road traffic on existing noise sensitive locations, referred to as Protected Premises and Facilities (PPFs) within NZS6806, have been assessed. In accordance with the NZS6806, PPFs within a 200 metre radius of the rural transport corridors and a 100 metre radius of the urban transport corridors have been included.

The assessment in accordance with NZS 6806 is undertaken for the Project road only, excluding other roads in the area. The assessment of traffic noise change takes account of all major roads in the vicinity of the Project road. In this instance, the traffic noise levels that may be experienced at PPFs from all traffic in the area is assessed to gain a good understanding, if:

- A Project road has an effect on the overall noise level received at individual PPFs and
- The change in noise level assuming all NoRs have been implemented (refer Section 16.2.2 below).

This means that the change in noise level takes account of the cumulative effect of all existing and future roads being used.

As required by NZS6806, the assessment methodology included the prediction of existing and future traffic noise levels, both without (Existing and Do Nothing scenarios) and within the proposed transport corridors (Do Minimum scenario and Do Minimum with Mitigation scenario). The scenarios are explained below:

- The Existing scenario represents the current road network with current traffic volumes, i.e. the existing environment as it is experienced now.
- The Do-Nothing scenario represents the current road network with future traffic volumes, assuming a full build out of the area.
- The Do Minimum scenario represents the proposed future road network, incorporating the proposed transport corridors and other transport projects in the area. This scenario assumes a full build out of the area, and the transport infrastructure to enable the development. This is a realistic scenario at a point in time when all new or upgraded transport corridors are operational.
- The Do Minimum with Mitigation scenario represents the proposed future road network, incorporating the proposed transport corridors and other transport projects in the area at the design year 2048, and includes mitigation that is designed specifically to reduce noise levels.

The RTC traverses both greenfield and brownfield areas. Where the RTC is adjacent, or close to, existing major roads such as SH1 and Dairy Flat Highway, PPFs have been assessed against the Altered road criteria. For all other parts of the alignment for the RTC, the PPFs have been assessed against the New Road criteria. A combination of New and Altered Roads are proposed in NoR 6, 11 and 12, and altered roads are proposed for NoRs 4, 7, 8, 9, 10, and 13. All these NoRs are assessed against NZS6806 and in relation to the change in noise levels.

It is important to note in the context of assessing noise effects of the operational transport corridors, the North Projects are intended to respond to future zoning changes and subsequent development of land surrounding the transport corridors in line with Council's future aspirations for the North. The proposed urban development of land in the vicinity is predicted to result in traffic volumes increasing, thus resulting in noise level increases for some areas when comparing current and future 2048 traffic volumes. The anticipated development of the North also means that some PPFs may not exist anymore at the time of construction, meaning the predicted effects may not be experienced by current residents.

As such, the results presented in the Assessment of Traffic Noise and Vibration Effects are indicative of a possible future scenario, but effects cannot be definitively determined at this stage. Confirmation of the road traffic noise at current PPFs will be carried out nearer the time of construction to confirm

that the recommended mitigation still represents the BPO. The review, confirmation and refinement of the BPO shall aim to achieve the same noise criteria categories as determined with the current BPO.

For the purposes of the Operational Noise Assessment, the RTC has been assessed as utilising an electric bus system, with 400 bus movements per day.

16.2.2 Operational Noise and Vibration Effects across all NoRs

Positive Operational Noise Effects

The North Projects will result in a redistribution of traffic across the wider area. They will enable people to choose different transport modes (other than cars) and therefore in places may result in a reduction in traffic using existing roads, and therefore may result in a reduction in noise levels over the wider area. In many cases, the implementation of a Project will provide an improvement for most PPFs (see further details in Section 16.2.3 below).

Potential Adverse Operational Noise and Vibration Effects

The number of PPFs for each NoR is set out in Table 16-1, below. Where a PPF would be affected by more than one NoR, this is set out in the Assessment of Traffic Noise and Vibration Effects, included in Volume 4.

Table 16-1: Number of PPFs for each NoR

NoR	Number of PPFs
1	231
2	0
3	0
4	161
5	0 (Less than 2000 annual average daily traffic (AADT), not assessed further)
6	12
7	17
8	154
9	90
10	21
11	35

NoR	Number of PPFs
12	55
13	132

The individual traffic noise level predictions were compared with the noise criteria categories¹⁶ A, B and C of NZS6806, and the anticipated noise level change due to the North Projects was calculated.

Overall, for the vast majority of existing PPFs, the noise level changes due to the North Projects will be insignificant, and in many instances reduced. In most instances where there is a perceptible increase, the expected noise level continues to fall within Category A. NoR-specific effects are covered in section 16.2.4.

At the approximate anticipated time of construction, it is anticipated that all buses will be electric. Electric buses do not cause significant noise levels at low speed or when stationary. Therefore, bus noise is likely to be unnoticeable from the RTC stations (including from bus layover areas) given their location in relation to major roads (SH1 and New Pine Valley Road). Therefore, the main noise source at stations is anticipated to be PA systems. These systems can be designed to comply with the relevant zone noise limits within the AUP:OP. PA systems can be turned down or off at night, or highly directional speakers can be used to avoid noise spill. Therefore, it is anticipated that the station operation, park and ride, and bus layover operations will have no effect on the noise levels received at any of the existing PPFs.

Vibration from road traffic can generally be managed for newly constructed and well-maintained roads. Road traffic vibration would likely generate no more than negligible traffic vibration impacts. Therefore, traffic vibration has not been assessed further for each corridor.

16.2.3 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Operational Noise and Vibration Effects

There are broadly three mitigation options that can be applied to manage road traffic noise (including RTC electric buses) that are discussed in NZS6806:

- The choice of road surface material, a mitigation option that reduces noise at the source (especially for roads with speeds above 40 – 50 km/h where the road-tyre interaction is the controlling noise source, rather than engine noise)
- The installation of noise barriers either on the roadside or on the property boundary
- The inclusion (for new builds) or retrofitting (for existing buildings) of Building Modification Mitigation (e.g. alternative ventilation to enable windows and doors to remain closed, improved joinery and/or glazing, or, in rare cases, the installation of additional wall and ceiling lining).

¹⁶ Category A: New Road ≤57 dB, altered road ≤ 64 dB, Category B: new road 57-64 dB, altered road 64-57 dB, Category C: new road 40 dB (provided the external noise level is >64), altered road 40 dB (provided the external noise level is >67)

A number of conditions are proposed in the Condition Set in Volume 1 so that operational traffic noise effects are appropriately considered prior to detailed design and construction of the Projects. A low road noise surface is proposed for all corridors.

As noted above, PA systems at the RTC stations can be designed to comply with the relevant zone noise limits within the AUP:OP, and a station noise condition is proposed to this effect. PA systems can be turned down or off at night, or highly directional speakers can be used to avoid noise spill.

16.2.4 NoR-Specific Operational Noise and Vibration Effects

Under the Do-Minimum scenario, all PPFs fell into Category A (the desired noise criteria category) for NoRs 1, 6, 7, 8, 9, 10 and 12. Two PPFs in NoR 11 and three PPFs in NoR 13 were predicted to be in Category B. Of these:

- **NoR 11** - Two PPFs (10 and 12 Kahikatea Flat Road) remained in Category B under both the Do Nothing and Do Minimum scenarios, because the predicted noise level increase did not equal or exceed 3dB. The road does not meet the definition of an Altered Road under NZS 6806. Therefore, the Standard does not apply, and mitigation options do not need to be considered under the Standard.
- **NoR 13** - 12 PPFs (1959 East Coast Road, 1746 East Coast Road, 1 Kea Road, 2 Spur Road, 1787 East Coast Road, 5 Kea Road, 7 Kea Road, 3 Kea Road, 9 Kea Road, 11 Kea Road, 13 Kea Road and 15 Kea Road) remained in Category B under both the Do Nothing and Do Minimum scenarios, because the predicted noise level increase did not equal or exceed 3dB. The road does not meet the definition of an Altered Road under NZS 6806. Therefore, the Standard does not apply, and mitigation options do not need to be considered under the Standard.

A low road noise surface is proposed for all corridors as provided for in the conditions.

The proposed Milldale Station (NoR 2) will accommodate a Kiss-and-Ride area level with Ahutoetoe Road, and a bus layover area to the south of the site. Both are predicted to generate noise levels that are similar to or lower than those of local traffic and SH1. It is predicted that the peak hour use of the station will comfortably comply with the most stringent night-time noise limit. Any PA system or mechanical plant will need to be designed to also comply with the relevant noise limits, which can be done during detailed design. A station noise condition has been included to this effect.

The proposed Pine Valley East Station (NoR 3) will accommodate a Park-and-Ride, drop off and pick up area and bus layover. It is predicted that for peak hour use the station and associated facilities can comply with the most stringent night-time noise limit of 45 dB LAeq at all positions. It is likely that the peak hour use will not be within the night-time period, and that noise levels will be even lower at night-time. Any PA system or mechanical plant will need to be designed to also comply with the relevant noise limits, which can be done during detailed design. A station noise condition has been included to this effect.

NoR 4 is the only NoR where additional mitigation in addition to a low noise road surface has been suggested. The BPO for this mitigation will be determined at Outline Plan preparation stage. This may include: mitigation in the form of 1-2m barriers is suggested for some PPFs. The assessment showed that barriers would reduce the number of PPFs in Category C from 23 under the Do-Minimum scenario to 14 under the Mitigation Option. The use of barriers in conjunction with a low noise road surface would reduce this further to 11. For any PPFs predicted to receive noise levels in Category C

once the BPO mitigation has been determined, mitigation via building modification can be investigated at the implementation of the Project (see Table 16-2, below).

The following table provides a summary of suggested NoR-specific mitigation measures for NoR 4 in relation to operational effects. Potential mitigation measures are set out in NZS6806 based on the BPO, and will be confirmed at Outline Plan stage. The proposed measures for NoR 4 provide for a low noise road surface; however any other mitigation such as barriers, are subject to further assessment at detailed design stage.

Table 16-2: NoR-Specific Operational Noise and Vibration Effects

Item / Action	Effects	Potential Mitigation (for further investigation at detailed design stage as per the conditions)	Relevant to NoRs:
PPFs receiving noise levels in Category C (East Coast Road, Kewa Road, Paikea Street)	23 PPFs receiving noise levels in Category C without mitigation measures.	2m barriers may be appropriate in some positions along the road, designation boundary, RTC or SH1. If implemented, these would likely achieve noise levels lower overall than without the North Projects, and would result in 9 of the 22 Category C PPFs receiving noise levels in Category B with this mitigation measure, if these PPFs are still present at the time of construction.	NoR 4
PPFs receiving noise levels in Category C	14 PPFs receiving noise levels in Category C where barriers alone do not provide any benefit.	2m barriers in conjunction with EPA7 50mm lower noise road surface would result in a further 3 of the 13 Category C PPFs receiving noise levels in Category B with this mitigation measure, if these PPFs are still present at the time of construction. The BPO will be determined at Outline Plan stage.	NoR 4
PPFs receiving noise levels in Category C	11 PPFs receiving noise levels in Category C where barriers in conjunction with EPA7 50mm lower noise road surface do not provide any benefit.	Building modification should be investigated at implementation stage of the project, if these PPFs are still present at the time of construction.	NoR 4

NoR 5 was not assessed further as it is predicted it will not meet the Annual Average Daily Traffic (AADT) threshold.

16.2.5 Summary of Operational Noise and Vibration Effects

The North Projects are predicted to result in a reduction in noise level across the majority of existing PPFs compared to existing noise levels. This is because while some PPFs are predicted to receive noise level increases (in the vicinity of NoR 4), overall, with mitigation based on the BPO in place, noise levels at the vast majority of PPFs will be lower with the North Projects implemented than would be the case without. Appropriate measures which comprise the BPO can be confirmed in accordance with the operational noise conditions of each NoR. As stated above, vibration from well-constructed and maintained roads is not an issue that causes adverse effects and vibration effects are not anticipated for these Projects.

17 Network Utilities Effects and Mitigation

This section identifies existing utilities within or adjacent to the new or upgraded corridors/stations, the expected effects of the North Projects on those utilities and any measures proposed to manage potential impacts.

17.1 Methodology

The North Projects and proposed designation footprints have considered desktop information from the publicly available Vector, Watercare, Transpower, etc. viewers and Auckland Council GeoMaps. However, thorough site investigations will be required at detailed design stage to confirm the full scope of works for service relocations. As part of the Te Tupu Ngātahi programme, regular engagement with network utility operators has also been undertaken to better understand how each new or upgraded transport corridor interfaces with utilities.

17.2 Positive Effects

The implementation or upgrade of transport corridors and associated relocation of utilities, if required, will allow utilities to be generally located outside the carriageway in the future, making ongoing access and maintenance easier.

Subject to ongoing engagement with utility providers (provided through the proposed designation conditions) there is the potential for positive effects resulting from the rationalisation of utilities service locations in the existing corridors and co-location within a common services trench for underground services for both new and existing corridors. This will also make future access and maintenance of the different utilities more manageable.

17.3 Existing Utility Approval Protocols

To understand the potential effects on utilities an understanding of the existing utility approval protocols is required.

There are established protocols for works within the existing road reserve controlled under the Utilities Access Act 2010 and associated National Code of Practice for Utility Operators' Access to Transport Corridors (Code of Practice).

Under the Code of Practice utility providers can access the road reserve (excluding motorways) as of right, subject to reasonable conditions imposed from the transport authority. Access is managed through the Corridor Access Request process, provided through AT and Waka Kotahi as the region's road controlling authorities.

All parties also have a duty to take all practicable steps to protect other parties' assets when working through its transport corridors. Effects of the new or upgraded transport corridors on these utilities can be effectively managed under the Code of Practice or subsequent superseding document as part of standard roading authority and network utility practice.

In addition, where a designation is in place for a utility under the RMA, AT/Waka Kotahi will be required to seek approval for works, noting that approval may be withheld if the works would prevent or hinder the public work or project or work to which the earlier designation relates. There are established protocols for obtaining this approval under the RMA.

17.4 Construction Effects

The typical utilities associated with each Project include:

- Three waters – wastewater, potable water, stormwater
- Electricity overhead and underground lines
- Gas lines
- Ethernet and telecommunications.

Additional non-typical utilities are identified in Table 17-1, below.

Table 17-1 Non-Typical network utilities affected by each NoR

NOR	Non-Typical Utilities
1 – New Rapid Transit Corridor	Transpower National Grid – 220kV High Voltage Transmission in the vicinity of Follies Way
2 – New Milldale Station and Associated Facilities	N/A
3 – New Pine Valley and Associated Facilities	N/A
4 – SH1 Improvements Package	Transpower National Grid – 220kV High Voltage Transmission through SH1 north of intersection with Bawden Road Designation 8914 – Millwater Substation, Vector Ltd
5 – New SH1 crossing at Dairy Stream	Transpower National Grid – 220kV High Voltage Transmission through eastern boundary
6 – New Connection between Milldale and Grand Drive	N/A
7 – Upgrade to Pine Valley Road	N/A
8 – Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat	Designation 4563 – Educational purposes – primary school (years 0 – 8), Minister of Education
9 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany	Transpower National Grid – 220kV High Voltage Transmission through Dairy Flat Highway south of intersection with Hobson Road Designation 8904 – Communications Hut (Radio), Vector Ltd
10 – Upgrade to Wainui Road	N/A

NOR	Non-Typical Utilities
11 – New Connection from Dairy Flat Highway to Wilks Road	N/A
12 – Upgrade and Extension to Bawden Road	Transpower National Grid – 220kV High Voltage Transmission through Bawden Road near intersection with Top Road
13 – Upgrade to East Coast Road from Silverdale to Ō Mahurangi Penlink (Redvale) Interchange	Transpower National Grid – 220kV High Voltage Transmission through East Coast Road near intersection with Worsnop Way Designation 8895 – Spur Road Substation, Vector Ltd

The works will result in construction disruption to existing network utilities within each transport corridor and may require the protection or relocation of services. The impacts of the Project's construction can generally be grouped into two categories:

- impacts to general services and assets
- impacts to non-typical assets, where works around them require additional control beyond business as usual, due to the potential disruptions to the service being significant.

17.4.1 General services and assets

New transport corridors will be formed as part of the corridor upgrades and extensions, including the RTC. These new corridors and the station designations cross multiple rural roads that are expected to carry network utilities and these have been considered in the indicative design. Existing road upgrades will impact the existing road reserve and are expected to have the following impacts on network utilities:

- Limitations on access to utilities within the corridor whilst construction works are being undertaken
- Risk of uncovering assets or potential damage to assets if depths are unknown, resulting in temporary disruption to users and requiring repair
- Location of devices shifting in relation to the road reserve corridor due to reallocation of corridor space.

As road controlling authorities, AT and Waka Kotahi have existing established processes for engaging and coordinating works with utility providers in the corridor. Although there will be temporary disruption, the staging of construction along the alignments will limit prolonged disruption in any section.

Engagement with network utilities will occur to coordinate works where practicable (such as laying new cables or services under the 'dig once' principle) as per the proposed designation conditions. These works will be coordinated to align with the Code of Practice and/or RMA requirements.

17.4.2 Non-Typical Utilities

Construction for the new or upgraded corridors with non-typical utilities in Table 17-1 has the potential for significant effects if carried out in an unplanned and uncoordinated way. Given the established protocols which exist under the Code of Practice and AT and Waka Kotahi's role as roading authorities, significant impacts are unlikely to occur.

Te Tupu Ngātahi holds a recurring network utilities forum for the network. Affected utility providers were engaged via meetings, phone call and email. This was to ascertain the design did not constitute a material risk to the utility and identify design cooperation that may benefit both parties. No opposing feedback was received to date from utility providers.

