



**TE TUPU NGĀTAHI**  
SUPPORTING GROWTH

VOLUME 2

# Takaanini Level Crossings Assessment of Effects on the Environment

November 2023

Version 2.0

## Document Status

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

Volume		Contents
1	Form 18 and supporting material	For each of NoR 1 and NoR 2: <ul style="list-style-type: none"> <li>• Form 18;</li> <li>• Attachment A: Designation Plans;</li> <li>• Attachment B: Schedule of Directly Affected Properties; and</li> <li>• Attachment C: Proposed Conditions for the Designation.</li> </ul>
2	Assessment of Effects on the Environment	Assessment of Effects on the Environment Report (this Report) Appendix A: Assessment of Alternatives
3	Design Drawings	General Arrangement Drawings
4	Supporting Technical Reports	Assessment of Arboricultural Effects Assessment of Archaeological and Heritage Effects Assessment of Construction Noise and Vibration Effects Assessment of Ecological Effects Assessment of Operational Noise Effects Assessment of Landscape and Visual Effects Assessment of Traffic and Transport Effects Assessment of Flooding Effects Social Impact Assessment Urban Design Evaluation Report

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## Glossary of Defined Terms and Acronyms

We note that 'Takaanini' (with double vowels) is used throughout the Report Acknowledging the ongoing kōrero and guidance from Manawhenua on the cultural landscape. 'Takanini' is used where reference is made to a specific and existing named place (e.g., Takanini Road, Takanini Town Centre etc.). Manawhenua is also used throughout the Report as while gifting the programme name as Te Tupu Ngātahi, Manawhenua confirmed this was an appropriate spelling (capital 'M' and one word). Notwithstanding this, the term is spelled as two words in other fora and the proposed designation conditions – Mana Whenua.

Acronym/Term	Description
ADP	Accidental Discovery Plan
AEE	Assessment of Effects on the Environment (this Report)
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project 2021-2031
AUP:OP	Auckland Unitary Plan: Operative in Part
BPO	Best Practicable Option
CAR	Cultural Advisory Report
CAS	Crash Analysis System
CCRA	Climate Change Response Act 2022
CEMP	Construction Environmental Management Plan
CHI	Cultural Heritage Inventory
CIA	Cultural Impacts Assessment
CMP	Cultural Monitoring Plan
CNVMP	Construction Noise and Vibration Management Plan
CoPTTM	Code of Practice for Temporary Traffic Management
CPTED	Crime Prevention Through Environmental Design
CRL	City Rail Link
CTMP	Construction Traffic Management Plan
CVA	Cultural Values Assessments
DBC	Detailed Business Case
DOC	Department of Conservation
ECE	Early Childhood Education
EcIA	Ecological Impact Assessment
EIANZ	Environmental Institute of Australia and New Zealand
ERP	Emissions Reduction Plan

Acronym/Term	Description
<b>Four Tracking</b>	Anticipated upgrade of North Island Main railway Trunk line from two tracks up to four tracks
<b>FDS</b>	Future Development Strategy
<b>FUZ</b>	Future Urban Zone
<b>GIS</b>	Geographic Information System
<b>GPSLT</b>	Government Policy Statement on Land Transport for 2021/22-2030/31
<b>IBC</b>	Indicative Business Case
<b>IPI</b>	Intensification Planning Instrument
<b>ISPP</b>	Intensified Streamlined Planning Process
<b>ISTN</b>	Indicative Strategic Transport Network
<b>KiwiRail</b>	KiwiRail Holdings Limited
<b>LGA</b>	Local Government (Auckland Council) Act 2009
<b>LINZ</b>	Land Information New Zealand
<b>LOS</b>	Level of service
<b>LTMA</b>	Land Transport Management Act 2003
<b>MCA</b>	Multi-Criteria Assessment
<b>MDRS</b>	Medium Density Residential Standards
<b>MoT</b>	Ministry of Transport
<b>MP</b>	Minister of Parliament
<b>MPD</b>	Maximum Probable Development
<b>MSM</b>	Macro Strategic Model (regional multi-modal model)
<b>N/A</b>	Not Applicable
<b>NES</b>	National Environmental Standard
<b>NIMT</b>	North Island Main Trunk railway trunk
<b>NoR</b>	Notice of Requirement
<b>NoR 1</b>	Notice of Requirement 1: Takaanini Level Crossings Project (Spartan Road, Manuia Road, Manuroa Road, and Taka Street)
<b>NoR 2</b>	Notice of Requirement 2: Takaanini Level Crossings Project (Walters Road)
<b>NPS</b>	National Policy Statement
<b>NPS:UD</b>	National Policy Statement on Urban Development
<b>NRSS</b>	National Rail System Standards
<b>NUMP</b>	Network Utility Management Plan
<b>NZAA</b>	New Zealand Archaeological Association
<b>PBC</b>	Programme Business Case

Acronym/Term	Description
<b>PC78</b>	Plan Change 78 to the Auckland Unitary Plan: Operative in Part
<b>PPFs</b>	Protected premises and facilities
<b>PPV</b>	Peak Particle Velocity
<b>Programme partners</b>	Auckland Transport, Waka Kotahi and Manawhenua
<b>PT</b>	Public Transport
<b>PWA</b>	Public Works Act 1981
<b>RCA</b>	Road Controlling Authority
<b>RLTP</b>	Auckland Regional Land Transport Plan
<b>RMA</b>	Resource Management Act 1991
<b>RP</b>	Regional Plan
<b>RPS</b>	Regional Policy Statement
<b>SAMM</b>	Strategic Active Mode Model
<b>SAP</b>	Site Access Points
<b>SATURN</b>	Simulation and Assignment of Traffic to Urban Road Networks model
<b>SCEMP</b>	Stakeholder and Communication Engagement Management Plan
<b>SCMP</b>	Stakeholder and Community Engagement Plan
<b>SEA</b>	Significant Ecological Area
<b>SH1</b>	State Highway 1
<b>SIA</b>	Social Impact Assessment
<b>SIDRA</b>	Signalised/ unsignalized Intersection Design and Research Aid model
<b>SME</b>	Subject Matter Expert
<b>SRS</b>	Site Recording Scheme
<b>SSBC</b>	Single Stage Business Case
<b>SSTMP</b>	Site-Specific Traffic Management Plan
<b>TAR</b>	Threatened and At-Risk
<b>Te Tupu Ngātahi</b>	Te Tupu Ngātahi Supporting Growth
<b>TfUG</b>	Transport for Future Urban Growth
<b>TLC/the Project</b>	Takaanini Level Crossings Project
<b>TMP</b>	Tree Management Plan
<b>Te Tangi a te Manu</b>	Tuia Pito Ora New Zealand Institute of Landscape Architects (2022) Te Tangi a te Manu, Aotearoa New Zealand Landscape Assessment Guidelines
<b>UDE</b>	Urban Design Evaluation
<b>ULDMP</b>	Urban and Landscape Design Management Plan

Acronym/Term	Description
VKT	Vehicle Kilometres Travelled
Waka Kotahi	Waka Kotahi NZ Transport Agency

# 1 Introduction

This Assessment of Effects on the Environment (**AEE**) has been prepared by Te Tupu Ngātahi Supporting Growth (**Te Tupu Ngātahi**) and supports two Notices of Requirement (**NoR**) for the Takaanini Level Crossings Project (**TLC / the Project**). Auckland Transport (**AT**) is the Requiring Authority for the Project. The NoRs propose to enable the construction, operation, maintenance, and upgrade of five grade-separated bridge crossings of the North Island Main Trunk (**NIMT**) rail line in the Takaanini area. These grade-separated crossings will replace four existing road-rail level crossings which will be closed to address existing safety, severance, and congestion issues.

## 1.1 About Te Tupu Ngātahi Supporting Growth

Te Tupu Ngātahi is a collaboration between AT and Waka Kotahi NZ Transport Agency (**Waka Kotahi**), and was formed to investigate, plan, and undertake route protection for the strategic transport networks needed to support Auckland's growth areas over the next 10 to 30 years.

AT and Waka Kotahi have partnered with Auckland Council, Manawhenua, and KiwiRail Holdings Limited (**KiwiRail**) and are working closely with stakeholders and the community to develop the strategic transport network to support Auckland's growth areas. The TLC is one of the projects comprising this future network.

The key objective of Te Tupu Ngātahi is to protect land for future implementation of the required strategic transport infrastructure. Designations secured through the route protection process will identify and protect the land necessary to enable the future construction, operation, and maintenance of the planned transport infrastructure. Designations provide certainty that the Requiring Authority can implement proposed projects, and that property owners, businesses, and the community can make more informed decisions. Designations can also significantly reduce long-term costs for local and central government and enable more effective land use and transport outcomes.

## 1.2 Project Context and Description

The TLC is one of the transport work packages proposed for the Takaanini area as part of Te Tupu Ngātahi programme and is intended to respond to both existing transport deficiencies as well as provide for the forecasted future growth pressures in the area.

There are currently four public road level crossings along the NIMT in the Takaanini area - at Spartan Road, Manuroa Road, Taka Street, and Walters Road (see Figure 1-1). Each of these east-west corridors experiences congestion, severance, and an elevated level of safety risk as a result of the level crossings at grade, and the operation of barrier arms to allow for rail operations. These issues will be exacerbated by both planned increases in train frequency, and growth in the Takaanini area.

As part of the anticipated future growth in passenger and freight rail services, KiwiRail is planning to upgrade the NIMT. This will consist of an increase in the number of rail tracks on the NIMT line from two tracks to up to four tracks (**Four Tracking**). Increased train movements are also anticipated from the operation of CRL. In the Takaanini context, the net result of Four Tracking and CRL is an increasing number of hourly train movements through Takaanini resulting in material increases to barrier closures during peak hours, which will contribute to overflow congestion in the immediate area

and impacts on the wider network. This will exacerbate existing congestion, severance, and increase potential safety issues at the existing level crossings.

Safe and reliable east-west connections across the NIMT are required to address these collective transport issues and support anticipated growth. Overall, the Project proposes to respond to the existing and anticipated future network issues through the closure and grade-separation of the existing four level crossings in Takaanini, and a new grade-separated crossing on the alignment of Manuia Road where no NIMT crossing currently exists. The proposed network is described in Table 1-1 and shown in Figure 1-1.

The works proposed for the TLC are located across five project areas referred to as the Spartan Road, Manuia Road, Manuroa Road, Taka Street and Walters Road project areas. Details of the Project and anticipated works within each project area are discussed further in Section 3.3 below and are shown in the accompanying General Arrangement Plans in Volume 3.

**Table 1-1: Summary of the TLC**

NoR Reference	Project area	Description	Requiring Authority
<b>Takaanini Level Crossings Project NoR 1</b>	<b>Spartan Road</b>	Closure of the existing level crossing, construction of a new bridge with walking and cycling facilities across the NIMT and associated works.	Auckland Transport
	<b>Manuia Road</b>	Construction of a new bridge with general traffic lanes and walking and cycling facilities across the NIMT and associated works.	
	<b>Manuroa Road</b>	Closure of the existing level crossing, construction of a new bridge with walking and cycling facilities across the NIMT and associated works.	
	<b>Taka Street</b>	Closure of the existing level crossing, construction of a new bridge with general traffic lanes and walking and cycling facilities across the NIMT and associated works.	
<b>Takaanini Level Crossings Project NoR 2</b>	<b>Walters Road</b>	Closure of the existing level crossing, construction of a new bridge with general traffic lanes and walking and cycling facilities across the NIMT and associated works.	

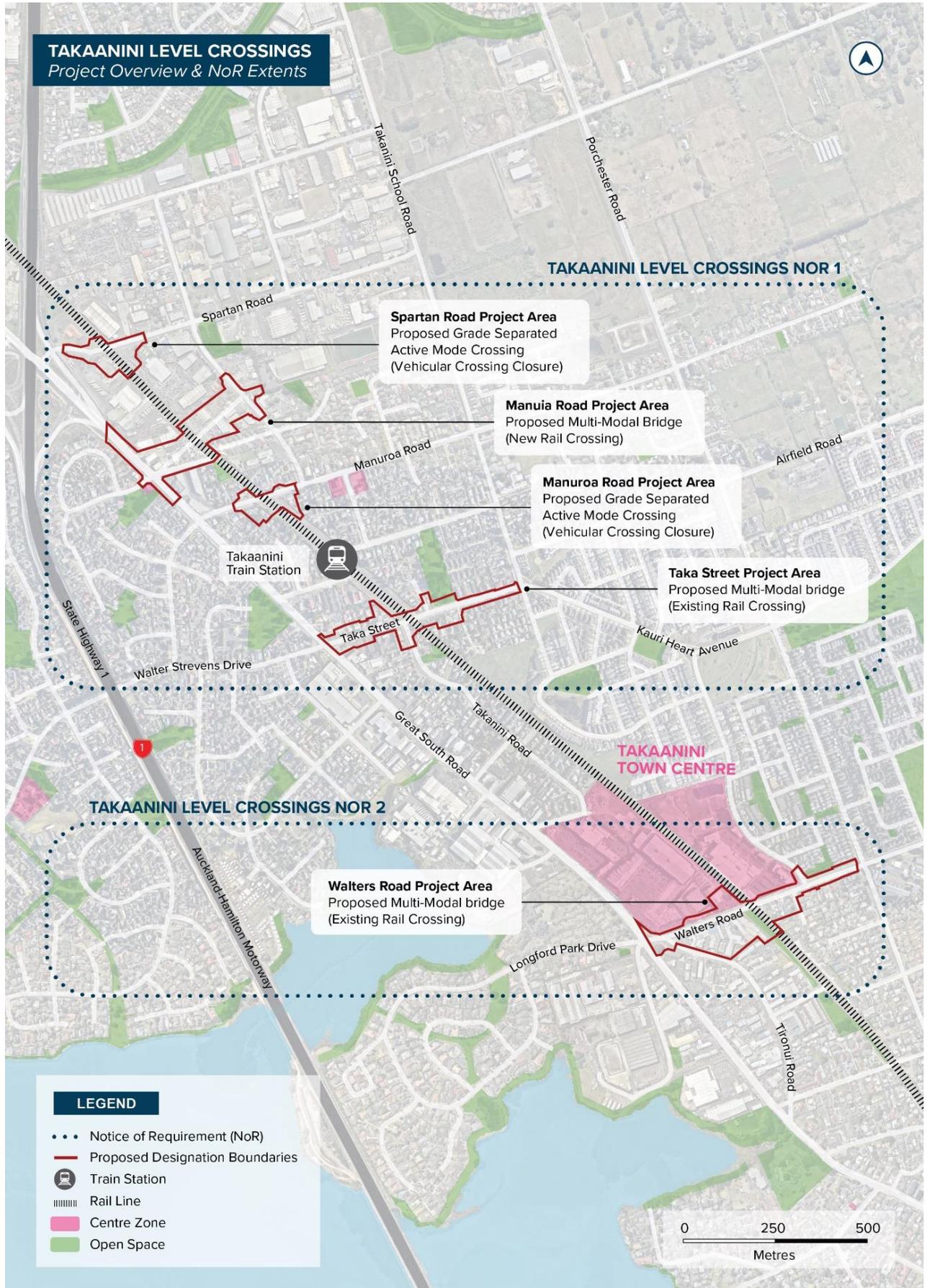


Figure 1-1: TLC proposed network

### 1.3 Auckland Transport's Requiring Authority status

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

AT's functions are identified in section 45 of the LGA and include managing and controlling the AT system in accordance with the LGA. These include performing the statutory functions and exercising the statutory powers set out in section 46 of the LGA as if AT were a local authority or other statutory body, and acting as a Requiring Authority under section 167 of the Resource Management Act 1991 (**RMA**).

Under section 47(1) of the LGA, AT is deemed a Requiring Authority as a network utility operator 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". Accordingly, AT may designate land to construct, operate and maintain roads, active mode connections, structures and any other activities that contribute to the Auckland transport system that AT or Auckland Council have financial responsibility for.

### 1.4 Notification

AT requests that the NoRs for the TLC are publicly notified.

## 2 Background and Context

### 2.1 Growth and urban development of Takaanini

Takaanini is a largely urbanised area located in South Auckland, between Manurewa to the north and Papakura to the south. The area has had a long history of occupation and development. This spans from Pre-European Māori occupation, European settlement in the 19<sup>th</sup> – 20<sup>th</sup> century<sup>1</sup> through to the urban development present to date with further intensification anticipated in future. The way that Takaanini has grown over the years has increased travel demand for east-west movements across the NIMT and has underlined the importance of east-west connections in the transport network.

The area has historically grown along and around two key north-south transport corridors; Great South Road and the NIMT. In the last 25 years, the growth and development of Takaanini has been guided by a range of plans and strategies. The 1999 Regional Growth Strategy identified the urbanised extent of Takaanini as an intensification node centred on the Takaanini Train Station, and also identified a greenfield area to the east of the NIMT for urbanisation.<sup>2</sup> The Papakura District Council subsequently developed the Takanini Structure Plan for the greenfield area in 2000 (refer to Figure 2-1) which anticipated staged urbanisation to the east of the NIMT with a view to accommodating a population of 20,000 by 2050.<sup>3</sup> The Structure Plan included community facilities including Bruce Pulman Park east of the NIMT. The possibility of a new or relocated train station was also identified in this Structure Plan.

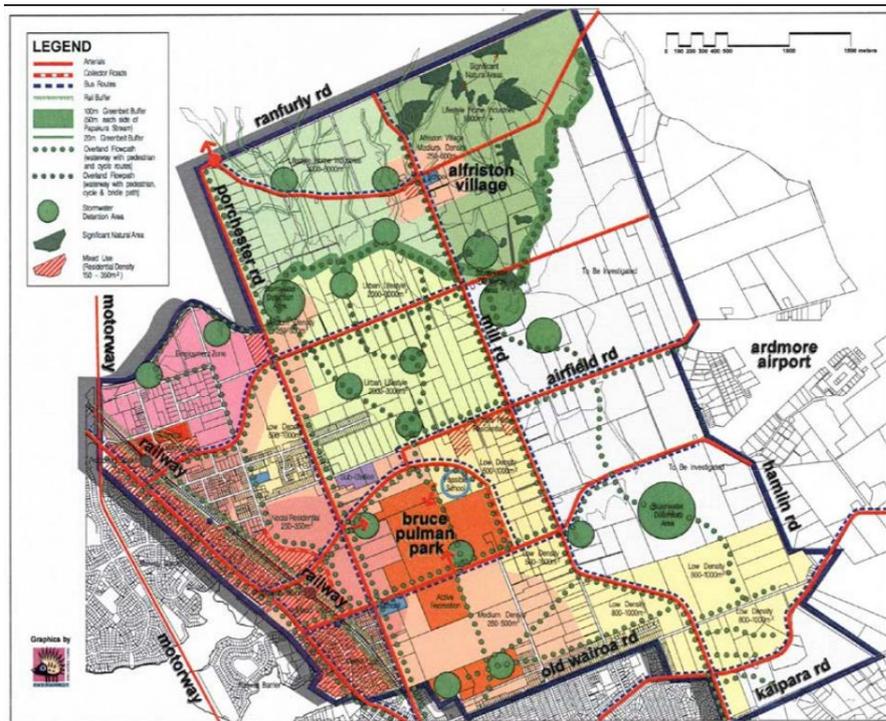


Figure 2-1: Takanini Structure Plan 2000

<sup>1</sup> Refer to Section 5.2 of 'Assessment of Archaeological and Heritage Effects' Report in Volume 4 of the application documents.

<sup>2</sup> Auckland Regional Growth Strategy 1999.

<sup>3</sup> Reid et al., *Living in Addison: An investigation into the lived experience of a master planned housing development in Auckland*, 2019.

Subsequent Plan Changes<sup>4</sup> in 2003 (refer to Figure 2-2) and in 2007 (refer to Figure 2-3) rezoned the greenfield area for residential and commercial development. The resultant urbanisation includes the 1,200 dwelling Addison development east of the NIMT, which was developed in nine stages by three main developers over the two decades commencing in 2003. The train station identified in the 2000 Structure Plan has not eventuated, and commercial development became strongly established around the NIMT at Walters Road and Great South Road.<sup>5</sup> Further urbanisation of the wider Structure Plan area was expedited in the 2010s under the Housing Accords and Special Housing Areas Act 2013. Development of the Takanini Town Centre area on the east of the NIMT (shown as Area 1A in Figure 2-3) also commenced following Council's approval of resource consents for Stage 1 of the development from 2012.<sup>6</sup> Subsequent consents for Stage 2 of the Town Centre were granted from 2017.<sup>7</sup> The Takanini Town Centre comprises a mix of commercial, retail and entertainment activities and is now largely complete, with the exception of some areas of Stage 2 which are currently under construction.

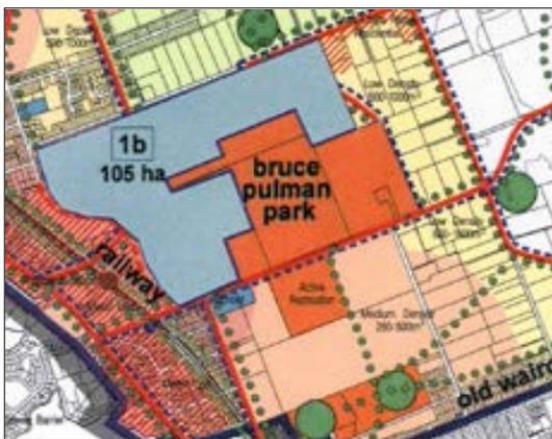


Figure 2-2: Plan Change 3 of the Papakura District Plan 2003

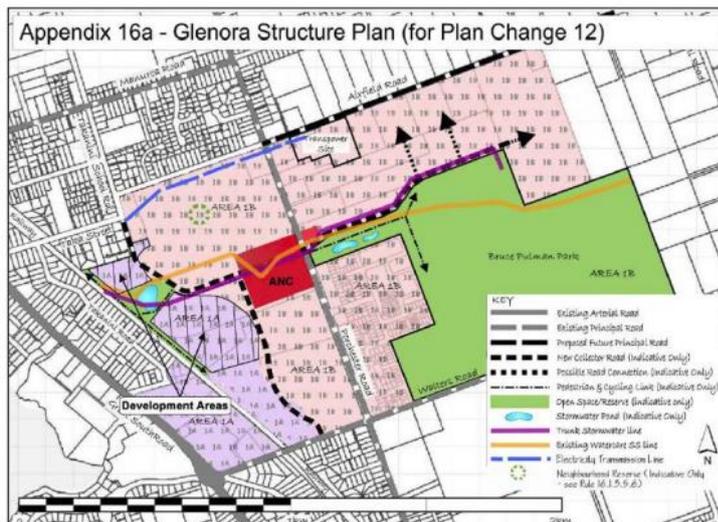


Figure 2-3: Plan Change 12 to Papakura District Plan 2007

<sup>4</sup> Plan Changes 3 and 12 to the Papakura District Plan.

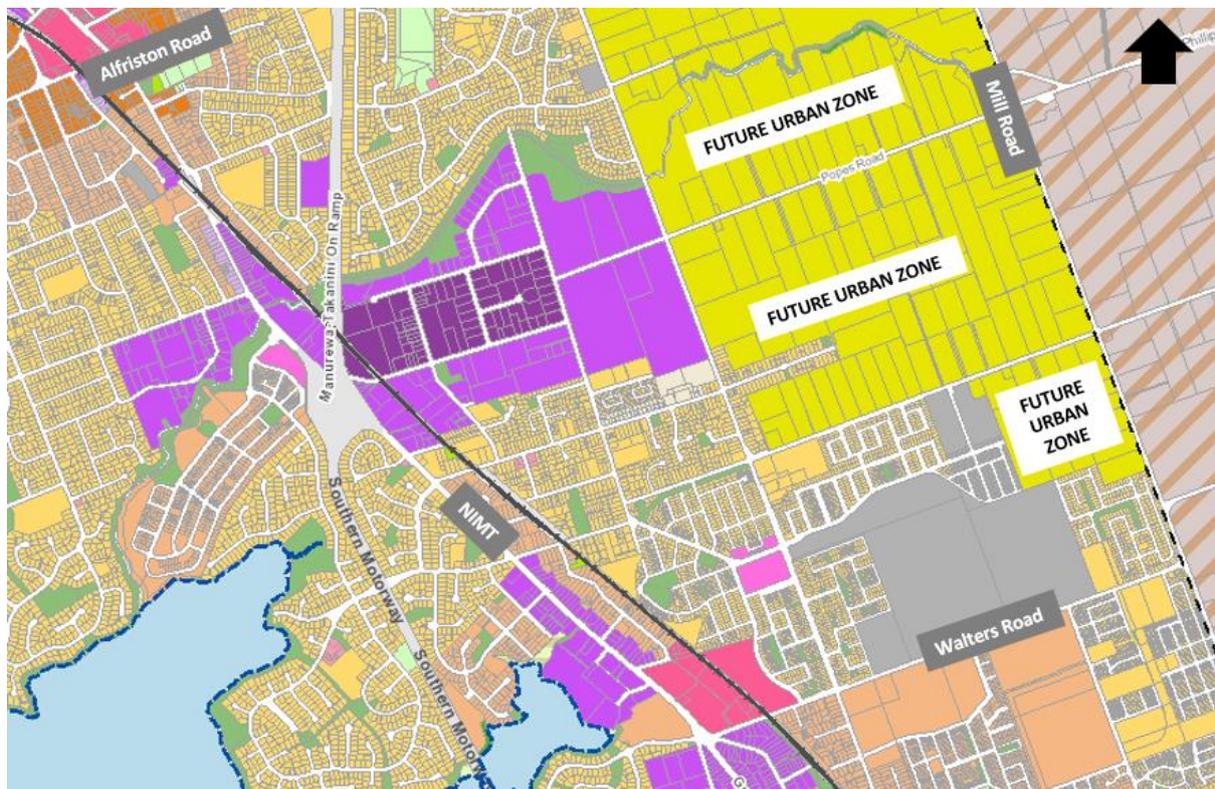
<sup>5</sup> Hill Young Cooper, 'Addison Urban Design Review: Report for Auckland Council', 2019.

<sup>6</sup> Resource consent Council Reference LU 10703, R/LUC/2012/109331 and 40362.

<sup>7</sup> Resource consent Council Reference LUC60308737 granted in 2017 for bulk earthworks and LUC60315613 granted in 2018 for establishment of buildings, parking and landscaping. Subsequent variation to LUC60315613 also approved in 2020.

Takaanini is anticipated to experience further intensification, particularly residential growth, as development is undertaken over time in response to the policy direction of the National Policy Statement on Urban Development (**NPS:UD**) (this is further discussed in Section 9.7 below). There are also some remaining parts of Takaanini (east of the NIMT and Porchester Road as shown in Figure 2-4) that are currently zoned Future Urban Zone (**FUZ**) that remain undeveloped. The current planned growth in Takaanini with the FUZ by 2053<sup>8</sup> is expected to result in a population of approximately 34,500 people, 12,500 households and 17,900 jobs – a growth of approximately 16,400 people, 6,700 households and 12,500 jobs compared with 2018 figures.

The status of the FUZ area is currently unclear in light of Auckland Council's draft Future Development Strategy (**FDS**), which recommends its removal. Notwithstanding this, the current planned growth in the existing urban Takaanini area by 2053<sup>9</sup> is expected to result in a population of approximately 23,700 people, 8,400 households, and 16,800 jobs – a growth of 6,700 people, 2,900 households, and 11,600 jobs compared with 2018 figures. Therefore, even if the FUZ is removed, safe east-west connections to replace the existing road level crossings within the transport network will still be required to support the existing and anticipated development within the existing urban zoned area in Takaanini.



**Figure 2-4: Current zoning of the Takaanini area under the AUP:OP - Future Urban Zone shown east of Porchester Road**

The frequency of north-south passenger and freight rail movements along the NIMT is also planned to increase over time as enabled by infrastructural improvements including the opening of the City Rail Link (**CRL**) and anticipated Four Tracking of the NIMT.

<sup>8</sup> Estimated figures are based on regionally agreed land use forecasts prepared by Council via the Auckland Forecasting Centre, with the most recent available forecasts (at the time of this assessment), referred to as Scenario I11.6.

<sup>9</sup> Estimated figures are based on regionally agreed land use forecasts prepared by Council via the Auckland Forecasting Centre, with the most recent available forecasts (at the time of this assessment), referred to as Scenario I11.6.

In summary, the history of urban development in Takaanini as well as the development anticipated in future as outlined above, reinforces a land use pattern with a concentration of trip-generating activities either side of the NIMT. The result of this pattern is a high-demand for east-west movements across the NIMT. However, rail movements along the NIMT are also anticipated to increase in frequency resulting in greater north-south movements. The existing level crossings are the current conflict points / interface between the east-west movements and north-south rail movements. Addressing these conflict points become increasingly important as Takaanini intensifies and there are more east-west movements.

The Project proposes to remove the conflict by grade separating the east-west movements across the NIMT, enabling both types of movement (east-west and north-south) to be undertaken safely, efficiently, and irrespective of each other's movements. Infrastructure to support this is critical to enable the transport network to function and to facilitate movement of people and goods within and beyond the Takaanini area.

## 2.2 Origins of the Project – Business case process

The Project focuses on the recommended transport network to facilitate east-west movements across the NIMT in Takaanini. In summary, the Project has been identified through an iterative business case process as follows:

- In 2015, AT, Waka Kotahi and Auckland Council formed the Transport for Future Urban Growth (**TfUG**) Programme. TfUG identified at a high level the transport networks needed to connect the urban growth areas across North, North West and South Auckland over the next 30 years. This work formed the basis of the Programme Business Case (**PBC**) finalised in 2016, which identified route protection as the priority for the next steps of the programme (which became Te Tupu Ngātahi);
- In 2019, the AT and Waka Kotahi Boards approved Indicative Business Cases (**IBC**) for each growth area (Warkworth, North, North West and South) to further test and develop the recommendations of the PBC. The South IBC identified an Indicative Strategic Transport Network (**ISTN**) (see Figure 2-5). Within Takaanini, this included indicative locations for rail crossing closures to vehicles (at Spartan Road and Manuroa Road), new grade separated rail crossings (at Taka Street and Walters Road) and a new grade separated rail and State Highway 1 (**SH1**) crossing to connect Mahia Road and Popes Road; and
- From 2020, Detailed Business Cases (**DBC**) were initiated to develop project-specific cases for route projection for projects comprising the ISTN. This included a DBC for the TLC, which involved optioneering to confirm the recommended east-west network across the NIMT in Takaanini (i.e, the proposed Project subject of this AEE). The TLC DBC was approved in part by the Waka Kotahi Board and AT Board in July 2023 (all parts of the DBC except Walters Road). The remaining parts of the DBC (Walters Road) were subsequently approved by the AT Board and Waka Kotahi Board in September 2023.

At each step in the business case process, the need to intervene at the existing Takaanini level crossings was identified consistently. Further discussion on the business case process and the origins of the Project are provided in the supporting Assessment of Alternatives supplied as Appendix A.

# SOUTH 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.

### RAIL CORRIDOR UPGRADE

- 1 Rail upgrade from Papakura to Pukekohe
- 2 Closure of Manurewa Road and Spartan Road rail crossings to vehicles
- 3 New grade separated rail crossings at Taka Street and Walters Road
- 4 New train station – Drury Central
- 5 New train station – Drury West
- 6 New train station – Paerata

### NEW OR IMPROVED PUBLIC TRANSPORT CORRIDOR

- 7 Frequent Transit Networks (FTNs) routes using SH1 and arterial roads to connect to town centres, and the major centres of Papakura, Drury and Manukau

### NEW WALKING AND CYCLING CORRIDOR

- 8 Strategic walking and cycling corridor to connect to SH1 Strategic Cycleway

### NEW OR IMPROVED TRANSPORT CORRIDOR

- 9 Mill Road Corridor including northern connections
- 10 Additional long term upgrades to SH1 between Manukau and Takaanini
- 11 Upgrade Mahia Road and Popes Road (including a new grade separated rail and SH1 crossing)
- 12 Upgrade Opaheke Road and Ponga Road
- 13 New arterial between Papakura industrial area, to Waihoehoe Road
- 14 Upgrade Jesmond Road, Bromner Road and Waihoehoe Road
- 15 Upgrade Drury West section of SH22
- 16 Connections from SH22 to the Pukekohe Expressway
- 17 New Pukekohe Expressway connecting Pukekohe to SH1
- 18 Pukekohe Ring Road
- 19 Upgrade Mill Road between Harrisville Road intersection and the Bombay interchange

### SAFETY IMPROVEMENTS

- 20 Safety improvements to Allfriston Road, Brookby Road, Papakura-Clevedon Road, Hingais Road, Hunua Road, Linwood Road, Walters Road, Blackbridge Road, Glenbrook Road, Kingsseat Road, McKenzie Road, Ostrich/Woodhouse Road, Pukekohe East Road, Logan Road, Waiuku Road and Buckland Road.

### OTHER PRIORITY PROJECTS

- 21 Rail electrification from Papakura to Pukekohe
- 22 SH1 Papakura to Bombay Project
- 23 Safe Networks Programme: SH22 Safety Improvements



Figure 2-5: 2019 South Indicative Strategic Transport Network recommended through the IBC – note the projects linked to the Takaanini level crossings project scope marked as ‘2’, ‘3’ and ‘11’ on the map.

## 3 The recommended project

### 3.1 Purpose of the Project

As described in Section 1.2 above, there are currently four public road level crossings along the NIMT railway in Takaanini at Spartan Road, Manuroa Road, Taka Street, and Walters Road. Each of these east-west corridors experiences congestion, severance, and safety issues as a result of the level crossings and the operation of barrier arms to allow for rail operations. These existing network deficiencies will be exacerbated in the future by two main factors:

- Increases in the frequency of train operations, particularly following the opening of the CRL and anticipated KiwiRail Four Tracking work, which in turn will increase the barrier arm down-time at each of the level crossings and further increase congestion and delays for road users; and
- Growth in the Takaanini area and the wider South Auckland area, which will further increase the demand for east-west travel across the NIMT in Takaanini.

The problem statements that the TLC is responding to (as set out in the DBC) are set out as follows.

Table 3-1: TLC problem statements

Problem Statements	
Problem Statement 1: Safety	<ul style="list-style-type: none"> <li>• Future growth, increased train services and four tracking of the rail corridor will exacerbate the current safety risks.</li> </ul>
Problem Statement 2: Resilience and Access	<ul style="list-style-type: none"> <li>• Increase in train frequency and barrier downtime will result in adverse east west connectivity and decreasing levels of service for all users including active modes.</li> </ul>
Problem Statement 3: Rail System Capacity	<ul style="list-style-type: none"> <li>• The existing level crossings limits the potential north south rail capacity restricting access to economic and social opportunities and rail freight efficiency.</li> </ul>

Safe and reliable east-west connections across the NIMT in Takaanini will be required to address these issues. The DBC investment objectives reflect this overarching purpose and are as follows:

- **Safety** – Provide improvements at level crossings that contribute to a transport network free from deaths and serious injuries;
- **Travel Choice** – Support mode shift by improving active mode facilities and rail capacity;
- **Resilience** – Support network resilience for Takaanini and improved reliability for the Southern Rail Line; and
- **Access** – Improve east-west connections to enable improved access to economic and social opportunities.

### 3.2 Project objectives

Section 171(1)(c) of the RMA states that: *When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to—*

(c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought;”

Having regard to the above, the following Project objective has been developed. Figure 3-1 below illustrates the line of sight between the investment objectives identified in the DBC, and the TLC Project objective for the purposes of consideration in the context of section 171(1)(c) of the RMA. The objective applies to both NoRs.

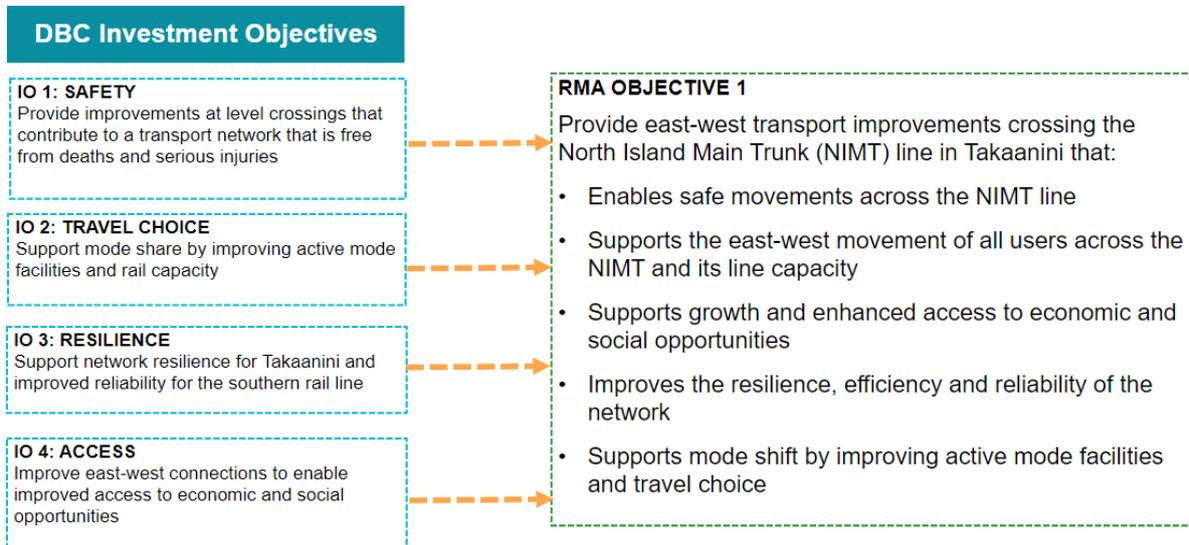


Figure 3-1. TLC Project objective

### 3.3 Overview of the Project

This AEE specifically relates to the two NoRs required to provide for the TLC. The TLC involves the closure and grade-separation of the existing four level crossings in Takaanini, including the provision of a new grade-separated crossing on the alignment of Manuia Road which does not currently cross the NIMT. The Project also covers associated works that may be required to support the level crossing removals and replacements. This includes works further along the east-west corridors and / or the immediate vicinity.

The Project primarily involves the construction of five new bridges to support safe and reliable east-west transport movement across the NIMT in Takaanini. This includes dedicated active mode bridges at Spartan Road and Manuroa Road, and two-lane arterial road bridges with active mode facilities at Manuia Road, Taka Street and Walters Road. Manuia Road is a new east-west connection in the network, acting as a replacement for vehicular trips that would have used the closed Spartan and Manuroa Road level crossings. This can be seen in the General Arrangement Plans which are set out in Volume 3. The bridges and associated works / improvements are located across five project areas and will be progressed as two NoR packages (refer to Section 5.3 below for further discussion on alternative statutory methods considered).

The indicative design has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final design will be refined and confirmed at the detailed design stage. Key features of the works common across project areas include the following:

- Bridge structures across the NIMT with a vertical clearance from existing ground level to road surface of approx. 7.8m;
- Works to tie in with existing roads;
- Batters and/or retaining and associated cut and fill activities;
- Vegetation removal within the project areas to enable construction; and
- Areas identified for construction related activities including site compounds, construction laydown, alternative access, and construction traffic manoeuvring.

It is noted that the design assumptions adopted, as well as the indicative design and designation boundaries proposed, have considered input from AT's Rail Team and KiwiRail (refer to Section 10 for further details). Co-ordination with these teams has been important throughout the design process so appropriate clearance assumptions could be adopted, especially with Four Tracking anticipated in the future.

The assumed minimum horizontal clearance required and future Four Tracking track arrangement at each rail crossing is set out in Table 3-2 and Figure 3-2 below.<sup>10</sup> The horizontal envelope consists of 4m between existing track centrelines and 4m between future track centrelines when on a single side of the existing tracks. A 6m offset is provided between existing tracks and future tracks. A 2.75m minimum offset is required beyond the track centreline as per KiwiRail National Rail System Standards (NRSS) / 6 Appendix E. An additional 3.65m width is provided beyond this for a total width of 6.4m from outside track centreline. This allows an increased width of 3.5m from track centreline to an access track of 2.5m width, with 400mm buffer. The buffer is sufficient to allow physical separation between rail track and access track, if required.

Further details of each project area are provided in the following sections below.

**Table 3-2: Assumed future rail track alignments and horizontal clearance**

Rail Crossing	Assumed future track arrangement	Minimum horizontal clearance perpendicular to rail alignment
Spartan Road	New track to either side of existing tracks	28.8m
Manuia Road	New track to either side of existing tracks	28.8m
Manuroa Road	New track to either side of existing tracks	28.8m
Taka Street	Two new tracks to the east of existing tracks	26.8m
Walters Road	New track to either side of existing tracks	28.8m

<sup>10</sup> Based on discussions with KiwiRail and their understanding of the potential future Four Tracking arrangement at the time of design and assessment for this Project. Reference to the KiwiRail Engineering Principles and Standards was also a key recommendation by KiwiRail to the design team to assess clearance and spacing allowances and provision for other rail infrastructure including overhead line supports and signalling.



Figure 3-2: General clearance requirements for four-tracking, with two future tracks to one side of existing tracks (top) and a future track to either side of existing tracks (bottom)

### 3.3.1 NoR 1 - Spartan Road project area

As set out in Table 3-3 below, the proposed works within the Spartan Road project area include closure of the existing level crossing and replacement with a new active modes bridge across the NIMT.

Table 3-3: Overview of Spartan Road project area

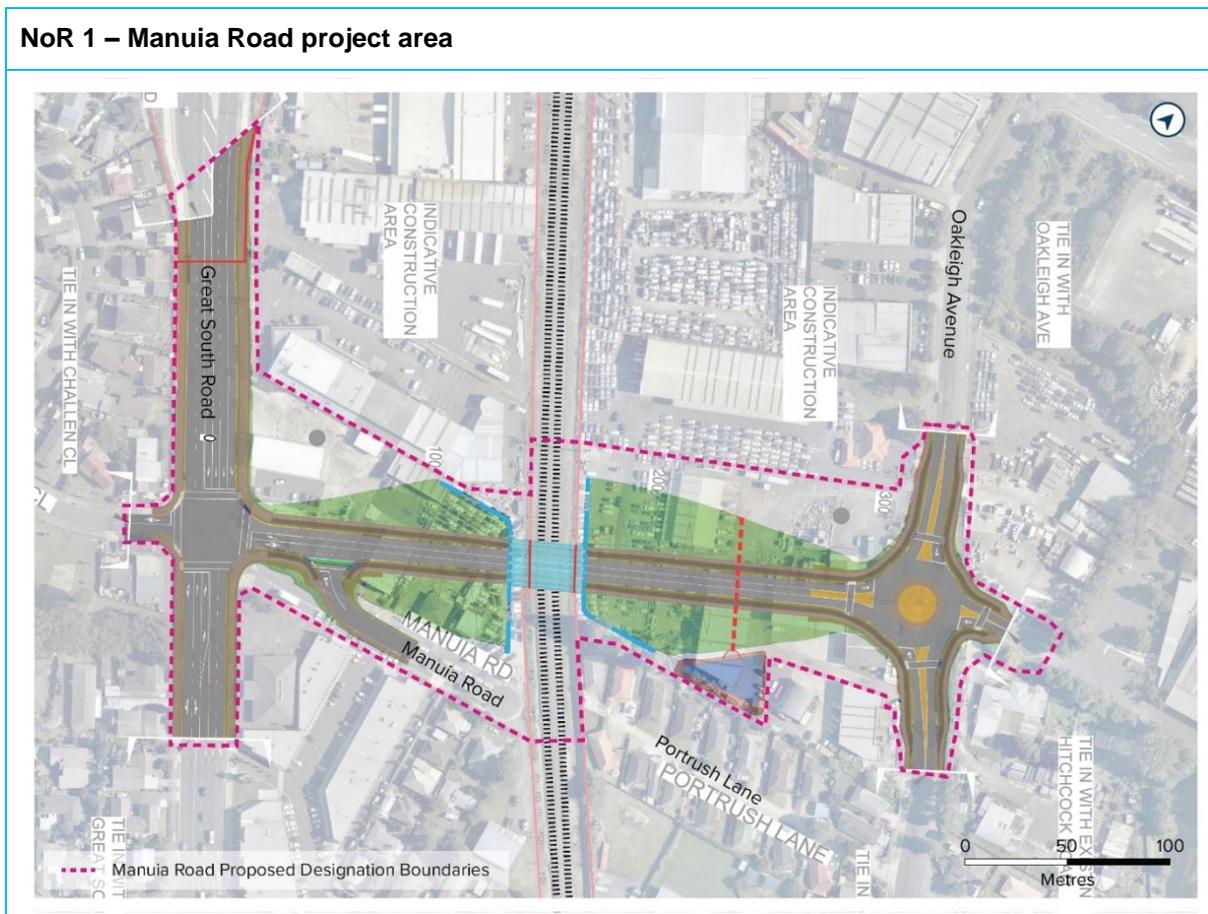
NoR 1 - Spartan Road project area	
Key features	
Overview	<ul style="list-style-type: none"> <li>• Closure of the existing road corridor to vehicular traffic across the NIMT.</li> <li>• Construction of an active mode bridge across the NIMT.</li> <li>• Construction of culs-de-sac (accommodating footpaths) and works to tie into the existing corridor on either side of the NIMT along Spartan Road.</li> <li>• Ramps and stairs will connect to the bridge on either side (east and west) of the NIMT and will tie into the cul-de-sacs.</li> </ul>
Other structures	<ul style="list-style-type: none"> <li>• None</li> </ul>
Other road closures / cul-de-sacs	<ul style="list-style-type: none"> <li>• None</li> </ul>
Speed environment	<ul style="list-style-type: none"> <li>• 50km/h (where it is trafficked)</li> </ul>
Access lanes	<ul style="list-style-type: none"> <li>• None</li> </ul>

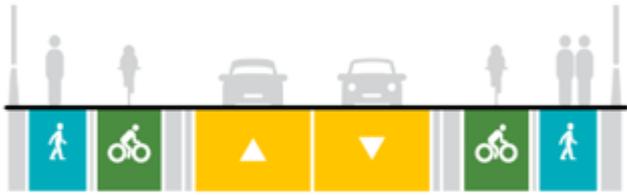
Intersections	<ul style="list-style-type: none"> <li>None</li> </ul>
Stormwater infrastructure	<ul style="list-style-type: none"> <li>Kerb and channel along road edge</li> </ul>
Typical cross sections	 <p style="text-align: center;"><b>ACTIVE MODE BRIDGE</b></p>

### 3.3.2 NoR 1 - Manuia Road project area

As set out in Table 3-4 below, the proposed works within the Manuia Road project area include construction of a new grade-separated road crossing (bridge) across the NIMT. The new bridge will accommodate one vehicle lane in each direction and active mode facilities.

**Table 3-4: Overview of the Manuia Road project area**



Key features	
Overview	<ul style="list-style-type: none"> <li>• There is currently no existing east-west corridor / level crossing across the NIMT in this project area.</li> <li>• Construction of a new arterial road bridge across the NIMT accommodating two lanes (one in each direction) and separated active mode facilities.</li> <li>• Construction of new arterial road corridors tying into either side of the bridge (east and west of the NIMT) accommodating two vehicle lanes (one in each direction) and separated active mode facilities.</li> </ul>
Other structures	<ul style="list-style-type: none"> <li>• Retaining / abutment walls (either side of the NIMT)</li> </ul>
Other road closures / cul-de-sac	<ul style="list-style-type: none"> <li>• Reconstruction of existing cul-de-sac at Hitchcock Road (east of the NIMT) to tie into the new intersection at Oakleigh Avenue / Manuia Road / Hitchcock Avenue (as described below) and upgrade with footpath.</li> </ul>
Speed environment	<ul style="list-style-type: none"> <li>• 50km/h</li> </ul>
Access lanes	<ul style="list-style-type: none"> <li>• Existing Manuia Road will be reconfigured into an access lane for remaining properties, tying in with the new Manuia Road corridor / bridge (west of NIMT).</li> </ul>
Intersections	<ul style="list-style-type: none"> <li>• Upgrade of the existing Great South Road / Challen Close / Manuia Road intersection to provide for signalisation, footpath upgrades and tie in works with the existing roads.</li> <li>• New roundabout intersection at Oakleigh Avenue / Manuia Road / Hitchcock Avenue with active mode facilities and tie in works.</li> </ul>
Stormwater infrastructure	<ul style="list-style-type: none"> <li>• Stormwater culvert and associated flood offset storage area</li> <li>• Kerb and channel along road edge</li> </ul> <p><i>Note: NoR has also considered space requirements for future stormwater treatment devices (though subject to future Regional Plan consenting process)</i></p>
Typical cross sections	 <p style="text-align: center;"><b>TWO LANE ARTERIAL BRIDGE</b></p>



### 3.3.3 NoR 1 - Manuroa Road project area

As set out in Table 3-5 below, the proposed works within the Manuroa Road project area include closure of the existing level crossing and replacement with a new active modes bridge across the NIMT.

Table 3-5: Overview of the Manuroa Road project area

NoR 1 – Manuroa Road project area	
<p>The map shows an aerial view of the Manuroa Road project area. A pink dashed line outlines the 'Manuroa Road Proposed Designation Boundaries'. Two orange shaded areas are labeled 'INDICATIVE CONSTRUCTION AREA'. Two white dashed lines are labeled 'TIE IN WITH MANUROA RD'. The map includes labels for 'MANUROA RD', 'Great South Road', 'SHAVE Oakleigh Avenue', 'OAKLEIGH AVE', 'Manuroa Road', 'Takaanini Train Station', and 'Manures Road'. A scale bar at the bottom right indicates 0, 50, and 100 metres. A north arrow is in the top right corner.</p>	
<b>Key features</b>	
Overview	<ul style="list-style-type: none"> <li>• Closure of the existing road corridor to vehicular traffic across the NIMT.</li> <li>• Construction of an active mode bridge across the NIMT.</li> </ul>

	<ul style="list-style-type: none"> <li>• Construction of cul-de-sacs (accommodating footpaths) and works to tie into the existing corridor on either side of the NIMT along Manuroa Road.</li> <li>• Ramps and stairs will connect to the bridge on either side (east and west) of the NIMT and will tie into the cul-de-sacs.</li> </ul>
Other structures	<ul style="list-style-type: none"> <li>• None</li> </ul>
Other road closures / cul-de-sac	<ul style="list-style-type: none"> <li>• None</li> </ul>
Speed environment	<ul style="list-style-type: none"> <li>• 50km/h (where it is trafficked)</li> </ul>
Access lanes	<ul style="list-style-type: none"> <li>• None</li> </ul>
Intersections	<ul style="list-style-type: none"> <li>• None</li> </ul>
Stormwater infrastructure	<ul style="list-style-type: none"> <li>• Kerb and channel along road edge</li> </ul>
Typical cross sections	 <p style="text-align: center;"><b>ACTIVE MODE BRIDGE</b></p>

### 3.3.4 NoR 1 - Taka Street project area

As set out in Table 3-6 below, the proposed works within the Taka Street project area include closure of the existing level crossing and replacement with a new grade-separated road crossing (bridge) across the NIMT. The new bridge will accommodate one vehicle lane in each direction and active mode facilities.

Table 3-6: Overview of the Taka Street project area

NoR 1 – Taka Street project area	
Key features	
Overview	<ul style="list-style-type: none"> <li>• Construction of an arterial road bridge across the NIMT accommodating two vehicle lanes (one in each direction) and separated active mode facilities.</li> <li>• Construction of arterial road corridors tying into either side of the bridge and existing intersections (east and west of the NIMT). The corridors will accommodate two vehicle lanes (one in each direction) and separated active mode facilities.</li> </ul>
Other structures	<ul style="list-style-type: none"> <li>• Retaining/abutment walls</li> </ul>
Other road closures / cul-de-sac	<ul style="list-style-type: none"> <li>• Closure of existing Takanini Road (north) to vehicular traffic at the intersection with Taka Street bridge i.e., no through-traffic provision. Replacement with a cul-de-sac and works to tie into the existing corridor of Takanini Road to the south. Active modes connection from Takanini Road to Takaanini Station (under the new Taka Street bridge).</li> </ul>
Speed environment	<ul style="list-style-type: none"> <li>• 50km/h</li> </ul>
Access lanes	<ul style="list-style-type: none"> <li>• Construction of four access lanes:                             <ul style="list-style-type: none"> <li>• Construction of a new access lane (cul-de-sac) located west of the NIMT and north of the Taka Street road corridor. It accommodates a footpath on the northern side and bi-directional traffic. The access lane will tie in with the Taka</li> </ul> </li> </ul>

	<p>Street corridor, and allows access to existing properties to remain, and Takaanini Station.</p> <ul style="list-style-type: none"> <li>• Construction of a new access lane located west of the NIMT and south of the Taka Street road corridor. It accommodates a footpath on the southern side and bi-directional traffic. The access lane will tie in with the Taka Street corridor and allows access to existing properties to remain.</li> <li>• Construction of two access lanes located west of the NIMT (north and south of the Taka Street road corridor and looping under the new Taka Street bridge). They accommodate a footpath on the outer edge and bi-directional traffic. The access lane(s) will tie in with the Taka Street corridor and allow access to existing properties to remain including Takaanini Reserve and Cathay Lane.</li> </ul>
<p>Intersections</p>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<p>Stormwater infrastructure</p>	<ul style="list-style-type: none"> <li>• Stormwater culvert and associated flood offset storage area</li> <li>• Kerb and channel along road edge</li> </ul> <p><i>Note: NoR has also considered space requirements for future stormwater treatment devices (though subject to future Regional Plan consenting process)</i></p>
<p>Typical cross sections</p>	<p>The image contains two diagrams illustrating typical cross sections of road infrastructure. The top diagram, labeled "TWO LANE ARTERIAL BRIDGE", shows a cross-section with two vehicle lanes (yellow with upward and downward triangles), two bicycle lanes (green with bicycle icons), and two pedestrian paths (blue with person icons). The bottom diagram, labeled "TWO LANE ARTERIAL", shows a similar cross-section but with a central green area between the vehicle lanes, possibly representing a median or drainage area, and trees on the sides.</p>

### 3.3.5 NoR 2 - Walters Road project area

As set out in Table 3-7 below, the proposed works within the Walters Road project area include closure of the existing level crossing and replacement with a new grade-separated road crossing (bridge) across the NIMT. The new bridge will accommodate one vehicle lane in each direction and active mode facilities.