The following three designations and associated infrastructure interact with the North Projects, whereby they overlap with the proposed designation footprints but are unlikely to be directly affected by permanent works:

- #8904, Communications Hut (Radio), Vector Ltd
- #8914, Millwater Substation, Vector Ltd
- #8895, Spur Road Substation, Vector Ltd.

Waka Kotahi and/or AT will be required to seek written consent under section 177 from Vector Limited, where the North Project works affect these designations. Engagement has been undertaken with Vector as detailed in Chapter 22.

The National Grid Corridor overlay makes a single crossing of each of the NoR1, NoR4, NoR9, NoR12 and NoR13 corridors. Constructability assessments of the indicative designs have considered the constraints associated with working near the National Grid. Construction activities around the National Grid will require management to reduce potential effects and appropriate construction methodologies will need to be developed and implemented (e.g., launching girders for the motorway bridge north of the Ō Mahurangi Penlink (Redvale) Interchange, within NoR 4). Engagement has been undertaken with Transpower as detailed in Chapter 22.

17.5 Operational Effects

Temporary diversion or relocation of non-typical utilities is not currently expected to be required (to be confirmed during detailed design). If temporary diversions are subsequently considered necessary, they are expected to be accommodated within the designation footprint, which will reduce the geographical extent of impacts. Early engagement with the respective utility provider will be required to identify the critical service and confirm a relocation methodology. These steps alongside meeting the Code of Practice and, if relevant, meeting RMA requirements for existing utilities that are designated will provide confidence that effects are avoided and or managed appropriately.

Once the North Projects are constructed and transport corridors operational there will be no ongoing adverse effects to the utility operations. As set out above in the positive effects discussion, it is considered that the rationalisation of utility services and location outside the existing carriageways will make access and maintenance easier.

17.6 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Network Utility Effects

A Network Utility Management Plan (NUMP) will be prepared prior to the Start of Construction for a Stage of Work, as outlined in the conditions for the North Projects. This will set out a framework for protecting, relocating and working in proximity to existing network utilities and will be prepared in consultation with the relevant Network Utility Operators, including Transpower in relation to the National Grid Corridor.

In addition, as set out in the proposed conditions, Network Utility Operators with existing infrastructure located within the proposed designation footprints will not require RMA written consent under section 176 of the RMA for the following prior to construction:

- 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
- The upgrade and replacement of existing network utilities in the same location with the same or similar effects as the existing utility.

This has been offered via an NOR condition for each Project, to streamline and provide certainty to utility partners. For works that will exceed this threshold, AT and Waka Kotahi have established processes for sections 176 / 178 approvals. This will not replace any of the existing approvals required e.g., Corridor Access Request will still apply.

17.7 Summary of Effects on Network Utilities

Service relocation works are expected to be accommodated within the construction corridors within the proposed designation footprints. Additional work areas may be required for realignment/relocation of key services for example overhead power lines. The exact scope of services for relocation works will be confirmed through detailed design in consultation and engagement with the respective utility providers. If additional works are required outside the designation, approvals will be sought as necessary based on the detailed methodology at the time.

An assessment of the existing utilities within the corridor has been carried out and considered. Through the implementation of the Requiring Authority approval for ongoing access and maintenance of works in advance of construction, it is considered that potential adverse effects on network utilities can be avoided or appropriately managed.

18 Arboricultural Effects and Mitigation

The Assessment of Arboricultural Effects included in Volume 4 provides an assessment of the actual and potential effects of the future construction and operation of the North Projects on existing trees protected under the District Plan provisions and recommends ways of managing these effects. Any trees that trigger Regional Plan requirements will be assessed and managed through a future consenting process.

18.1 Methodology

Trees were recorded singularly, or in groups where logical groupings could be made based on species, configuration and/or size. Sufficient information was gathered to allow an assessment of the existing environment and consideration of the future environment. Tree details are presented in Appendix A of the Assessment of Arboricultural Effects provided in Volume 4.

Given that the North Projects are to be delivered in the long term, a verification assessment at the time of implementation will be undertaken prior to construction to confirm that the current conditions are still relevant. Any future tree removal, tree planting or mass planting vegetation will be assessed at that time, with the current Assessment of Arboricultural Effects intended to provide a baseline survey.

18.2 Positive Effects

For most of the NoRs (excluding the RTC and SH1 improvements), the proposed cross sections include a formal berm on both sides of the new corridor for the majority of each route. This will allow for the replanting of new trees in an environment conducive to good tree growth with suitable setbacks provided from future roading infrastructure; although in some cases, such as near intersections, further planting may not be possible. The full extent of replacement planting will be determined at the detailed design stage which will be completed prior to construction; however urban design principles will be followed when determining the type and extent of replanting new and upgraded corridors.

18.3 Construction Effects

As outlined in Table 18-1, the removal of District Plan protected trees will be required for the construction of NoRs 1, 2, 4, 8, 9, 10 and 13 from open space zoned land and in the road reserve. Works may also occur in the root zone of protected trees. NoRs 3, 5, 6, 7, 11 and 12 do not traverse areas which have trees protected by district plan provisions. Any vegetation alteration, removal or disturbance for these NoRs will be assessed in the future to determine whether regional resource consents are required for vegetation removal.

Tree removal has the potential to result in adverse amenity and ecological effects on the surrounding environment. It is anticipated that one Notable Kauri tree growing on the boundary of 19 Hobson Road will require removal to facilitate the proposed works in this location for NoR 9. It is unlikely that the removal of this tree can be avoided, however all future works will be assessed in accordance with the Tree Management Plan (TMP) requirements and tree removals will be avoided where possible.

Mitigation measures are described in detail in Section 18.5 below. Works near trees to be retained may involve 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 likely to be affected by each corridor is provided in Schedule 3 appended to the proposed conditions, and Appendix A, of the Assessment of Arboricultural Effects in Volume 4. In order to manage potential adverse effects, a TMP and replanting is proposed for each NoR, as described in Section 18.5.

Table 18-1: Summary of protected trees, groups and vegetation requiring removal for each NoR

NoR	Number of protected trees requiring removal	Mass planted areas/groups of vegetation requiring removal
NoR 1	0	2
NoR 2	0	2 (a portion of the two groups is also within NoR 1)
NoR 3	0	0
NoR 4	0	3 (a portion of one of the three groups is also within NoR 1)
NoR 5	0	0
NoR 6	0	0
NoR 7	0	0
NoR 8	1	2
NoR 9	1 (Notable tree)	2
NoR 10	2	0
NoR 11	0	0
NoR 12	0	0
NoR 13	7	3
Total	11	14

18.4 Operational Effects

The operational effects of the North Projects are largely limited to the maintenance of sight lines and the overhead and lateral clearances of the RTC, general traffic lanes and the high-quality active mode facilities. The required clearances will largely be limited to existing retained vegetation and newly planted vegetation within the proposed berm areas and will only require management in the medium term, with little pruning expected in the early establishment period (1 – 7 years following planting).

18.5 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Arboricultural Effects

Mitigation measures for tree works have been considered with the aim of avoiding, remedying and mitigating effects on trees. The effects on trees protected by the district plan will be mitigated by replacement planting within the corridors/stations and on adjacent land. To address the potential effects identified, a TMP will be prepared prior to construction to identify the existing trees protected under the District Plan, confirm the construction methods and impacts on each tree and detail methods for all work within the root zone of trees that will be retained. The TMP is proposed as a condition for each NoR, and will include:

- Confirmation that protected trees/groups identified in 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 such as protective fencing, ground protection and physical protection of roots, trunks and branches;
- Detailing methods for all work within the root zone of trees that are to be retained in line with appropriate arboricultural standards;
- Where good quality trees in the road reserve are identified for removal, consideration of tree transplanting will be included in the TMP. An assessment of the quality of the trees and the feasibility of transplantation will form part of the plan.

The TMP is limited to trees identified in the Assessment of Arboricultural Effects that are protected under the District Plan. Trees protected under Regional Plan provisions will be addressed as part of a future consenting process.

The effects of tree loss can be mitigated by comprehensive planting within the new berms, and areas identified in the ULDM which will be guided by the Urban Design Evaluation and Assessment of Landscape, Natural Character and Visual Effects (provided in Volume 4). Replacement planting will be confirmed through a planting plan for the North Projects under the proposed ULDM condition. The ULDM will also include methodologies to establish new trees within the road reserve, including creation of quality below ground environments, correct planting methods and appropriate maintenance. The replanting to be specified in the ULDM will provide the appropriate mitigation for the potential effects from the removal of trees protected by the District Plan. The long-term outcome of comprehensive street tree planting will be more trees in the public realm and increased amenity value within the public transport corridors.

18.6 Summary of Arboricultural Effects

The North Projects have the potential to effect up to 11 District Plan protected trees and 14 groups of District Plan protected trees. The impacted trees will be confirmed prior to construction, where a verification assessment will be undertaken to confirm which trees are affected and how effects can be mitigated. Mitigation measures will include the implementation of a TMP to manage effects on trees to be retained during construction, and locations for replanting along transport corridor alignments will be detailed in the ULDM for each project.

19 Community and Social Effects and Mitigation

The Social Impact Assessment (SIA), included in Volume 4, assesses the actual and potential social impacts associated with the planning (route protection phase), construction, operation and maintenance of the North Projects on regional, wider, and local communities. Assessment is based on the existing and likely future environment and provides recommended measures that may be implemented to avoid, remedy and / or mitigate these impacts. These effects are summarised below and should be read in conjunction with that report.

19.1 Methodology

The methodology used for the SIA is guided by the International Association for Impact Assessment Guidelines and Waka Kotahi Social Impact Assessment Guidelines. The methodology has been developed to identify the potential social impacts of the North Projects during the pre-construction (designation), construction, and operation phases, to assess the significance and severity of the impacts, and provide recommendations for potential mitigation measures. This has included the following steps:

- Developing an understanding of the proposal, scope and context including a review of the project descriptions, site visits, designation drawings, and a literature review.
- Identifying a preliminary 'social area of influence' – a geographical extent within which social impacts are expected to be experienced. This includes consideration of both existing and planned communities and the spatial extent of the North Projects.
- Identifying and describing the stakeholders and communities (existing and future) likely to be impacted (both positively and negatively) by each Project, at a range of scales. This included a business and resident survey and stakeholder interviews (described in further detail in Appendix H of the SIA in Volume 4).
- Impact identification and assessment - determining the nature and assessing the likely social impacts. The categories of likely social impacts that the SIA analyses are:
 - Way of life – how people carry out and get to their daily activities including consideration of access to and between communities and places/centres.
 - Community cohesion, stability, character, and severance
 - Values and identity – shared beliefs, customs, values and stories, and connections to land, places, and buildings.
 - Quality of the living environment and amenity – access to and use of ecosystem services; public safety and security; access to and use of the natural and built environment; the quality of the air and water; the level of hazard or risk, dust, and noise they are exposed to; the adequacy of sanitation; their physical safety; and their access to and control over resources.
 - Health and wellbeing –including health being a state of complete physical, mental, social, and spiritual wellbeing and not merely the absence of disease or infirmity
 - Personal and property rights – including whether economic livelihoods are affected, and whether people experience personal disadvantage or have their civil liberties affected
 - Fears and aspirations – including perceptions about their safety, their fears and aspirations about the future community.

- Recommending mitigation and management opportunities to avoid, reduce, remedy or enhance identified social impacts.

19.2 Pre- Construction Phase Social Effects

Prior to the design and construction phase, the designations will be in place but most property acquisitions will not have occurred yet. The duration of this phase will depend on when each Project is implemented, with this most likely to occur when planned urbanisation occurs, which could be in up to 30 years or more. The following sections describe the potential positive and adverse social impacts on people during the pre-construction phase where effects on those properties subject to the designations have been assessed as moderate or higher without mitigation.

19.2.1 Pre- Construction Phase Positive Effects

The North Projects have been designed and planned to meet the anticipated establishment of new and growing communities in the North. The NoRs allow communities to establish around the future transport routes. Route protection also prevents future disruption by protecting route alignments while they are still rural and allows future form to build in a way that is cognisant of this infrastructure. This has potentially low positive social impacts on the future wider, local and immediate communities.

19.2.2 Pre- Construction Phase Adverse Effects

Way of life

For directly affected landowners, the designating of properties has the potential to restrict how people live, work or recreate in the future. Whilst it does not change their current way of life, it places potential restrictions on people's future plans for their property (prior to acquisition). This could result in a negative social impact depending on the location and the extent of the designation on someone's property. Given the potential extended period of time proposed for these designations, this could result in moderate negative impacts for the affected properties. With mitigation in place (described in Section 19.5.1) this could drop to a low negative impact.

Fears and aspirations

The process of route protection may challenge the future aspirations of individuals and the immediate community. For directly affected landowners, and some landowners immediately adjacent to a designation, this includes things like properties being their 'forever home', retiring at the property and raising future generations. It may be anxiety provoking (creating uncertain futures) for many members of the immediate communities and (to a lesser extent) the local communities of these Projects. Lack of certainty is generally in regards to:

- When construction will commence
- How long an affected party will be subject to construction effects and the degree to which they will be affected by those effects
- The form of the potential effects of the future operation of the designation
- The ability to sell a property in the interim, once a designation is applied but before construction commences.

For current landowners within live zoned areas this has a potentially moderate negative impact on fears and aspirations (noting anticipated changes within the existing community in relation to future growth) of the immediate community. With mitigation in place (described in Section 19.5.1) this could drop to a low negative impact. For communities and current landowners within FUZ areas where urbanisation (and consequential change) is anticipated and has been signalled for some time, it is considered that route protection will have a lesser effect on fears and aspirations of the existing community.

Health and wellbeing

Whilst the route protection process provides certainty of where the transport corridor will be, it does not provide people with details of timing, detailed design, and detailed mitigation. Therefore, people will be living with an impending change without understanding when or specifically how (in detail) it may impact them. This may cause stress, anxiety, and a sense of loss amongst both directly impacted property owners and their families and (to a lesser extent) those within close proximity to the North Projects. Without mitigation there is the potential for this to have a moderate impact on wellbeing. It is anticipated that there is a degree of mitigation that can be provided in the form of communication and information that may lessen this impact.

19.3 Construction Phase Social Effects

The construction phase is the period where detailed design, property acquisition (noting some early property acquisition initiated by landowners may have already occurred) and construction occurs. The sequencing and timing of the North Projects is not confirmed but it is anticipated that Projects will take between 1 and 6 years to construct, averaging around 3 years. The longest construction period is anticipated to be NoR 1 and 4, with the shortest being the smaller existing road upgrades. The construction of some Projects may also overlap.

The following sections describe the potential positive and adverse social impacts on people during the construction phase where effects have been assessed as moderate or higher without mitigation.

19.3.1 Construction Phase Positive Effects

The construction of the North Projects will create employment opportunities for people from both the local and wider communities in Auckland. During construction there also may be opportunity for education and training such as local apprenticeships and partnering with local training providers. The construction will generate more activity within local areas and some businesses may be positively impacted by construction workers accessing local areas for food and other services pertaining to the North Projects. The construction of the North Projects could therefore have low to moderate positive social impacts on people's way of life where they are able to benefit from the additional opportunities created by the construction.

19.3.2 Construction Phase Adverse Effects

Way of life: Access

Due to construction and/or operation requirements some private and business accesses may need to be relocated or there may be temporary restrictions. In addition, there may be road diversions or

temporary road closures. This may change how people move around the area, causing delays to travel. In addition, there are several childcare facilities and schools adjacent to the proposed construction. Noise and access may disrupt their operations. Without mitigation this could have a moderate impact on properties and local road users. With mitigation in place (described in Section 19.5.2) this could drop to a low negative impact.

Way of life: Travel Patterns

Several of the North Projects involve upgrades to major arterials: NoR 8, 4 and 13. Construction on these roads could lead to disruption and increased time spent commuting. It could also lead to difficulty accessing community facilities such as local shops and schools (like Dairy Flat Primary School). The construction of these Projects will take a number of years to complete and collectively may disrupt the community for some time. Without mitigation there are potentially moderate to high negative social impacts. With mitigation in place (described in Section 19.5.2) this could drop to a moderate negative impact.

Way of life: Business Disruption

Construction activities may require the removal of parking on the roads outside business and changes to accesses. This is most likely to occur for the construction of NoRs 8, 9, 11 and 13 where existing businesses are located along the corridors and road widening is occurring. Construction works have the potential to disrupt how businesses operate and how customers access businesses, which in turn could impact productivity. Whilst works are progressive, and disruption would be temporary, it has the potential to cause moderate to high negative social impacts without mitigation. With regard to NoR 8 and NoR 11, construction of these Projects will potentially disrupt the Dairy Flat Village at the corner of Kahikatea Flat Road and Dairy Flat Highway, which currently functions as a hub for the local area. Whilst this hub will likely change in the future with development of the FUZ to the east, at the time of construction it is anticipated that this will still be a local area for the Dairy Flat community, if not a more local sub community of Dairy Flat. With mitigation in place (described in Section 19.5.2) this could drop to a moderate to low negative impact. Traffic and transport effects are also discussed in further detail in Section 10.2.2.

Community Services

The local Dairy Flat Tennis Club on Dairy Flat Reserve will be impacted by the construction of NoR 8, with three courts expected to be impacted during construction, as well as the clubhouse. This is likely to require relocation of the club prior to construction. Without mitigation this would have a high impact on this community resource, as the club would not be able to remain functional. With mitigation (e.g. if the services are able to be maintained elsewhere on the Dairy Flat Reserve site or in another location that is central to the Dairy Flat community) it is anticipated that this could have a low to moderate impact on the community depending on the level of disruption. Representatives of the club and Council as landowner were engaged with in July 2023 as described in Chapter 22.