Table 3-7: Overview of Walters Road project area

NoR 1 – Walters Road project area	
Key features	
Overview	<ul style="list-style-type: none"> <li>• Construction of an arterial road bridge across the NIMT accommodating two vehicle lanes (one in each direction) and separated active mode facilities.</li> <li>• Construction of arterial road corridors tying into either side of the bridge and existing intersections (east and west of the NIMT). The corridors will accommodate two vehicle lanes (one in each direction) and separated active mode facilities.</li> </ul>
Other structures	<ul style="list-style-type: none"> <li>• Retaining/abutment walls</li> </ul>
Other road closures / cul-de-sac	<ul style="list-style-type: none"> <li>• None</li> </ul>
Speed environment	<ul style="list-style-type: none"> <li>• 50km/h</li> </ul>
Access lanes	<ul style="list-style-type: none"> <li>• Construction of two access lanes located west of the NIMT (north and south of the Walters Road corridor and looping under the new Walters Road bridge). They accommodate a footpath on the outer edge and bi-directional traffic. The access lane(s) will tie in with the Walters Road corridor and allow access to remaining properties.</li> </ul>

<p>Intersections</p>	<ul style="list-style-type: none"> <li>• Upgrade of the existing Arion Road / Walters Road intersection to provide for footpath upgrades and works to tie into existing Arion Road.</li> <li>• Upgrade of the existing Braeburn Place / Walters Road intersection to provide for footpath upgrades and works to tie into existing Braeburn Place.</li> <li>• Upgrade of the existing Tironui Road / Walters Road intersection to provide for footpath upgrades and works to tie into existing Tironui Road.</li> </ul>
<p>Stormwater infrastructure</p>	<ul style="list-style-type: none"> <li>• Stormwater culvert</li> <li>• Kerb and channel along road edge</li> </ul> <p><i>Note: NoR has also considered space requirements for future stormwater treatment devices (though subject to future Regional Plan consenting process)</i></p>
<p>Typical cross sections</p>	<p><b>TWO LANE ARTERIAL BRIDGE</b></p> <p><b>TWO LANE ARTERIAL</b></p>

## 4 Section 171 of the Resource Management Act 1991

Section 171 of the RMA sets out the matters that a territorial authority must (subject to Part 2 of the Act) have particular regard to when considering the effects of the environment of allowing a NoR.

Table 4-1 sets out these matters and identifies the relevant sections of the AEE in which the matters are primarily addressed.

**Table 4-1: Section 171 of the RMA**

<b>Matter to consider</b>	<b>Section of the AEE where the matter is primarily addressed</b>
<p>(1) <b>When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to-</b></p> <p>(a) Whether particular regard has been had of any relevant provision of<sup>11</sup>:</p> <ul style="list-style-type: none"> <li>(i) A national policy statement;</li> <li>(ii) A New Zealand coastal policy statement;</li> <li>(iii) A regional policy statement or proposed regional policy statement; or</li> <li>(iv) A plan or proposed plan</li> </ul>	<p>Refer to Section 12.1 for assessment against the relevant policy documents.</p>
<p>(b) Whether adequate consideration has been given to alternative sites, routes or methods of undertaking the work if<sup>12</sup>:</p> <ul style="list-style-type: none"> <li>(i) The requiring authority does not have an interest in the land sufficient for undertaking the work; or</li> <li>(ii) It is likely that the work will have a significant adverse effect on the environment.</li> </ul>	<p>Refer to Section 5 and Appendix A: Assessment of Alternatives for discussion on alternative sites, routes and methods.</p> <p>Refer to Section 11 for the assessment of effects on the environment.</p>
<p>(c) Whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought<sup>13</sup></p>	<p>Refer to Section 6.</p>
<p>(d) Any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement<sup>14</sup></p>	<p>Refer to Section 12.2.</p>

<sup>11</sup> Section 171(1)(a) of the RMA.

<sup>12</sup> Section 171(1)(b) of the RMA.

<sup>13</sup> Section 171(1)(c) of the RMA.

<sup>14</sup> Section 171 (1)(d) of the RMA.

## 5 Assessment of alternatives

### 5.1 Statutory requirement to consider alternatives

Section 171(1)(b) of the RMA provides that when making a recommendation on a NoR, a territorial authority shall consider whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work in circumstances where the requiring authority does not have an interest in the land sufficient for undertaking the work; or where it is likely that the work will have significant adverse effects on the environment.

A requiring authority must consider and apply well-established principles when undertaking an assessment of alternatives and identifying a preferred option. Of note are the following:

- The process should be adequately transparent and robust, and clearly recorded so that it can be understood by others;
- An appropriate, but not necessarily exhaustive, range of alternatives should be considered; and
- The extent of options considered, and the assessment of these options, should be proportional to the potential effects of the options being considered.

AT does not have sufficient interest in the land required for the Project, and as such is required to give adequate consideration to alternatives. AT has accordingly considered an appropriately broad range of possible alternative routes and other methods for undertaking the Project. The Assessment of Alternatives Report sets this out in detail, and is included at **Appendix A**.

### 5.2 Assessment of alternatives methodology

The TLC Project has required several stages of alternatives assessment. A full Assessment of Alternatives has been undertaken (as supplied in Appendix A) which includes the process for which options were developed and assessed to result in the proposed TLC network and Project. The following section provides an overview of the process undertaken.

Overall, the process comprised of a staged approach which reflects that multiple aspects of alternatives have required consideration, namely:

- The **number** of east-west crossings needed in the TLC network, and which transport modes should be accommodated;
- The **locations** for east-west crossings in the TLC network;
- The **physical form of grade separation** for the TLC network – whether grade separation of road and rail is to be achieved by raising or lowering roads, or raising or lowering rail; and
- The **alignment** and **physical extent** of each east-west crossing in the TLC network.

Identifying a preferred network for the TLC was not possible without assessing all aspects identified above. Decisions on each of the aspects above resulted in flow-on effects for the others, and as a result have required consideration in a careful sequence.

Table 5-1 sets out a summary of the general optioneering process that has been followed. The purpose of each step in the chronology and key decision points reached at each stage are noted.

Table 5-1: Alternatives Assessment Chronology

Stage of process	Aspect assessed	Purpose of step in optioneering chronology and key decision points
Gap Analysis – setting the scene	Overall scope of optioneering required	<ul style="list-style-type: none"> <li>Captures the contextual changes that have occurred between the IBC (completed in 2019) and DBC, and whether these would require IBC recommendations to be revisited (i.e., influence a change in scope of optioneering required for the DBC and/or merits of IBC conclusions).</li> <li>Key considerations in the gap analysis were retesting IBC conclusions in terms of the requirement for three east-west crossings in the network, and the locations of those crossings (Rangi Road, Taka Street, and Walters Road).</li> </ul> <p><b>Key Decision Points – Confirmation of the number of crossings needed in the TLC network (three multi-modal crossings), and whether further assessment of their location, alignment, and physical form would be needed.</b></p>
Initial Consideration of Physical Form	Physical form of grade separation	<ul style="list-style-type: none"> <li>Following confirmation of the number of crossings needed in the TLC network, the physical form of grade separation was considered at a high level using the Waka Kotahi EAST tool. The merits of four methods of achieving grade separation were considered - road-over-rail, road-under-rail, rail-over-road, and rail-under road.</li> <li>The primary purpose of the initial high-level assessment was to inform the types of options that needed to be assessed at the subsequent network optioneering stage. In particular, as grade separation via rail grade changes generate different options to grade separation via road grade changes.</li> </ul> <p><b>Key Decision Points – Confirmation of the initially preferred form of grade separation to be assumed for network optioneering purposes, in particular that grade separation is likely to be achieved via road grade changes rather than rail grade changes.</b></p>
Network Optioneering	Number and location of crossings	<ul style="list-style-type: none"> <li>This stage focused on confirming the preferred number and location of crossings for the TLC, guided by the required number of crossings (identified in the Gap Analysis) and the initial preference grade separation form (identified in the Initial Consideration of Physical Form above).</li> <li>The assessment was undertaken through a scenario development approach in which 'options' assessed comprise different combinations of network interventions (i.e. grade separations, level crossing closures, or entirely new crossings). Each network scenario was assessed using the MCA Framework.</li> </ul> <p><b>Key Decision Points – Confirmation of the preferred locations of crossings (Manuia Road, Taka Street, Walters Road for multi-modal crossings; with active mode crossings at Spartan Road and Manuroa Road).</b></p>
Further Consideration of Physical Form	Physical form of grade separation	<ul style="list-style-type: none"> <li>These stages focused on confirming the physical form of grade separation in greater detail following confirmation of the preferred number and location of crossings at the network optioneering stage.</li> </ul>

Stage of process	Aspect assessed	Purpose of step in optioneering chronology and key decision points
Final retesting of Walters Road physical form		<ul style="list-style-type: none"> <li>Consideration was limited to an assessment of the merits of a road-over-rail bridge compared with a road-under-rail underpass given the conclusions from the Initial Consideration of Physical Form assessment above. These options were compared using the MCA Framework, and retested multiple times.</li> </ul> <p><b>Key Decision Points – Confirmation of the preferred physical form of grade separation- road-over-rail bridges</b></p>
Network refinement	Alignment and physical extent of crossings	<ul style="list-style-type: none"> <li>This stage focused the process of option refinement which has informed the preferred alignment and physical extent of each crossing.</li> <li>The process considered form and functional elements, as well as refinement of concept design and alignments in each location.</li> </ul> <p><b>Key Decision Points – Confirmation of the preferred alignment and physical extent of each crossing.</b></p>

### 5.3 Consideration of alternative methods

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

This assessment considered of a range of methods including:

- Designations;
- Resource consents;
- Structure Planning and Plan Changes
- Landowner/developer negotiations; and
- Traditional property acquisition.

Designations were identified as the preferred method in the context of the Project. Designations were considered to be the most logical and effective method to protect a corridor in an evolving environment because a designation:

- Provides certainty to all parties including the community and affected landowners (e.g., timing, location, process, and parameters for works to be undertaken and ability to plan for their own aspirations accordingly);
- Is a well-recognised and understood tool for route protection which also enables land acquisition processes through the link to the Public Works Act 1981 (PWA);
- Maximises flexibility for future implementation;
- Negates the need for additional land use consents to implement works authorised under the district plan (s9(3) of the RMA); and
- Will continually provide for future operation and maintenance requirements.

## 5.4 Summary

The sites, routes, and methods chosen will achieve the overarching purpose of the TLC which is to:

- Identify and enable the east-west connections across the NIMT required in Takaanini to address issues such as congestion, severance, and safety issues relating to the existing level crossings and the operation of barrier arms to allow for rail operations; and
- Support the anticipated growth in Takaanini over the next 30 years.

It will also provide certainty to transport authorities, partners, infrastructure providers, the community and investors/developers of the location and form of the east-west connections and enable phased delivery of the TLC as funding is made available.

The preferred network provided for by the NoRs has been based on a comprehensive and robust optioneering process considering specialist assessment and feedback from Manawhenua, stakeholders and landowners and the community. 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 section 171(1)(b) of the RMA.

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

Section 171(1)(c) of the RMA requires a territorial authority to have particular regard to whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought. In our view:

- *Necessary* falls somewhere between desirable and essential; and
- *Reasonably* allows for some tolerance in terms of where necessary falls.

Accordingly, we consider that the threshold of “reasonable necessity” allows for a threshold assessment, proportionate to the circumstances to determine whether the Project is justified in the context of Section 171(1)(c) of the RMA.

As noted in section 3.2, the objective for the two NoRs is as follows:

*Provide east-west transport improvements crossings the North Island Main Trunk (NIMT) line in Takaanini that:*

- *Enables safe movements across the NIMT line.*
- *Supports the east-west movement of all users across the NIMT and its line capacity.*
- *Supports growth and enhanced access to economic and social opportunities.*
- *Improves the resilience, efficiency and reliability of the network.*
- *Supports mode shift by improving active mode facilities and travel choice.*

The work is reasonably necessary to achieve this Project objective because:

- The existing east-west connections across the NIMT at Spartan Road, Manuroa Road, Taka Street and Walters Road experience congestion, severance, and safety issues as a result of the public road level crossings and the operation of barrier arms to allow for rail operations. These existing deficiencies will be exacerbated by the anticipated increase in both train movements along the NIMT, and demand for east-west travel across the NIMT resulting from growth. Accordingly, the current network with level crossings cannot not achieve the Project objective.
- The proposed work responds to and addresses these issues. The grade separation of the east-west connections across the NIMT removes the existing conflict points between rail (north-south movements) and all other users (east-west movements). Rail movements are free to move north-south improving the NIMT line capacity and providing for its wider social and economic function (freight and passenger services). For east-west movements, the NIMT no longer becomes a barrier/hinderance to movement enabling users to move within the area more efficiently and safely. The network benefits are further discussed in the Transport and Social effects chapters of this AEE (refer to Sections 11.1, 11.2 and 11.8) and in the Assessment of Transport Effects Report and Social Impact Assessment (**SIA**) in Volume 4.

The designation is reasonably necessary to achieve this objective because:

- As evaluated in Section 5.3 above, a designation was identified as the most appropriate method under s171(1)(b) to secure route protection for the Project. Alternative mechanisms do not provide for route protection given that AT does not own the land required to implement the work; nor do they provide for the requisite design flexibility. Therefore, the use of the designation mechanism is reasonably necessary to achieve the Project objective.

- The proposed extent of designation provides for the ongoing operation and maintenance of the proposed infrastructure as well as its construction. As such, the extent of designation includes areas required for the construction-process such as laydown areas and construction yards. It also provides areas that may be utilised to implement recommended mitigation.
- The designation extent is reflective of the needs of the Project and has taken into account inputs from technical specialists and feedback from AT, Waka Kotahi, Manawhenua, public engagement and landowners / stakeholders.

## 7 Lapse period sought and rationale

Under section 184 of the RMA the default lapse date for designations is five years unless the designation provides a different lapse period.

A key objective of Te Tupu Ngātahi is to identify and protect land now for future transport networks. We consider that an extended lapse period of 15 years is reasonably necessary to achieve this, as it provides statutory protection of the transport corridors for the Takaanini level crossings that is consistent with anticipated implementation timeframes and funding availability.

In the context of this Project, a 15-year lapse period is considered reasonably necessary because it:

- Provides AT with sufficient time to:
  - Determine the prioritisation of the Project(s) - noting that while the existing Takaanini level crossings have been identified as a significant constraint to enabling capacity of the CRL and passenger rail in the south, there are separate AT business case processes (i.e., Auckland Rail PBC and the Auckland Level Crossings Single Stage Business Case (**SSBC**)) being undertaken to evaluate all road-level crossings in Auckland and their priority for removal/replacement;
  - Undertake the detailed design of the Project;
  - Obtain the necessary resource consents;
  - Obtain funding (noting that some funding has been secured through the Regional Land Transport Plan 2021 – 31 for all level crossings across Auckland but there is no certainty on what crossing(s) will be prioritised);
  - Undertake tendering/procurement;
  - Undertake property and access negotiations; and
  - Construct the Project.
- Provides AT sufficient flexibility to coordinate Project delivery with related public works such as NIMT Four Tracking and scheduled maintenance;
- Provides property owners, business and the community certainty on where transport routes will be located (i.e. within the designation boundaries) and within what timeframe the designation is to be given effect to;
- Protects the land necessary to provide safe and efficient grade-separated crossings and protects it from incompatible land uses in the interim. This is particularly critical given the intensification provided for through Plan Change 78 to the Auckland Unitary Plan: Operative in Part (**PC78**) and the Medium Density Residential Standards (**MDRS**) which could see greater build out and compromise to the Project areas before funding is available to implement the works; and
- It is generally accepted that large complex infrastructure projects require longer lapse periods as confirmed on recent projects such as the Drury Arterial Network (AT) in 2022, East West Link (Waka Kotahi) in 2018, Southern Links (Waka Kotahi) in 2015, the Northern Interceptor Wastewater Pipeline (Watercare) in 2013, and the Hamilton Ring Road (Waikato District Council, Hamilton City Council).

## 8 Overview of Notices of Requirement

Table 8-1 provides an overview of the purpose, objective, lapse period and affected properties for the two NoRs. Figure 1-1 above shows the five project areas that are provided for by the two NoRs.

**Table 8-1: Overview of the TLC NoRs**

Notice	Projects	Purpose	Project objective	Lapse period	Overview of properties	
					Partial property impact	Full property impact
NoR 1	Spartan Road	Construction, operation, maintenance, and upgrade of bridges crossing the North Island Main Trunk line and associated infrastructure in Takaanini.	Provide east-west transport improvements crossing the North Island Main Trunk (NIMT) line in Takaanini that: <ul style="list-style-type: none"> <li>• Enables safe movements across the NIMT line;</li> <li>• Supports the east-west movement of all users across the NIMT and its line capacity;</li> <li>• Supports growth and enhanced access to economic and social opportunities;</li> <li>• Improves the resilience, efficiency and reliability of the network; and</li> <li>• Supports mode shift by improving active mode facilities and travel choice.</li> </ul>	15 years	12 properties	0 properties
	Manuroa Road				19 properties	22 properties
	Manuia Road				9 properties	3 properties
	Taka Street				86 properties	16 properties
NoR 2	Walters Road				47 properties	17 properties

## 9 Design and assessment approach

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

### 9.1 Approach to design

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

The proposed project areas and alignments are included in the drawing set in Volume 3 of the application. 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 section 176A of the RMA. Resource consents will also need to be applied for in the future.

It is anticipated that the final design of the Project (including the design and location of associated works including 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.

### 9.2 Construction methodology

#### 9.2.1 General approach

An indicative construction methodology has been developed based on the level of design undertaken to date and the current land use/landform context in which the Project is located.

The construction of the Project will be undertaken within a Management Plan framework. The conditions for the proposed designation will be in place to manage the effects of the construction activities. Should the contractors need to undertake construction activities in a manner which is not within the scope of the proposed designation, 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 Project setting out how specific matters will be managed. A suite of Management Plans is proposed for the Project. These include the following:

- Construction Environmental Management Plan (**CEMP**);
- Construction Noise and Vibration Management Plan (**CNVMP**);
- Construction Traffic Management Plan (**CTMP**);
- Stakeholder and Communication Engagement Management Plan (**SCEMP**); and
- Network Utility Management Plan (**NUMP**).

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

The Management Plans and future Outline Plan(s) required for the proposed designation will be submitted to Auckland Council prior to the commencement of construction.

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

### 9.2.2 Construction area requirements

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

Table 9-1 below provides guidance on the typical offsets and construction areas. These are intended to allow sufficient working areas to facilitate the construction of the Project and are indicative only. Final locations and utilisation of areas for construction will be determined during detailed design and construction planning phase and informed through the Outline Plan process.

**Table 9-1: Typical Construction Work Areas**

Construction Element	Typical area or offset required for construction
Earthworks – construction of batter slopes (urban environment, minimal earthworks cut/ fill, at grade carriageway and active mode works)	2m from earthworks batter slopes
Earthworks – construction of batter slopes (moderate earthworks cut/ fill, significant grade change on existing road/ground level)	6m from earthworks batter slopes for construction access and environmental controls
Construction access road	Typically, 4m wide for construction vehicles, excl. cranes/piling rigs.
Bridge construction (substructures: abutments, piers)	20m either side of the bridge, and minimum 40m behind each abutment ends for construction access, e.g. cranes, piling rigs, trucks
Bridge construction (superstructure)	20m either side of bridge for typical crane movements, truck access
Retaining wall construction (minor/ small retaining walls e.g. timber or blocks works)	Typically, 2m for fill retaining walls
Retaining walls (large) e.g. secant pile wall, sheetpiles, mechanically stabilised earth	Typically, 5m behind wall for fill retaining walls

Construction Element	Typical area or offset required for construction
Main site compound	Up to 3,000m <sup>2</sup> for one typical project. Multiple or programme wide projects being constructed all at once may require a larger main compound.
Culverts and headwalls	Typically, 10m beyond extent of permanent works for culverts and larger headwall construction.
Construction areas for large scale complex construction works, e.g. bridges works, large embankment retaining walls	Up to 2,000 m <sup>2</sup> for construction laydown areas for plant and material storage (located near critical work areas, e.g. bridge, retaining walls, culverts, major earthworks for site staff and crews)
Construction areas for smaller construction activities, e.g. cul-de-sac, roundabout, intersections, minor retaining walls	500 - 1000m <sup>2</sup> for construction laydown areas for plant and material storage.

### 9.2.3 General construction activities

The following sections contain descriptions of the following general construction considerations across the whole Project including:

- Enabling works, protection and/or relocation of existing network utilities;
- Site establishment;
- Temporary traffic management;
- Bridge and structures works;
- Earthworks; and
- Pavement construction, streetscape and finishing works.

### 9.2.4 Enabling works, utility relocation, and protection

The Project traverses a predominantly urban environment. As a result, there are several network utilities crossing the corridor. The typical services within the NoRs include:

- High voltage overhead and underground transmission lines;
- Gas distribution lines;
- Fibre telecommunication lines;
- Water and wastewater network; and
- Electrified rail overhead lines and rail underground lines.

Initial discussions have been undertaken with network utility operators. Works in relation to any network utility will be undertaken in accordance with any future agreements made with each network utility operator as needed to ensure compliance with their methodologies, standards, and requirements.

The exact scope of works for service relocation will be confirmed through site investigations and developed in consultation with the respective utility operators. As noted in Section 3.3 above, discussions with KiwiRail have been undertaken as part of this NoR process to determine the appropriate clearance assumptions and considerations to adopt. Considering the interface of the Project with the NIMT, continued discussions with KiwiRail is also anticipated as part of the detailed design and implementation phase.

## 9.2.5 Site establishment

### 9.2.5.1 Construction areas

Construction areas include main site compounds and site laydown areas. The main site compound will be used as office facilities for project and administration staff. Typically, the main compound will be located in a strategic location with easy access from a nearby road or public transportation.

Where possible, the main site compound will utilise an existing site or building(s) that are within the proposed designation boundaries due to being impacted by the Project. The use of the main site compound will only be required during the construction period and the site will be reinstated upon completion of the works.

Construction areas are located with the various project areas near work sites such as major earthworks and bridges. These areas are relatively flexible and can evolve as the construction progresses. Areas within the designation boundaries have been identified as indicative construction areas and are shown in the plans contained in Volume 3 of the application.

### 9.2.5.2 Site clearance and demolition

Site clearance to allow for construction activities across the Project may involve the removal of topsoil, fences, structures, trees, vegetation, and other clearance works such as building demolition.

Vegetation removal will be carried out by a suitably qualified and experienced person/contractor and will be in accordance with relevant designation conditions. Traffic management will be required during the clearing of vegetation adjacent to live carriageways.

In some instances, site clearance includes the demolition of existing buildings or structures. Property demolition will be carried out by a suitably qualified and experienced person/ contractor. The scope of demolition and accommodation works will be verified by the contractors once detailed design and construction planning progresses.

## 9.2.6 Traffic management and access

Construction of the Project will involve disruption to the surrounding existing road network and property access. Additional traffic will be generated from general staff and workforce for the Project as well as construction specific traffic such as traffic movements for material delivery and movement within construction areas.

The contractor will develop an outline plan for managing traffic for the Project. The CTMP which will describe the overall strategy for managing traffic, including public and construction traffic. A suite of Site-Specific Traffic Management Plans (**SSTMP**) can be further developed for specific temporary traffic management requirements that will be deployed on the roads.

The development of these SSTMPs will require early planning by the contractor and will require approval from the Road Controlling Authority (**RCA**).

The assessment and proposed temporary construction traffic management measures are discussed in Section 11.2 of this AEE and detailed in the Assessment of Transport Effects provided in Volume 4.

Generally, access along the existing Project alignment will be maintained, however, some closures will be needed for critical activities at night or on weekends. The construction staging may need to prioritise the construction of the new access lanes for access to the existing residents and stakeholders along the Project alignment to minimise any access disruptions.

Depending on the final alignment developed in the detailed design, temporary roads may need to be constructed, or existing lanes widened or modified to enable the establishment of the temporary traffic diversion. Temporary traffic requirements have been allowed for within the designation, although detailed decisions on these and final bridge alignments may affect decisions on construction staging and methodology.

Site Access Points (**SAP**) will be required to access the nominated construction zones and work areas. Each construction zone may require several access points to ensure adequate access and flexibility for the construction works. Access for construction vehicles, plant and materials will be via the designated SAPs.

The SAPs and temporary traffic management controls will be in accordance with the Waka Kotahi Code of Practice for Temporary Traffic Management (**CoPTTM**).

### 9.2.7 Bridges and structures

The bridge works will be confirmed during detailed design and be undertaken in accordance with any specific conditions on the designation and the applicable resource consent conditions. Resource consents for works will be sought as required as part of the future consenting stage.

Bridges across rail will require specific KiwiRail approval to work adjacent live overhead lines and rail lines. These works are required to be carried out during a block of line which are typically carried out during night-time, weekends, and public holidays. An extended block of line is typically available during the Christmas and New Years' period which the contractor may plan to carry out significant construction works to make use of the prolonged closure period.

### 9.2.8 Earthworks

Bulk earthworks will typically be undertaken during summer earthworks months and minor earthworks and pavement construction can be carried out all year round provided sediment runoff and environmental controls are managed accordingly. Resource consents for bulk earthworks will be sought in the future as required at detailed design stage. Depending on structural design, bulk earthworks may be required to accommodate road formation.

Earthworks will typically include the following activities once enabling works have been undertaken:

- Topsoil stripping and removal of any unsuitable materials;
- Cut and/or fill to grade or formation, including conditioning and suitable compaction;
- Preparation and conditioning of the subgrade layer;
- Final trimming and topsoil placement; and

- Landscaping and site reinstatement.

Area is allowed for within the designation boundaries for handling, stockpiling some topsoil, loading and conditioning site won material will be established to enable better utilisation of existing material. Where required, topsoil stockpiles can also be utilised. The topsoil can be used as water diversion bunds for environmental control purposes. The remaining volume will need to be stockpiled in site laydown areas.

Suitable dust management measures will be considered for the Project and are anticipated to include:

- Water carts to minimise dust during earthworks;
- Covered trucks hauling material onto and off site; and
- Mulching and top soiling of exposed earthworks.

Erosion and sediment control measures will be installed in the future, in accordance with any applicable resource consent conditions and the Auckland Council Erosion and Sediment Control Guidelines or subsequent amendments.

### 9.2.9 Indicative construction staging and programme

There are various potential options for undertaking and completing the anticipated work. However, the specific staging and phasing of the work will be dependent on the:

- Outcomes of separate AT Level Crossing-related Business Cases evaluating project prioritisation and timing (i.e., Rail PBC and Auckland Level Crossings SSBC);
- Funding availability;
- Procurement methods;
- Land acquisition;
- The construction duration and targeted completion date;
- Technological advances in construction methods;
- Availability of contractors; and
- Availability of other resources (such as materials and construction equipment).

Based on a high-level estimate of similar transport projects, the anticipated construction duration for each project area within the NoRs is set out in Table 9-2 below. These durations are indicative and assume that each project area will be constructed independently of each other. These durations may change if the bridges were to be constructed concurrently or sequentially.

**Table 9-2: Indicative construction duration for each project area**

Project area	Estimated duration
Spartan Road	1 to 2 years
Manuia Road	2.5 – 3 years
Manuroa Road	1 to 2 years
Taka Street	2.5 – 3 years

Project area	Estimated duration
Walters Road	2.5 – 3 years

### 9.3 Approach to urban design

Urban design input has been considered to inform the Project’s design, the alternatives assessment process, and the proposed designation footprint. An Urban Design Evaluation (**UDE**), included in Volume 4 has been undertaken for the Project based on the principles set out in Te Tupu Ngātahi Urban Design Framework (appended to the UDE). The UDE provides urban design commentary on the concept design of the proposed TLC and recommends how urban design opportunities and outcomes could be considered in future design stages of the Project.

Overall, the UDE concludes that the Project is generally supportive of the Urban Design Framework principles. In particular, the Project will be designed to achieve the following outcomes:

- Integration (particularly of project elements like bridges, retaining walls and access lanes) with the adjacent urban and landscape context including the surrounding urban environment, natural environment, and open space zones. This includes:
  - Providing appropriate interfaces to existing development like the Takanini Care Home, changing adjacent built forms and community amenities such as Takaanini Train Station, Takaanini Reserve and Takaanini Town Centre;
  - Supporting direct access to existing centres, schools, community functions, train stations and open spaces like Takaanini Reserve;
  - Providing appropriate walking and cycling connectivity to and interfaces with existing and future adjacent land uses, public transport infrastructure (e.g., Takaanini Station) and other walking and cycling connections;
  - Promoting a sense of personal safety and addresses potential risk areas (e.g., under the adjacent bridge structures and areas connecting to Takaanini Train Station and Takaanini Reserve) by aligning with best practice guidelines such as Crime Prevention Through Environmental Design (**CPTED**) principles and anti-vandalism/anti-graffiti measures; and
  - Inclusive access with infrastructure that considers the needs and safety of people of all ages and abilities.

An Urban and Landscape Design Management Plan (**ULDMP**) is recommended to be prepared prior to implementation which will allow further development of the design outcomes and opportunities recommended above as well as other design matters not specifically covered in the UDE.

### 9.4 Approach to stormwater management

Effects of stormwater quantity, quality and effects on streams are authorised under the Regional Plan (**RP**) and therefore will be considered as part of a future consenting process.

Notwithstanding this, provision is made for the future mitigation of potential stormwater effects (retention/detention and stormwater quality) within the proposed designation boundaries. This is based on a stormwater philosophy developed for the Project in partnership with Manawhenua.

The stormwater design philosophy for the Project seeks to achieve the following objectives:

- Provide stormwater treatment and retention/detention for new impervious surfaces;
- Re-use and re-purpose existing infrastructure where possible;
- Enhance with green infrastructure and incorporate with urban design;
- Provide treatment of existing surfaces where possible, including where existing runoff mixes with new, prioritising high loading areas such as intersections; and
- It is noted that this approach sets out the overarching stormwater management philosophy and rationale for proposed stormwater management treatment across the project areas in the context of relevant stormwater related statutory requirements. This approach will be further developed through future consenting and the detailed design process.

## 9.5 Approach to geotechnical design

Geotechnical effects arising from construction of the Project will be dealt with as required as part of future regional consenting processes. The Project is currently seeking designations which authorises District Plan matters only, with the relevant assessment considerations limited to those within AUP:OP Chapters *E12 Land Disturbance – District* and *E36 Natural Hazards*. It is noted that the project areas are not on land that would be considered as land which may be subject to instability under the AUP:OP. Any RP requirements and necessary effects mitigation will be subject to additional future consenting processes and assessment.

On this basis, the level of assessment of geotechnical assessment and design is commensurate with the authorisations currently being sought and has primarily been undertaken to inform options assessment and designation footprint. More specifically, geotechnical-related matters such as ground stability and the anticipated construction requirements for the scale/context of works<sup>15</sup> have been considered as part of the Project's design, the alternatives assessment process, and to inform the proposed designation footprint. Geotechnical engineers were involved in the proposed indicative design and verification of the design. Of note are the following geotechnical design parameters and considerations made during the design process:

### Slope stability

- Desktop assessment including review of recent and historic investigation was undertaken as part of this phase of design, but this does not include numerical analysis at this stage. Stability of slopes has been assessed based on the mapped geomorphology, and the performance of similar geological areas.
- 1V:3H slopes have been adopted as the default batter for cut and fill slopes to meet maintenance requirements. Within the Auckland region, similar slopes have been widely utilised successfully in soils that do not have known slope instability issues.
- 1V:5H slopes have been adopted in areas underlaid by soft soils/peat with the maximum embankment height of 2m. This is in the case of Manuroa Road and Taka Street. Mechanically stabilised earth walls or bridge structure is to be provided once maximum height is achieved. It is acknowledged that additional ground improvement measures may also be needed to mitigate the effects of settlement which could include installing wick drains or by stabilising the soils with rigid inclusions or stone columns.

<sup>15</sup> Refer to Section 9.2 above for the assumptions adopted for construction requirements.

### Retaining walls

- Vertical retaining walls are proposed where necessary within the indicative design to limit impact on properties and manage topographic constraints. Fill walls have been assumed to be constructed using generic mechanically stabilised earth techniques.
- The level of geotechnical information currently available reflects the stage of design (i.e., indicative for NoR purposes) and what is needed to inform the designation footprint. As such, retaining walls were assumed and detailed as typical with the most suitable wall types identified to inform the indicative construction methodology and cost estimation. Final decisions around wall type will be undertaken during subsequent design phases once further site investigation is carried out.

### Bridge abutments

- Vertical abutment walls have been adopted as the default approach to bridge abutments within the existing urbanised/industrial area. The vertical abutment walls have been assumed to be constructed using mechanically stabilised earth walls. No specific design of abutment walls slope stability has been carried out during this phase of design.

Assumptions made on the location of piles as they relate to construction noise and vibration effects are further discussed in the *Assessment of Construction Noise and Vibration Effects Report* included in Volume 4 of the application.

It is noted that the MCA undertaken for the Assessment of Alternatives (refer to Appendix A of the AEE) includes natural hazards and construction risk criteria which base high-level assessment in part on assumed ground conditions. These in turn were based on review of publicly available site investigation data from the New Zealand Geotechnical Database. The resultant ground profile adopted for the purposes of this assessment is as follows:

- 0-2m bgl – Fill;
- 2-12m bgl – Peat (Ardmore Member);
- 12-18m bgl – Soft Clay (Takaanini Formation);
- 18-30m bgl – Stiff Alluvium (Takaanini Formation);
- Unknown depth to top of Waitematā Group rock; and
- Groundwater level assumed at 2m bgl.

It is anticipated that targeted local geotechnical investigations may be required and undertaken to support the future regional consenting process.

## 9.6 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. In the context of the Project, the NoRs will be new designations for AT.

When assessing the actual or potential effects on the environment under section 171 of the RMA, the assessment of effects on the environment for the Project has been limited to matters that trigger a district plan consent requirement under the AUP:OP as these are the only activities authorised by the proposed designation. Where National Environmental Standards (**NES**) or RP consenting requirements are triggered, these will not be authorised by the proposed designation and will require resource consents in the future. Notwithstanding this, relevant national and regional resource consent

matters have been considered to inform the Project's design, the alternatives assessment process, and the proposed designation footprint.

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

Based on the above, the assessment of effects that have been undertaken to support the Project is limited to the following matters:

- Cultural;
- Transport;
- Landscape and Visual;
- Noise and Vibration;
- Arboriculture;
- Terrestrial ecology;
- Flooding;
- Social;
- Property; and
- Archaeology and built heritage.

## 9.7 Approach to assessing the likely receiving environment

As set out above, a key purpose of the NoRs is to protect the necessary transport network that will support east-west movements across the NIMT in Takaanini and the future growth of the area. It is anticipated that the network will not be constructed and operational until funding is made available.

It is well established that the “*environment*” is the existing environment as well as elements of the future environment such as permitted activities under the relevant plans and resource consents that have or are likely to be implemented. In addition, it is acknowledged that the future environment requires consideration of that environment as signalled by operative objectives and policies of a District Plan.

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 infrastructure will be experienced.

The Project Team has developed an approach to assessing the likely receiving environment. This has included consideration of proposed PC78 to the AUP:OP, which at the time of writing had been notified as Auckland Council's Intensification Planning Instrument (**IPi**) under the Intensification Streamlined Planning Process (**ISPP**) provided for under the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. Accordingly, PC78 constitutes the planning response to Policy 3 of the NPS:UD which sets clear national direction on providing for urban intensification; and implements the MDRS as required for by the aforementioned RMA amendment. Notwithstanding that, it is noted at the time of writing that PC78 is not yet operative, and that the timeframe for hearings on PC78 was extended by twelve months in early 2023.

Policy 3 of the NPS:UD is of particular relevance to the Project as it requires that Regional Policy Statements (**RPS**) and District Plans enable intensification, including a minimum of six storeys within walkable catchments of existing and planned rapid transit stops. Moreover, the MDRS will provide for three dwellings up to three storeys in height per site in areas beyond a walkable catchment of a rapid transit stop.

Figure 9-1 below provides an indication of what the implementation of Policy 3 in the NPS:UD could look like in the context of the Project (at the time of lodgement). Four of the proposed project areas (Spartan Road, Manuia Road, Manuroa Road and Taka Street) are within a walkable catchment of Takaanini Station which is an existing rapid transit stop.

Sections 9.7.1 - 9.7.5 set out the receiving environment for the Project as at the date of lodgement and considering the assessment approach described in above.

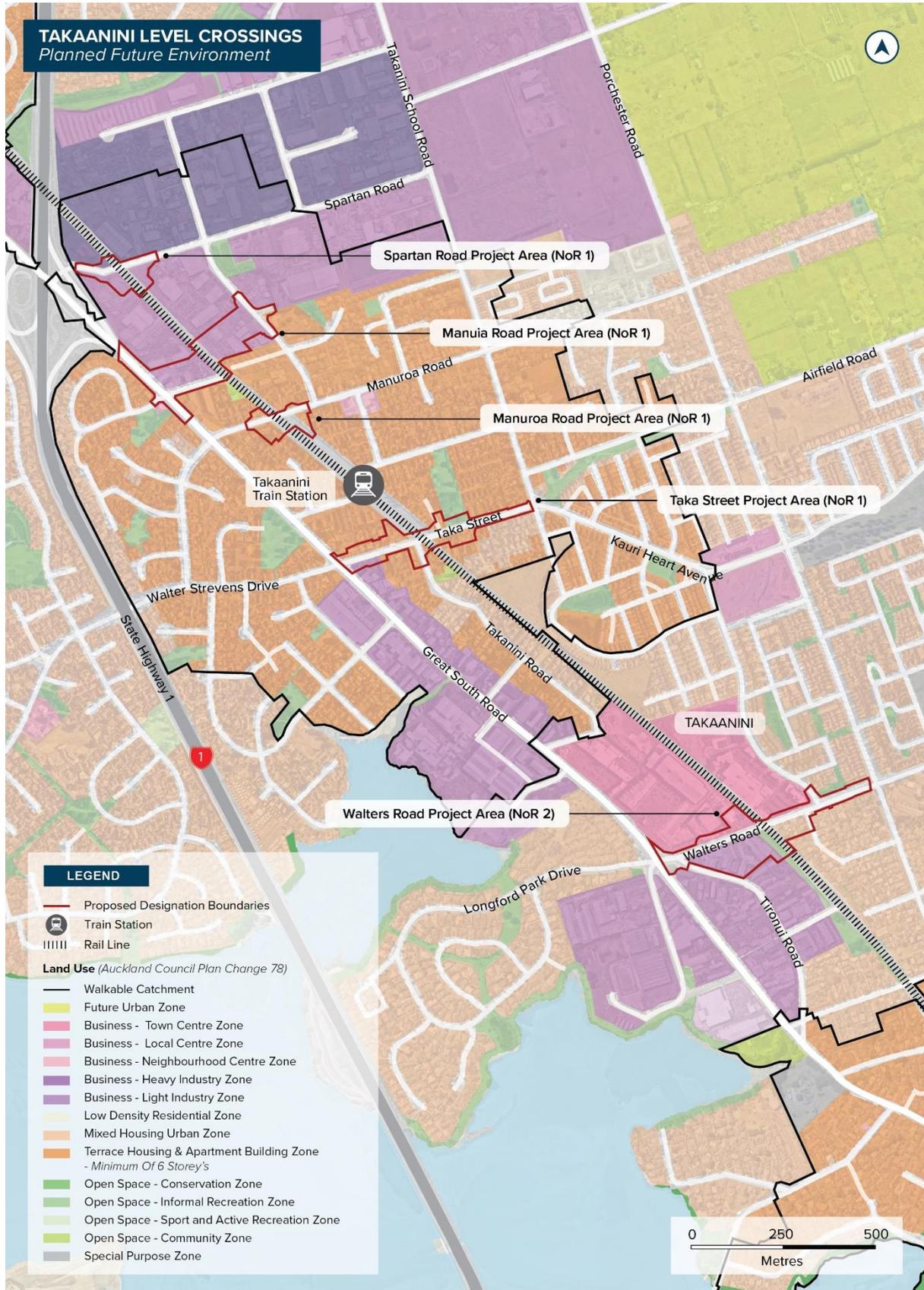


Figure 9-1: Application of the NPS:UD in the context of the Project – Notified zoning for the Takaanini area/project areas as per Plan Change 78 map viewer (Auckland Council, August 2022)

### 9.7.1 Spartan Road project area

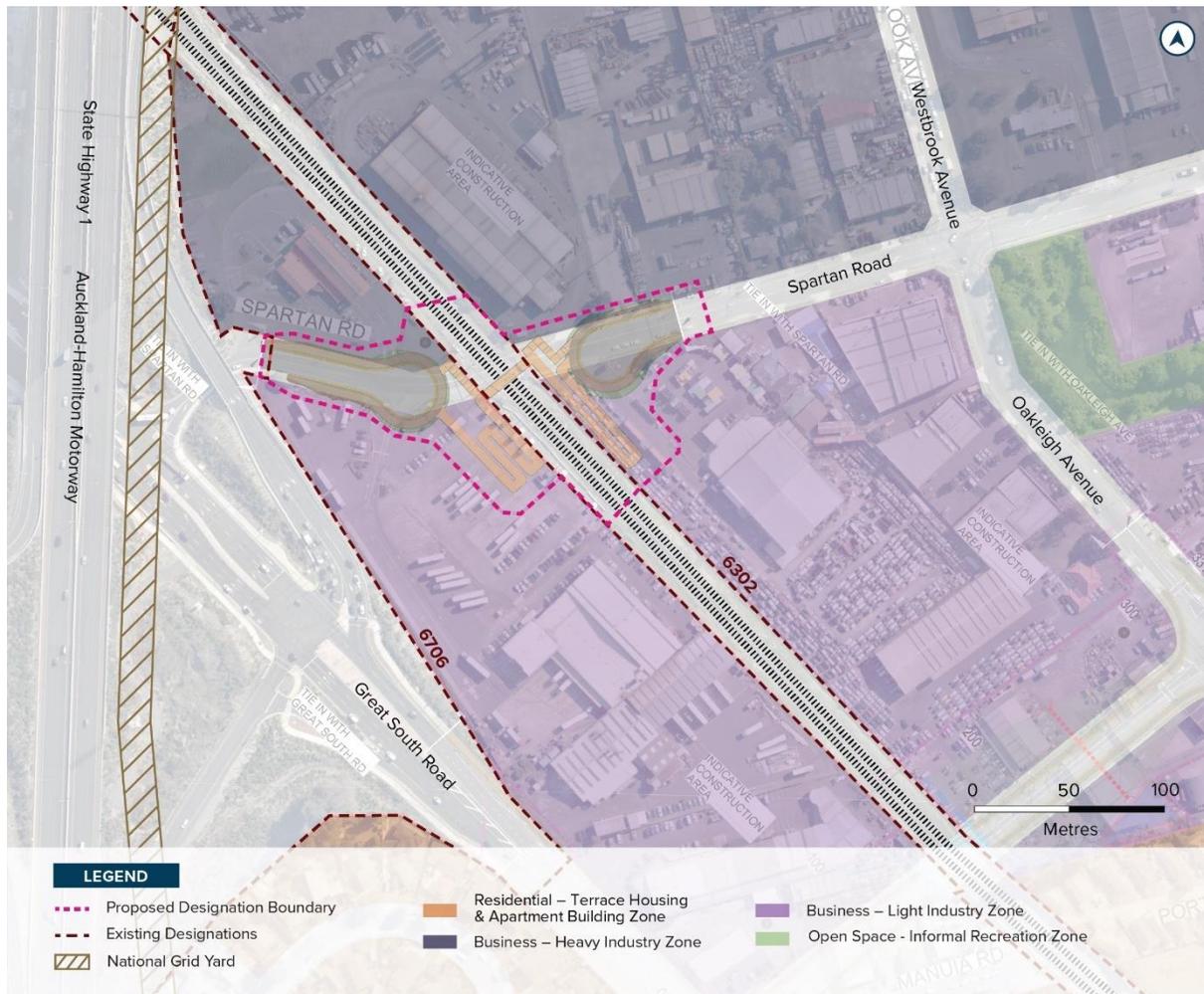


Figure 9-2: Likely zoning of the Spartan Road project area (considering PC78 and MDRS)

Table 9-3: Spartan Road project area receiving environment

Features	Description
Current land use	<ul style="list-style-type: none"> <li>The land use surrounding the project area comprises predominantly of heavy and light industrial uses (e.g. car yards, Hynds pipe supply yard and VTNZ testing centre).</li> </ul>
Community and recreational facilities	<ul style="list-style-type: none"> <li>VTNZ Takanini (noted not a typical community facility, but provides driver licensing services).</li> </ul>
Watercourses /Waterbodies	<ul style="list-style-type: none"> <li>The project area crosses an artificially constructed (land drain) .</li> <li>On the south-eastern corner of Spartan Road and Oakleigh Ave there is a stormwater pond / modified natural wetland.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>One tree (pest species) within road reserve in project area.</li> <li>Exotic grassland and treeland.</li> </ul>

Features	Description
Historic heritage and archaeological values	<ul style="list-style-type: none"> <li>No historic heritage or archaeological values identified.</li> <li>No Heritage Orders identified.</li> </ul>
Areas of cultural value	<ul style="list-style-type: none"> <li>No specific areas identified within the Sites and Places of Significance to Mana Whenua Overlay under the AUP:OP.</li> <li>See Section 11.12 for further discussion on cultural values.</li> </ul>
Existing designations	<p><u>Overlapping with project area</u></p> <ul style="list-style-type: none"> <li>200 Ardmore Airport purposes (Ardmore Airport Ltd).</li> <li>1102 Obstacle Limitation, Runway Protection and Ground Light Restriction (Auckland International Airport Ltd).</li> <li>6302 North Island Main Trunk Railway Line (KiwiRail Holdings Ltd).</li> <li>6706 State Highway 1 (Waka Kotahi NZ Transport Agency).</li> </ul>
Precincts	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Overlays	<ul style="list-style-type: none"> <li>National Grid Corridor Overlay.</li> <li>High-Use Aquifer Management Areas Overlay.</li> </ul>
Other non statutory features	<ul style="list-style-type: none"> <li>Flood Prone Areas.</li> <li>Flood Plains.</li> <li>Overland Flow Paths.</li> </ul>
Current zoning	<ul style="list-style-type: none"> <li> Business - Heavy Industry Zone</li> <li> Business - Light Industry Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Likely future zoning	<ul style="list-style-type: none"> <li> Business - Heavy Industry Zone</li> <li> Business - Light Industry Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Level of certainty of likely future zoning	<ul style="list-style-type: none"> <li>High</li> </ul>

### 9.7.2 Manuia Road project area



Figure 9-3: Likely zoning of the Manuia Road project area (considering PC78 and MDRS)

Table 9-4: Manuia Road project area receiving environment

Features	Description
Current land use	<ul style="list-style-type: none"> <li>The land use surrounding the Manuia Road project area comprises predominantly of commercial and industrial uses to the north (e.g., service station, car yards, mechanics, warehouses and fabrication services). It is however, on the fringe of established residential, retail and community land uses to the south (e.g., scout hall and family centre).</li> </ul>
Community and recreational facilities	<ul style="list-style-type: none"> <li>Takanini Surgery (medical centre)</li> <li>Local Centre (Takanini Superette)</li> <li>Challen Close Park &amp; Playground</li> <li>Scout Hall</li> <li>TopKids Manuroa childcare</li> <li>BestStart Manuroa Road</li> <li>Early Learning Counties Manukau Takanini</li> <li>Takanini Family Centre</li> </ul>

Features	Description
Watercourses / Waterbodies	<ul style="list-style-type: none"> <li>The south-eastern corner of Spartan Road and Oakleigh Ave contains a stormwater pond / modified natural wetland.</li> <li>Modified natural wetland located on Scott Field Drive.</li> <li>Modified stream channel that connects Oakleigh Ave stormwater pond / modified natural wetland and Scott Field Drive modified natural wetland adjacent to Manuia Road project area.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>Four street trees within project area</li> <li>Exotic grassland, amenity planting and some exotic and native trees</li> </ul>
Historic heritage and archaeological values	<ul style="list-style-type: none"> <li>CHI 20287 Milepost 17, which is no longer present</li> <li>No Heritage Orders identified.</li> </ul>
Areas of cultural value	<ul style="list-style-type: none"> <li>No specific areas identified within the Sites and Places of Significant to Mana Whenua Overlay under the AUP:OP.</li> <li>See Section 11.12 for further discussion on cultural values</li> </ul>
Existing designations	<p><u>Overlapping with project area</u></p> <ul style="list-style-type: none"> <li>200 Ardmore Airport purposes (Ardmore Airport Ltd)</li> <li>1102 Obstacle Limitation, Runway Protection and Ground Light Restriction (Auckland International Airport Ltd)</li> <li>6706 State Highway 1 - Takanini to Drury, Designations (Waka Kotahi NZ Transport Agency)</li> <li>6302 North Island Main Trunk Railway Line (KiwiRail Holdings Ltd)</li> </ul>
Precinct	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Overlays	<ul style="list-style-type: none"> <li>High-Use Aquifer Management Areas Overlay</li> </ul>
Other non statutory features	<ul style="list-style-type: none"> <li>Flood Prone Areas</li> <li>Flood Plains</li> <li>Overland Flow Paths</li> </ul>
Current zoning	<ul style="list-style-type: none"> <li> Business – Light Industry Zone</li> <li> Business – Neighbourhood Centre Zone</li> <li> Residential – Mixed Housing Suburban Zone</li> <li> Residential – Mixed Housing Urban Zone</li> <li> Open Space- Community Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Likely future zoning	<ul style="list-style-type: none"> <li> Business – Light Industry Zone</li> <li> Business – Neighbourhood Centre Zone</li> <li> Residential – Terrace Housing and Apartment Building Zone</li> <li> Open Space- Community Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>

Features	Description
Level of certainty of likely future zoning	<ul style="list-style-type: none"> <li>High</li> </ul>

### 9.7.3 Manuroa Road project area

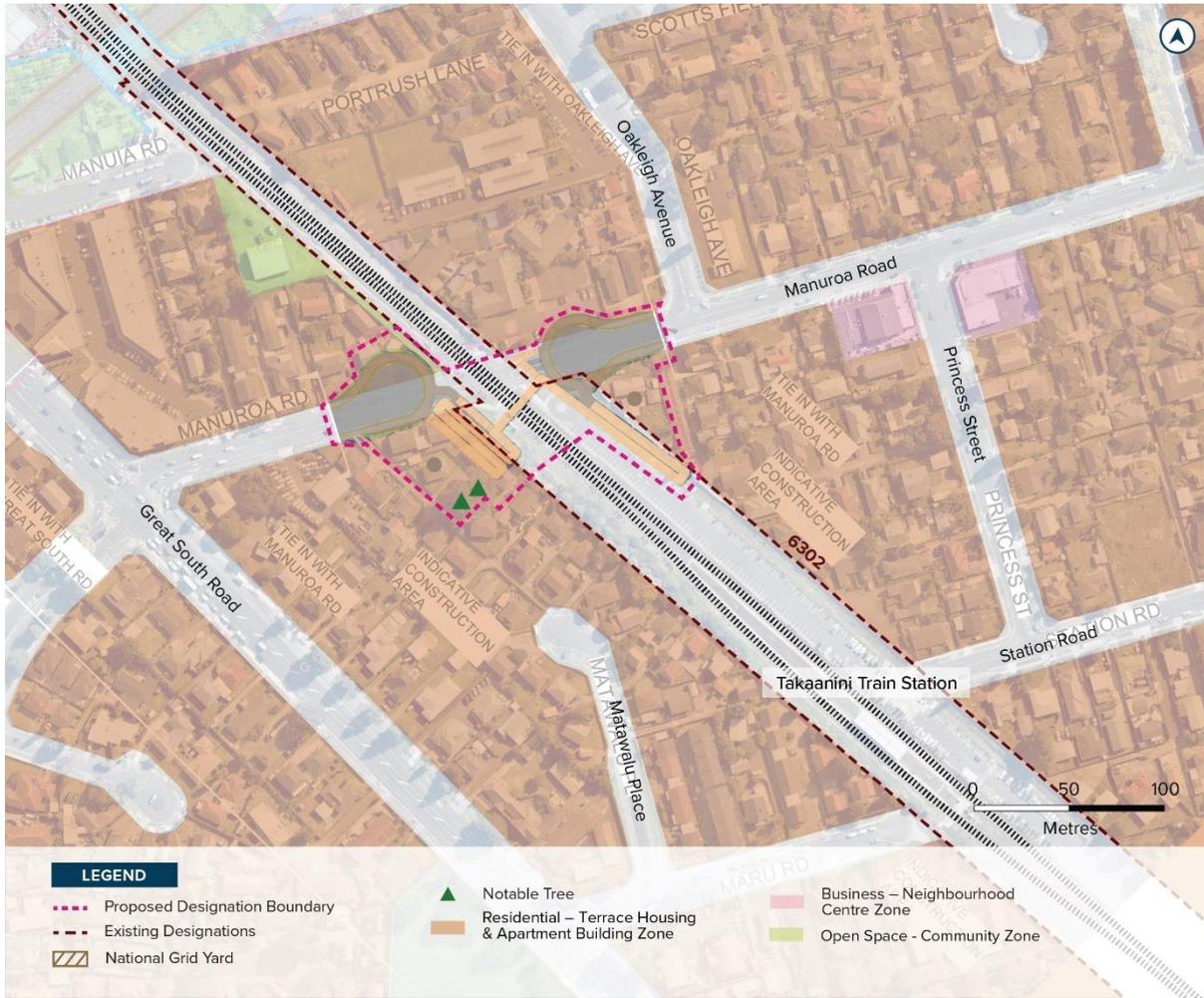


Figure 9-4: Likely zoning of the Manuroa Road project area (considering PC78 and MDRS)