The Southstar Equestrian Facility at 9 Bawden Road, Dairy Flat, will be affected by the construction of NoR 12. This facility is leasing land within the FUZ area and therefore may be subject to land change prior to the commencement of this project and is subject to the decisions of the landowner. Given the likely urbanisation of the area, a facility like this will likely need to relocate to a more rural area; however it is noted that if the facility is not relocated within the Dairy Flat area, it will be a loss of a

community asset for those within the equestrian community. This landowner was engaged with in July 2023.

The Matea Trust, at 1016 Dairy Flat Highway, Dairy Flat, will have some disruption to the front of its property during construction of NoR 8, but it is anticipated that the service can continue and residents remain on site. Communication and co-ordination with this service can mitigate any anticipated impacts.

There are also a number of local parks and reserves which either adjoin or marginally sit within designation boundaries. The level of impact on the parks will depend on the final design alignment of the transport corridors, which will be refined at the detailed design stage. Further discussion on potentially impacted parks and reserves is provided in Section 20.5.2. Engagement with Council was undertaken in July 2023 in relation to these parks/reserves.

Community cohesion and stability

The construction phase is where active property acquisition will take place and it is expected that there will be a lot of change in the community during this time. Multiple construction projects coupled with the overall process of urbanisation and subsequent development are likely to be happening at the same time. This will most likely result in a period of community instability due to all the changes occurring (particularly to the west of SH1). Overall, it is anticipated that the North Projects will have a moderate to high impact on community cohesion and stability without mitigation. With mitigation in place (described in Section 19.5.2) this could drop to a moderate negative impact.

Quality of living environment and amenity

Landscape changes, noise and dust have the potential to negatively impact the quality and amenity of the living environment. It is anticipated in the future that there may be higher density housing in closer proximity to the construction works. Due to the close proximity of Projects to each other, some members of the community could be subject to construction impacts for a prolonged period of time. Due to the potential prolonged disruption and the number of Projects (coupled with other urbanisation construction being undertaken) it is anticipated that overall, this could have moderate impacts on the quality of the amenity of the living environment without mitigation. With mitigation in place (described in Section 19.5.2) this could drop to a low negative impact.

Health and wellbeing

The construction of the North Projects will be coupled with the urbanisation and development that will be occurring within the same community. Prolonged disruption has the potential to be stressful and anxiety provoking for the local community. For those particularly sensitive to noise or with requirements to sleep during the day there may be long periods of disruption. Without mitigation this could be moderate negative impact. With mitigation in place (described in Section 19.5.2) this could drop to a low negative impact.

19.4 Operational Phase Social Effects

Once the North Projects are operational, the effects on surrounding communities will be largely positive as outlined below. The following sections describe the potential positive and adverse social

impacts on people during the operation phase where effects have been assessed as moderate or higher without mitigation.

19.4.1 Operational Phase Positive Effects

Way of life: Access

The North Projects will provide transport choice and will provide safe and efficient options for public transport and active transport in addition to private vehicles. People will have an opportunity to be more active and connect to places by active transport modes such as walking or cycling. For those who do not drive they will have more opportunity to independently connect to the local and wider community with improved public transport connections. North and south connections will be provided via NoRs 1, 4, 8 and 13. As well as providing greater access within and in/out of this area, the North Projects will also provide more efficient travel potentially reducing people's commute times and allowing more time to work or participate in other activities. The North Projects will also have positive impacts on the efficiency of freight in the area, improving the way businesses operate providing potential economic benefits to the region. Collectively the North Projects will have a potentially high positive impact on the way the local and wider community move around and have access to the area through improvements to existing roads and new networks.

Aspirations

The North Projects will contribute to the aspirations of the community to have improved and increased public transport connections. They will also help allay the fears of the impacts of population growth in the area by providing more efficient transport networks to enable people to move around. The North Projects will support the aspirations to provide future growth areas and housing options for Aucklanders whilst remaining connected to wider Auckland. Overall, the North Projects will have a high positive impact on aspirations of the community once operational.

Community cohesion and connectivity

The North Projects provide increased options for people to connect between and within local communities and within the wider community and beyond. This includes connecting people to both existing and future community hubs such as Dairy Flat Village (which currently has employment, services, retail and community services for the local community) and the future Dairy Flat town centre. In addition, the North Projects are addressing existing severance issues by providing walking and cycling connections across SH1 at Silverdale, Wainui, Redvale, near Dairy Stream and at Wilks Road, and also providing for all modes at interchanges. Collectively these Projects will have a high positive impact on community cohesion and connectivity.

Health and wellbeing

The North Projects will provide a safer transport network, considering all Projects have a focus on safety including adoption of Road to Zero safety principles. The provision of active transport networks promotes people to move, which in turn generates a healthier community. Overall, these Projects will have a high positive impact on the health and wellbeing of local communities.

19.4.2 Operational Phase Adverse Effects

Community severance

Both the widening and construction of new links/roads could sever existing and future communities if they are not able to be accessed and crossed at regular intervals, particularly by active modes of transport. This effect is most notable for NoR 1 and road extensions/connections NoR 5, 6, 11 and 12. Specifically, the RTC (NoR 1) will have limited crossing points and will be a new corridor that passes through established communities. Some arterials will have access restrictions and Dairy Flat Highway rural section (NoR 9) will have some median barriers.

In addition, extensions to existing corridors and new connections across SH1 (NOR 5, 6, 11 and 12) will create severance through the existing environment (noting these are within FUZ and the level of severance will be dependent on future urban form). This could result in limitations in access to future/existing community infrastructure and social connectivity for local communities. Without mitigation it is anticipated impacts could be moderately negative subject to how the FUZ is developed in the future. With mitigation in place (described in Section 19.5.3) this could drop to a low negative impact.

Quality of living environment and amenity

For NoR 1, 6 and 11 where there are new connections being created, it is more likely that people will experience a change to the quality and amenity of their living environment due to a new transport corridor being constructed in close proximity to their property. This would impact only those that are currently located near the NoRs and remain post construction. Whilst it is acknowledged that in most cases (not all) this is in the context of an urbanising environment, without mitigation impacts on these properties could be moderate. With mitigation in place (described in Section 19.5.3) this could drop to a very low negative impact.

19.5 Recommended Measures to Avoid, Remedy or Mitigate Adverse Effects

The following sections outline the proposed measures to avoid, remedy or mitigate the potential adverse social effects during the pre-construction, construction and operational phases of the North Projects.

19.5.1 Pre-Construction Phase Mitigation Measures

The following measures are proposed in order to manage adverse effects during the pre-construction phase of the North Projects:

- The proposed conditions (provided in Volume 1) include a Project Information condition which requires a Project website or equivalent virtual information source to be established within 12 months of the date the designation is included in the AUP:OP. All directly affected owners and occupiers will be notified in writing once the website has been established. The website will include information including the status of the North Projects, anticipated construction timeframes, contact details, what the designation means for someone's property and the s176 process under the RMA.

- Under the RMA, section 176 provides a process for landowners to seek approval for development on designated land/buildings.
- In addition, the SIA recommended that - due to the anticipated timeframes of the pre-construction phase of the North Projects designations - an additional mechanism be provided to increase flexibility of development and management of designated land for the interim period. A condition has therefore been included for AT projects which sets out some common activities which will not require written consent to be sought, with the condition itself constituting written approval. It is considered this condition for AT projects, in conjunction with the abovementioned Project Information condition, achieves the intent of this recommendation within the SIA.

19.5.2 Construction Phase Mitigation Measures

The following measures are proposed in order to manage adverse effects during the construction phase of the North Projects:

- A Stakeholder and Communication Engagement Management Plan (SCEMP) will be prepared prior to the start of construction for a stage of work. The SCEMP will include:
 - The contact details for the project liaison person which will be advertised on the project website
 - The procedures for ensuring there is a contact person available for the duration of construction works, for public enquiries or complaints about the construction works
 - A list of stakeholders, organisations and businesses who will be engaged with
 - Identification of the properties whose owners will be engaged with
 - Methods and timing to engage with landowners whose access is directly affected
 - Methods to communicate key project milestones and the proposed hours of construction activities.
- A Construction Traffic Management Plan (CTMP) will be prepared prior to construction for each stage of work which will detail methods to manage the effects of temporary traffic management activities on traffic, detour routes where required, methods to maintain access to properties and businesses, and methods for communicating traffic management measures to affected road users.
- In accordance with the proposed CTMP and SCEMP, meetings will be held with businesses prior to construction to address potential business disruption issues with regards to access and parking.
- The preparation of construction management plans required by the proposed condition set (including a CTMP, ULDMP, CEMP (Construction Environmental Management Plan) and CNVMP (Construction Noise and Vibration Management Plan)) will also enable the appropriate management of effects on the environment and local communities during construction.

19.5.3 Operational Phase Mitigation Measures

The following measures are proposed in order to manage adverse effects during the operation phase of the North Projects:

- An Urban and Landscape Design Management Plan (ULDMP) will be prepared prior to construction which will include details on how the North Projects will be integrated into the surrounding landscapes and communities.
- The detailed design elements of the North Projects including crossing locations will be determined as part of the future UDLMP. As recommended in the Urban Design Evaluation (UDE), this should encourage locating crossings at regular intervals and near community services for ease of access.
- Operational noise will be addressed through the provision of low noise road surfaces and other Best Practicable Option (BPO) noise mitigation where appropriate, as described in further detail in Section 16.

19.6 Summary of community and social effects and mitigation

The North Projects will have positive effects for the communities in which they will operate. The corridors will support planned urban growth and will have safety and transport benefits through the provision of safe, resilient and integrated connections which provide for active transport and public transport connections. The projects will also improve community cohesion and access to community resources.

A range of potential adverse social effects are anticipated during the pre-design and construction phases of the projects, which relate to the uncertainty of the construction timeframes of the projects, the long lapse dates and impacts on people's aspirations for their properties, and construction disruption and impacts on access to businesses and properties. These effects can be managed with the development and implementation of the appropriate plans and mitigation measures outlined in Section 19.5 including communication with the community (including via the Project Information condition on each designation), affected landowners and occupiers. Where effects cannot be fully mitigated, they can be managed through discussions with the affected parties.

20 Property and Land Use Effects and Mitigation

Construction of the North Projects will have impacts on property and land use. This section of the AEE assesses the potential effects from these impacts. Section 19 – Community and Social Effects and Mitigation, considers effects on the community generally, including disruption to businesses.

20.1 Methodology

The North Projects have sought to reduce potential adverse effects on existing private properties and businesses through alignment and corridor design, where practicable, while acknowledging the planned urban growth will result in substantial changes to the area over the long term. The assessment has included specific consideration of the potential property and business impacts in the Assessment of Alternatives report, provided in AEE Appendix A. Efforts have been made through engagement with affected stakeholders to refine the corridor design and the designation footprints.

The North Projects propose to designate land to provide a sufficient footprint to enable the construction, operation and maintenance of the proposed transport corridors. Private properties that are directly affected vary across the corridors between residential, primarily rural, rural-residential, open space / reserve and commercial / industrial land uses. Refer to the Form 18 for each NoR (Volume 1) for a list of properties impacted by each corridor. The existing and likely future land use of each corridor is provided at Section 8 – Receiving Environment.

20.2 Positive Effects

The proposed transport corridors/stations support the intensification of land and at a network level are designed to support the identified urban growth as enabled through the AUP:OP. In the North, this is most evident on FUZ land, where the land is to undergo plan changes and rezoning, and the designations identify the infrastructure required to support that development.

The identified designations will enable integrated planning and delivery of environments from greenfield to urban with infrastructure suitable to support anticipated development density and desirable urban form. This will support the development of impacted property in the future.

20.3 Pre-Construction Phase Effects – Long Lapse Periods

Lapse periods of up to 30 years are sought for the North Projects designations. The rationale for this is set out at Section 5, and potential social impacts of these timeframes are addressed at Section 19.2.2.

Long lapse periods can result in a lack of certainty around the timing and nature of effects, and potential interim impacts such as how a designated property can be used, or whether it can be sold, prior to works commencing. Notwithstanding the influence of any proposed mitigation, the significance of potential effects resulting from this lack of certainty is generally proportional to the length of the lapse period. In other words, a longer lapse period can create uncertainty for a longer period of time than a shorter lapse period.

Given the zoning and current land use pattern in the North, and the likely long-term timing for development of the North Projects, the degree and nature of planning blight is likely to differ from that of blight related to shorter term designations in existing urban areas (i.e. there is a risk of long-term uncertainty, and therefore long-term blight). Therefore, there is an opportunity to reduce blight by providing as much certainty as possible.

In the absence of a specific construction commencement date, and other precise information regarding construction duration within any specific area, it is considered that the most workable method for managing any outstanding uncertainty associated with the lapse period being sought is ongoing communication and we discuss the adequacy of proposed conditions (including those relating to ongoing communication) in more detail below.

Conversely, it is anticipated that the long lapse periods may provide some positive benefits to landowners, given they allow greater time to plan and prepare for future change enabled by the designations, and allow landowners to make better informed decisions around property upgrades and investment.

20.3.1 Future Urban Zone

When considering effects associated with an extended lapse period, it is important to note that the majority of the North Projects are within the Future Urban Zone (FUZ). The FUZ is a land use 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 that:

- 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.
- Developers who develop FUZ areas in future, will do so with knowledge of where the network will be. In some instances, large-scale developer-led development is already occurring or planned in close proximity to the network. Refer to Section 7.1.
- 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. It is considered that the 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.

For rural areas which are not zoned FUZ – including Mixed Rural Zone and Countryside Living Zone, the existing zones place restrictions on development and activities. It is therefore likely that the

ongoing use and development of these rural areas will continue as they are. Significant development is not anticipated.

In order to manage uncertainty of restrictions and project delivery timeframes for owners, Waka Kotahi and AT will establish information platforms following confirmation of the designations and before construction starts, to inform owners of project timelines. This requirement is provided for in the Project Information condition, contained in Volume 1.

20.3.2 Land Use and the Section 176(1)(b) Process

The designations will not preclude the continued (unchanged) use of any directly affected properties prior to construction. However, in accordance with section 176(1)(b) of the RMA, anyone (other than a requiring authority with an earlier designation) is restricted from carrying out work on the designated land which would prevent or hinder the designated work without first obtaining the requiring authority's written consent. For properties that are partially designated, only works within the areas of the designation are required to obtain written consent. For those properties adjacent to or in proximity to the designations, before implementation of the transport corridors, urban development and investment can continue to occur, informed by the designation.

A condition has been added for AT projects which sets out some common activities which can occur within designation boundaries on properties zoned Rural or Future Urban, which are not considered to prevent or hinder the designated work. As the condition itself constitutes written approval by the AT for the specified activities, the landowner will not have to seek written approval to undertake the activities as nominated in the condition, within the designation boundary.

Where feasible, AT and Waka Kotahi will work with landowners and developers through the section 176(1)(b) process to help them integrate earthworks, road upgrades (or extensions to roads), stormwater solutions and development so that those works will not prevent or hinder the work authorised by the designation and enable written consent to be provided. The Project Information condition will include a requirement for information on this process to be included on the relevant project websites.

20.3.3 The Public Works Act process

Land may continue to be sold or leased whilst designated. Where landowners contact Waka Kotahi or AT in advance of the property acquisition process, the respective requiring authority will engage with those landowners to:

- Direct them to public information on the PWA¹⁷ process and its provisions for landowners (noting that the PWA is a non-RMA process);
- Explain expected timeframes for the corridor delivery to address landowners' uncertainty;
- Explain how to seek written consent under Section 176(1)(b) of the RMA for works in the designation.

¹⁷ [https://www.linz.govt.nz/resources/regulatory/guideline-acquisition-land-under-public-works-act-1981-linzq15703#:~:text=The%20Public%20Works%20Act%201981%20\(PWA\)%20sets%20out%20the%20procedures,the%20process%20of%20land%20acquisition](https://www.linz.govt.nz/resources/regulatory/guideline-acquisition-land-under-public-works-act-1981-linzq15703#:~:text=The%20Public%20Works%20Act%201981%20(PWA)%20sets%20out%20the%20procedures,the%20process%20of%20land%20acquisition)

Refer to Form 18 for each NoR (Volume 1) for a list of properties within the proposed designation footprint for each corridor, and to Volume 3 for Conceptual Design Drawings.

20.4 Construction Phase Effects

The proposed designation footprints include land required for temporary construction and permanent works. These specific areas will not be confirmed until detailed design. Temporary effects on access and parking are discussed at Section 10 – Traffic and Transport Effects and Mitigation.

20.4.1 Land Required Permanently

Land required for the ongoing operation and maintenance of each transport corridor/station (including project mitigation, ongoing maintenance, and operation) will be identified and acquired typically in a period of 2 – 3 years leading up to main construction. The PWA is the legislative framework under which entitled landowners will receive compensation. The PWA is a non-RMA process. Therefore, land required permanently will be purchased and owners relocated prior to construction occurring.

20.4.2 Land Required Temporarily

If temporary occupation of the land is required at the time of construction (such as construction area and access arrangements), it is typically leased in agreement with the property owner. Potential effects from the temporary lease / use of the land within the proposed designation footprint include:

- Disruption to normal business access and parking (see Section 10 – Traffic and Transport Effects and Mitigation, and Section 19 – Community and Social Effects and Mitigation)
- Disruption to farm activities, temporary loss of grazing pasture, stock-proof fencing (given the expected urbanisation of the North, this is predominantly an issue for parts of NoRs 1, 4, 6, 8, 9 and 13, where rural uses are expected to remain)
- Change to driveways including gradient or alignment, loss of yard vegetation and construction impacts (including noise and vibration, and visual amenity).

20.5 Post Construction Effects

20.5.1 Land No Longer Required Following Completion of Works

On completion of the work, private land not required for ongoing operation, maintenance or effects management will be reintegrated with the balance of the land parcels in coordination and discussion with directly affected landowners. Land that is permanently required for the transport corridor/station will have been purchased and those landowners will no longer be affected by the designation. There will therefore be no ongoing effects for these parties.

Temporarily affected properties will be reintegrated. This may include reintegration of private driveways, private parking, fences, gardens and yards, and reintegrating construction areas (e.g., batters, laydown areas, stormwater ponds) with the surrounding landform. As per section 182 of the RMA, the designation footprint will be reviewed upon completion of the North Projects and will be uplifted from those areas not required for the on-going operation, maintenance or effects mitigation associated with corridors.

For properties in proximity to operating corridors where post completion effects related to ongoing visual landscape and noise and vibration changes are likely, these are discussed in the relevant topic sections along with specific mitigation. This is most relevant for rural areas where a lower built environment character is expected. Property access effects are discussed at Section 10 – Traffic and Transport Effects and Mitigation.

20.5.2 Community Facilities / Open Space

Dairy Flat Tennis Club will be impacted by NoR 8, potentially losing a court (permanently) and thus affecting the local Dairy Flat community and tennis club members. Depending on the availability of directly adjacent land or land within the proposed new Dairy Flat town centre, this may result in required relocation of the club. To avoid impact this relocation would need to take place prior to construction, which can be facilitated through the PWA process.

Green Park is the largest existing park in the North Projects area. This is a 154-hectare open space in Auckland Council ownership, located southwest of Dairy Flat Highway, adjacent (but not within) the proposed designation boundary of NoR 8. It comprises open space / rural outlook, several waterways including Rangitōpuni and Huruuru Streams, and areas of exotic and native bush. As the wider area urbanises, it is expected this open space will be developed to serve the growing surrounding population, with aspirations for a multi-use hub including sporting facilities, active and passive recreation, and restoration of natural systems, as outlined in the Green Road Park Masterplan. The Projects will not affect this park and will, in fact, improve access to it in the long term.

Smaller Reserves and community recreational facilities that adjoin or marginally sit within the proposed designation areas include:

- The Avenue Esplanade Reserve (Lucas Esplanade) – near designation boundary of NoR 9;
- Serenity Reserve – partly within designation boundary of NoR 9, but likely not directly affected by the permanent works;
- Three Streams Reserve – adjoins designation boundary of NoR 9;
- Pukeatua (Albany Heights) West Reserve – partly within designation boundary of NoR 9, proposed fill batter through the edge of the reserve;
- Hosking Reserve – partly within designation boundary of NoR 9, likely permanently affected by proposed intersection upgrade (existing intersection with Hobson Road) through the edge of the reserve;
- O'Brien Reserve North – adjoins designation boundary of NoR 9;
- Albany Heights Reserve – a narrow park accessway is within designation boundary of NoR 9; likely permanently affected with a proposed cut batter through the edge of the accessway;
- Dairy Flat Reserve – partly within designation boundary of NoR 8, likely permanently affected by proposed intersection through the edge of the reserve;
- Baker St Reserve – partly within designation boundary of NoR 4, proposed fill batter and surface flow conveyance through the edge of the reserve;
- Travis View Reserve – near designation boundary of NoR 4;
- Millwater Parkway Bush Reserve – partly within designation boundary of NoR 4, will be permanently affected to add an active mode connection to/from the SH1 active mode facility at the edge of the reserve;

- Hooton Reserve – partly within designation boundary of NoR 1, will be permanently affected to accommodate a stormwater pond at the eastern end, immediately adjacent to the RTC corridor ; and
- Unnamed open space reserve on Fairview Avenue, Fairview Heights – partly within designation boundary of NoR 4, with a mix of temporary effects and permanent effects relating to stormwater infrastructure and the active mode facility.

Engagement was undertaken with Council in relation to these reserves/parks in July 2023.

The North Projects will improve access to the above open space areas and others across the broader North Projects area, including via active modes and public transport. The design of works within each designation will be further refined at the detailed design stage, with ongoing consultation with and input from Council Parks informing final designs of each Project. A UDLMP is provided as a condition of each designation, and will require all construction areas in open space areas be reinstated at the completion of the construction period. Potential effects on amenity values of open space areas can be managed through engagement with residents, community and stakeholders via the requirement for a SCEMP, with construction impacts managed via the CNVMP, CTMP and CEMP.

The Auckland Memorial Park and Cemetery will be impacted by NoR 13, with the upgrade to the existing East Coast Road corridor resulting in effects to landscaping along the existing road edge. The corridor design has sought to reduce impacts on the cemetery land as far as practicable, recognising the scarcity of cemetery land across Auckland. The East Coast Road carriageway will remain a two-lane traffic corridor and be upgraded with separated walking and cycling and a slower speed limit, rather than a corridor of higher intensity, which is anticipated to allow for a similar amenity value for visitors to the cemetery with regard to access and noise. Replacement landscaping will be considered in future at detailed design and outline plan stage as part of the ULDM development. Engagement was undertaken with the landowner in July 2023.

20.6 Recommended Measures to Avoid, Remedy or Mitigate Potential Adverse Effects

20.6.1 Land use uncertainty and property impacts

Following confirmation of the designations, a project website or other suitable information source shall be established with information on the North Projects, such as their status and anticipated construction timeframes. This requirement is provided for via a condition on each NoR.

Additional measures available for landowners include:

- Providing information on the Section 176(1)(b) process and Waka Kotahi or AT contact details to support the integration of development with the extension and / or upgrade of each corridor, where practicable
- Providing a condition for AT projects which allows for some nominated activities to be undertaken within the designation boundary without the need to seek written approval via the Section 176 process
- Providing information on the PWA to address landowner uncertainty, noting the PWA is a non-RMA process.

Implementation of a SCEMP will occur prior to the start of the construction to identify how the public and stakeholders (including directly affected and adjacent landowners and occupiers of land) will be communicated with before and during construction works. The requirement to provide a SCEMP is provided for via a condition on each NoR. The SCEMP will:

- Determine adequate notice periods for the commencement of construction activities and works that affect access to properties.
- Identify appropriate communication channels to support property owners and occupiers to understand and plan around works, (such as a project website, and nominated contact person). The selected communication channels will inform parties of:
 - The expected timing, duration and staging of works
 - The type and nature of effects to be anticipate
 - Progress updates, provided regularly.

At detailed design stage, engagement will be undertaken with affected landowners on Waka Kotahi's and AT's approach to temporary and permanent land impacts (including leasing or acquisition processes, as covered under the PWA). For those properties that are fully designated and required permanently, these will be purchased and no longer be present at construction. For partially acquired properties, management plans will be implemented to manage adverse amenity impacts.

20.6.2 Access

Disruption to property access will be managed via the CTMP for each corridor, which is provided for via a condition on each NoR. The approach is to maintain vehicle access to property and / or private roads where practicable, or to provide alternative access arrangements when it will not be practicable.

Where legal access cannot be maintained, the impacted property typically falls wholly within the designation footprint and will likely require full acquisition prior to operation.

20.6.3 Land Re-Integration

Where property features are damaged within the designation on properties that are not fully designated and will remain in place, features will be reinstated, as far as practicable, including private driveways, parking, fences, gardens, and yards, and reintegration of construction areas with the surrounding landform.

Following Project completion, a review of the designation footprint as per Section 182 of the RMA will be undertaken to identify areas no longer required for the ongoing use and operation of each transport corridor/station.

20.6.4 Construction Activities

Construction activities can be expected to temporarily reduce amenity. Effects will be managed and minimised through implementation of a CEMP. At detailed design stage, affected parties will be engaged on the approach to temporary and permanent land impacted (including leasing or acquisition required, covered by the PWA).

20.6.5 Noise and Vibration

Reductions in amenity from noise and vibration disturbing normal residential and business use will be managed by implementation of a CNVMP, which will include methods to:

- Communicate and engage with nearby residents and stakeholders.
- Minimise the construction disruption for affected properties during construction.

In addition to a CNVMP, it may be necessary to produce site specific 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. Refer to Section 16.

20.7 Summary of Effects on Property and Land Use

The new and upgraded transport corridors/stations can be expected to have a range of effects on property. These include the private property restrictions and landowner uncertainty imposed by the designation throughout its duration. Prior to and during construction, effects will include changes to the existing environment's amenity, disturbance to normal enjoyment whilst works are carried out, as well as permanent changes to private properties.

Prior to construction, measures are proposed which will assist in alleviating some of the associated uncertainty for landowners, including the measures within the SCEMP (as set out above at Section 20.6.1), the Project Information condition included on each NoR, and the s176 condition which allows for some nominated activities to occur within designation boundaries without the need for written consent, for AT projects. Suitable management plans and measures have also been proposed to manage effects of the works during construction.

Property impacts outside the RMA are summarised above, and as appropriate will be provided for under specific legislative processes. As per Section 182 of the RMA, the designation footprints will be reviewed upon completion of each Project, and will be uplifted from those areas not required for the ongoing operation, maintenance or effects mitigation associated with the corridors. Given the mitigation proposed, it is considered that effects on property will be appropriately managed.

21 Effects of Change in Purpose of State Highway 1 Designations – NoR 4

As noted in Section 6, the proposed alterations to existing SH1 designations 6751, 6760, 6759 and 6761 for NoR 4 – State Highway Improvements include a change in purpose to the existing designations (including the full extent of these designations). The existing designations at the northernmost and southernmost end of the geographical area subject to NoR 4 (existing designations 6751 and 6761 respectively) extend further to the north and south, beyond the area where works are proposed under NoR 4 for the Te Tupu Ngātahi programme. It is proposed to update the designation purpose for the existing designations as a whole. The purposes of all four designations will be updated, with the main substantive change being that the new purposes allow for provision of a ‘cycleway and / or shared path’ in each instance (refer Form 18 for NoR 4 in Volume 1).

This change in purpose for each of these designations is expected to have a positive enabling effect by supporting Waka Kotahi’s multi-modal approach to management of the transport network, and particularly in relation to active modes. This will have associated positive benefits in relation to reducing vehicle kilometres travelled (relative to the existing situation) and associated greenhouse gas emissions in the long term, as well as health, access and connectivity benefits associated with active transport. The change in purpose is likely to cause the same or lesser adverse effects when compared to the existing SH1 purpose in each instance. In general terms the effects of a ‘cycleway and /or shared path’ will be less than a motorway or state highway.

22 Proposed Measures to Manage Adverse Effects

The majority of adverse effects have been avoided and mitigated via alignment decisions and design choices. Where potential effects have not been designed out, measures are proposed to avoid, remedy or mitigate the potential adverse effects identified in this AEE, and these are summarised in Table 25-1 below. These measures are included in the proposed conditions as relevant, for each NOR. The below measures are in relation to district plan matters only, and proposed measures to avoid, remedy or mitigate potential adverse effects in relation to regional plan matters will be determined at the time future regional consents are sought.

Table 22-1: Summary of measures to avoid, remedy or mitigate potential adverse effects

AEE Section / Topic	Specific Measure – to be conditioned
Traffic and Transportation	<ul style="list-style-type: none"> • Construction Environmental Management Plan (CEMP) • Construction Traffic Management Plan (CTMP) • Urban and Landscape Design Management Plan (ULDMP). • Network Integration Management Plan (NIMP) • Existing property access condition
Manawhenua Partnership	<ul style="list-style-type: none"> • Outline Plans • Management Plans • Cultural Advisory Report • Urban Landscape and Design Management Plan (ULDMP) • Stakeholder and Communications Engagement Management Plan (SCEMP) • Cultural Monitoring Plan • Historic Heritage Management Plan (HHMP)
Landscape and Visual	<ul style="list-style-type: none"> • Urban Landscape and Design Management Plan (ULDMP) • Construction Environment Management Plan (CEMP)
Natural Hazards	<ul style="list-style-type: none"> • Construction Environment Management Plan (CEMP) • Flood Hazard Condition: Flood risk outcomes to be achieved at detailed design (demonstrated through the Outline Plan(s)) • Urban and Landscape Design Management Plan (ULDMP)
Terrestrial Ecology	<ul style="list-style-type: none"> • Ecological Management Plan(s) (EMP) • Pre-construction Ecological Survey • Urban and Landscape Design Management Plan (ULDMP).
Historic Heritage and Archaeological	<ul style="list-style-type: none"> • Historic Heritage Management Plans (HHMP) Authorities to Damage or Destroy Sites HNZPT
Traffic Noise and Vibration	<ul style="list-style-type: none"> • Traffic Noise conditions including implementation of low road noise surface and any other BPO mitigation required to meet road noise conditions • Urban and Landscape Design Management Plan (ULDMP). (Station noise condition – NoRs 2 and 3 only)
Construction Noise and Vibration	<ul style="list-style-type: none"> • Construction Noise and Vibration Management Plan (CNVMP) • Stakeholder and Communications Engagement Management Plan (SCEMP) • Complaints Register • Construction Noise Standards • Construction Vibration Standards

AEE Section / Specific Measure – to be conditioned Topic	
Network Utilities	<ul style="list-style-type: none"> • Network Utility Operators (exclusion for Section 176 Approval) • Network Utilities Management Plan (NUMP)
Arboricultural	<ul style="list-style-type: none"> • Tree Management Plan (TMP) • Urban Landscape and Design Management Plan (ULDMP)
Community and Social	<ul style="list-style-type: none"> • Project information condition • s176 condition constituting written approval for nominated activities • Stakeholder Communication and Engagement Management Plan (SCEMP) • Complaints register condition
Property, Land Use and Business	<ul style="list-style-type: none"> • Project information condition • Designation boundary review condition • Land Use Integration Process condition (AT Projects only) • s176 condition constituting written approval for nominated activities
Urban Design	<ul style="list-style-type: none"> • Urban Landscape and Design Management Plan (ULDMP)



PART E – ENGAGEMENT

23 Engagement

23.1 Introduction

This section provides an overview of engagement undertaken for the North Projects. It summarises the approach during each phase, focusing on key themes and common issues raised and the general outcomes.

Where engagement has affected a specific NoR corridor design outcome, such as alternatives or consideration or identification and management of environmental effects, that is considered in either the Assessment of Alternatives (AEE Appendix A), or this AEE, as relevant.

The North Projects have been through various stages of engagement, summarised in Table 26-1 and Table 23-1, below. Prior to detailed design and construction, further engagement will be undertaken by AT and Waka Kotahi as needed to manage impacts of the North Projects, as facilitated by the proposed Stakeholder and Communication Engagement Management Plan (SCEMP) condition.

Table 23-1: North Projects Engagement Summary

Project Stage	Timing	Engagement Summary
Programme Business Case (PBC)	2016	<p>As part of the Transport for Future Urban Growth project, two stages of public consultation were undertaken across three key areas of Auckland (of which North Auckland was one). AT initially consulted with residents and other stakeholders to understand current and future transport movements and participants' views on potential improvements. Following this a draft network of transport improvements was developed and feedback was sought on this network in a second round of public consultation. This included information events, business breakfasts and a young planner's session. Feedback from 300 businesses across all of the growth areas was also received as part of the 'Auckland Business Transport Survey'.</p> <p>For North Auckland (Wainui and Silverdale – Dairy Flat) bus service improvements were supported by the public and some businesses, including a bus express service between Albany and Silverdale. New road connections, upgrades and improvements, including improvements for motorway access. and separated walking and cycling facilities were also supported.</p>
Indicative Business Case (IBC)	2018	<p>At IBC stage, public consultation focused on the future of transport in the northern growth area. This included 30,000 advertising flyers which were sent to local households, 2 public information events, and 171 written feedback responses.</p> <p>People showed support for a rapid transit corridor (RTC), with separated walking and cycling facilities. The need for safety upgrades to the existing network, and improvements at SH1 were also raised. A key theme of feedback was that the RTC should follow the existing SH1 corridor.</p>

Project Stage	Timing	Engagement Summary
Detailed Business Case (DBC)	2022	<p>The project team sought feedback on the proposed strategic transport network for the North and asked whether or not there was anything else that should be considered to identify and confirm the preferred routes. The team also asked if people consider route protection to be the right process to progress planning.</p> <p>Engagement during this stage focused on key stakeholders, potentially impacted landowners and the wider community. Letters were sent to potentially affected landowners (for around 1,274 properties). A total of 241 feedback responses were received from the community and the project website was viewed 4,754 times.</p> <p>Te Tupu Ngātahi's approach to protect land now for future transport routes was supported by the majority of community feedback respondents. Partner, key stakeholder and community feedback was also generally supportive of the preferred transport network. Many people still thought that the RTC should follow the existing SH1 corridor.</p>
Notices of Requirement	2023	<p>Engagement at this phase commenced with an update on the preferred routes to Local Boards, elected representatives, and key stakeholders. Following this engagement the focus was on discussing potential impacts of the Projects with directly affected landowners, given a preferred alignment and draft designation boundaries had been identified.</p> <p>710 letters were sent to landowners and to date the project team have attended 239 meetings with landowners.</p>

23.2 Engagement Strategy and Approach

Te Tupu Ngātahi has worked with partners, stakeholders, potentially affected landowners, and the wider community through all project stages including IBC, DBC and preparation of the NoRs/AEE. Although there is no statutory obligation to engage it is widely accepted as best practice, and has generally been undertaken with the following objectives:

- Provide information to landowners on how projects might impact their property, the route protection and anticipated timelines.
- Identify and understand constraints including any characteristics or features of properties (environmental, historic, cultural) not previously known to the Project team, to inform and develop the project(s).
- Integrate and collaborate with other network providers to achieve strategic co-benefits where practicable and/or not preclude future network plans.
- Keep the community informed of the project's progress.
- Avoid, remedy and manage potential adverse effects either created by or likely to impact on the North Projects where practicable.

Engagement at the IBC and DBC stages was at a broad community level. As the projects moved into the NoR/AEE preparation phase, engagement was targeted to directly affected landowners and

stakeholders. At the commencement of the NoR/AEE preparation phase, the draft designation boundaries for the projects had been determined, enabling more detailed conversations with landowners (see **Error! Reference source not found.**). It is noted that engagement during detailed design and delivery will be undertaken at a later date by the requiring authorities, as facilitated by the SCEMP condition.