Table 9-5: Manuroa Road project area receiving environment

Features	Description
Current land use	<ul style="list-style-type: none"> <li>The land use surrounding the Manuroa Road project area comprises predominantly residential uses with some community and commercial land uses (e.g. a church, early childcare centre, shopping centre).</li> <li>Takaanini Train Station is located to the south of Manuroa Road.</li> </ul>
Community and recreational facilities	<ul style="list-style-type: none"> <li>NZ Post Centre Takanini</li> <li>Trinity Presbyterian Church</li> </ul>

Features	Description
	<ul style="list-style-type: none"> <li>• TopKids Manuroa childcare</li> <li>• BestStart Manuroa Road</li> <li>• Early Learning Counties Manukau Takanini</li> <li>• Takanini Family Centre</li> <li>• Scout Hall</li> <li>• Takanini Surgery (Medical Centre)</li> <li>• Takaanini Train Station</li> </ul>
Watercourses / Waterbodies	<ul style="list-style-type: none"> <li>• The project area crosses an artificially constructed (swale)</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>• Two notable trees within project area</li> <li>• Exotic grassland and some exotic and native treeland</li> </ul>
Historic heritage and archaeological values	<ul style="list-style-type: none"> <li>• Notable Trees – Two Oak Trees on 15 Manuroa Road (ID: 2265)</li> <li>• No Heritage Orders identified.</li> </ul>
Areas of cultural value	<ul style="list-style-type: none"> <li>• No specific areas identified within the Sites and Places of Significant to Mana Whenua Overlay under the AUP:OP</li> <li>• See Section 11.12 for further discussion on cultural values</li> </ul>
Existing designations	<p><u>Overlapping with Project area</u></p> <ul style="list-style-type: none"> <li>• 200 Ardmore Airport purposes (Ardmore Airport Ltd)</li> <li>• 1102 Obstacle Limitation, Runway Protection and Ground Light Restriction (Auckland International Airport Ltd)</li> <li>• 6302 North Island Main Trunk Railway Line (KiwiRail Holdings Ltd)</li> </ul>
Precinct	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Overlays	<ul style="list-style-type: none"> <li>• High-Use Aquifer Management Areas Overlay.</li> </ul>
Other non-statutory features	<ul style="list-style-type: none"> <li>• Flood Prone Areas</li> <li>• Flood Plains</li> <li>• Overland Flow Paths</li> </ul>
Current zoning	<ul style="list-style-type: none"> <li> Business – Neighbourhood Centre Zone</li> <li> Residential – Mixed Housing Suburban Zone</li> <li> Residential – Mixed Housing Urban Zone</li> <li> Open Space – Community Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Likely future zoning	<ul style="list-style-type: none"> <li> Business – Neighbourhood Centre Zone</li> <li> Residential – Terrace Housing and Apartment Building Zone</li> <li> Open Space – Community Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Business – Neighbourhood Centre Zone</li> <li></li> </ul>

Features	Description
	Strategic Transport Corridor Zone
Level of certainty of likely future zoning	<ul style="list-style-type: none"> <li>High</li> </ul>

### 9.7.4 Taka Street project area

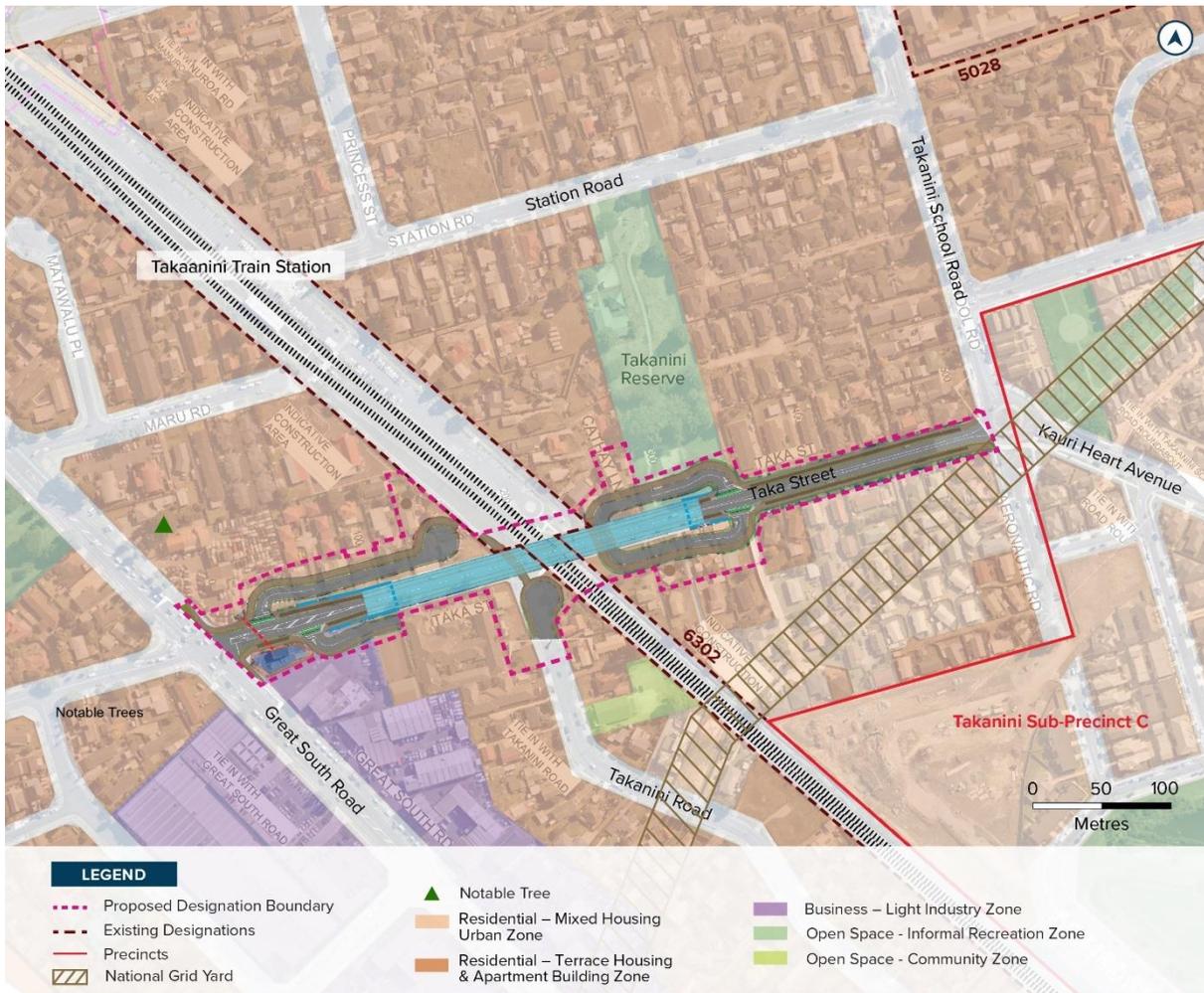


Figure 9-5: Likely zoning of the Taka Street project area (considering PC78 and MDRS)

Table 9-6: Taka Street project area receiving environment

Features	Description
Current land use	<ul style="list-style-type: none"> <li>The land use surrounding the Taka Street project area is dominated by residential uses but has some open space, industrial and commercial uses.</li> </ul>
Community and recreational facilities	<ul style="list-style-type: none"> <li>Takanini Care Centre</li> <li>Takanini Hall (Community Centre)</li> <li>Amber Early Learning Centre</li> <li>Takaanini Reserve</li> </ul>

Features	Description
Watercourses / Waterbodies	<ul style="list-style-type: none"> <li>The project area crosses an artificially constructed (swale and drain)</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>9 trees within Takaanini Reserve (Open Space zone) and 4 street trees within road reserve</li> <li>Exotic grassland and some exotic and native treeland</li> </ul>
Historic heritage and archaeological values	<ul style="list-style-type: none"> <li>No historic heritage or archaeological values identified.</li> <li>No Heritage Orders identified.</li> </ul>
Areas of cultural value	<ul style="list-style-type: none"> <li>No specific areas identified within the Sites and Places of Significant to Mana Whenua Overlay under the AUP:OP</li> <li>See Section 11.12 for further discussion on cultural values</li> </ul>
Existing designations	<p><u>Overlapping with project area</u></p> <ul style="list-style-type: none"> <li>200 Ardmore Airport purposes (Ardmore Airport Ltd)</li> <li>1102 Obstacle Limitation, Runway Protection and Ground Light Restriction (Auckland International Airport Ltd)</li> <li>6302 North Island Main Trunk Railway Line (KiwiRail Holdings Ltd)</li> </ul> <p><u>In proximity, but outside of project area</u></p> <ul style="list-style-type: none"> <li>5028 Takanini School (Minister of Education)</li> </ul>
Precinct	<ul style="list-style-type: none"> <li>Takanini sub-precinct C</li> </ul>
Overlays	<ul style="list-style-type: none"> <li>National Grid Corridor Overlay</li> <li>High-Use Aquifer Management Areas Overlay</li> </ul>
Other non statutory features	<ul style="list-style-type: none"> <li>Flood Prone Areas</li> <li>Flood Plains</li> <li>Overland Flow Paths</li> </ul>
Current zoning	<ul style="list-style-type: none"> <li> Business – Light Industry Zone</li> <li> Residential – Mixed Housing Urban Zone</li> <li> Residential – Mixed Housing Suburban Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Likely future zoning	<ul style="list-style-type: none"> <li> Business – Light Industry Zone</li> <li> Residential – Terrace Housing and Apartment Building Zone</li> <li> Residential – Mixed Housing Urban Zone</li> <li> Open Space – Informal Recreation Zone</li> <li> Strategic Transport Corridor Zone</li> </ul>
Level of certainty of likely future zoning	<ul style="list-style-type: none"> <li>High</li> </ul>

### 9.7.5 Walters Road project area

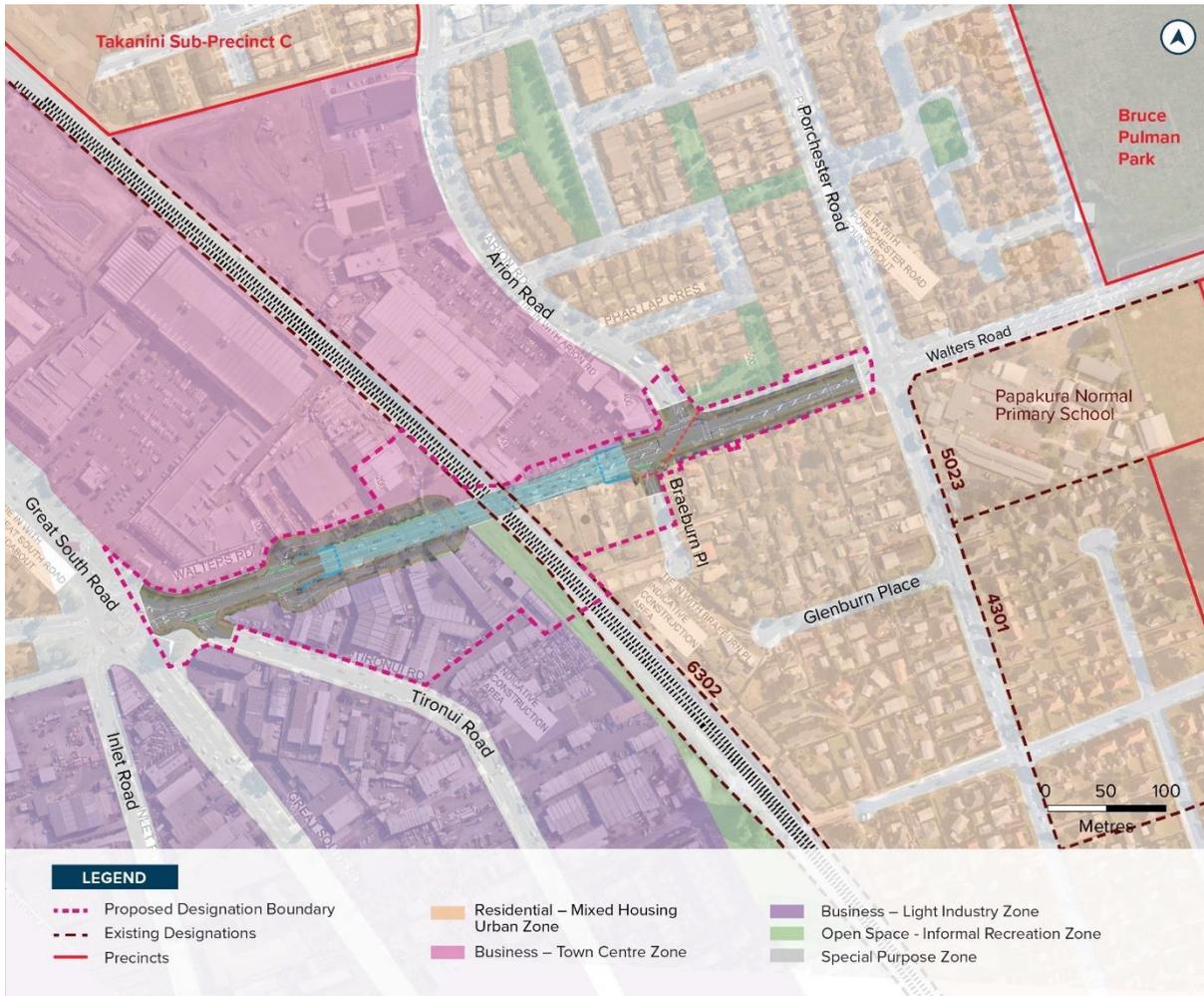


Figure 9-6: Likely zoning of the Walters Road project area (considering PC78 and MDRS)

Table 9-7: Walters Road project area receiving environment

Features	Description
Current land use	<ul style="list-style-type: none"> <li>The land use surrounding the Walters Road project area to the east of the NIMT comprises predominantly of residential and some commercial and retail activities within the Town Centre zone.</li> <li>The area west of the NIMT comprises of industrial, commercial, and retail activities to the west.</li> </ul>
Community and recreational facilities	<ul style="list-style-type: none"> <li>Papakura Normal Primary School</li> <li>Bruce Pulman Park</li> <li>NZ Post Centre Southgate</li> <li>Go Bananas Childcare Takanini</li> <li>Learning Adventures Takanini</li> <li>Informal park area at the corner of Arion Road and Walters Road</li> </ul>

Features	Description
Watercourses / Waterbodies	<ul style="list-style-type: none"> <li>No watercourses / waterbodies identified.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>1 tree within Open Space zone and 25 street trees identified within project area</li> <li>Exotic grassland and some exotic and native treeland</li> </ul>
Historic heritage and archaeological values	<ul style="list-style-type: none"> <li>No historic heritage or archaeological values identified.</li> <li>No Heritage Orders identified.</li> </ul>
Areas of cultural value	<ul style="list-style-type: none"> <li>No specific areas identified within the Sites and Places of Significant to Mana Whenua Overlay under the AUP:OP</li> <li>See Section 11.12 for further discussion on cultural values</li> </ul>
Existing designations	<p><u>Overlapping with project area</u></p> <ul style="list-style-type: none"> <li>200 Ardmore Airport purposes (Ardmore Airport Ltd)</li> <li>1102 Obstacle Limitation, Runway Protection and Ground Light Restriction (Auckland International Airport Ltd)</li> <li>6302 North Island Main Trunk Railway Line (KiwiRail Holdings Ltd)</li> </ul> <p><u>In proximity but outside of Project area</u></p> <ul style="list-style-type: none"> <li>5023 Papakura Normal School (Minister of Education)</li> <li>4301 Papakura Military Camp (Minister of Defence)</li> </ul>
Precinct	<ul style="list-style-type: none"> <li>Bruce Pulman Park Precinct</li> <li>Takaanini sub-precinct C</li> </ul>
Overlays	<ul style="list-style-type: none"> <li>High-Use Aquifer Management Areas Overlay</li> </ul>
Other non statutory features	<ul style="list-style-type: none"> <li>Flood Prone Areas</li> <li>Flood Plains</li> <li>Overland Flow Paths</li> </ul>
Current zoning	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ff69b4; border: 1px solid black; margin-right: 5px;"></span> Business – Town Centre Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ff69b4; border: 1px solid black; margin-right: 5px;"></span> Business – Light Industry Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ffcc99; border: 1px solid black; margin-right: 5px;"></span> Residential – Mixed Housing Urban Zone;</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ffff99; border: 1px solid black; margin-right: 5px;"></span> Residential – Mixed Housing Suburban Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #99cc99; border: 1px solid black; margin-right: 5px;"></span> Open Space – Informal Recreation Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Strategic Transport Corridor Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #999999; border: 1px solid black; margin-right: 5px;"></span> Special Purpose Zone.</li> </ul>
Likely future zoning	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ff69b4; border: 1px solid black; margin-right: 5px;"></span> Business – Town Centre Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ff69b4; border: 1px solid black; margin-right: 5px;"></span> Business – Light Industry Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ffcc99; border: 1px solid black; margin-right: 5px;"></span> Residential – Mixed Housing Urban Zone;</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #99cc99; border: 1px solid black; margin-right: 5px;"></span> Open Space – Informal Recreation Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Strategic Transport Corridor Zone</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #999999; border: 1px solid black; margin-right: 5px;"></span> Special Purpose Zone.</li> </ul>

Features	Description
Level of certainty of likely future zoning	<ul style="list-style-type: none"> <li>High</li> </ul>

## 10 Engagement

### 10.1 Introduction

This section provides an overview of partner, stakeholder, and public engagement for the TLC. It summarises the approach to engagement during each phase of the Project and sets out the common feedback themes raised, and how these have informed the development of the Project.

Where engagement has affected a specific design outcome, such as alternatives consideration or identification and management of environmental effects, this has been considered in either Appendix A: Assessment of Alternatives or the AEE, as relevant.

Prior to detailed design and construction, further engagement will be undertaken by AT, as needed to manage impacts of the Project.

### 10.2 Engagement Stages and Approach

Te Tupu Ngātahi has engaged through all project stages including IBC, DBC, and preparation of NoRs. Although there is no statutory obligation to engage it is widely accepted as best practice, and engagement has generally had the following objectives:

- Seek the community's views, and keep the community informed of the projects progress;
- 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 and the area not previously known to the Project Team, in order to inform and develop the project;
- Integrate and collaborate with other network providers to achieve strategic co-benefits where practicable and / or not preclude future network plans; and
- To avoid, remedy and manage potential adverse effects, where practical, either created by or likely to impact on the Takaanini Road Network.

Following the broad engagement at the business case stage, which indicated a high level of support, the Takaanini level crossings project moved into the pre lodgement NoR engagement phase, focusing on directly affected landowners and stakeholders. These engagement phases are summarised below in Figure 10-1.

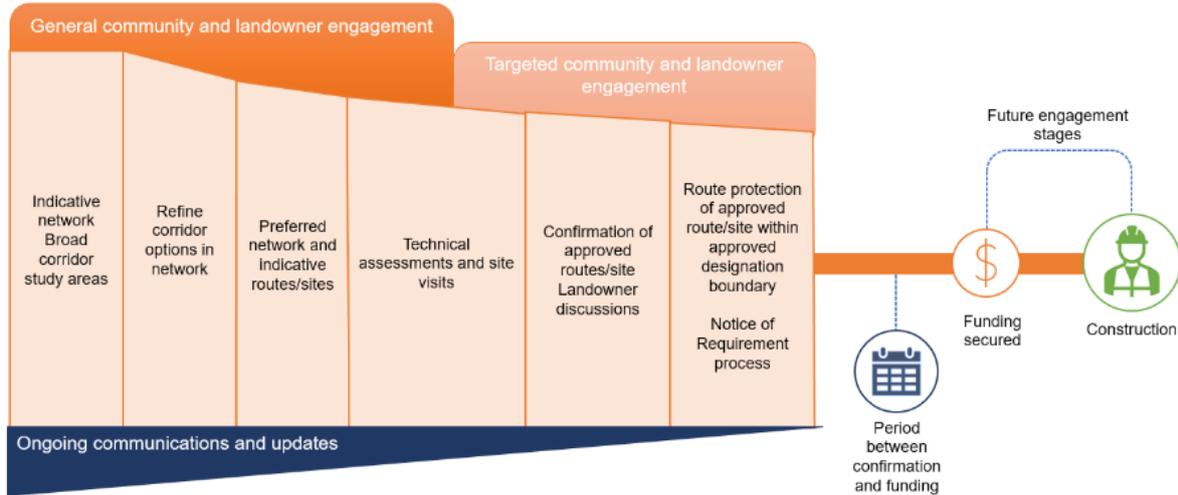


Figure 10-1 – Te Tupu Ngātahi consultation and engagement phases

Project stakeholders have been engaged using a variety of tools and methods (see Figure 10-2 below). Online engagement tools were increasingly used during and following the COVID-19 pandemic but was supported with additional face-to-face engagement both for the general public and for directly affected landowners during later engagement phases.

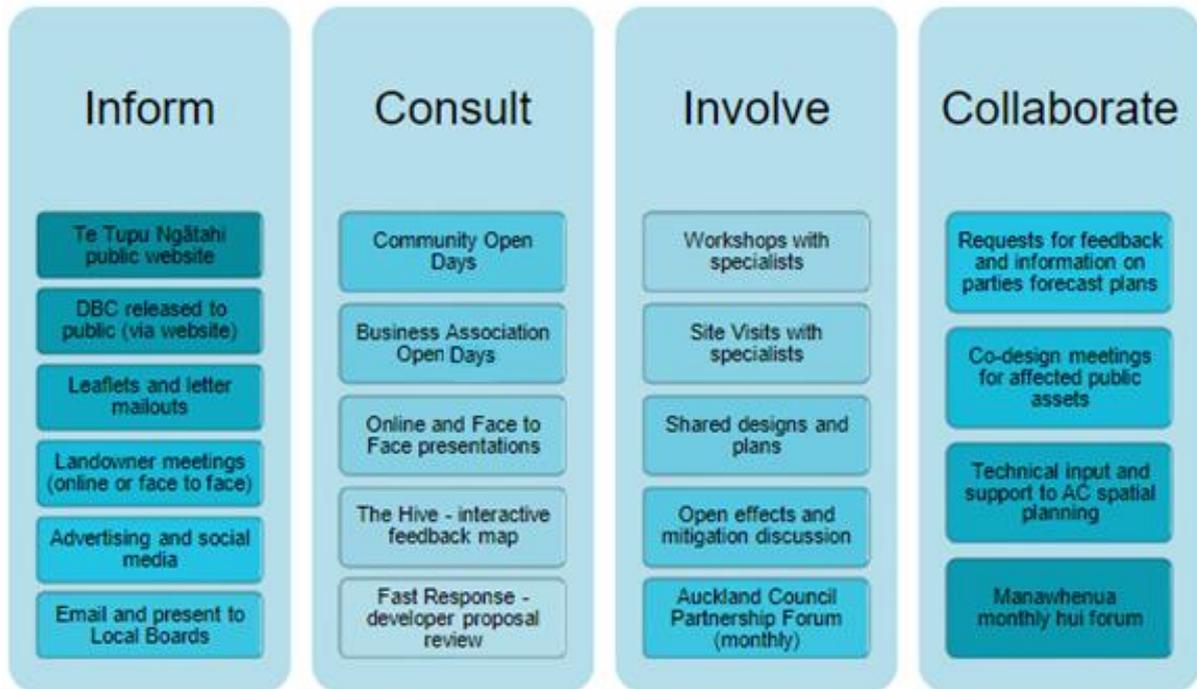


Figure 10-2 – Spectrum of engagement tools and methods used by Te Tupu Ngātahi

The phases of engagement undertaken for the Project are summarised in Table 10-1 below.

**Table 10-1: Summary of engagement undertaken for the TLC**

Project stage	Timing	Engagement purpose
Indicative Business Case	2018- 2019	<ul style="list-style-type: none"> <li>Receive feedback on the options considered for the business case.</li> <li>Community information drop-ins, workshops to develop an IBC for the South future transport network.</li> </ul>
Detailed Business Case	2022	<ul style="list-style-type: none"> <li>Engagement undertaken to inform the preparation of the DBC and options assessment.</li> <li>Briefings with key stakeholders, Councillors, Ministers of Parliament (<b>MP</b>) and local boards.</li> <li>Business Breakfast sessions on 27 November and 12 December 2022.</li> <li>Landowner engagement took place from August to December 2022. 380 letters were sent to potentially impacted property owners inviting them to contact us to discuss projects further and provide feedback. 23 landowners got in touch with the Project Team, and two meetings were held.</li> <li>Community engagement consisted of two community open days and an advertising and social media campaign to raise awareness of the engagement with the wider community, which directed people to the online interactive engagement platform "The Hive" to provide feedback. During the engagement period there were 1,627 unique visitors to the project site. 70 pieces of feedback was provided via survey responses, comments added to the social map and emails.</li> </ul>
Pre-lodgement of Notice of requirement	2022-2023	<ul style="list-style-type: none"> <li>Engagement undertaken to inform the final proposed designation boundaries and during the preparation of the AEE.</li> <li>June 2023 - shared further information with the community on the assessment of options for bridge options versus underpass options, particularly at Walters Road. Project website was updated with new visual material, an email information campaign to our database, media advertising, offer for face-to-face sessions with resident groups, and a drop-in session for the wider community at the Takaanini Community Centre</li> <li>Briefings and presentations to local board members, Auckland Transport Regional Freight Group and other elected representatives.</li> </ul>

Project stage	Timing	Engagement purpose
		<ul style="list-style-type: none"> <li>• 190 letters sent to potentially affected property owners in March 2023.</li> <li>• At the time of writing, 63 landowners (33%) have contacted the Project Team via email and phone. 52 meetings (27%) were held with landowners, which have covered a total of 59 affected properties. Engagement with directly impacted landowners has helped inform the final designation boundaries.</li> </ul>

### 10.3 Partnership with Manawhenua

AT and Waka Kotahi recognise and respect Te Tiriti o Waitangi as Te Tūāpapa (foundation). This underpins the way AT and Waka Kotahi partner with Manawhenua, to build strong, meaningful and enduring relationships.

Partnership in the context of this Project is a commitment to ongoing and regular engagement with Manawhenua at all levels (including governance and kaitiaki) in a manner that is open and transparent to ensure Manawhenua continue to have the space and resources to influence decision making at all phases of the Project. The sections to follow summarise the partnership with Manawhenua to date.