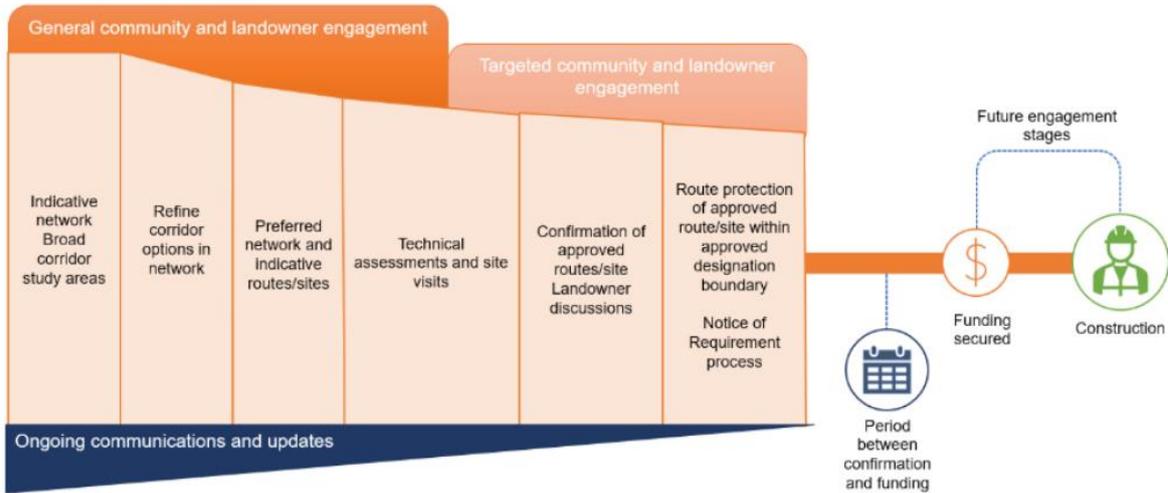


Figure 23-1: Te Tupu Ngātahi Engagement Process

23.3 Previous Engagement Undertaken for the North Projects

During the IBC and DBC phases of the North Projects, engagement was undertaken with the following partners and stakeholders, as well as the broader North area community:

- Programme partners – Auckland Council Partnership Forum, Northern Manawhenua
- Elected Members – Upper Harbour Local Board, Hibiscus Coast and Bays Local Board, Rodney Local Board;
- Network Utility providers;
- Transpower;
- Business North Harbour;
- Silverdale Business Association;
- North Shore Aero Club Inc (North Shore Airport);
- Department of Conservation;
- Heritage New Zealand Pouhere Taonga;
- Ministry of Education;
- QEII Trust;
- Fletcher Building;
- AV Jennings (Hall’s Farm);
- Fulton Hogan;
- Hugh Green Group; and
- Highgate Business Park.

Written feedback was also received from:

- Spark
- Fletcher Building
- Kāinga Ora.

The various methods of engagement carried out are summarised below:

- Regular hui with Manawhenua through the Northern Manawhenua Table, as well as involvement of Manawhenua in options development and assessment (refer AEE Appendix F for details);
- Sessions with key stakeholders and AT, Waka Kotahi and Auckland Council staff to introduce the Programme and projects;
- Presentations, small group meetings, and one-on-one meetings with key stakeholders. This engagement sought feedback during the development of the business case and included workshops on the long list and short list option development and assessment;
- Letters and flyers were sent to communities, potentially affected property owners, and businesses within the Project area. These provided information on the Projects and set out opportunities for the community to be involved. This was followed by community open days, emails, phone calls, and one-on-one meetings as required;
- Surveys and interactive maps for the community to provide feedback; and
- Media releases and regular information on websites and social media was provided for the public.

Te Tupu Ngātahi's approach to protect land now for future transport routes was supported by the majority of community feedback respondents. Partner, key stakeholder and community feedback was also generally supportive of the preferred transport network. The RTC attracted the most feedback and a large number of people in the community did not support the alignment through the Dairy Flat future growth area. This was because of the impact on property owners, the existing rural environment, floodplains, and because it is a less direct route for existing residential communities. Potentially affected landowners were also concerned by the long time frames for implementation and said that they would have difficulty selling their property.

Engagement with Manawhenua has occurred throughout all stages of the Projects' development as detailed in Appendix F to this AEE.

23.4 Engagement during the AEE/NoR phase of the Projects

The following sections summarise engagement undertaken for the AEE/NoR phase of the Projects with partners, key stakeholders and directly affected landowners. The sections identify key matters raised through engagement and how these have been addressed by the Project Team where practicable.

23.4.1 Engagement with Te Tupu Ngātahi Partners

23.4.1.1 Northern Manawhenua

Engagement with Manawhenua partners is discussed in detail in Chapter 11 and Appendix F - Manawhenua Engagement Summary.

23.4.1.2 Auckland Council

Regular integration meetings with Auckland Council have been held as part of the Te Tupu Ngātahi programme wide forum. The Project Team have provided updates for these meetings in relation to key Project milestone and decisions. Council were also involved in option development and assessment in relation to land use and transport integration with the RTC, as detailed in Appendix A.

The Project team have also met with relevant teams within Auckland Council to discuss proposed impacts to Council owned land. This has included sharing plans showing the extent of designation and meetings with the Parks & Community Facilities Department. A key focus of these discussions was the Dairy Flat Tennis Club and Hall properties at Dairy Flat Reserve.

23.4.2 Engagement with key stakeholders

23.4.2.1 Local Boards and Elected Members

The project team have provided regular updates to Local Boards, Councillors and MPs within the Project Area. Ongoing briefings will be provided and, in some instances, elected members have participated in key stakeholder briefings, for example the Dairy Flat Tennis Club. The chair of the Dairy Flat Landowners Association was also briefed along with MPs, local Councillors and local board members.

23.4.3 Network utility providers

23.4.3.1 Transpower

Engagement with Transpower has been ongoing throughout the development of the Projects, with meetings held as required to discuss issues and opportunities for managing and operating the National Grid. This has included project overviews, updates and information sharing and potential impacts on Transpower assets, including the national grid which passes through several of the North Project designations.

Proposed designation footprints and preliminary designs were provided and discussed in a meeting with Transpower Planning and Engineering in June 2023.

No opposing feedback has been received to date.

23.4.3.2 Vector and Watercare

Engagement with Vector and Watercare has been ongoing throughout the development of the Projects, with meetings held as required to discuss issues and opportunities. Areas of interest that relate to the Projects include:

- The Project extents including proposed designation boundaries;
- Timeframes and likely commencement of construction; and
- Conditions – specifically those relating to network utility operators.

Works in relation to any network utility will be undertaken in accordance with the proposed Network Utilities Management Plan (NUMP) condition and any agreements made with each network utility operator to ensure compliance with their methodologies, standards and requirements. The exact scope of works will be confirmed through site investigations and the respective utility operators will be consulted once detailed design of the Projects is complete.

23.4.4 Healthy Waters

The pre-Project catchment models were sent to Healthy Waters in 2020 and these were updated based on review responses. Auckland Council's Healthy Waters has also previously provided guidance on the maximum impervious area in the North Projects area through their "Land Use Zone Imperviousness for Hydraulic Modelling based on the Auckland Unitary Plan Operative in Part" memorandum dated 4 September 2019.

The project team met with Auckland Council's Healthy Waters department in July 2023 to further discuss the flood modelling and stormwater design. A general level of comfort was expressed by Healthy Waters representatives in relation to the level of design and modelling undertaken for route protection.

23.4.5 Heritage New Zealand Pouhere Taonga (HNZPT)

The project team have attended meetings with HNZPT to update on the progress of the North Projects and potential impacts on heritage and archaeological value. Most recently, an update on the North Projects was provided on 21st June 2023 and a draft Assessment of Archaeological and Ecological Effects Report was provided for HNZPT comment and review.

23.4.6 Dairy Flat Tennis Club

A meeting was held in July 2023 with Dairy Flat Tennis Club and Auckland Council as the property owners. The project team explained how the club would be impacted by the proposed Projects (specifically NoR 8) and discussed potential mitigation at a high level.

The Tennis Club's lease expires in 2032 and there will be a new lease with an early termination clause to provide for the future construction of NoR 8.

23.4.7 North Shore Aeroclub

Several meetings have been held with the North Shore Aeroclub during the business case and NoR phases. At meetings during the business case phase, key concerns raised were that Club's runway expansion plans are not precluded and that stormwater ponds may attract birds and increase the risk of bird strike. The Aeroclub also noted their preference for both North and South facing ramps at the Wilks Rd Interchange and support for an RTC station close to the airport. The North Projects do not preclude the Club's runway expansion aspirations. South facing ramps only are proposed at Wilks Interchange as part of NoR 4 -SH1 Improvements. North facing ramps at Wilks interchange were considered at the IBC phase, but are not proposed as explained in the Assessment of Alternatives in

Appendix A. The location of RTC stations through Dairy Flat will be determined in future when more detailed planning of the area is confirmed.

During the NoR phase, a meeting was held in June 2023 to provide an update on the North Projects and timelines. No specific concerns were raised by the Aeroclub at this meeting.

23.4.8 Dairy Flat School and Ministry of Education

A meeting was held in June 2023 with the Dairy Flat School Principal, Board of Trustees, and the Ministry of Education. A small corner of Dairy Flat Primary School needs to be designated to construct a pipe to the stormwater pond which is likely to be a temporary effect. The school is concerned about the impact of urbanisation on the capacity of the school, flooding, and traffic congestion and parking. There was discussion of a joint submission with the Ministry of Education.

23.4.9 Fulton Hogan

The project team met with Fulton Hogan in March and June 2023 to discuss impacts of the designations on Fulton Hogan owned land (NoR 1, NoR 2, NoR 4, NoR 7, NoR 8, NoR 10, NoR 11). Some concerns were raised on the extent of designations on land held by Fulton Hogan within the Silverdale West Structure Plan area and the potential that this would sterilise the land. The project team have considered the designation boundary in this area in response to this feedback.

23.4.10 Landowners

The focus during the AEE/NoR phase of engagement was on landowners whose properties would be directly affected by the proposed designations.

A total of 710 letters were couriered to landowners whose properties were directly affected by the proposed designation boundaries on 30 May 2023 (this is less than the total number of properties as some own multiple affected properties). The letters were also sent via email to landowners who had been in contact with the project team previously. The letters included a plan of the affected property showing the extent of the proposed designation. Directly affected landowners were encouraged to meet with the project team to discuss what this means for their property/properties. Meetings with Mandarin, Cantonese and Korean speakers in attendance were also offered.

A second follow up letter was also couriered to 69 landowners on 27 June 2023, where courier tracking showed that the first letter had not been delivered.

At the time of preparing this AEE, the project team have attended 247 meetings with landowners. In these meetings the Project Team assisted landowners by:

- Introducing the Projects;
- Explaining the rationale for the concept design and route protection of the Projects; and
- Explaining the NoR process, including lodgement timing, the ability to make a submission and attend a hearing.

During landowner engagement questions were raised about property (including the acquisition process, loss of value and access), the timing and likelihood of construction, noise and visual effects. Feedback was similar to that raised in during previous engagement regarding the suitability of

development in the area and the long timeframes for construction. Uncertainty regarding the development of the North area (in particular Dairy Flat) was a common point of discussion during these meetings, particularly considering Auckland Council's Draft Future Development Strategy noted the need for further investigation of the suitability and/or timing of development in the North future urban zone areas.

In response to specific matters identified through engagement with directly affected landowners (such as advice from landowners on recently approved or proposed resource consents) some small amendments to the designation boundaries were made where appropriate.

The Project team will continue to meet and engage with directly affected landowners as required to ensure landowners have adequate information about the Projects.

As a condition on the proposed designations, a Project Information website or equivalent virtual information source will be established to provide information on the Projects during the period prior to construction. In addition, a SCEMP will be prepared to identify how the public and stakeholders (including directly affected landowners and adjacent owners and occupiers of land) will be communicated with, prior to and throughout the construction of the Projects.

23.4.11 Other

The Project team also reached out to the Dairy Flat Hall, and the Matea Trust – (a residential service and support for people with intellectual disabilities) to offer a meeting with the project team. We did not receive a response from these stakeholders.



PART F – STATUTORY ASSESSMENT

24 Assessment of Relevant Objectives and Policies

This section sets out an overview of the relevant statutory provisions under section 171(1)(a), 181(2) and Section 171(1)(d) RMA, as well as other policy considerations relevant to the North Projects.

24.1 Section 171(1)(a) and Section 181(2)

In accordance with section 171(1)(a) and 181(2) of the RMA, an assessment has been undertaken of the relevant statutory provisions, including all relevant objectives and policies of the AUP:OP. This is set out in full in AEE Appendix D, which should be read in tandem with this section. A summary assessment of the key themes identified in the context of the North Projects is set out in the subsequent sections.

24.1.1 Transport

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 managed¹⁸. 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 choices¹⁹. The AUP:OP also outlines the prioritisation of pedestrian safety along footpaths and seeks that road/rail crossings are operated safely with neighbouring land use²⁰. Transport policies²¹ in the AUP:OP direct that:

- Existing and future areas and routes for developing Auckland's transport infrastructure are identified and protected;
- Transport infrastructure is designed, located and managed to integrate with existing land uses and provide effective pedestrian and cycle connections;
- Integration of land use and transport is improved by ensuring transport infrastructure is planned, funded and staged to integrate with urban growth; and
- The adverse effects associated with the construction or operation of transport infrastructure on the environment and on community health and safety are avoided, remedied or mitigated.

The North Projects respond to the transport objectives and policies of the AUP:OP by identifying and protecting for the long term development of transport infrastructure to support future growth and facilitate mode shift from private vehicles to public transport and active modes. The North Projects will provide a high-quality integrated transport network to support future development in North Auckland. The North Projects are designed to integrate with likely future land use, as anticipated in the AUP:OP and other spatial strategies. This has been achieved through close partnership with Auckland Council through the option development and assessment phase, and input into Council's spatial strategies for the North as detailed in Section 3.2 and the Assessment of Alternatives in AEE Appendix A. Detailed land use planning is yet to commence for large areas of the North and the timing of urban development is somewhat uncertain; however the proposed designations, extended lapse dates and

¹⁸ AUP:OP E27.2(1), (2)

¹⁹ B3.3.1(1)

²⁰ AUP:OP E27.2(5)

²¹ AUP:OP B3.3.2

conditions (particularly the UDLMP) provide sufficient flexibility to enable effective integration as future planning and development occurs.

The North Projects will provide increased reliability for public transport through the provision of a new rapid transit corridor (RTC), room for bus lanes on some corridors and additional resilience through urbanised alternative routes. The new/upgraded corridors and stations will provide real travel choice with high quality, attractive alternatives to the private vehicle. The North Projects will also provide opportunities for walk up catchments to public transport interchanges and enable a high frequency local bus network to be established in future. The North Projects are designed to be safe for all users, including separated active modes and grade separated crossings of the RTC and SH1. The adverse effects associated with the construction and operation of the NoRs are able to be avoided, remedied or mitigated through a range of detailed measures as outlined in Sections 9 to 21 and Section 22 of this report, and in the proposed condition set in Volume 1.

24.1.2 Urban growth, amenity and form

The objectives and policies of the National Policy Statement for Urban Development (2020) (NPS:UD) seek that urban environments are well-functioning and that people and communities are enabled to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future. This includes, enabling increased commercial and residential activity around centre zones; areas with employment opportunities; and areas that are well serviced by existing or planned public transport (including RT stations), or where there is high demand for housing or business. The Medium Density Residential Standards (MDRS) will result in residential intensification in existing urban areas, and in future urban areas once future rezoning takes effect (if this policy remains in place).

The AUP:OP objectives and policies seek to ensure that urban growth and associated transport infrastructure are provided for and are integrated in appropriate locations.

As set out in this AEE, the North Projects will:

- Support and enable growth by protecting improved and new transport corridors/stations that will support and integrate with Auckland Council's growth aspirations for the growth areas of Auckland, including intensification or density of growth resulting in more efficient and well-functioning urban land development;
- Improve and enable access for all people – including by way of public transport or active transport - to provide for their economic, cultural, and social needs and for their health and safety;
- Improve resilience of the strategic transport network in the North; and
- Support substantial mode shift from private vehicles to public transport, walking and cycling.

Therefore, the North Projects will contribute to achieving a well-functioning urban environment by providing people and communities with significantly improved public transport access and active mode facilities.

The RTC and Pine Valley East Station in particular (NoRs 1 and 3) will support future development of high density development within walkable catchments of high quality public transport. The RTC alignment also connects to centre zones at Albany and a likely future town centre in the centre of Dairy Flat, and employment areas such as the future industrial area in Silverdale West.

24.1.3 Manawhenua

The objectives and policies of the AUP:OP seek to recognise and provide for the principles of the Treaty of Waitangi in the sustainable management of natural and physical resources including ancestral lands, water, air, coastal sites wāhi tapu and other taonga²² and including Manawhenua in resource management processes, particularly in decision making in their role as kaitiaki²³. Protection of sites and places of significance to Manawhenua is also recognised and provided for in the objectives and policies of the AUP:OP²⁴.

Manawhenua have been in partnership with the Te Tupu Ngātahi Supporting Growth Programme from the start of the early Indicative Business Case (IBC) works. In developing the transport corridors, recognition has been given to both the relationship of Tangata Whenua to their lands, culture and traditions in the North area and the commitment to partnership between Manawhenua and AT and Waka Kotahi (as a representatives of the Crown) founded through Te Tiriti o Waitangi.

Through the 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 North. 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 received from Manawhenua informed the decisions made by the Project team at each step in the assessment process.