Further discussion on Manawhenua outcomes, values, and the potential effects of the Project as they relate to the cultural landscape, that have been shared with the Project Team through the various kōrero is provided in Section 11.12. This includes any formal condition responses proposed by the Project.

#### 10.3.1 Partnership in previous phases of the Project

Manawhenua have been involved in all previous phases of the Project. Engagement with Manawhenua at the PBC stage commenced in 2015, followed by engagement on the South IBC in 2017 and TLC DBC in 2021. The partnership has involved project workshops and monthly hui over the course of the previous business case process to seek feedback from Manawhenua on key project decisions through the Auckland Transport's Southern Mana Whenua Table.

##### 10.3.1.1 Programme Business Case

During the Programme Business Case engagement phase, letters were sent out to all nineteen iwi groups in Auckland (based on the Auckland Council database). These groups were invited to participate in the programme moving forward.

Twenty-two hui were held over a six-month period with a total of fifteen Mana Whenua groups participating in at least one of these hui to provide feedback on the options developed by the Project Team. These participating groups included:

- Makaurau Marae Māori Trust (Te Ahiwaru - Waiohua);
- Ngāti Manuhiri Settlement Trust (Ngāti Manuhiri);
- Ngāti Maru Rūnanga Trust (Ngāti Maru);
- Ngāti Paoa Iwi Trust (Ngāti Paoa);

- Ngāi Tai ki Tāmaki (Ngāi Tai);
- Ngāti Tamaoho Trust (Ngāti Tamaoho);
- Ngāti Tamaterā;
- Ngaati Whanaunga;
- Ngāti Whātua o Kaipara (Kaipara);
- Ngāti Whātua Ōrākei;
- Ngātiwai Trust Board (Ngātiwai);
- Te Ākitai Waiohua Iwi Authority (Te Ākitai Waiohua);
- Te Ara Rangatu o Te Iwi o Ngāti Te Ata Waiohua (Ngaati Te Ata Waiohua);
- Te Kawerau a Maki (Te Kawerau);
- Te Patukirikiri.
- Te Rūnanga o Ngāti Whātua (Ngāti Whātua); and
- Te Uri o Hau Settlement Trust (Te Uri o Hau).

A set of Mana Whenua values was developed in consultation with these groups, to be incorporated into the MCA. The values identified are as follows:

- Papakāinga, Māori land and Marae (existing and future);
- Mana whenua heritage (tangible and intangible);
- Giving effect to treaty settlement outcomes and the principle of redress;
- Te Taiao (air, land, water, coast, taonga); and
- Mana whenua well-being.

### 10.3.1.2 South Indicative Business Case

In November 2017, a dedicated forum for Te Tupu Ngātahi was established with Mana Whenua to provide regular updates and input to the IBC.

Ngāti Tamaoho, Te Ahiwaru - Waiohua, Ngāi Tai, Ngāti Manuhiri, Ngāti Maru, Ngāti Te Ata Waiohua, Ngāti Whanaunga, Ngāti Whātua, Kaipara, Te Ākitai Waiohua, Te Patukirikiri, Ngāti Pāoa, and Te Kawerau chose to be further involved in the development of the ISTNs for Te Tupu Ngātahi, as Mana Whenua with an interest in the southern Project areas.

Ngāti Tamaterā attended a hui in 2017 and Ngātiwai attended two in 2018, however they did not attend any subsequent hui.

Following this, Mana Whenua attended the South IBC workshops and two Cultural Specialist Hui (4th July 2018 and 8th October 2018).

### 10.3.1.3 Detailed Business Case and NoR phases

The Project Team has engaged and collaborated closely with Manawhenua on the TLC prior to and during wider community engagement, and feedback and involvement was actively sought during the DBC and NoR processes.

Te Tupu Ngātahi held a Southern Projects Hui with Manawhenua representatives, occurring twice a month from November 2021. The purpose of these Hui was to collaborate with Manawhenua on option development and assessment processes, update Manawhenua on progress on the level crossings project as part of the DBC and NoR phases, present technical information, and findings

from investigations to involve Manawhenua as partners. Manawhenua were also invited to prepare Cultural Impact Assessments (**CIA**) or Cultural Values Assessments (**CVA**) for the Project (further discussed in Section 11.12 below).

Nine Manawhenua have a direct interest in the Project site according to Auckland Council database<sup>16</sup>, and eight of these nine (highlighted in **bold**) have been involved in the DBC and NoR phases:

- **Ngāi Tai ki Tāmaki Tribal Trust (Ngai Tai ki Tāmaki);**
- **Ngāti Maru Rūnanga Trust (Ngāti Maru);**
- **Ngāti Tamaoho Trust (Ngāti Tamaoho);**
- **Ngāti Tamaterā Settlement Trust (Ngāti Tamaterā);**
- **Te Ara Rangatu o Te Iwi o Ngāti Te Ata Waiohua (Ngaati Te Ata Waiohua);**
- **Ngaati Whanaunga Incorporated (Ngaati Whanaunga);**
- **Te Ākitai Waiohua Iwi Authority (Te Ākitai Waiohua);**
- **Makaurau Marae Māori Trust (Te Ahiwaru Waiohua);** and
- Te Whakakitenga o Waikato Incorporated (Waikato – Tainui).

Alongside the above, the following Manawhenua partners have also been involved in the DBC and NoR phases:

- Ngāti Paoa Trust Board.

The Project Team's close engagement with Manawhenua during the DBC process has led to careful consideration of values, issues, concerns, and considerations pertinent to Manawhenua into the Project Team's decisions. The Project Team recognise the importance of te taiao to Manawhenua. In particular, through ongoing kōrero at the Southern Te Tupu Ngātahi hui, it was acknowledged that the environment is steeped in cultural history for iwi Māori through whakapapa, and the interconnectivity of people, place, and nature. Te Tupu Ngātahi will continue to engage with Manawhenua as project partners as the TLC progresses and a monthly Manawhenua forum for operational and kaitiaki level interaction will be maintained.

The cultural values and narrative shared by Manawhenua through the ongoing kōrero has guided development of the proposed Project conditions (contained in **Volume 1**). These conditions sets out a framework to identify Project specific opportunities to acknowledge and respond to the cultural landscape within the project areas and surrounding areas. In particular, the condition set includes the Manawhenua Partnership condition which is intended to facilitate continued participation by Manawhenua as project partners at the detailed design and implementation stages of the Project.

## 10.4 Previous engagement undertaken for the Project

During the previous business case stage, engagement was undertaken with Auckland Transport, Waka Kotahi and Manawhenua (Programme partners), elected members, potentially affected landowners, and other key stakeholders. A summary of the engagement methods is set out in Table 10-2 below.

<sup>16</sup> <https://www.aucklandcouncil.govt.nz/building-and-consents/resource-consents/prepare-resource-consent-application/Pages/find-hapu-iwi-contacts-for-your-area.aspx>

Table 10-2: Engagement activity by stakeholder group

Who we engaged	How we engaged
Partners	<ul style="list-style-type: none"> <li>• <b>Southern Manawhenua table</b> – ongoing twice monthly hui with Manawhenua and the Project Team.</li> <li>• <b>Auckland Council Partnership Forum</b> – twice monthly meetings to update Council on Te Tupu Ngātahi projects (including the level crossings project).</li> <li>• <b>Update to KiwiRail</b> – three online meetings held with KiwiRail as project partners to update them on the project and obtain input on key design assumptions. These were held on 18 July, 22 July, and 30 August 2022. KiwiRail was also invited to provide comments on the Revision A design during August and September 2022.</li> </ul>
Elected Members	<ul style="list-style-type: none"> <li>• <b>Papakura Local Board presentation</b> – updates on the level crossings project held on 15 June 2022, and post-election in November 2022.</li> <li>• Written updates to <b>Franklin and Manurewa Local Boards</b> – project updates sent in December 2022.</li> <li>• <b>Dr Anae Neru Leavasa MP for Takanini and Councillors Dalton and Newman</b> – a meeting to provide a project overview and invite to the Business breakfast (see below).</li> <li>• <b>Briefing pack</b> – informative brief on the project that contained the community flyer, the landowner letter with the project map, and a memo to Papakura Local Board. This was distributed to then Mayor Phil Goff, the Auckland Council Planning Committee, Papakura Local Board, ward councillors, and offices of local MPs.</li> </ul>
Local stakeholders	<ul style="list-style-type: none"> <li>• <b>Information packs</b> – we sent information via email and dropped flyers to local stakeholders to inform them of the project; this was sent to local schools, the Takanini Business Association, and early childhood centres (August 2022).</li> <li>• <b>Meetings</b> – we held meetings with the Papakura Commercial Projects Group (10 August 2022), and Wallace Construction to discuss the project (multiple meetings since June 2022 – August 2023).</li> <li>• <b>Presentation</b> – we presented to the Auckland Transport Regional Freight Group on 3 October 2022.</li> <li>• <b>Business breakfast sessions</b> – working with the Takanini Business Association, we held breakfast presentations to local business owners on 27 November and 12 December 2022.</li> </ul>
Potentially affected landowners	<ul style="list-style-type: none"> <li>• <b>Letters</b> – 380 letters sent out in August 2022 to potentially affected landowners encouraging them to have their say.</li> <li>• <b>Landowner meetings</b> – 1:1 meetings, either online for face to face were offered to potentially affected landowners to provide them with a further opportunity to discuss the project with members of the Project Team.</li> </ul>
Community	<ul style="list-style-type: none"> <li>• <b>Advertising</b> – we distributed an interactive poster and newspaper advertorial, as well as information and links posted on Papakura Local Board’s social media channels (September 2022).</li> <li>• <b>Video</b> – a visual of the project created for use on the Te Tupu Ngātahi YouTube page, as well as the project’s interactive online engagement platform.</li> <li>• <b>The Hive</b> - an online engagement platform open to the public to give their feedback. Between 12 August and 26 September 2022, and 5 November to 20 December, the community were engaged to provide comment.</li> </ul>

Who we engaged	How we engaged
	<ul style="list-style-type: none"> <li>• <b>Community open days</b> – we held community open days on 5 November (Takaanini Community Hub) and 8 November 2022 (Bruce Pulman Park), to give people the chance to come and speak with the Project Team and learn more about the project. A subsequent open day was also held on 24 June 2023 (Takaanini Community Hub).</li> </ul>

Table 10-3: Summary of key themes

Key theme	Comments
Requests for more information	<ul style="list-style-type: none"> <li>• People felt that the engagement collateral did not have enough information</li> <li>• Some pieces of feedback asked whether there were 3D models or concept designs we could show for the bridges. This was a common question across both rounds of consultation. Artists impressions were developed in response to these questions and were shown in several in-person engagement events. Visualisations for Manuia Road, Taka Street and Walters Road were also subsequently developed and included online on The Hive (refer to Figure 10-3 to Figure 10-7 below).</li> <li>• People also commonly asked where the bridges would start and stop, what height they would be, and what route they would follow. Further information was shared through subsequent discussions with interested parties, online on the Hive and additional public information drop in-events.</li> </ul>
Utilising underground space at Walters Road	<ul style="list-style-type: none"> <li>• Some people queried the rationale for the preferred bridge option rather than use of underpass at Walters Road.</li> <li>• Some people also stated they wanted to see the current rail tracks move underground or become a 'subway' style network.</li> </ul>
Potential closures of the Spartan Road and Manuroa Road level crossings	<ul style="list-style-type: none"> <li>• We heard from industrial freight stakeholders that this is an important route for them and their ability to conduct business.</li> <li>• People felt that closing Spartan Road would redirect heavy vehicle traffic into residential streets and create congestion.</li> <li>• Some feedback did not think Oakleigh Avenue has the capacity to support increased traffic movements should both crossings potentially close.</li> <li>• People also told us that the current Manuroa Road crossing is widely used by thousands of vehicles and day, and that closing it would not be a good outcome for the community.</li> </ul>
Grade separation at Takaanini Train Station	<ul style="list-style-type: none"> <li>• A small number of people's feedback requested that grade separation also be extended to the Takaanini Train Station.</li> <li>• People feel the current level crossing to get to the platform is unsafe, and that increased train services will heighten the chance of an accident.</li> </ul>
Active modes	<ul style="list-style-type: none"> <li>• Some pieces of feedback from the community doubted an uptake on active modes, based on anecdotal evidence that it is currently unsafe and that the current community does not walk or cycle.</li> <li>• Other pieces of feedback voiced concern for the proposed road closures impacting people's ability to walk around the community. Some people felt this would disrupt their ease of walking to locations of interest.</li> </ul>





WALTERS ROAD GRADE SEPARATION  
GROUND LEVEL VIEW FROM TOWN CENTRE CAR PARK LOOKING WEST (WITH TREES)

Visualisation for the purpose of showing proposed design options for Walters Road grade separation. The visualisation is for the purpose of showing proposed design options for Walters Road grade separation. The visualisation is for the purpose of showing proposed design options for Walters Road grade separation. The visualisation is for the purpose of showing proposed design options for Walters Road grade separation.



Figure 10-4: Visualisation of Walters Road grade separation (Ground level view from Town Centre car park looking west (with trees))



TAKA STREET GRADE SEPARATION  
AERIAL VIEW LOOKING SOUTH - JUNE 2023

Visualisation for the purpose of showing proposed design options for Taka Street grade separation. The visualisation is for the purpose of showing proposed design options for Taka Street grade separation. The visualisation is for the purpose of showing proposed design options for Taka Street grade separation. The visualisation is for the purpose of showing proposed design options for Taka Street grade separation.

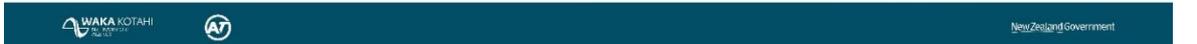


Figure 10-5: Visualisation of Taka Street grade separation (Aerial view looking south - June 2023)



TAKA STREET GRADE SEPARATION  
GROUND LEVEL VIEW FROM TAKAANINI RESERVE (WITH PLANTING)

Visual simulations are illustrative only and have been generated using collated views by the authors over photographs for the purpose of showing approximate location, form and scale of the project. The authors are not responsible for any development that may be proposed in the future. The views shown are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project.

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Figure 10-6: Visualisation of Taka Street grade separation (Ground level view from Takaanini Reserve (with planting))



MANUIA ROAD GRADE SEPARATION  
AERIAL VIEW LOOKING NORTH WEST (WITH LOW PLANTING)

Visual simulations are illustrative only and have been generated using collated views by the authors over photographs for the purpose of showing approximate location, form and scale of the project. The authors are not responsible for any development that may be proposed in the future. The views shown are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project. The views are illustrative only and do not represent any design or construction that has been approved through the project.

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Figure 10-7: Visualisation of Manuia Road grade separation (aerial view looking north west (with low planting))

## 10.5 Engagement during NoR phase of the Project

The following sections summarise the engagement undertaken for the NoR phase of the Project with partners, key stakeholders, and directly affected landowners.

### 10.5.1 Auckland Council

Regular integration meetings and site visits with Auckland Council officers have been held. The Project Team have provided updates for these meetings in relation to key Project milestones and decisions.

### 10.5.2 Kāinga Ora

The Project Team engaged with Kāinga Ora to discuss the Project and its relationship with Kāinga Ora properties. Te Tupu Ngātahi gave an overall programme update to Kāinga Ora staff on 11 March 2021. A number of meetings were held with Kāinga Ora on 31 August 2022, 27 March 2023 and 12 April 2023 to discuss their properties and if there were any future development plans. Kāinga Ora was interested in alternative assessment and diversion routes for Manuora Road. There was general support for the Project and want to keep dialogue open moving forward.

### 10.5.3 Local Boards and Elected Members

The Project Team have provided regular updates to Papakura Local Board as well as providing overviews to Franklin and Otara-Papatoetoe Local Boards. The purpose of these updates was to provide an overview of the Project, including key social opportunities and outcomes for their communities. Potential effects of the Project were discussed, and opportunities were provided to seek clarification about these effects. On 28 September 2022, Papakura Local Board resolved to support Supporting Growth's work on the Takaanini Level Crossings programme.

In June 2023 the Project Team shared further information with the community on the assessment of bridge options versus underpass options particularly at Walters Road. Further engagement activities were undertaken, combined with engagement for the Takaanini Frequent Transit Network project. This included updating the Project website with new visual material, email information to our database, media advertising, offer for face-to-face sessions with resident groups, and a drop-in session for the wider community at the Takaanini Community Centre.

The most recent updates to all relevant Local Boards on the TLC were held in July and August 2023. This included Manurewa Local Board, Papakura Local Board, Otara-Papatoetoe Local Board and Franklin Local Board. Specific engagement has also taken place with the Papakura Local Board to share an independent peer review of the recommendation regarding the preference for a road over rail bridge at Walters Road (refer to Section 9 of the Assessment of Alternatives in Appendix A for further details). An information campaign has been implemented to notify all interested parties and stakeholders of the outcome, including information regarding the independent peer review.

Briefings were provided to Members of Parliament and Elected representatives as requested.

Key matters that were discussed through these engagements included:

- Overview of the Project including timings;
- Engagement with the community and key stakeholders;
- Why the project is needed; and

- Key matters raised by the local community.

#### 10.5.4 Auckland Council Community Facilities – Parks

The Project Team has met on several occasions with Auckland Council Parks to discuss the Project and potential impacts of the Project to adjoining parks. These discussions also provided an opportunity for Auckland Council Parks to share information on the future uses and upgrades planned for parks and reserves. There have been site meetings in relation to Takaanini Reserve on Taka Street and the dialogue has considered the potential impacts on this facility. This has included meeting with Council's Urban Forest specialist to discuss the impacts on trees within land managed by Auckland Council Parks such as in Takaanini Reserve. Ongoing discussions with different parts of Council as landowner/asset manager will continue.

#### 10.5.5 KiwiRail

KiwiRail has been engaged on the interface between the Project and the KiwiRail network, particularly relating to construction impacts of the Project with multiple bridge structures across a live network. While KiwiRail were not directly in the optioneering process of the TLC network which involved a Multi-Criteria Analysis (**MCA**) process (as documented in the Assessment of Alternatives in Appendix A), KiwiRail inputs were provided which informed the options assessed by the Project Team and specialist experts.

KiwiRail representatives attended two meetings in August 2022 followed by a workshop in May 2023. The first meeting was a workshop of Subject Matter Experts (**SMEs**) discussing and reviewing the initial design (referred to as the Rev A design) and the second was a meeting on rail design assumptions. The subsequent May 2023 workshop was a forum for further testing the Project Team's assessment and key assumptions underpinning the preference for a bridge over an underpass particularly in terms of construction and operational implications for the NIMT line.

The key matter raised by KiwiRail was in relation to their future plans for the Four Tracking of the NIMT and ensuring that the Project does not preclude the provision of additional tracks. The Project Team acknowledged this matter and the bridge structures have been designed accordingly, with input from KiwiRail on key clearances and dimensions. The final design would be confirmed through the detailed design stage and discussed with KiwiRail. Any proposed works within the rail corridor will also be discussed with KiwiRail including permission to work within their designation for bridge construction activities.

#### 10.5.6 Network Utility providers

Alliance wide engagement with network utility providers is undertaken regularly and specific projects are discussed during the development of the Project. Te Tupu Ngātahi engages with network utility providers such as Vector, First Gas and Transpower and this engagement has been ongoing throughout the development of the Project.

Conversations relating to the Project have included:

- The Project extent including proposed designation boundaries;
- Project overview, updates and information sharing;
- 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 a Network Utilities Management Plan (**NUMP**) (as provided for by the proposed conditions set out in **Volume 1**) 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 Project is complete.

### 10.5.7 Kāinga Ora

The Project Team engaged with Kāinga Ora to discuss the Project and its relationship with Kāinga Ora properties. Te Tupu Ngātahi gave an overall programme update to Kāinga Ora staff on 11 March 2021. Subsequent meetings were held with Kāinga Ora on 31 August 2022, 27 March 2023, and 12 April 2023 to discuss Kāinga Ora properties, and if there were any future development plans impacted on by the Project. Kāinga Ora was interested in the Assessment of Alternatives, and potential diversion routes for Manuroa Road. There was general support for the Project from Kāinga Ora, and a desire to maintain the dialogue moving forward.

Works in relation to any network utility will be undertaken in accordance with the NUMP 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 Project is complete.

### 10.5.8 Engagement with directly affected landowners

Engagement with landowners potentially affected by the refined options consisted of a two-stage approach:

- Letters and an accompanying map about the Project were sent to all potentially affected landowners in August 2022. The map showed the proposed crossings and closures. Landowners were invited to meet with the Project Team and make comment on the proposals online; and
- Following this, 190 letters were sent to directly affected landowners in March 2023. The letter included a plan of the affected property, showing the property boundary and the extent of the proposed designation within the property. Directly affected landowners were invited to meet with the Project Team to discuss the impacts to their property either face to face or online.

To date, 63 landowners (<33%) have spoken to the team on the phone or via email, and 52 landowners (<27%) have undertaken a meeting with the Project Team in relation to 59 properties. In the meetings, the Project Team assisted landowners by:

- Providing an overview of the Project;
- Explaining the rationale for the concept design of the Project and plan in front of them;
- Explaining the NoR process, including lodgement timing, the ability to make a submission and attend a hearing;
- Listened to landowners concerns and history of the area; and,
- Providing an information pack on the NoR process, Route Protection Information sheet and AT Landowner Guide.

During landowner engagement, questions were raised around property (including the acquisition process, loss of value, and access), implementation timing, and likelihood of construction. Specific queries regarding ongoing tenure of property, traffic modelling, alternatives assessment (in particular

the merits of a bridge relative to underpass at Walters Road), property subdivision, and noise were also raised.

Some of the landowners potentially affected also included developers with interests in Takaanini and the project area. This includes developers currently constructing or planning to construct on sites adjacent or interfacing the project areas. It also included those entities with established development within the project areas such as the Takanini Group who have raised concern about the proposed works within the Walters Road project area (refer further to the Assessment of Alternatives in Appendix A).

Specific matters identified through engagement with directly affected landowners were used to make changes to designation boundaries where possible and provide further understanding of the potential receiving environment.

## 10.6 Summary of engagement outcomes

Engagement has occurred for the TLC through all project stages which includes the IBC, the DBC (including options assessment) and NoR preparation stages. Engagement has been with partners, other network providers, stakeholders, directly affected landowners, and the wider community. Engagement has been used by the Project Team to inform and as appropriate update, change or refine the Project provided for by the NoRs as well as the proposed designation boundaries. As noted, further detail on engagement outcomes is set out in relevant report sections of Assessment of Alternatives (Appendix A).

### 10.6.1 Ongoing and future consultation

The Project Team will continue to meet and engage with directly affected landowners as required, to ensure landowners have adequate information about the Project.

Prior to detailed design and construction, further engagement will be undertaken by the requiring authority as needed to manage the effects of the Project. Specific provision for ongoing engagement is set out in the proposed conditions at Volume 1. These include the requirement for a SCEMP to 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 Project. The Mana Whenua Kaitiaki Forum condition will also provide for the ongoing partnership with Manawhenua who wish to be involved with the future stages of Project including the planning, design, and implementation phases.

## 11 Assessment of Effects on the Environment

An assessment of actual and potential effects of the Project is set out in the following sections of the Report considering the assessment undertaken by the relevant technical specialists in Volume 4. The assessment considers the actual and potential effects of the Project as whole in the first instance. Where required, the assessment focuses on the potential effects arising within the individual project areas (i.e., Spartan Road, Manuia Road, Manuroa Road, Taka Street which falls within NoR 1 and Walters Road which falls within NoR 2). Where appropriate, measures to avoid, remedy or mitigate effects are also recommended.

Where the individual project areas are discussed, sub-sections are arranged by project area in geographical order along the NIMT moving north to south.

One exception to the above is discussion on traffic and transport effects anticipated during construction. This section takes a nuanced approach to reflect the assessment methodology which is further discussed in Section 11.2.1 below.

### 11.1 Positive effects of the Project

This section sets out the positive effects of the Project. Given the interconnected nature of the positive effects associated with the Project, these effects are summarised in this section as opposed to being broken down into the individual effects sections (Section 11.2 onwards).

As well as the range of positive effects identified in Table 11-1, one of the fundamental positive effects of the Project is that it provides a direct response to the existing transport network deficiencies and anticipated issues in the Takaanini (and wider South) area as identified in Sections 2.1 and 3.1 above. If the existing level crossings are retained and failure to address the transport deficiencies will result in a likely future transport environment that comprises of the following outcomes:

- Increased safety risks at level crossings resulting from the combination of traffic growth and increased barrier closures and train movements (especially with the increased train movements anticipated with the CRL and Four Tracking);
- Level crossing barriers may be down for 61% to 64% of the peak hour, with approximately one minute of delay expected per vehicle due to barrier closures;
- Increased delays may result in greater frustration and increase the likelihood of people taking risks at the level crossings to avoid delays;
- Congested transport corridors, due to traffic and queues from barrier closures overflowing to adjacent intersections and impacting the wider network; and
- Decreased east-west connectivity due to minimal walking and cycling facilities in the TLC area and the increased delay.

Implementation of the Project will therefore enable the existing level crossings to be removed and replaced with the necessary infrastructure and connections that are critical to support the safe, resilient, efficient and reliable operation of the transport network for all users.