The proposed designation condition set provides a framework for the ongoing engagement and participation of Manawhenua in the future design and implementation of the transport corridor(s) and stations which make up the North Projects as outlined in Volume 1 and in Section 11.

24.1.4 Enabling infrastructure

The AUP:OP recognises the role that resilient, effective and efficient transport infrastructure has in improving Auckland's social, economic and cultural wellbeing. As part of this, the construction, operation and maintenance of infrastructure is anticipated²⁵. In addition, 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 network²⁶. In giving effect to this policy direction, Chapter E26 of the AUP:OP acknowledges that:

- Infrastructure is critical to the social, economic, and cultural well-being of people and communities and the quality of the environment;
- Infrastructure can have a range of adverse effects on the environment;
- When assessing the adverse effects of infrastructure, consider the need and benefit of the infrastructure;

²² AUP:OP B6.2.1(1), (2)

²³ AUP:OP B6.2.2(1)

²⁴ AUP:OP D21

²⁵ AUP:OP B3.2.1(1), (2), (4), B3.2.2(1), B3.3.1(1), B3.3.2(1), B3.3.2(1), (3)

²⁶ NPS-ET Objective

- Infrastructure and in particular linear infrastructure often has a functional and operational need to traverse or locate within or across different environments, including areas of identified value.

As set out in Section 2 there is a strong need for the North Projects (and their route protection) and the projects provide a range of transport benefits for the community both individually and as part of the wider network, including:

- Improving access to and around the North to support future anticipated development in the area and provide for the future communities' economic and social wellbeing;
- Increasing public transport and active mode share; and
- Improving the safety, reliability, and efficiency of the transport network.

The adverse effects of the North Projects have been largely addressed through the proposed conditions on the designations. Not all effects of the North Projects can be avoided or mitigated. Chapter E26 recognises that linear infrastructure may have a functional or operational need to traverse features or areas of value identified in the AUP:OP²⁷. The same policy recognises the benefits derived from infrastructure, the adverse effects of not providing the infrastructure²⁸ and seeks consideration of how the infrastructure contributes to the strategic form or function, or enables the planned growth and intensification, of Auckland²⁹. Although the development and Assessment of Alternatives sought to avoid key features as much as practicable (refer AEE Appendix A), the North Projects do directly affect some features and areas of value such as some Significant Ecological Areas (SEA) (NoRs 1, 4, 7 and 9), some heritage sites of value (see Section 15), a notable tree (NoR 9 – see Section 18) and the National Corridor Grid Overlay (NoRs 1, 4, 5, 9, 12 and 13). The North Projects have a functional and operational need to locate in these areas to meet the Project objectives. As established, the North Projects will enable intensification and growth in the northern growth areas of Auckland, and without their route protection and future implementation, growth would be constrained. The North Projects are consistent with the objectives and policies of the NPS-ET because they have been indicatively designed so that they will not compromise the integrity of the national grid, will not lead to reverse sensitivity issues and will comply with safe distance requirements.

24.1.5 Ecology

This section identifies the key themes related to freshwater, terrestrial and coastal ecology. These provisions are relevant as part of the consideration of alternatives and to the effects authorised by the NoRs (i.e. district plan effect). But as coastal and regional consents will be sought in the future, the provisions that relate and apply to regional planning matters are not relevant to the consideration of the effects of the NoRs.

The National Policy Statement for Indigenous Biodiversity (NPS-IB) seeks to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity³⁰. The Policies of the NPS-IB seek that a cautionary approach is used when considering effects on indigenous biodiversity both within and beyond Significant Natural Areas (SNAs) and

²⁷ AUP:OP E26.2.2(6)(b)

²⁸ AUP:OP E26.2.2(6)(a)

²⁹ AUP:OP E26.2.2(6)(f)

³⁰ NPS-IB Objective

including areas supporting specified highly mobile fauna³¹ ³². Effects on identified SNAs should be avoided or managed, whilst recognising and providing for activities which contribute to New Zealand's social, economic, cultural and environmental wellbeing³³. Increased indigenous vegetation cover in urban and non-urban environments is promoted³⁴, as is information gathering and monitoring of indigenous biodiversity³⁵.

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.

In line with the above, the North Projects are consistent with the relevant objective and policies of the NPS-IB through:

- Having regard to the provisions of the draft NPS-IB and to the AUP equivalent provisions when assessing route options, selecting preferred alignments, and confirming designation boundaries. In particular, SEAs – which are the equivalent of SNAs in the NPS-IB – were identified and avoided where practicable. Indicative habitat mapping was also undertaken and informed route selection and refinement processes. Consistent with the AUP and, in light of the draft NPS-IB, an emphasis was placed on avoiding indicative habitat areas where practicable;
- Seeking to maintain indigenous biodiversity through the implementation of Ecological Management Plans (EMPs) as required as a condition of each designation; and
- Future assessment of the North Projects at the regional consenting phase, against relevant policies.

The NPS-IB sets out a number of adverse effects of use and development on an 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 an SNA, and where there are no practicable alternative locations³⁶ and the effects are managed within the effects management hierarchy³⁷. The North Projects are 'specified infrastructure', as they are "infrastructure that delivers a service operated by a lifeline utility" and provide significant regional benefit. As outlined in the Assessment of Alternatives, there is an operational need for the Projects to be in their various locations due to various technical, logistical, or operational characteristics or constraints. Consistent with the effects management hierarchy the projects have been located and designed to avoid or, where there is no practicable alternative, to limit impacts to areas which comprise SEAs or are likely to constitute SNAs in future as detailed below and in AEE Appendix A - Assessment of Alternatives. In particular the SEAs which are adjacent or impacted by NoRs 1, 4, 7, 9 and 10 or which are likely to support specified highly mobile

³¹ NPS-IB Policies Policy 3

³² NPS-IB Policies Policy 15

³³ NPS-IB Policies Policy 10

³⁴ NPS-IB Policies Policy 14

³⁵ NPS-IB Policies Policy 17

³⁶ NPS-IB Clause 3.10

³⁷ NPS-IB Clause 3.11

fauna on the basis of indicative habitat mapping. The conditions require that effects on the ecology that are authorised by the NoRs are fully addressed through the EMP(s).

The overarching concept of the National Policy Statement for Freshwater Management 2020 (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. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community. 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 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 third³⁸. The Policies of the NPS:FM seek to ensure that freshwater is managed in a way that gives effect to Te Mana o te Wai³⁹, there is no further loss of extent of natural inland wetlands⁴⁰, the loss of river extent and values is avoided to the extent practicable⁴¹, the habitats of indigenous freshwater species are protected⁴², and communities are enabled to provide for their social, economic and cultural well-being in a way that is consistent with the NPS:FM⁴³.

As detailed in the Assessment of Alternatives in AEE Appendix A, protecting the health of freshwater was a key focus in the development and assessment of options for the North Projects, as well as design refinement of the preferred options. The programme-wide MCA framework applied to the optioneering included freshwater ecology (alongside terrestrial ecology) and stormwater/flood hazard considerations. Constraints mapping (with specialist input) was completed early in the DBC option development process to seek to avoid key freshwater features where practicable including streams and natural wetlands. Manawhenua were also involved in the constraints mapping and MCA processes. Once preferred options were selected, ecology specialists refined their mapping of ecological features (including streams and natural wetlands) and inputted to design development and option refinement. Indicative stormwater designs were also developed and provided for in the designation footprints to provide room for attenuation and treatment of the corridors/stations in future. Regional/NES consents will be required for the North Projects in future (prior to their implementation) in relation to freshwater issues, stormwater and earthworks, at the time detailed design is undertaken. That process will also need to consider the provisions of the NPS:FM and the protection for Te Mana o te Wai. Overall, it is considered the North Projects are in general accordance with the objectives and policies of the NPS:FM.

The AUP:OP objectives and policies seek to protect and enhance ecological values across terrestrial, freshwater and coastal environments⁴⁴. The objectives and policies place particular emphasis on avoiding adverse effects on SEAs and where it is not practicable minimising the adverse effects, and then remedying, mitigating or offsetting these effects⁴⁵. Specific recognition is also given through the policies that it is not always practicable to locate and design infrastructure to avoid SEAs. As discussed above in relation to the infrastructure theme, the AUP contemplates that infrastructure will

³⁸ NPS:FM 2.1 Objective

³⁹ NPS:FM 2.2 Policies, Policy 1

⁴⁰ NPS:FM 2.2 Policies Policy 6

⁴¹ NPS:FM 2.2 Policies Policy 7

⁴² NPS:FM 2.2 Policies Policy 9

⁴³ NPS:FM 2.2 Policies Policy 15

⁴⁴ AUP:OP B7.2.1(1), (2), D9.2(1)

⁴⁵ AUP:OP D9.2(1)

occur in high value areas and may cause some adverse effects. Similarly, other adverse effects on biodiversity and ecosystems should also be avoided, remedied or mitigated.

In line with the above, the North Projects placed emphasis on avoidance of SEAs as far as practicable in the first instance. However, for some corridors (NoRs 1, 4, 7, 9, and 10) the presence of SEAs both directly adjacent to, and in some case within, the existing road reserve boundaries meant that some areas of SEA are unable to be practicably avoided. For NoR 9, SEAs are located on both sides of the road and hence cannot be avoided. For NoR 1, there are effects on an area of SEA where the RTC crosses from the SH1 corridor to join the FUZ. This area was the subject of detailed alternatives assessment as it is very constrained between SEAs, the coastal environment to the east and East Coast Road. As outlined in the Assessment of Alternatives, other options in the area had similar or greater adverse effects. Near to Milldale, the main SEA area at Kathy's Thicket was avoided by the permanent footprint of the RTC (NoR 1), and the SH1 active mode facility (part of NoR 4) was located on the eastern side of SH1 to minimise encroachment on the higher values to the west. In these cases, emphasis was placed on minimising potential impacts, including where possible a preference to follow the existing road corridor boundary where practicable to limit potential impacts to the fringe areas of the SEA. Encroachment into SEA outside the existing road reserve was minimised.

As described above under AEE Section 23.1.4, the North Projects also sought to avoid and protect freshwater ecological values. Opportunities for enhancement of ecological values (terrestrial and freshwater) were also considered in the MCA and design refinement process and assessments of effects. Ecology in the coastal environment is discussed in Section 23.1.6 below.

It is anticipated that through the detailed design phase and future regional consenting process there will be further opportunities to minimise and manage potential impacts on terrestrial ecology (including SEAs, SNAs, and other areas identified to support specified highly mobile fauna), freshwater ecology and coastal ecology. Opportunities for SEA offset within the designation boundaries were also considered in the Assessment of Ecological Effects in Volume 4, and will be tested further at the regional consenting stage.

24.1.6 Coastal Environment

The objectives and policies of the New Zealand Coastal Policy Statement 2010 (NZCPS) seek a range of different outcomes including to preserve and protect the natural character of the coast, protect the coastal environment from inappropriate use and development, protect indigenous biodiversity in the coastal environment, preserve the natural character of the coast, protect natural features and landscapes, provide for public access to coastal areas, and achieve the outcomes of the HGMPA⁴⁶. The AUP:OP coastal provisions also seek to maintain the natural characteristics and qualities that contribute to the coastal environment whilst providing for subdivision and development, and also restoring and rehabilitating the natural character values⁴⁷. In providing for use and development in the coastal environment, the provisions seek that this is undertaken in appropriate places and is of an appropriate form and within appropriate limits⁴⁸.

Work was undertaken in the IBC and DBC phases to map out and identify areas with special values (i.e. natural character, natural features and natural landscapes in the coastal environment) and

⁴⁶ NZCPS Objective 2, Policies 6, 11, 13, 15, 18

⁴⁷ AUP:OP B8.2.1(2), B8.2.2(3), (4), B8.3.1(1), (2)

⁴⁸ AUP:OP F2.14.2(4), F2.14.3(1), (3), (5)

ensure that such areas are avoided where practicable from the outset of options assessment. In the study area for the North Projects are the sensitive coastal environments of the Ōkura River (next to SH1 and NoRs 1 and 4) and the Ōrewa River (crossed by SH1 and NoR 4) and close to NoR 10.

The North Projects avoid the coastal marine area of the Ōkura River. In addition, minimising effects on this sensitive coastal environment was a key consideration in optioneering for NoRs 1 and 4. The proposed active mode facility on SH1 (part of NoR 4) assumes a new crossing of the coastal marine area (CMA) at the Ōrewa River which will be subject to future regional consents. Options that avoid the CMA/coastal environment were considered for this path as detailed in Section 9.6.9 of the Assessment of Alternatives (Appendix A), but were discounted in favour of the proposed new bridge crossing in order to best meet the Project Objectives and balance other effects (such as minimising encroachment of the Kathy's Thicket SEA on the west of SH1 further to the South). A connection from this active mode facility is also proposed down to the coastal edge next to the Millwater stormwater ponds, which will seek to improve public access to the coastal environment as per Policy 19 of the NZCPS, while avoiding SEAs in this area where practicable.

In accordance with the relevant objectives and policies, impacts on the coastal environment, in particular from NoR 1, 4 and 10, have been minimised through alignment of bridges adjacent to existing crossings, which will limit effects on coastal areas and surrounding vegetation. Using existing crossing points recognises the significance of the natural and physical resources of the Hauraki Gulf by limiting adverse transport corridor effects (e.g. light and noise) to areas where these effects already exist. The assessment of Landscape and Visual Effects (in Volume 4) has considered natural character of the coastal environment and includes recommended measures to remedy and mitigate effects, as well as opportunities to enhance natural character values. Furthermore, space for stormwater treatment is provided within the designations to enable the treatment of runoff from the corridors/stations before discharge into the receiving coastal environment, and sedimentation during construction will be managed through standard construction practices.

24.2 Section 171(1)(d)

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

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

Section 23.3 provides an overview of the other policy considerations in relation to the North Projects.

24.3 Other Policy Considerations

Other legislation and policy that has informed the development of, and will inform the future implementation of, the North Projects are set out in Table 24-1, below.

Table 24-1: Assessment against other policy considerations

National
<p>Government Policy Statement (GPS) on Land Transport for 2021/22 – 2030/31</p> <p>The GPS 2021 continues the strategic direction of the GPS 2018, but provides stronger guidance on what Government is seeking from land transport investments. The GPS 2021 outlines the Government’s strategy to guide land transport investment over the next 10 years, influencing decisions on how money from the National Land Transport Fund will be invested across activity classes, such as state highways and public transport. The overall strategic priorities for GPS 2021, the national objectives for land transport and the themes and the results the Government wishes to achieve through the allocation of the fund are summarised as follows:</p> <ul style="list-style-type: none"> • Safety – a safe system, free of death and serious injury • Access – a system that provides increased access to economic and social opportunities • Climate change – a low carbon transport system that supports emissions reductions, while improving safety and inclusive access • Improving freight connections – improving freight connections for economic development. <p>The North Projects will provide a safe and reliable transport network that supports growth, enables travel choice, addresses safety concerns and improves access to employment and social amenities. The North Projects are anticipated to reduce the risk of deaths and serious injuries, and improve road safety for all users. The North Projects will improve transport facilities for all modes, resulting in improved safety for those that travel by car, freight, active mode and public transport. The North Projects improve corridor capacity, resulting in improved journey times and reliability for future freight and public transport demand.</p> <p>The GPS 2021 prioritises reduction of greenhouse gas emissions and a shift to active modes, public transport and low emission vehicles. The North Projects are well aligned with this objective as they provide an increase in modal choice including active modes and public transport, which support a reduction in greenhouse gas emissions compared to trips taken in private vehicles. Overall, the North Projects will positively contribute towards the strategic priorities in the GPS 2021.</p> <p>At the time of writing, the draft GPS 2024/25 – 2033/34 was out for consultation. The new GPS builds on the strategic direction of GPS 2021, but proposes a stronger focus on maintaining assets and services and enhancing resilience. The North Projects will align with these strategic priorities, involving upgrades and maintenance to existing and proposed corridors, and increasing resilience in the transport network through alternative routes and flood resilient corridors.</p>
<p>Climate Change Response Act 2002 (CCRA)</p> <p>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).</p> <p>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 AT work within this framework and actively considered climate change considerations throughout the business case, optioneering and planning phases of project development. This includes considering how an efficient transport network can be developed that:</p> <ul style="list-style-type: none"> • 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

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 North Projects have taken into account transport target 1 as they seek to support planned growth and connect communities in a manner that assists in reducing VKT by light fleet by providing safe and reliable public transport facilities and high quality walking and cycling facilities. The North Projects will provide an efficient transport network that reduces congestion and encourages and facilitates mode shift. The extent to which the North Projects contribute to meeting New Zealand’s emissions reduction targets is a transport policy consideration that has guided the options assessment and alternatives assessment process for the North Projects (see the Assessment of Alternatives, AEE Appendix A, for more details).

Transport targets 2, 3 and 4 in the ERP are more effectively addressed through the other national and regional policy and economic levers set out above which sit outside the RMA and form part of the CCRA framework which is the primary mechanism for regulating responses to climate change in New Zealand.

The Thirty Year New Zealand Infrastructure Plan 2015

The Thirty Year New Zealand Infrastructure Plan developed by The Treasury looks to 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 will contribute to a strong economy and high living standards.

In regard to Auckland, the Plan notes that challenges exist around projected population growth with Auckland forecast to grow by another 716,000 people by 2045 meaning Auckland will need to provide 400,000 more dwellings. The North Projects provide an integrated approach to land-use and infrastructure planning which is critical to delivering good urban outcomes. The plan envisages \$18.7 billion being spent on infrastructure between 2015 – 2025. The North Projects form part of this spending and fall within the scope of this plan by supporting future urban growth in the north of 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 North Projects, 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 North Projects are consistent with Arataki, as they provide greater certainty about the type and delivery of strategic transport projects in the North area. The designation of these projects will also allow for them to be commenced in response to the growth in these areas. The North 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 the North including via active and public transport modes. This will lead to safer, more efficient and sustainable transport outcomes.