Table 11-1: Positive effects of the TLC Project

Outcome	Positive effects
Network integration and safety	<ul style="list-style-type: none"> <li>• Improved safety for all road users including vulnerable road users such as pedestrians and cyclists. The Project removes the level crossings and therefore the delays experienced from the barrier arms being down. This in turn will remove the risks taken by road users who decide to cross the level crossings at inappropriate times out of frustration with the barrier arms being down so regularly. Removing the level crossings to allow the uninterrupted east-west flow of vehicles, pedestrians, and cyclists across the NIMT should lead to a transport network that ceases to experience rail crossing related deaths and serious injuries. This will be facilitated by safe by design principles in the final design and construction.</li> <li>• Improved local connectivity in Takaanini, providing east-west connectivity and access to social and economic opportunities: <ul style="list-style-type: none"> <li>• Better travel time reliability;</li> <li>• Improved access for freight to the Takaanini industrial area;</li> <li>• Safer walking and cycling connections and increased active mode permeability in the network;</li> <li>• Greater network resilience and improved reliability for rail services along the NIMT;</li> <li>• Reduction in level crossing fault incidents and disruption of rail services along the NIMT; and</li> <li>• Reduction in industrial freight movements within residential areas (particularly at Manuroa Road) and near ECEs compared with the existing situation.</li> </ul> </li> </ul>
Urban integration	<ul style="list-style-type: none"> <li>• Overcoming the severance effect of the NIMT by establishing uninterrupted connections between the east and west sides of the rail.</li> <li>• Opportunity to reconnect people with the landscape through connected pathways and thematically through cultural narratives associated with the built infrastructure and spaces.</li> <li>• Connecting people through improved connectivity between parks, open space zoned land and recreational facilities.</li> <li>• Integrating the proposed transport infrastructure 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 urban environment.</li> <li>• Typical shared path typologies and planting strips within the road corridor will contribute to better quality landscape outcomes when compared to the existing environment where the roads are dominated by vehicular carriageways.</li> <li>• The Project will remove the existing barrier arms and alarms at each of the level crossings. This will minimise visual clutter either side of the rail line and eliminate barrier arm alarm noise.</li> <li>• The closure of the existing level crossings at Spartan Road and Manuroa Road and replacement with active mode connections minimises vehicular traffic passing through this area. This has positive effects in terms of noise experienced in the surrounding area.</li> </ul>

Outcome	Positive effects
Environmental and Sustainability Outcomes	<ul style="list-style-type: none"> <li>• Providing both shorter and more direct routes in the network which reduce vehicle kilometres travelled (<b>VKT</b>), in turn reducing emissions related to congestion at the level crossings.</li> <li>• Increasing the safe opportunity to use sustainable forms of transport such as PT and walking and cycling.</li> <li>• Protecting improved and new transport corridors will support the Government's policy shift towards achieving an urban form which facilitates reductions in VKT and transport emissions through effective integration of land use and transport.</li> <li>• The inclusion of berms within the corridor will provide an opportunity to establish street trees and vegetation suited to the environment which in turn will increase canopy cover in southern Auckland.</li> <li>• Opportunity to increase canopy cover and re-establish natural landscape values, thus contribute to Auckland Council's aspiration for a connected green network and urban ngahere.</li> <li>• Opportunity for landscape planting to include native eco-sourced trees and revegetation of amenity areas.</li> <li>• Opportunity for landscaping to tie-in with surrounding feature which could improve habitat connectivity.</li> </ul> <p>The designation boundary provides sufficient footprint to:</p> <ul style="list-style-type: none"> <li>• Raise the existing road levels and introducing bridge structures to roads subject to flooding;</li> <li>• Improving drainage on roads, preventing flood flows along and across the road, reducing flood hazard (where this is not limited by existing flooding effects upstream) for road users;</li> <li>• Improve existing culvert capacities and/or provide new stormwater infrastructure which improve ponding and stream flow in the area; and</li> <li>• Improve stormwater quality treatment, retention and detention for existing and proposed impervious areas.</li> </ul>
Socio-Economic	<ul style="list-style-type: none"> <li>• The Project will enable improved accessibility to economic and social opportunities for the Takaanini community, both through enhanced east-west connectivity, more frequent rail services on the NIMT, and greater overall transport network capacity and resilience.</li> <li>• The Project will support and enable Auckland Council's aspirations for the growth of the Takaanini area, including residential and employment intensification to meet anticipated growth demands.</li> <li>• Long-term employment for people involved in construction of the Project.</li> <li>• Auckland Transport has a sustainable procurement programme which focuses on creating quality employment opportunities for local people whilst also getting supplies from local sources.</li> <li>• Designation of land can provide confidence that future transport investment in the area will occur (which in turn could trigger more intensive development); and provide certainty as to the area of impact for the Project (which in turn may enable business and landowners to plan for their future with more certainty).</li> </ul>

## 11.2 Traffic and transport

The Assessment of Transport Effects Report (**Transport Assessment**), included in Volume 4, assesses the actual and potential effects of the future construction and operation of the Project as it relates to transport; and recommends ways of managing these effects. This effects assessment has been based on both a 2038 forecast year and a 2048 forecast year to account for construction effects and full operational effects respectively. This aligns with the available regional transport models and the likely implementation timeframes for the Project.

To consider the effects of the Project, transport networks with and without the Project were assessed in the context of land use scenarios that best represents the likely construction timeframe (i.e. 2038) and full growth build out forecast year (2048). These land use scenarios are based on demand forecasting estimates provided by Auckland Council. Land use forecasts have inherent uncertainty. Currently, there is additional uncertainty around the likely outcomes and the rate and location of the higher density development planned to be enabled through the NPS:UD and MDRS. The land use planning response to these policies is currently being progressed by Auckland Council, and revised land use forecasts reflecting any expected changes were not available at the time of preparing this assessment.

The subsequent sections provide a summary of the transport effects and proposed management measures. The positive transport effects are set out in Section 11.1 above.

### 11.2.1 Assessment methodology

The Transport Assessment methodology outlined in this section assesses the Project in the context of the existing and future environment. The approach to the assessed environment can be found in section 3.2 of the Transport Assessment. Sections 11.2.1.1 – 11.2.1.3 provide an overview of the assessment parameters and the approach to the assessment of operational and construction effects respectively.

#### 11.2.1.1 Assessment Parameters

Section 3.3 of the Transport Assessment identifies the assessment parameters that informed the Transport Assessment. Table 11-2 below gives an overview of these parameters.

**Table 11-2: Transport Assessment Parameters**

<p><b>Assessment years</b></p> <ul style="list-style-type: none"> <li>• 2038 for construction effects, being the likeliest time for construction whilst ensuring some future contextual flexibility.</li> <li>• 2048 for operational effects, ensuring that the maximum extent of impacts (both adverse and positive) is being captured for a period beyond initial implementation.</li> </ul>
<p><b>Approach to staging and sequencing</b></p> <ul style="list-style-type: none"> <li>• Construction effects consider a range of possible sequencing plans during construction. This included several construction scenarios based on geographic areas and assessing construction of a crossing in isolation and simultaneous crossing construction works.</li> </ul>

**Assessment years**

- Operational effects assessment does not assess the interim staging of individual corridors, instead placing a greater focus on the 'full build-out' of the Project to support future communities and assess the transport effects of the Project on the likely future environment.

**Assessment limitations**

- With the assessment being focused on Project implementation beginning in approximately 15 years, the following stages would need to be taken prior to implementation: Business Case for implementation; updated transport modelling; detailed design, consent applications, construction planning and approvals (including the PWA process); and construction.
- Given the above, the NoRs are based on a concept-level design and rely on outline plans of work, conditions, and future management plans to confirm design detail and address local effects. As such the NoRs makes greater use of generic cross-sections and design standards, focuses more on desired outcomes and full-build footprints, takes a longer-term view, and assumes more use of recommended management plans and planning processes rather than specific design details to manage the potential effects.

### 11.2.1.2 Approach to assessment of operational transport effects

Section 3.4 of the Transport Assessment covers the approach to assessment of operational transport effects for this Project.

The potential operational effects were assessed in terms of alignment with key policy documents (section 3.4.1 of the report), transport planning assessment of expected outcomes and effects, and transport modelling to inform demands and network performance (section 3.4.2 of the report).

Below is a list and summary of transport forecasting models:

- The regional multi-modal model (**MSM**) is used to create estimates of vehicle movement at a regional level, based on land use, network, and policy inputs. This model is primarily used to estimate future PT usage;
- The local traffic model, Simulation and Assignment of Traffic to Urban Road Networks model (**SATURN**), uses traffic demands from MSM on a more detailed representation of the road network. This model is the main tool used to predict changed in traffic flows;
- A strategic active modes model, Strategic Active Mode Model (**SAMM**), is used to provide estimates of walking and cycling demands (including those induced by the Project);
- Signalised/ unsignalized Intersection Design and Research Aid model (**SIDRA**) is the intersection model that was used to check concept designs and expected intersection performance at key locations. SIDRA models use expected traffic flows at key locations from the SATURN model;
- Crash Analysis System (**CAS**), was extracted form the last 10 years to determine crash rates over the past ten years to assess trends in the existing environment; and
- Level of service (**LOS**) metrics were used to quantify the potential change in system efficiency. LOS categorises traffic flow quality based on a performance measure from A to F, with A being free flowing traffic and F being forced or breakdown flow.

Table 9 within the Transport Assessment summarises how the operational effects resulting from the Project have been assessed for each component of the transport network. Information sources and

assessment methodologies are covered for all transport modes, as well as safety, property access, and parking outcomes.

**11.2.1.3 Approach to assessment of construction transport effects**

Section 3.5 of the Transport Assessment covers the approach to assessment of construction transport effects for this Project.

Project works will still generally be within the existing road corridors, so major movement of trucks for earthworks or bulk materials is not anticipated. While construction traffic will still be present, the corridors are generally within dense urban road networks with multiple alternative routes. Given this context and the uncertainty of the future construction methodologies, this assessment has not assessed detailed estimates of construction traffic movements.

The impact of any temporary traffic management measures implemented to undertake the Project will be reassessed in the future, prior to construction, when a greater level of detail is available in terms of the specific construction methodology and traffic environment.

It is anticipated that most of the project works will be undertaken ‘online’, within or immediately adjacent to operational corridors. Any future assessment should be required to consider network capacity reductions through potential road closures, capacity reductions on key corridors through lane closures, effects on property access through road or lane closures, and any other ancillary effects such as shoulder closures or temporary loss of access to individual properties.

Given the long-term nature of the Project, construction methodologies are indicative only to identify the general type of transport effects that could eventuate, and thereby inform the scope of proposed management plans.

The main construction effects assessment in this Report considers:

- A number of scenarios (‘construction scenarios’) where the level crossings are closed during the construction of the bridge to assess various scenarios of traffic impact on the network;
- Community access and the expected travel time under the different construction scenarios;
- Impact of the construction scenarios on the various transport modes including general traffic, freight, buses, pedestrians and cyclists;
- An overview of key considerations including speed, potential impacts to pedestrians and cyclists and property access; and
- Identification of any works that should not occur at the same time.

**11.2.2 Operational effects**

Considering the Transport Assessment, the main potential effects anticipated during the operational phase of the Project are summarised in Table 11-3 below.

**Table 11-3: Summary of potential transport and traffic effects during the operation of the Project**

Potential Effect	Assessment
Closure of <b>Takaanini Road</b> at Taka Street	Closure of Takaanini Road with Taka Street will affect the environment as vehicle users who would typically traverse through this link will have to divert via Glenora Road or Beach Road to access Great South Road and Taka Street.

Potential Effect	Assessment
effects community access to the Takaanini Hall	While this would be known to residents and regular visitors to the area, it may cause confusion to new visitors to the Takaanini Hall Community facility.
The current <b>over-dimension freight</b> route is not suitable in the future network due to closure of Manuroa Road level crossing.	Manuroa Road currently forms part of the existing over-dimension freight route. The closure of the level crossing and replacement with an active-modes bridge only will mean that this connection is no longer available within the network for vehicles and could disrupt freight movement within the network.
Routing from the businesses on Spartan Road (west of the railway) northbound onto Great South Road and access to SH1 northbound on-ramp are affected due to <b>Spartan Road level crossing closure</b> .	<p>VTNZ and Hall’s Cold Chain Logistics are typically required to travel northbound onto Great South Road to access the SH1 northbound on-ramp for the operation of their businesses.</p> <p>These businesses would normally travel via a U-turn manoeuvre at the Takaanini interchange (0.5km, 2 minutes), or re-route east over the rail line, through Oakleigh Avenue and Manuroa Road (1.8km, 4 minutes). The option to route via Manuroa Road will no longer be possible due to the closure of the Spartan Road level crossing.</p> <p>The alternative route will be via Manuia Road and using the Manuia Road/ Oakleigh Avenue roundabout to perform a U-turn. This route would be 1.7km and take approximately 4 - 5 minutes to reach the north-bound on-ramp. This routing distance and expected travel time is approximately equivalent to the current routing via Manuroa Road. The respective routes are shown in detail in Section 7.1.3 of the Transport Assessment.</p> <p>The closure of the Spartan Road level crossing has the potential to increase U-turn manoeuvres at the interchange intersection from the remaining land uses (VTNZ and Hall’s Cold Chain Logistics). It is noted that a high number of trips generated from Hall’s Cold Chain Logistics are by heavy vehicles. The current U-turn manoeuvre could potentially be more appealing for traffic generated from these two existing businesses as vehicles will have to pass the U-turn point if they were to use an alternative route to travel northbound.</p> <p>Notwithstanding this, it is noted that U-turn manoeuvres are an existing issue. The closure of the Spartan Road level crossing will reduce the overall amount of traffic coming in and out of Spartan Road onto Great South Road in the middle of the Takaanini interchange. As such, there will be a lower incidence of this existing effect occurring, with the closure of the Spartan Road level crossing.</p>
Potential effects on existing <b>pedestrian access to Takaanini Station</b> from Taka Street and Manuroa Road	The future infrastructure may result in the existing pedestrian access to Takaanini Station from Taka Street and Manuroa Road being impacted permanently.
Potential operational and <b>safety risks at the Takaanini Interchange during peak periods</b> .	There is a risk that queues on the northern arm of Manuia Road / Great South Road intersection could back to the interchange, impacting the operation of the interchange in busy peak periods. There is a risk that if not managed, the queue could extend up through the southbound off-ramp of the SH1 interchange, and vehicles travelling southbound may hit the back off the queue.

Potential Effect	Assessment
Existing <b>property access may be altered</b> in the surrounding network with potential land take	The proposed works may cause parcels to be landlocked if existing property access is altered and a safe alternative access is not provided.

### 11.2.3 Construction effects

#### 11.2.3.1 Construction scenarios assessed

A detailed assessment on transport effects during the construction phase of the Project is undertaken in Section 5 of the Transport Assessment. In summary, the assessment of construction effects was undertaken by dividing the Project into three construction ‘areas’, within which five potential sequencing scenarios were assessed. This was undertaken to demonstrate a range of feasible construction options and identify the range of potential adverse effects. It also informed whether any potential construction scenarios should be avoided or mitigated. The three construction areas addressed the northern crossings (Spartan Road, Manuia Road and Manuroa Road), the Taka Street crossing, and the Walters Road crossing respectively. The scenarios assessed within each of these construction areas are set out in Table 11-4, Table 11-5 and Table 11-6 below.

**Table 11-4: Construction scenarios assessed for construction of northern crossings**

Area 1 – northern crossings (construction of Manuia Road bridge)													
<ul style="list-style-type: none"> <li>Testing two scenarios where Manuia Road bridge has not been built yet.</li> <li>It noted that the Manuia Road bridge can be built without closing either Spartan Road or Manuroa Road level crossings. Hence, the purpose of the above scenarios is to identify which construction staging scenarios would have significant adverse effects and would therefore need to be avoided or mitigated.</li> </ul>													
Scenario 1a – Closure of only Spartan Road level crossing													
<table border="1"> <thead> <tr> <th>East-west connection</th> <th>Scenario 1a</th> </tr> </thead> <tbody> <tr> <td>Spartan Road</td> <td>Closed</td> </tr> <tr> <td>Manuia Road</td> <td>Construction</td> </tr> <tr> <td>Manuroa Road</td> <td>Open</td> </tr> <tr> <td>Taka Street</td> <td>Open</td> </tr> <tr> <td>Walters Road</td> <td>Open</td> </tr> </tbody> </table>	East-west connection	Scenario 1a	Spartan Road	Closed	Manuia Road	Construction	Manuroa Road	Open	Taka Street	Open	Walters Road	Open	
East-west connection	Scenario 1a												
Spartan Road	Closed												
Manuia Road	Construction												
Manuroa Road	Open												
Taka Street	Open												
Walters Road	Open												

**Area 1 – northern crossings (construction of Manuia Road bridge)**

- Testing two scenarios where Manuia Road bridge has not been built yet.
- It noted that the Manuia Road bridge can be built without closing either Spartan Road or Manuroa Road level crossings. Hence, the purpose of the above scenarios is to identify which construction staging scenarios would have significant adverse effects and would therefore need to be avoided or mitigated.

**Scenario 1b – Closure of only Manuroa Road level crossing**

East-west connection	Scenario 1b
Spartan Road	Open
Manuia Road	Construction
Manuroa Road	Closed
Taka Street	Open
Walters Road	Open



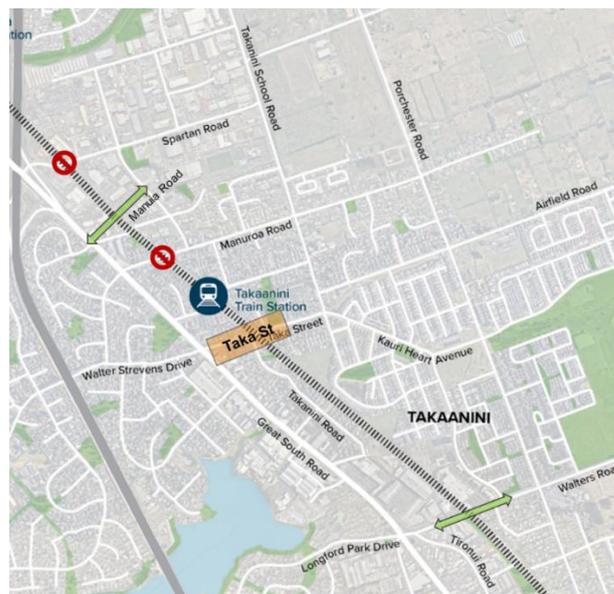
Table 11-5: Construction scenarios assessed for construction of Taka Street bridge

**Area 2 – construction of Taka Street bridge**

- Testing two scenarios where Taka Street bridge has not been built yet and will be under construction.

**Scenario 2a – Closure of both Spartan Road and Manuroa Road (with Manuia Road built)**

East-west connection	Scenario 2a
Spartan Road	Closed
Manuia Road	Built
Manuroa Road	Closed
Taka Street	Construction
Walters Road	Open



**Area 2 – construction of Taka Street bridge**

- Testing two scenarios where Taka Street bridge has not been built yet and will be under construction.

**Scenario 2b – Spartan Road and Manuroa Road remain open (with Manuia Road yet to be built)**

East-west connection	Scenario 2b
Spartan Road	Open
Manuia Road	Not built yet
Manuroa Road	Open
Taka Street	Construction
Walters Road	Open

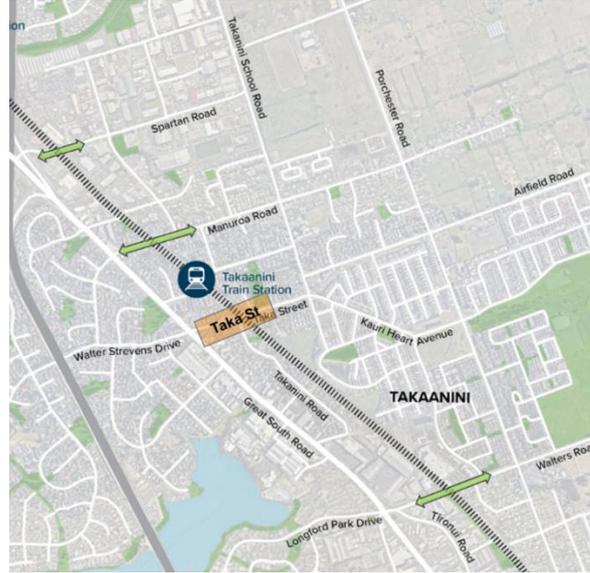


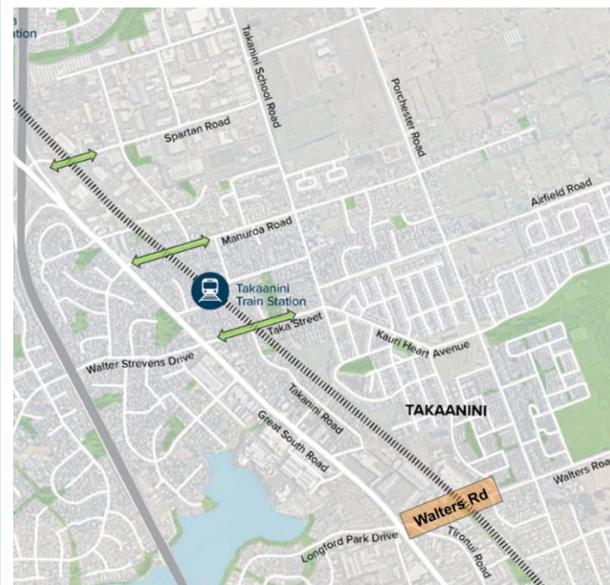
Table 11-6: Construction scenario assessed for construction of Walters Road bridge

**Area 3 – construction of Walters Road bridge**

- Testing one scenario where Walters Road bridge has not been built yet and will be under construction.

**Scenario 3 – Spartan Road and Manuroa Road remain open (with Manuia Road yet to be built)**

East-west connection	Scenario 3
Spartan Road	Open
Manuia Road	Not built
Manuroa Road	Open
Taka Street	Open
Walters Road	Construction



### 11.2.3.2 Key construction effects identified

#### Construction scenario-based effects

Impacts on all transport modes were assessed. The effects identified under each scenario are summarised in the table below.

**Table 11-7: Summary of construction effects identified in each assessed construction scenario**

Scenario	General Traffic	Freight	Walking & Cycling	Public Transport
<b>Scenario 1a</b>	Manuroa Road becomes increasingly congested.	Additional freight on Manuroa Road	Walk time could increase to be an additional 12 minutes	Diverted traffic adds pressure on bus network
<b>Scenario 1b</b>	Taka Street becomes increasingly congested	Increased freight on residential streets	No significant increase in walk time	Diverted traffic on bus routes are not significant
<b>Scenario 2a</b>	Only two east-west connections in the network. Manuia Road is very congested in peak periods. Drive time for locals east of the rail line travelling to/from Southgate could increase by 3 minutes	Industrial and residential traffic mixing on Manuia Road	Walk time could increase to be an additional 9 minutes or 17 minutes (if no through-movement pedestrian access is permitted via Takaanini Station)	Diverted traffic on bus routes are not significant
<b>Scenario 2b</b>	Manuroa Road worsens. However, delay increase is not significant. Drive time for locals east of the rail line travelling to/from Southgate could increase by 3 minutes	No effect on freight access or surrounding residential neighbourhoods	Walk time could increase to be an additional 9 minutes or 14 minutes (if no through-movement pedestrian access is permitted via Takaanini Station)	Diverted traffic on bus routes are not significant
<b>Scenario 3</b>	There is a significant gap in east-west connectivity. Drive time for locals east of the rail line travelling to/from the Tironui Road shops could increase by 2.5 minutes	No effect on freight access or surrounding residential neighbourhoods	Walk time could increase to be an additional 10 minutes or 28 minutes (if pedestrian access is closed at Tironui Station Road)	Diverted traffic on bus routes are not significant

The potential effects identified for each construction scenario tested (see Table 11-7) have informed the considerations for future construction sequencing. Overall, the scenario testing illustrates that there are various ways in which construction and construction sequencing could be undertaken with a range of respective potential construction effects on different transport modes. As noted previously, a

set construction sequencing is not proposed at this stage with this decision based on a range of factors such as project funding, network performance and likely capacity at the time of construction.

High-level recommendations are as follows:

- Manuia Road bridge should be constructed and operational before the level crossings at Spartan Road and Manuroa Road are closed. Ensuring that the Manuia Road bridge is operational before the other crossings are closed will resolve the issues that would have occurred in Scenario 1a and 1b.
- A suitable alternative to facilitate traffic, pedestrian and cyclist movement should be provided for the closure of Taka Street during construction. This could mean the following:
  - Partial closure with some movements retained on Taka Street; and/or
  - Reroute traffic to an alternative connection such as Manuroa Road or Manuia Road (with Spartan Road open in either scenario). This would mean at least three connections are provided in the Takaanini network.
- Continued access to Takaanini Station during construction of the Project will need to be managed via the construction traffic management plan.
- Walters Road is a key connection in the Takaanini network, providing access to the Takanini Town Centre. Not providing a connection at this location will result in a significant gap in east-west connectivity in the network. Hence, offline construction (as much as practicable) is recommended to retain movements in this corridor.
- A suitable alternative to facilitate traffic movement will be provided for the closure of Taka Street and/or Walters Road during construction. This could entail offline construction or partial closure.

The considerations above provide a baseline understanding of recommendations in each of the assessed areas to inform the future detailed design process and preparation of the Construction Traffic Management Plan (CTMP) required by the proposed designation conditions. The outcomes anticipated by the CTMP will address these matters and are set out at Section 11.2.4 below.

### General construction effects

Further to the above scenario-based assessment, the following general potential construction traffic effects were identified. These effects are relevant across multiple scenarios:

- Temporary disruption to people movement and vehicle movement in the area for the indicative construction duration of 2.5 – 3 years;
- Reduced network resilience due to multiple level crossing closures during construction. If one corridor is closed for construction without an alternative, the network will see an increase in congestion and reduction in network resilience;
- Traffic generated during construction, including construction vehicle movements to and from the construction areas, partial or full road closure, temporary speed limits restriction around site access, and impacts to vulnerable road users. Points of conflict along the TLC corridors include access points along each corridor;
- Effects on existing pedestrian access to Takaanini Station from Taka Street and Manuroa Road;
- Access to properties along the TLC corridors may be impacted by temporary traffic management controls during the construction works; and
- Construction vehicles parking in the surrounding network.

The considerations above provide a baseline understanding of effects to inform the future detailed design process and preparation of the CTMP required by the proposed designation conditions. The

outcomes anticipated by the CTMP will address these matters and are set out at Section 11.2.4 below.

### 11.2.4 Recommended measures to avoid, remedy, or mitigate adverse traffic and transport effects

The following sections discuss the proposed measures to manage the transport effects of the Project.

#### 11.2.4.1 Construction traffic effects mitigation measures

The Transport Assessment recommends a number of measures to address the potential impacts arising during the construction phase as outlined in Table 11-8 below.