Waka Kotahi Amended 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 GPS on Land Transport 2021/22 – 2030/31 in 2021. 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 North Projects provide a safe and reliable transport network that supports growth, enables sustainable travel choice, addresses safety concerns and improves access to employment and social amenities. The North Projects are therefore consistent with the Waka Kotahi Amended Statement of Intent.

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 10 year period to 2030. 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 North Projects play a key role in providing the opportunity to plan and design system improvements that embed the Road to Zero strategy. The North Projects are anticipated to reduce the risk of deaths and serious injuries and improve road safety for all users. The North Projects will improve transport facilities for all modes, resulting in improved safety for those that travel by car, commercial vehicle, freight, active mode and public transport.

Natural and Built Environment Act 2023 and Spatial Planning Act 2023

The Natural and Built Environment Act (NBEA) was passed into law on 23 August 2023. The NBEA (along with the Spatial Planning Act) will replace the RMA. Under the NBEA, 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 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 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;
- some compliance and enforcement provisions are applied; and
- some provisions relating to contaminated land and aquaculture are applied.

The above are either not relevant to the North Projects, or will be considered at future design stage, closer to construction (freshwater-related resource consents, and provisions relating to contaminated land).

Regional

Auckland Transport Alignment Project 2021-2031 (ATAP)

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 in three main areas including arterial roads and footpaths (including bus and cycle lanes where required).

The North Projects are consistent with ATAP as they will provide a safe and reliable transport 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 Land Transport Plan 2018-2028 (RLTP)

The RLTP sets out the funding programme for Auckland's transport services and activities over a 10 year period. Planned transport activities for the next three years are provided in detail while proposed activities for the following seven years are outlined. The RLTP is jointly delivered by AT, Waka Kotahi and KiwiRail, and forms part of the National Land Transport Programme.

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 Future Urban Land Supply Strategy (FULSS), and improves access to places where people live and work.

Hauraki Gulf Marine Park Act 2000

The Hauraki Gulf Marine Park Act seeks to integrate the management of natural, historic and physical resources of the Hauraki Gulf, the islands and its catchment. The Act recognises the national significance of

the Hauraki Gulf and life supporting capacity of the environment of the Gulf.

NoRs 1 and 4 pass close to but avoid the Hauraki Gulf Marine Park at the Ōkura River crossing. Avoiding this sensitive coastal marine area was a key consideration in optioneering for these projects. As summarised above in section 23.1.5, the SH1 active mode facility (part of NoR 4) and the Upgrade to Wainui Road (NoR 10) cross the Hauraki Gulf Marine Park with bridges. Both bridges are directly adjacent to existing crossings. Using existing crossing points recognises the significance of the natural and physical resources of the Hauraki Gulf by limiting adverse transport corridor effects (e.g. light and noise) to areas where these effects already exist.

The North Projects are designed with provision for stormwater treatment through the use of ponds and/or swales. Space for the relevant stormwater treatment features is provided within the designations to enable the treatment of runoff from the corridor before discharge into the receiving environment of the Hauraki Gulf. This enables the protection of the Hauraki Gulf environment's life supporting capacity.

Auckland Plan 2050

The purpose of the Auckland Plan is to contribute to Auckland's social, economic, environmental and cultural well-being through a 30 year vision for Auckland's growth. It sets a strategic direction for Auckland and its communities that integrates social, economic, environmental, and cultural objectives. The Auckland Plan's Development Strategy outlines the direction Auckland will take managing expansion in future urban areas noting the constraint that these areas are predominantly rural at present and have little or no infrastructure in place to cope with urban development. The Auckland Plan outlines the need to provide the required bulk infrastructure (water, wastewater, storm water and transport) to these areas in the right place at the right time. The Auckland Plan also seeks that Aucklanders will be able to get where they want to go more easily, safely and sustainably.

The North Projects will provide a safe and reliable transport 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. The development of the North Projects has been a direct response to the Auckland Plan. The North Projects will help facilitate the sustainable growth of Auckland suburbs enabling the bulk transport infrastructure required to unlock development potential.

Vision Zero for Tāmaki Makaurau: a transport safety strategy and action plan to 2030

Developed in 2019, Vision Zero extends the existing safe system approach to place safety at the forefront of the future transport system for all modes by designing safe places for people. Vision Zero has a goal to eliminate transport deaths and serious injuries by 2050 (in line with the Auckland Plan 2050).

The North Projects play 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 North Projects are anticipated to reduce the risk of deaths and serious injuries and improve road safety for all users. The North Projects will improve all transport facilities for all modes, resulting in improved safety for those that travel by car, commercial vehicle, freight, active mode and public transport.

Auckland Long-Term Plan 2018-2028/ The 10-Year Budget 2021-2031 (Our Recovery Budget)

The Auckland Long Term Plan 2018-2028, which is required to be prepared under the Local Government Act 2002, sets out Auckland Council's 10 year financial plan, and is guided by the strategic direction set by the Auckland Plan, as described and assessed above. The budget was superseded by 'Our Recovery Budget' 2021-2031 as a result of COVID-19. The new budget responds to investment demands from rapid growth, transport demand, aging assets, and climate change.

The North Projects support investment in transport, as well as supporting rapid growth demands. The North Projects include new corridors/stations and upgrades to existing assets (roads) and future proof them; for example through provision for new rainfall/flooding expectations and supporting a shift to active mode for changing communities.

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 North Projects have been designed having regard to and taking into account climate change and resilience. The North Projects will deliver better accessibility and mode choice (thus reducing the present reliance on low occupancy vehicles). This provides an important component to realising the regional emissions benefits of an integrated network. This shows alignment with, and a positive contribution towards the Climate Action Framework and Plan.

Te Ara Whakaheke Tukuwaro Ikiiki: Transport Emissions Reduction Pathway

The Transport Emissions Reduction Pathway sets out a plan to reduce Auckland's transport emissions by 64 per cent by 2030. The Transport Emissions Reduction Pathway sets out 11 areas for transforming Auckland's transport system and land use planning that align with the government's Emissions Reduction Plan.

They are (relevant areas are bolded):

- **making walking and cycling safer, easier and more accessible**
- **using public transport much more**
- prioritising and resourcing sustainable transport
- reducing travel where possible and appropriate
- **making neighbourhoods safer with less traffic**
- putting things closer to where people live
- using vehicles powered by electricity
- **enabling new transport options**
- using low emission buses, trains and ferries
- making freight and services cleaner and more efficient
- **helping Aucklanders make sustainable transport choices.**

The North Projects are unlikely to be built within the 2030 target but are well-aligned with the Transport Emissions Reduction Pathway as they seek to connect communities in a manner that assists in reducing VKT by light fleet by providing safe and reliable public transport facilities and high quality walking and cycling facilities.

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 North Projects will require the removal of some street trees and trees within SEAs, this will be mitigated by planting within the new road/station layouts and result in an overall increase of trees from existing. 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 Ngāhere (Forest) strategy.

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. The North Projects will require designation of land within a number of parks/open spaces along the route during construction and operation (see Section 20). This will reduce the amount of park space available to Auckland residents for the construction period, and in some instances on a permanent basis. However, once complete, each of the transport corridors within the North Projects will reinstate parks (where effects are only temporary) and provide new connections between existing parks and open spaces via proposed walking and cycling infrastructure.

Local

Local Board Plans

The North Projects are situated within three local board areas: Rodney, Upper Harbour and Hibiscus and Bays. The Local Board Plans outline outcomes for the respective local board areas. The plans identify outcomes relating to an improved and well-connected transport system, including active modes, managing growth, economic prosperity and protection and care for the environment. The North Projects are consistent with the outcomes of the three Local Board Plans. The Projects will integrate well with proposed surrounding land uses and the wider transport network, to respond to the timing, scale and form of urban development triggers and staging of future infrastructure corridors. In doing so the North Projects will manage any adverse effects on the environment. The North Projects will provide a multimodal, safe and reliable transport network that supports growth, enables sustainable travel choice for all transport users, address safety concerns and improves access to employment and social amenities. The North Projects will also support the economic outcomes sought by supporting economic growth and increased productivity. The North Projects will help facilitate the sustainable growth of the Rodney, Upper Harbour and Hibiscus and Bays areas.

Silverdale West Dairy Flat Industrial Area Structure Plan

The North Projects are located within the Silverdale West Dairy Flat Industrial Area Structure Plan (Structure Plan) area. The Structure Plan is a blueprint for transforming the Silverdale West and Dairy Flat area into an urbanised industrial area. The plan sets out future land use, proposed transport corridors, walking and cycling connections, environmental enhancements and a development staging plan. The North Projects will support land use development and growth envisaged by the Structure Plan and will integrate with this plan by route protecting transport corridors that are indicated by the Structure Plan (noting that some of the North Project alignments have changed since the Plan was adopted). The North Projects also considered potential connections with more local walking and cycling corridors and blue green infrastructure envisaged by the Plan. This will enable transport corridor development to better align with land use developments within the Structure Plan area in the future. The RTC will create some severance of future industrial land envisaged in the Structure Plan and opportunities to minimise this are identified in the Urban Design Evaluation (UDE) in Volume 4, which can be considered in the future development of the Urban and Landscape Design Management Plan (ULDMP) and detailed design for the RTC as well as through Council led Plan Changes anticipated in the Structure Plan area (which the Project Team is collaborating with Council on).

25 Other Statutory Approvals Required

Further and separate approvals under other legislation will be required and will be sought in future. This report does not seek authorisation or approval for those works, but they are set out in Table 25-1 for clarity.

Table 25-1: Other statutory approvals required

Other statutory authority 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 (as the territorial authority) one or more outline plan(s), detailing all relevant aspects of the transport corridors/stations following the completion of detailed design and prior to the commencement of construction.
Land subject to existing designations	<p>Some land to be designated for the transport corridors/stations 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) consents required for each corridor are set out in AEE Section 17 for network utilities and Section 19 for Dairy Flat School (which is also designated).</p> <p>Written approval is required in order to undertake works within the earlier designations where those works may prevent or hinder the earlier designation's purpose or project. We have met with these requiring authorities to discuss the effects of the designation and any concerns; however, it is appropriate that written consent is sought at detailed design prior to construction when further detail will be known and to account for any changes to status of earlier designations. Therefore, written approval under section 177(1)(a) of the RMA will be sought closer to construction.</p>
Future resource consents	<p>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 proposed designation footprints.</p> <p>These consents will be sought when the detailed design for each of the transport corridors is completed.</p>
Considerations under other legislation	<ul style="list-style-type: none"> • 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 (e.g., taking and / or killing of wildlife for certain purposes and / or causing damage) • Marine and Coastal Area (Takutai Moana) Act 2011 - when applying for resource consent in the coastal marine area, Waka Kotahi and/or AT will notify and seek the views of any group that has applied for recognition of customary marine title in the area. If resource consent is sought in an area where a customary marine title has been recognised, the applicant will seek the written permission of the customary marine title group prior to applying for resource consent.

26 Assessment of Part 2 of the RMA

Section 171(1) 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 North Projects promote 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 North Projects subject to Part 2 of the RMA.

26.1 Section 6 - 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. The following matters of national importance are considered to be relevant to the North Projects (refer Table 26-1).

Table 26-1: Matters of National Importance

Matter of national importance	Assessment
<p>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</p>	<p>The North Projects will preserve the natural character of the river/stream environments through reinstatement and mitigation planting at the completion of works. Natural character effects have been assessed through a detailed Landscape and Visual assessment. The North Projects provide opportunities for natural character values to be improved through enhancements via landscaping.</p> <p>Adverse effects on natural character values identified have largely been avoided through the alternatives assessment process. As a result, the North Projects mostly avoid significant landscape features and seek to limit physical effects on SEAs, outstanding natural landscapes (ONLs), natural wetlands, streams and other high value landscape features within the local landscape.</p> <p>The North Projects seek to reduce impacts on the coastal environment by limiting additional crossing points and through managing stormwater discharges into the coastal environment. This recognised the importance of reducing impacts on landscape values, natural character, habitats and reduces the extent of vegetation clearance along the coast.</p> <p>A new active mode bridge over the coastal marine area (CMA) is proposed as part of NoR 4 and will be subject to future regional</p>

Matter of national importance	Assessment
	<p>consents. This crossing is within the boundary of Waka Kotahi's existing SH1 designation and is directly adjacent to the existing SH1 crossing. It is considered to be appropriate use and development of the CMA, noting it is not authorised by the designation as it will also be subject to future regional consents.</p> <p>The designations also provide room for treating stormwater through soft stormwater infrastructure methods such as swales and stormwater wetlands. This approach is expected to appropriately manage downstream coastal water quality impacts on the CMA and therefore natural character of the coastal environment, noting stormwater discharges will also be subject to future regional consenting.</p>
<p>the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development</p>	<p>The North Projects avoid outstanding natural features.</p> <p>The North Projects have sought to avoid ONLs through corridor alignment choice where possible.</p> <p>The existing Dairy Flat Highway alignment interacts with the edge of an ONL associated with Dairy Stream and Green Road Park. NoR 8 (an upgrade to this highway) has sought to minimise the extent of designation within the ONL, with effects anticipated to be temporary / construction related only. The permanent transport corridor avoids the ONL.</p>
<p>the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna</p>	<p>The transport corridors/stations in the North Projects have sought to avoid or minimise impacts on a range of high value ecological areas including SEAs, streams, wetlands and other significant habitats of indigenous fauna. This is demonstrated through a comprehensive alternatives assessment process undertaken. Indicative designs and designation boundary setting have sought to minimise effects further.</p> <p>Some indigenous vegetation and habitat removal is unable to be avoided. Where avoidance of effects is not practicable, measures are proposed to mitigate effects of the works – noting this AEE only seeks to authorise vegetation removal that is subject to district plan controls. Additionally, the proposed designations provide further opportunities to minimise any impacts within the corridor alignments during future detailed design where more will be known about geotechnical conditions, hence batters/cuts into high value areas may be able to be reduced (particularly for NoRs 1 and 9). The proposed designations are of adequate width to enable further mitigation related to resource consent mitigation requirements where required. In particular, a high level analysis of SEA offsetting areas within the designations has been completed as part of the Assessment of Ecological Effects. This has confirmed that sufficient space is likely available within the proposed designations; and if not there is significant opportunity for offset within public land close to the corridors.</p> <p>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 North Projects can be adequately managed in any future consent process. Overall it is considered that areas of significant indigenous vegetation and habitats will be protected.</p>
<p>the maintenance and enhancement of public</p>	<p>The proposed designations will not impact upon any existing public access to streams or the coastal marine area (CMA). The North</p>

Matter of national importance	Assessment
access to and along the coastal marine area, lakes, and rivers	Projects have the potential to provide enhanced access to streams in the transport corridor areas through the provision of active transport facilities and future integration with Auckland Council's proposed Blue-Green Network. In addition, NoR 4 provides for public active mode connections to and along the CMA at the Ōrewa River.
the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga	<p>Manawhenua have been actively involved throughout development of the corridors, including through alternatives assessment and identification of the preferred options. The opportunity to provide Cultural Impact Assessments (CIAs) was provided and the joint Te Kawerau ā Maki - Ngāti Manuhiri CIA has been considered by the project team.</p> <p>The ongoing partnership with Manawhenua has provided an understanding and the incorporation of Manawhenua values and expression of kaitiakitanga throughout the development of the North Projects.</p> <p>The relationship of the respective iwi with the transport corridors/stations, their ancestral lands, wāhi tapu and taonga will be recognised and provided for through the continued involvement of Manawhenua as partners in developing and implementing various mitigation measures and management plans at the time of detailed design and construction (as provided for through the conditions).</p>
the protection of historic heritage from inappropriate subdivision, use, and development	<p>Effects on historic heritage will be managed through the implementation of a Historic Heritage Management Plan (HHMP). Effects on heritage and archaeological sites will be avoided where possible.</p> <p>There are several recorded archaeological and heritage sites within the proposed NoR areas which have the potential to be affected by works. In addition, there is the potential to disturb previously unrecorded deposits during construction. These factors will be managed by the requirement for an accidental discovery protocol and implementation of a HHMP requiring further research and survey.</p>
the protection of protected customary rights	The North Projects do not affect any known protected customary rights.
the management of significant risks from natural hazards	<p>A number of design measures to provide resilience to flooding, inundation and climate change have been adopted across the North Projects. The Assessment of Flooding Effects in Volume 4 has made recommendations which are to be implemented at detailed design so that:</p> <ul style="list-style-type: none"> • There is no increase in flood levels for existing authorised habitable floors that are already subject to flooding; and • There are no new flood prone areas created. There is sufficient space within the designations for stormwater and flood mitigation.

On that basis the North Projects are considered to be consistent with Section 6 of the RMA.

26.2 Section 7 - 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. It is considered the other matters outlined in Table 26-2 are relevant to the North Projects.

Table 26-2: Specified Other Matters

Other matter	Assessment
a) kaitiakitanga:	Manawhenua kaitiakitanga has been recognised through engagement at each stage and will continue through future phases of the North Projects, including at construction and operation. This includes the preparation of management plans and the involvement of Manawhenua as partners in the detailed design and consenting phases of the North Projects.
aa) the ethic of stewardship:	The ethic of stewardship is recognised through engagement and participation with stakeholders and partners who have a specific interest in or exercise stewardship over particular resources.
bb) the efficient use and development of natural and physical resources:	The alternatives assessment process has determined the most efficient use of natural and physical resources to achieve the needs of the community, particularly in utilising existing corridors where appropriate.
ba) the efficiency of the end use of energy:	Not considered relevant to the North Projects.
c) the maintenance and enhancement of amenity values:	<p>The alignment selection and the design process have sought to avoid adverse effects on existing and future amenity. Particular regard has been given to the management of amenity values associated with SEAs, streams and tributaries and natural wetlands, which are considered to have moderate to heightened, localised natural character values. The active mode network will be notably improved in the North, improving the safety and amenity of the urban environment.</p> <p>The maintenance and enhancement of amenity values will be achieved through the implementation of the ULDM which is a condition on the designations.</p>
d) intrinsic values of ecosystems:	Corridor development has sought to avoid adverse effects on ecosystems as far as practicable while allowing flexibility for further refinement during detailed design. Appropriate mitigation will be undertaken where ecosystem values are compromised.
e) maintenance and enhancement of the quality of the environment	The quality of the environment (both the existing and likely future environment) will be maintained and enhanced in some places through the implementation of the ULDM which is a condition on the designations.

Other matter	Assessment
f) any finite characteristics of natural and physical resources:	Not considered relevant to the North Projects.
g) the protection of the habitat of trout and salmon:	Not considered relevant to the North Projects.
h) the effects of climate change:	<p>The North Projects seek to minimise the effects of climate change and greenhouse gas emissions by providing improved public transport and high-quality active mode network (which will assist with mode shift away from private vehicles to these more sustainable modes in future).</p> <p>Each corridor/station is also designed to provide resilience to flooding, taking into account climate change and where feasible, reducing the urban heat island effects through the provision of planting.</p>
i) the benefits to be derived from the use and development of renewable energy.	Not considered relevant to the North Projects.

The North Projects are considered to be consistent with Section 7 of the RMA for the reasons set out above.

26.3 Section 8 - The Treaty of Waitangi / Te Tiriti ō 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 ō Waitangi).

Te Tupu Ngātahi has partnered with Manawhenua throughout the development of the North Projects. This has resulted in the selection of transport corridors/stations which avoid and minimise adverse effects on cultural values where practicable. This has included avoiding or minimising impacts on SEAs, puke, wetlands and streams, 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 Treaty of Waitangi are taken into account. Given these factors, the development of the North Projects is considered to be consistent with the principles of the Treaty of Waitangi, and section 8 of the RMA.

26.4 Section 5 - The Purpose of the Act

Section 5 states the purpose of the Act is to promote the sustainable management of natural and physical resources. Sustainable management is defined in Section 5(2) to mean:

“Managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, while –

- a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
- c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment”*

The North Projects will meet this by:

Part 2 S5(2) Enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety

- Enabling planned urban growth within the North growth areas by providing critical transport infrastructure required to support growth and capacity in the FUZ land resource.
- Providing a safe and reliable, multifaceted transport network that supports and integrates with planned growth, enables sustainable travel choice, addresses safety concerns and improves access to employment and social opportunities by:
 - Increasing active modes and public transport choices
 - Reducing the risk of death and serious injuries (DSIs) and improving road safety for all uses
 - Improving connectivity between future/existing centres and industrial areas, and within the North area
 - Improving corridor capacity and resilience, resulting in improved journey times and reliability for all modes of transport including future freight and public transport.

Part 2 S5(a) Sustaining the potential of natural and physical resources for future generations

- Improving the resilience of the transport network to flood hazards by accounting for future rainfall predictions and providing room for stormwater facilities for each corridor/station.
- Meeting the future transport needs of the North by providing an RTC with proposed stations (as well as opportunity for future stations) servicing and integrating with future town centres, areas of employment and residential catchments, thereby improving connectivity, resilience, reliability, and travel choice.
- For road corridors, generally existing road corridors are utilised to enable the efficient use of existing resources. Where required, new road network connections are enabled.
- Not precluding opportunities for staged improvements to existing corridors for public transport (such as the opportunity to use NoR 4 for bus shoulder lanes in the interim).

Part 2 S5(b) Safeguards the life supporting capacity of air, water, soil, and ecosystems by

- Improving mode choice and reducing congestion, which has the potential to benefit air quality at a local level.
- Providing sufficient land to manage water quality and quantity at future consenting stages.
- Managing future construction works.
- Avoiding (where practicable) high value ecological areas and highly productive soils.

Part 2 S5(c) *Avoiding, remedying, or mitigating any adverse effects*

- Each of the corridors/stations within the North Projects avoid, where practicable, and otherwise remedy or mitigate adverse effects on the environment through the corridor/site selection and designs developed to date, and through identification of mitigation measures to be captured in the subsequent outline plan of works and resource consenting phases.

The North Projects will result in some adverse effects; however, when considering the significant regional and local benefits of the North Projects, and the measures proposed to avoid, remedy and mitigate the adverse effects, the North Projects are considered to be consistent with Section 5 of the RMA.

27 Whether the Work and Designations 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. In our view:

- a) 'Necessary' falls somewhere between desirable and essential; and
- b) 'Reasonably' allows for some tolerance in terms of where necessary falls.

It is considered that “reasonable necessity” allows for a threshold assessment, proportionate to the circumstances to determine whether the North Projects are justified in the context of Section 171(1)(c) of the RMA. As detailed in section 6 of this AEE, the proposed designation footprints allow room to construct, operate and maintain the North Projects, to maintain property access where required, and to mitigate district plan effects, whilst recognising the need for flexibility required due to the uncertainty of the future urban environment and the concept level of design. The designation setting needs to be adaptive to and allow room to integrate with a future form which is has not yet been planned in detail. It also allows room for future stormwater treatment, links between projects and sufficient space for intersections. For all these reasons, the extent of the proposed designation boundaries are considered reasonably necessary.

For all the North Projects, the method of designation is considered reasonably necessary to achieve the objectives because it enables the identification and protection of the land required for the North Projects for an extended duration.

The following table provides an assessment of whether the works (the North Projects) on are reasonably necessary for achieving the project objectives:

Table 27-1: Assessment of North Projects against Section 171(1)(c) - Reasonable Necessity

NOR and Project	Project Objectives	Project achieves objectives by:
1 New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path	Provide for a new public transport and active modes corridor between Albany, Dairy Flat and Milldale that: a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable d) Integrates with and supports planned urban growth e) Supports a quality compact urban form	The work is reasonably necessary to achieve the objectives because it will: <ul style="list-style-type: none"> • Provide a new, high quality public transport connection which supports the regional and interregional public transport system • Improve connectivity between transport networks, including the broader bus network, other North Projects, other planned transport projects and between planned growth areas. • Be safe with a grade separated public transport corridor and dedicated active mode facility (cycleway and / or shared path) which

NOR and Project	Project Objectives	Project achieves objectives by:
	<p>f) Integrates with and supports the existing and future transport network</p> <p>g) Improves travel choice and contributes to mode shift</p>	<p>separates vulnerable users from conflict with vehicles.</p> <ul style="list-style-type: none"> • Support the development of an efficient, resilient and reliable multi-modal transport network for the North growth area • Support the urbanisation of FUZ land and provide the opportunity to integrate with future town centres, higher density residential areas, and business areas. • Support higher density living and a quality compact urban form. • Provide access to economic and social opportunities for existing and planned urban areas in the North. • Connect with the existing Albany Station and future transport and active mode network to support urban growth. • Provide attractive transport alternatives to the private vehicle, encouraging mode shift.
<p>2</p> <p>New Milldale Station and Associated Facilities</p>	<p>Provide for a new transport station and associated transport interchange in Milldale that:</p> <p>a) Improves connectivity</p> <p>b) Is safe</p> <p>c) Integrates with and supports planned urban growth</p> <p>d) Supports a quality compact urban form</p> <p>e) Provides accessibility to economic and social opportunities for the Northern growth area, as an integral component of the rapid transit corridor</p> <p>f) Integrates with and supports the existing and future transport network</p> <p>g) Improves travel choice and contributes to mode shift</p>	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide a new public transport facility for the existing and future communities in Milldale, Millwater, and surrounding areas which provides access to the RTC and enables improved access to wider economic and social opportunities. The RTC supports mode shift for the North growth area and surrounding communities in the North through the provision of a safe, high-quality, frequent, and reliable public transport system that connects the North with Albany, the North Shore and Auckland city centre. • Support appropriate transit-oriented development around the RTC stations and will be integrated with bus, walking, and cycling networks to promote travel choice enabling improved access to the adjacent residential and employment areas. The station can also be accessed via walking and cycling from the adjacent Milldale development, and across SH1 over the consented Highgate Bridge. • Improve connectivity between transport networks, including local bus services and the RTC, other North Projects and between planned growth areas including through the

NOR and Project	Project Objectives	Project achieves objectives by:
		<p>provision of bus interchange and layover. This supports access for broader northern catchment in the North, via local bus services.</p> <ul style="list-style-type: none"> • Support urbanisation and a quality, compact urban form in the FUZ areas to the north of the existing Milldale development, which can connect to the station via local buses and active modes. In the long term, the project may also support more intensive development of Milldale itself as per direction within the National Policy Statement for Urban Development (2020) for intense residential development within walkable catchments of RT stations. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North growth areas.
<p>3</p> <p>New Pine Valley East Station and Associated Facilities</p>	<p>Provide for a new transport station and associated transport interchange in Dairy Flat that:</p> <ol style="list-style-type: none"> Improves connectivity Is safe Integrates with and supports planned urban growth Supports a quality compact urban form Provides accessibility to economic and social opportunities for the Northern growth area, as an integral component of the rapid transit corridor Integrates with and supports the existing and future transport network Improves travel choice and contributes to mode shift 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide a new public transport facility for the planned urban growth in Pine Valley, Silverdale West, and surrounding areas including existing rural communities to the west, which provides access to the RTC and enables improved access to wider economic and social opportunities. • Support mode shift and travel choice in the future urban area by providing access to public transport services via the RTC. The Park-and-Ride facilities at the station will also support mode shift and public transport use by those in the outer rural areas and those north of Milldale who will not be directly serviced by the RTC. • Improve connectivity between transport networks including local and frequent transit network bus services and the RTC, other North Projects and between planned urban growth areas, including through the provision of bus interchange and layover. • Support the urbanisation of FUZ land and provide the opportunity to integrate with future town centres, employment and higher density residential areas.

NOR and Project	Project Objectives	Project achieves objectives by:
<p>4</p> <p>SH1 Improvements</p> <p>(alteration to designations 6761, 6760, 6759, 6751)</p>	<p>Provide for an upgrade to the SH1 corridor between Albany and Ōrewa that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable d) Integrates with and supports planned urban growth e) Provides for inter-regional and freight movements f) Integrates with and supports the existing and future transport network g) Improves access to SH1 from/to the Silverdale West future industrial area and from/to the Dairy Flat future urban area h) Improves travel choice and contributes to mode shift 	<ul style="list-style-type: none"> • Support the development of an efficient, resilient and reliable multi-modal transport network for the North growth area. <p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide an upgraded SH1 transport corridor that is integrated with the surrounding urban growth areas and with new transport corridor Ō Mahurangi (Penlink). • Support Vision Zero and road safety outcomes. • Be safe including by providing dedicated active mode facilities which separates vulnerable users from conflict with vehicles. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Provide room and resilience for growth in freight movements. • Support mode shift through provision of a strategic active mode facility between Albany and Grand Drive, and by providing opportunity for bus shoulder lanes ahead of the RTC development. • Improve connectivity between transport networks, including other North Projects, the RTC and between planned growth areas. • Include new and upgraded interchanges to/from the Silverdale west future industrial area and the Dairy Flat FUZ. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>5</p> <p>New SH1 crossing at Dairy Stream</p>	<p>Provide for a new east-west crossing of SH1 that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable d) Integrates with and supports planned urban growth e) Integrates with and supports the existing 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide a new connection for all modes between growth areas east and west of SH1, enabling better access to social and economic opportunities for future communities. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles.

NOR and Project	Project Objectives	Project achieves objectives by:
	<p>and future transport network</p> <p>f) Improves travel choice and contributes to mode shift</p>	<ul style="list-style-type: none"> • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate with and support growth areas either side of SH1; and integrate with and support the future transport network. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>6</p> <p>New Connection between Milldale and Grand Drive</p>	<p>Provide for a new transport corridor between Milldale and SH1 at Grand Drive that:</p> <p>a) Improves connectivity</p> <p>b) Is safe</p> <p>c) Is efficient, resilient and reliable</p> <p>d) Integrates with and supports planned urban growth</p> <p>e) Integrates with and supports the existing and future transport network</p> <p>f) Improves travel choice and contributes to mode shift</p>	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide a new transport corridor that connects the growth areas of Milldale, Ara Hills and Ōrewa and is integrated with the surrounding urban growth areas. • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles. • Integrate and support the future transport network including other North Projects. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>7</p> <p>Upgrade to Pine Valley Road</p>	<p>Provide for an upgrade to Pine Valley Road between the rural urban boundary and Argent Lane that:</p> <p>a) Improves connectivity</p> <p>b) Is safe</p> <p>c) Is efficient, resilient and reliable</p> <p>d) Integrates with and supports planned urban growth</p>	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide an upgraded transport corridor that connects rural areas to the west with future urban areas to the east and is integrated with the surrounding urban growth areas. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles.

NOR and Project	Project Objectives	Project achieves objectives by:
	<ul style="list-style-type: none"> e) Integrates with and supports the existing and future transport network f) Improves travel choice and contributes to mode shift 	<ul style="list-style-type: none"> • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate and support the future transport network including other North Projects, like the NoR 1 - New Rapid Transit Corridor (RTC) between Albany and Milldale, including new walking and cycling path. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>8</p> <p>Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat</p>	<p>Provide for an upgrade to Dairy Flat Highway between Silverdale interchange and Durey Road that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) is efficient, resilient and reliable 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 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide an upgraded transport corridor that connects the Silverdale West and Dairy Flat future urban areas and is integrated with the surrounding urban growth areas. • Support mode shift and improve safety by providing dedicated active mode facilities which separates vulnerable users from conflict with vehicles, and room for bus priority lanes. • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate and support the future transport network including other North Projects, like the NoR 4 - SH1 Improvements and NoR 9 - Upgrade to Dairy Flat Highway between Dairy Flat and Albany. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>9</p> <p>Upgrade to Dairy Flat Highway between Dairy Flat and Albany</p>	<p>Provide for an upgrade to Dairy Flat Highway between Durey Road and Albany village that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide an upgraded transport corridor that connects the Dairy Flat future urban area with Albany village and is integrated with the surrounding urban growth and rural areas.

NOR and Project	Project Objectives	Project achieves objectives by:
	<ul style="list-style-type: none"> c) Is efficient, resilient and reliable 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 	<ul style="list-style-type: none"> • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles. • Support Vision Zero and road safety outcomes through median and side barrier safety improvements. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate and support the future transport network including other North Projects, like NoR 8 - Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat.. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>10</p> <p>Upgrade to Wainui Road</p>	<p>Provide for an upgrade to Wainui Road between Lysnar Road and SH1 that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable 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 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide an upgraded transport corridor that connects the Wainui/Milldale growth area with SH1 and is integrated with the surrounding urban growth areas. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles. • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate and support the future transport network including other North Projects, like NoR 4 – SH1 Improvements and NoR 6 – New Connection between Milldale and Grand Drive. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>11</p> <p>New connection between Dairy Flat</p>	<p>Provide for a new transport corridor between Dairy Flat Highway and Wilks Road that:</p>	<p>The work is reasonably necessary to achieve the objectives because it will:</p>

NOR and Project	Project Objectives	Project achieves objectives by:
Highway and Wilks Road	<ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable 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 	<ul style="list-style-type: none"> • Provide a new transport corridor that connects the Silverdale West future industrial area with Dairy Flat Highway and SH1, and is integrated with the surrounding urban growth areas. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles. • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Integrate and support the future transport network including other North Projects, like NoR 4 – SH1 Improvements and NoR 8 – Upgrade to Dairy Flat Highway between Silverdale and Dairy Flat. • Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
12 Upgrade and Extension to Bawden Road	<p>Provide for an upgrade and extension to Bawden Road between the SH1 Ō Mahurangi Penlink (Redvale) Interchange and Dairy Flat Highway that:</p> <ul style="list-style-type: none"> a) Improves connectivity b) Is safe c) Is efficient, resilient and reliable 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 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> • Provide a new transport corridor that connects the Dairy Flat future urban area to SH1 and is integrated with the surrounding urban growth areas. • Support Vision Zero and road safety outcomes. • Enable access to economic and social opportunities by providing an integrated multi-modal corridor. • Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles, and room for bus priority lanes. • Integrate and support the future transport network including Ō Mahurangi (Penlink) and other North Projects, like NoR 1 – New Rapid Transit Corridor (RTC) between Albany and Milldale including new walking and cycling path, NoR 4 – SH1 Improvements and NoR 8 – Upgrade to Dairy Flat Highway between Dairy Flat and Albany.

NOR and Project	Project Objectives	Project achieves objectives by:
		<ul style="list-style-type: none"> Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.
<p>13</p> <p>Upgrade to East Coast Road between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange</p>	<p>Provide for an upgrade to East Coast Road between Hibiscus Coast Highway and Redvale that:</p> <ol style="list-style-type: none"> Improves connectivity Is safe Is efficient, resilient and reliable Integrates with and supports planned urban growth Integrates with and supports the existing and future transport network Improves travel choice and contributes to mode shift 	<p>The work is reasonably necessary to achieve the objectives because it will:</p> <ul style="list-style-type: none"> Provide an upgraded transport corridor that connects the urban growth areas of Silverdale and Redvale and is integrated with the surrounding urban growth areas. Support Vision Zero and road safety outcomes. Enable access to economic and social opportunities by providing an integrated multi-modal corridor. Support mode shift and improve safety by providing dedicated active mode facilities which separate vulnerable users from conflict with vehicles. Integrate and support the future transport network including Ō Mahurangi (Penlink) and other North Projects, like NoR 4 – SH1 Improvements. Support the development of an efficient, resilient and reliable multi-modal transport network for the North areas.