**Table 11-8: Summary of recommendations in the Transport Assessment to manage construction effects**

Potential Effect	Recommendation
<p>Temporary disruption to people movement and vehicle movement in the area for an indicative construction duration of 2.5 – 3 years.</p> <p>Reduced network resilience due to multiple level crossing closures during construction. If one corridor is closed for construction without an alternative, the network will see an increase in congestion and reduction in network resilience.</p>	<ul style="list-style-type: none"> <li>• Provide a suitable alternative to facilitate traffic, pedestrian and cyclist movement for the closure of Spartan Road or Manuroa Road level crossings such as constructing <b>Manuia Road</b> bridge.</li> <li>• Provide a suitable alternative to facilitate traffic, pedestrian and cyclist movement for the closure of <b>Taka Street</b> level crossing during construction. This could mean the following: <ul style="list-style-type: none"> <li>• Partial closure; and/or</li> <li>• Reroute traffic to an alternative connection such as Manuroa Road</li> </ul> </li> <li>• Provide a suitable alternative to facilitate traffic, pedestrian and cyclist movement should be provided for the closure of <b>Walters Road</b> level crossing during construction. This could mean undertaking offline construction or partial closure.</li> <li>• Mitigate impacts by having appropriate timing of closures and community engagement.</li> </ul>
<p>Traffic generated during construction, including construction vehicle movements to and from the construction areas, partial or full road closure, temporary speed limits restriction around site access, and impacts to vulnerable road users. Points of conflict along the TLC corridors include access points along each corridor.</p>	<ul style="list-style-type: none"> <li>• Managed/ mitigate effects through temporary traffic management planning, such as Construction Traffic Management Plan(s) (<b>CTMP</b>), including engagement before construction commencement.</li> <li>• Access to compound sites, laydown areas and construction zones for construction vehicles, plant and materials should be via site access points identified as part of future CTMPs.</li> <li>• Provide sufficient space for construction laydown areas to allow for construction vehicles to be stored off the transport corridors and to reduce impact on through movement in the network.</li> </ul>
<p>Access to properties along the TLC corridors may be impacted by temporary traffic management controls during the construction works.</p>	<ul style="list-style-type: none"> <li>• Provide safe temporary access provision for existing driveways that remain during construction.</li> <li>• Manage constraints on access to affected properties during construction.</li> </ul>

Potential Effect	Recommendation
Construction vehicles parking in the surrounding network.	<ul style="list-style-type: none"> <li>Provide construction parking facilities within the site footprint. Construction site workers should be provided with allocated facilities to access the site so that local business parking will not be impacted.</li> </ul>

The primary mechanism to respond to these recommendations include the following key conditions (refer to Volume 1) put forward for all NoRs:

- **CTMP** – this provides a mechanism for determining:
  - 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
  - Access routes and access points for all construction vehicles, parking areas for plant, construction vehicles, and the vehicles of workers and visitors;
  - Identification of detour routes and other methods to ensure the safe management and maintenance of traffic flows, including pedestrians and cyclists, on existing roads;
  - Methods to maintain vehicle access to property and/or private roads where practicable, or to provide alternative access arrangements when it will not be;
  - The management approach to loads on heavy construction vehicles;
  - Methods that will be undertaken to communicate traffic management measures to affected road users (e.g., businesses, residents, public, stakeholders, emergency services);
  - Auditing, monitoring and reporting requirements relating to traffic management activities;
  - Details of minimum network performance parameters during the construction phase, including any measures to monitor compliance with the performance parameters; and
  - Details of any measures proposed to be implemented in the event of thresholds being exceeded.
- **CEMP** – This provides a mechanism for determining details such as the programme of works, staging approach and the proposed hours of construction.
- **Stakeholder Communication and Engagement Management Plan (SCEMP)** – This provides a management framework for identifying and engaging with affected parties and stakeholders about the construction phase of Project including proposed hours of construction activities such as construction traffic.
- **Project Information** – requires the establishment of a project website or equivalent virtual information source to provide information on the Project including anticipated construction timeframes, status of the Project, contact details for enquiries, implications of the designation for landowners and occupiers and advice on how/where they can receive additional information.

#### 11.2.4.2 Operational transport mitigation measures

The Transport Assessment recommends measures to manage transport effects arising from the operation of the Project. The Project responds to these recommendations through a range of proposed conditions (refer to Volume 1), specifically the following:

- **Outline Plan for a Stage of Work** – prior to the construction and implementation of the Project, the detailed design process will be undertaken to determine the final design including final corridor

cross-sections, stacking lengths, and any required safety measures. The final design will then be required to be submitted for approval with the Council as part of an Outline Plan (or Plans).

- **ULDMP** – the ULDMP provides a mechanism for determining how the Project is designed to integrate with the adjacent urban and landscape context, provides appropriate walking and cycling connectivity, promotes inclusive access and a sense of personal safety by aligning with best practice guidelines such as CPTED principles, Safety in Design requirements and Maintenance in Design requirements. It also requires details of roadside elements such as wayfinding and signage.
- **Existing Process Access** – Requires consultation with landowners whose vehicle access to their property will be altered by the Project and to demonstrate how safe reconfigured or alternative access could be provided (unless otherwise agreed with the landowner).

Alongside these conditions, it is also noted that an alternative over-dimension route from Porchester Road to Great South Road, through the industrial area can be provided via Manuroa Road, Oakleigh Avenue and the Manuia Road connection. This alternative route has been agreed with AT freight SMEs. The Outline Plan process above can further ensure that Manuia Road (which forms part of this new route) is sufficiently designed to provide for this function.

## 11.3 Landscape and visual

An Assessment of Landscape and Visual Effects Report (hereafter **Landscape Assessment**) is supplied in Volume 4. The Landscape Assessment considers the actual and potential effects associated on natural character, landscape character and visual effects associated with the construction and operation of the Project and recommend measures to mitigate these effects.

The following sections provide a summary of the key assessment findings, including the methodology applied and recommended measures to manage effects. Any identified positive landscape and visual effects are covered as part Section 11.1 above.

### 11.3.1 Assessment methodology

The Landscape Assessment was undertaken in accordance with Tuia Pito Ora New Zealand Institute of Landscape Architects (2022) *Te Tangi a te Manu*, Aotearoa New Zealand Landscape Assessment Guidelines (**Te Tangi a te Manu**). Actual and potential landscape and visual effects during the construction and operational phases of the Project were considered for the overall network as well as the individual project areas.

In relation to 'natural character', the Landscape Assessment considers that while the natural and biophysical environment is a critical component of landscape assessment, under the RMA, natural character is to be evaluated in relation to Section 6(a) of the RMA. With this as the reference point and taking into account the context of the project areas which are highly modified urban environments (which anticipates future intensification) the Landscape Assessment concludes that the project areas do not possess attributes or characteristics which warrant an assessment of natural character. Effects on natural character are therefore assessed and considered to be nil.

The Landscape Assessment therefore focuses on and provides a level of effect for landscape and visual effects only.

### 11.3.2 Construction effects

The temporary adverse landscape character and visual amenity effects from the Project (considering the network as a whole) during the construction phase are summarised below:

- **Construction footprint:** Potential adverse construction effects are expected to result from the construction works footprint, where construction machinery, laydown areas, temporary structures and site preparation works including earthworks and vegetation removal, will be introduced within the environment. The additional width of works required during construction may also cause vegetation outside of the permanent corridors to be removed and for work to occur within the protected root zone of existing trees.
- **Open spaces and reserves:** The Project has the potential to affect five open spaces during the construction phase – this is generally along the edge of the open space adjacent the street frontage, or changes to the access/routing to the space. There is the potential for the removal of trees within the open spaces during the construction phases which can have an impact on their landscape character values. Although construction activities will result in some disruption to these open spaces, they can still remain accessible and usable.
- **Exposed earthworks:** Exposed earthworks can result in visual landscape effects during construction.
- **Reduced amenity:** Adjacent residents and users of the spaces (e.g., vehicles, pedestrians, cyclists) are likely to experience temporary reduced amenity, including from noise, dust and lighting, as well as from visual effects caused by the presence of construction activities.
- **Reduced visual amenity:** Fixed viewers along the project areas will be proximate to and will have views of the construction activities. Views from public locations will likely be restricted to transient viewers (e.g., motorists, pedestrians, cyclists, commuters) travelling along the road and rail corridors, within open spaces and shopping centre carparking where they are proximate the project areas.
- **Temporary effects:** it is anticipated that activities during construction of the works will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by public transient viewing audiences. Another important consideration is that landscape change by way of vegetation removal, land modification and urban development forms part of the expected backdrop of the existing environment as the area intensifies. Notwithstanding this, some public and private vantage points are likely to witness heightened adverse visual effects through the construction phase.

Assessment of the key construction effects relevant to each specific project area are further discussed in the following sections below. In summary, the level of effects during the construction phase for each of the project areas are provided in Table 11-9 below.

**Table 11-9: Summary of level of landscape and visual effects during the construction phase**

<i>NOR</i>	<i>Project Area</i>	<i>Construction Phase</i>	
	<i>Spartan Road</i>	<i>Landscape Character</i>	<b><i>Low adverse</i></b>
		<i>Visual Amenity</i>	<b><i>Low adverse</i></b>
	<i>Manuia Road</i>	<i>Landscape Character</i>	<b><i>Moderate adverse</i></b>
		<i>Visual Amenity</i>	<b><i>Moderate adverse</i></b>

<b>NOR</b>	<b>Project Area</b>	<b>Construction Phase</b>	
<b>NoR 1</b>	<i>Manuroa Road</i>	<i>Landscape Character</i>	<b>Low adverse</b>
		<i>Visual Amenity</i>	<b>Low to Moderate adverse</b>
	<i>Taka Street</i>	<i>Landscape Character</i>	<b>Moderate adverse</b>
		<i>Visual Amenity</i>	<b>Moderate to High adverse</b>
<b>NoR 2</b>	<i>Walters Road</i>	<i>Landscape Character</i>	<b>Moderate adverse</b>
		<i>Visual Amenity</i>	<b>Moderate to High adverse</b>

### 11.3.2.1 Spartan Road project area

#### Landscape character

- The construction phase will change the landscape character of the project area from a working industrial urban landscape with road and rail corridors to an active construction site. Construction machinery, materials, and activity will be introduced. The works will disrupt access and driveways for a number of local businesses along Spartan Road. The only tree that will be impacted is noted as a pest species.
- Although there will be temporary disruption with the introduction of the construction works, these are not considered out of place or inconsistent with the character of the area. No buildings will be impacted; with works only anticipated within areas of open paving (approx. 12 properties). This part of Takaanini has low landscape values / amenity attributed to its industrial character. Adverse effects on the landscape character during construction are temporary and assessed to be **low adverse**.

#### Visual amenity

- In terms of visual amenity, views of the project area are largely restricted to the localised context of Spartan Road, the adjacent industrial properties, from SH1 and users of the rail line. There are no residential properties or open spaces within the immediate setting with viewers of the project area largely transient. The degree of disruption is moderated by the works being restricted to the existing road reserve and industrial properties. While construction works will be visible from the adjacent properties and partially visible from the nearby SH1, any adverse visual amenity effects during construction are assessed to be **low adverse**.

### 11.3.2.2 Manuia Road project area

#### Landscape character

The works anticipated in this project area will modify the urban pattern and street network in this part of Takaanini through the construction of a new road and bridge crossing the NIMT. As such, there will be disruption and considerable modification to the area through the construction phase. The existing buildings and some street trees within the project area will need to be removed to enable construction machinery, materials, temporary structures, and activities within the project area. The construction equipment is anticipated to be of greater scale (e.g., cranes) to construct the bridge. The character of the project area will therefore change from the existing industrial land use to that of an active

construction site. Access to some properties and businesses proximate to the designation may be impacted.

Although the construction works will present a temporary change to the character of the area which includes commercial, residential, and open space community uses, modification and development in an urban environment can be anticipated. The extent of the project area/works is not considered to be out of context, and this part of Takaanini has relatively low existing landscape values and amenity. Overall, any adverse effects on landscape character resulting from the construction phase will be temporary and assessed as **moderate adverse**.

### Visual amenity

As above, this part of Takaanini is considered to have poor visual amenity due to the utilitarian use and industrial character. Views of the project area are limited and are largely restricted to the immediate and localised context due to impeding existing buildings and vegetation. While the degree of disruption is moderated by works being only on existing industrial properties, properties (including residential, fixed viewers) that remain adjacent to the project areas will experience the greatest potential adverse effects. This is due to their proximity and potential outlook to the project area and construction works.

Although visible, the construction works will be temporary and will be seen in the context of the wider industrial land use. The construction phase will present activities which are not common (although not unanticipated), changing the outlook from local properties and from roads. It is acknowledged that those residential properties closest to the designation boundaries (to the southeast), accessed via Portrush Lane have potential to experience greater adverse effects and be more affected than others. However, any adverse effects on visual amenity resulting from the construction phase are assessed to be **moderate adverse** overall.

### 11.3.2.3 Manuroa Road project area

#### Landscape character

The construction phase will introduce machinery, materials and activity into the project area, resulting in a change from predominantly residential zoned land use to an active construction site. The works have the potential to disrupt access for several properties along Manuroa Road and pedestrian access to the Takanini Station. Two notable trees<sup>17</sup> will also require removal to facilitate construction work. Their removal through the construction phase will result in an adverse effect on the landscape character before replacement (mitigation) planting can be undertaken.

While there is disruption within the area, the works are not considered to be out of place or inconsistent with the character of the area. Potential effects on landscape character are assessed to be **low adverse** because:

- The construction works phase will be temporary;
- The extent of the project area is limited;
- Construction work and development area anticipated in the urban environment (as sought by the respective AUP:OP provisions and PC78);
- The works will not be out of context associated with the road and rail transport infrastructure and corridors; and

<sup>17</sup> Which would trigger consent under District Plan provisions to remove (refer to Section 11.5.1 for further discussion).

- Mitigation measures can be implemented (further discussion refer to Section 11.3.4 below).

### Visual amenity

Views of the project area are limited and largely restricted to the localised context of transient viewers along Manuroa Road, Oakleigh Avenue and the rail corridor, as well as the static views from remaining adjacent residential properties and buildings. The greatest potential adverse effects are likely to be experienced by those properties immediately adjacent to the project area given their proximity and potential outlook to the construction works.

It is anticipated that lower-level construction activity and machinery can largely be contained by hoardings. However, taller elements such as cranes used for the construction of the bridge will still be visible.

Notwithstanding this, the area is considered to have relatively low visual amenity attributed to the setting and intersection of the road and rail corridor, located adjacent to the suburban residential context. The construction works will be viewed within this context.

Taking into account the limited visual catchment and context of the viewing audience, any adverse effects on visual amenity during the temporary construction phase are assessed to be **low to moderate adverse** overall.

#### 11.3.2.4 Taka Street project area

### Landscape character

The construction phase will introduce machinery (including elements of scale such as cranes), materials, and activity within a predominantly suburban residential environment. The works will involve acquiring and clearing a number of properties adjacent to and fronting the existing road to facilitate the works. While the project area is linear, the works will result in disruption to the existing urban pattern and form of the area. The works will also result in the closure and disconnection of Takanini Road with Taka Street. Takaanini Station is also located off Taka Street, with the existing pedestrian access potentially disrupted by the works.

An existing open space east of the rail line on Taka Street called Takaanini Reserve is partially within the project area and will be impacted by the construction phase. A removal of a number of established trees<sup>18</sup> (refer further to the arboriculture effects assessment in Section 11.5) and the existing skate park will reduce the landscape amenity and appreciation of the area. The reserve will also marginally reduce in size with potential for access to be impacted if not addressed. Other existing landscape features within the project area such as street trees will also require removal to facilitate works.

While the construction work will present a temporary change to the character of the area, modification and development in an urban environment is anticipated. Notwithstanding this, given the number of properties impacted, loss of open space land (including established trees and the skatepark), large scale machinery required and the more sensitive residential receiving environment, on balance, the adverse effects on landscape character are assessed to be **moderate adverse**.

### Visual amenity

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<sup>18</sup> which would trigger consent under District Plan provisions to remove (refer to Section 11.5.1 for further discussion).

Similar to the other projects areas assessed above, views of this project area are limited to the immediate and localised context. Views are largely restricted to Taka Street, Great South Road, Takanini School Road, Takanini Road, adjacent remaining properties (including an aged care centre), users of Takaanini Reserve and along the rail line. The area has relatively low visual amenity attributed to the intersection of the road and rail corridor. However, the level of amenity increases due to Takaanini Reserve and the suburban residential context.

Viewers of the construction work in this project area will include those who are transient moving through the area within the road corridor (e.g., vehicles, pedestrians, cyclists), people in Takaanini Reserve or those travelling along the rail line. More static views will be afforded from the adjacent residences and properties. The visual catchment, although restricted, extends along the entire length of Taka Street with residences (including the aged care centre) and Takaanini Reserve located adjacent to the proposed designation boundaries. Those properties that remain adjacent to the project area such as the aged care centre are likely to experience the greatest potential adverse effects given their proximity and potential outlook to the works area.

Taking into account the visual catchment, the nature of the view and the extent of the works area, any adverse effects on visual amenity during the construction phase are assessed to be **moderate to high adverse** overall.

### 11.3.2.5 Walters Road project area

#### Landscape character

The linear project area extends over the existing Walters Road corridor and a number of properties adjacent to and fronting Walters Road and Tironui Road. Existing buildings, areas of vegetation and street trees will need to be removed to facilitate works within the project area. This includes removal of a row of Sweet Gum trees<sup>19</sup> along the Arion Road reserve at the eastern end of Walters Road. These trees enhance the streetscape character and amenity of the area which will be adversely affected with their removal. An area of planting fronting the Takanini Town Centre carpark which includes low-level manicured planting and trees will also be affected by the construction work.

Machinery, materials, structures, and activities associated with the construction phase will be introduced within the project area. Over time during the construction phase, earthworks will also be undertaken to create new landforms and physical attributes (e.g., retaining walls to enable the works) for the batter slopes and levels necessary for the bridge. This will see a slow introduction of a new physical element in this context. The area will change from the mix of uses (Business – Town Centre, industrial, residential, road corridor) to a construction site. The construction works will disrupt the existing urban pattern of the area. Access to a number of properties which front the project area will also be affected by the works.

The construction phase will result in a temporary change to the character of the area, however, modification and development in this urban environment can be anticipated through the AUP:OP provisions and PC78. The location and extent of the project area are not considered to be out of context in this setting and in order to deliver improvements of transport infrastructure to support urban growth. Overall, any adverse effects on landscape character resulting from the construction phase are assessed as being **moderate to high adverse**.

<sup>19</sup> which would trigger consent under District Plan provisions to remove (refer to Section 11.5.1 for further discussion).

## Visual amenity

The topography of the area is generally flat, however, there is a gentle rise from west to east. Similar to the other project areas, views to the construction area are limited due to the impeding existing buildings and vegetation. In the context of Walters Road, views are largely restricted to the localised context of the project area. Viewers of the construction works will include those who are transient moving through the area on the nearby adjoining roads and spaces (e.g., pedestrians, shoppers, cyclists, and vehicles). This includes along the rail line, a small section of Great South Road, Braeburn Place, Arion Road, Porchester Road and along Walters Road, as well as within the carparking of the Takanini Town Centre and Southgate Shopping Centre). More static views will also be afforded from the remaining residential, industrial, and commercial properties (including buildings/offices within the Takanini Town Centre) adjacent to the project area.

The visual catchment from these properties, although restricted, extends along the entire length of Walters Road. The construction works will be temporary but introduces activities which are not common (although not unanticipated), changing the outlook from the adjacent locations described above. There will be greater adverse effects on localised areas and some parties will be more affected than others given the works required. In particular, this will include the properties on the Business – Town Centre zoned land (and buildings) to the north of the works which will have views directly to the construction area and emerging form required for the bridge.

Although mitigation measures are recommended (see Section 11.3.4), the extent of construction works will be visible, including larger construction machinery such as cranes required to construct the bridge.

Taking into account the visual catchment, the nature of the view and the extent of the project area, any adverse effects on the visual amenity during the temporary construction phase are assessed to be **moderate to high adverse** overall.

### 11.3.3 Operational effects

The following sections discuss the key potential natural character and visual effects which could arise from the operation of Project, on a project-area basis. For the purposes of this assessment, operational effects consider mitigation measures (as recommended in Section 11.3.4 below) as being fully implemented. It assumes that planting has become fully established (i.e., 5 years growth).

In summary, the level of effects for each of the project areas during the operational phase are provided in Table 11-10 below.

**Table 11-10: Summary of level of landscape and visual effects during the operational phase**

<b>NOR</b>	<b>Project Area</b>	<b>Operational Phase</b>	
	<i>Spartan Road</i>	<i>Landscape Character</i>	<b>Very Low adverse</b>
		<i>Visual Amenity</i>	<b>Very Low adverse</b>
	<i>Manuia Road</i>	<i>Landscape Character</i>	<b>Low adverse</b>
		<i>Visual Amenity</i>	<b>Low to Moderate adverse</b>

<b>NOR</b>	<b>Project Area</b>	<b>Operational Phase</b>	
<b>NoR 1</b>	<i>Manuroa Road</i>	<i>Landscape Character</i>	<b>Low adverse</b>
		<i>Visual Amenity</i>	<b>Low adverse</b>
	<i>Taka Street</i>	<i>Landscape Character</i>	<b>Low to Moderate adverse</b>
		<i>Visual Amenity</i>	<b>Low to Moderate adverse</b>
<b>NoR 2</b>	<i>Walters Road</i>	<i>Landscape Character</i>	<b>Moderate adverse</b>
		<i>Visual Amenity</i>	<b>Moderate adverse</b>

### 11.3.3.1 Spartan Road project area

#### Landscape character

In relation to landscape character, the industrial land uses and utilitarian character of the area will remain the same post construction. The main difference will be the configuration of Spartan Road which will include two cul-de-sac heads (either side of the rail line) and the active mode bridge crossing the NIMT. Traffic movements will reduce in this area to destination based rather than an east-west thoroughfare for vehicles.

While the project area encroaches into the adjacent properties, the existing buildings are anticipated to remain. However, over time, the area is anticipated to change and be developed in accordance with the AUP:OP provisions and PC78. As such, the Project will form a complementary element in this landscape and any adverse effects on landscape are anticipated to be **very low adverse**, with the mitigation measures implemented (refer to Section 11.3.4 below).

#### Visual amenity

Any adverse effects on visual amenity are also assessed to be **very low adverse**. Some positive effects are anticipated resulting from the upgrade of the streetscape environment and reduction of vehicle movements. The project area and anticipated infrastructure elements will not be seen out of context and can integrate into the surrounding urban environment.

### 11.3.3.2 Manuia Road project area

#### Landscape character

The character and land use of the area will remain primarily industrial in land use (to the north) and residential to the south (with some commercial activity retained within the existing residential zoned land). However, the existing Residential - Mixed Suburban Zone to the south will be upzoned to Residential – Terrace Housing and Apartment Buildings Zone as anticipated through PC78. As such, this area is anticipated to change to enable urban intensification, including buildings of greater density and height.

The project works will introduce a new land use i.e., a new multi-modal bridge crossing through an industrial area and where there is currently no crossing. It will however be of a scale that is consistent with the anticipated future landscape character and enabling better east-west transport connections through the area. The new road also provides a connection and logical alignment by 'squaring up' the overall urban form (road and lot layout) in this part of Takaanini. The abutments / embankments anticipated within the project area could be planted with native vegetation (of varying form and scale) which can contribute to the urban ngahere (forest) and will enhance the character of the area.

The works are considered to form a complementary element within the landscape and any adverse effects on landscape character are anticipated to be **low adverse**, with mitigation measures implemented (refer to Section 11.3.4 below).

### Visual amenity

The works within the Manuia Road project area present a considerable change to this urban landscape. It will result in positive effects related to the 'squaring up' of the roading and development block pattern in the area. It also adds a new east-west connection across the rail line through this landscape. While the anticipated abutments / embankments could be large in scale, their visual effects could be mitigated through the design of their form and appropriate planting. The scale of the new bridge is acknowledged to be necessary to enable the future four-tracking of the rail line and will not be viewed as being out of context. It will also integrate with the future urban form anticipated from the urban uplift and development in the area.

The access lane proposed off the 'new' Manuia Road connection provides a logical connection to the adjacent properties. Views toward the project area from remaining properties adjacent to the project area will be toward either:

- A new road; or
- A bridge abutment / embankment which can be planted.

Any adverse effects on visual amenity are assessed to be **low to moderate adverse**.

### 11.3.3.3 Manuroa Road project area

#### Landscape character

During the operational phase, the landscape character of the area is anticipated to change considerably with urban intensification, including buildings of greater density and height. This is enabled by the AUP:OP provisions and PC78, with upzoning of the existing Residential - Mixed Housing Urban zoning to the more intensive Residential – Terrace Housing and Apartment Building zone. The works in the project area will result in the reconfiguration of Manuroa Road to have two cul-de-sac heads (either side of the rail line) and an active modes bridge crossing the rail line. Traffic movements will reduce as this area will become 'destination' based rather than an east-west thoroughfare for vehicles.

Overall, the works are considered to be consistent with the future landscape character, enabling infrastructure that is of a scale that can achieve the necessary Four Tracking spatial clearances and a better and safer transport connection through the area. It will introduce complementary elements into this landscape and any adverse effects on landscape character are anticipated to be **low adverse**, with mitigation measures implemented (refer to Section 11.3.4 below).

It is noted that following the implementation of the infrastructure and any mitigation required, there are opportunities to consider reintegration of land that may no longer be required post construction. This could include enabling the land to be redeveloped in accordance with the broader urban intensification direction and their underlying land use zoning.

### Visual amenity

Any adverse effects on visual amenity area also assessed to be **low adverse**. Some positive effects are anticipated resulting from the upgrade of the streetscape environment, decluttering of the road environment, and reduction of vehicle movements. The project area and anticipated infrastructure elements will not be seen out of context in relation to the proximity of the rail line and will integrate into the surrounding urban environment.

#### 11.3.3.4 Taka Street project area

### Landscape character

The landscape character of the area is anticipated to change considerably as enabled by the AUP:OP provisions and PC78, upzoning the existing Residential – Mixed Housing Urban Zoning to Residential – Terrace Housing and Apartment Buildings zone. As such, this area is anticipated to intensify with buildings of greater height and density. The proposed bridge will introduce large transport infrastructure into this urban and predominantly residential environment. Notwithstanding this, it is a logical connection across the rail line along Taka Street, improving and providing a safer east-west transport connection and providing a link to Takaanini Reserve and Takaanini Station.

The cul-de-sac heads and access lanes result in the remaining houses which front the project area having a greater setback from the street edge which leads to disjointed connectivity and urban form. With this layout, the bridge has the potential to be more visible for these adjacent properties, however, the separate distance from the property boundary can also provide some relief as in most instances buildings will not be immediately adjacent to works. The proposed undercroft spaces (i.e., spaces under the bridge) will have potential adverse effects on landscape character as there is potential for these areas to become unsafe and have low amenity values. This will need to be a key consideration for the detailed design phase and will be addressed through the ULDMP.

Overall, the works within the project area will be consistent with the future landscape character. It enables infrastructure that is of a scale that is functional (i.e., meets sufficient clearances required over the future Four Tracking), but can achieve a better and safe transport connection through the area and across the rail line. The proposed configuration of the road cross section can generally achieve improved streetscape amenity with the provision for active modes and street tree planting.

Potential effects on landscape character during the operational phase are assessed to be **low to moderate adverse overall**.

As above, following the implementation of the infrastructure and any mitigation required, there are also opportunities to consider reintegration of land that may no longer be required post construction. This could include enabling the land to be redeveloped in accordance with the broader urban intensification direction and their underlying land use zoning.

### Visual amenity

Any adverse effects on visual amenity are assessed to be **low to moderate adverse**. Although the project works will introduce a new bridge element of considerable scale into this setting, it will

generally be viewed in the context of the aforementioned emerging urban environment. There are specific cases such as the aged care centre located immediately adjacent to the bridge where adverse effects could potentially be higher. It is however noted that these sites are subject to upzoning and anticipated intensification under PC78. Overall, the works are anticipated to include mitigation measures with trees and planting to provide visual softening of the proposed form and enhancement of the streetscape, particularly from those properties adjacent to the project area.

### 11.3.3.5 Walters Road project area

#### Landscape character

The landscape character of this project area and its wider context is also anticipated to change as enabled by the AUP:OP and the direction of the NPS:UD (including MDRS standards). As such, urban intensification is anticipated, and the proposed bridge and form of the abutments can become integrated parts of this urban landscape. While the proposed works will provide a change to the character of the area, it will provide improved transport infrastructure enabling better transport connections to support the anticipated urban growth. The infrastructure is also of a scale that reflects the anticipated growth to the rail line through future Four Tracking. The proposed road cross section will generally improve streetscape amenity along the mainline corridor with the provision for active modes and street trees.

The proposed access lanes, however, will result in future buildings which front the project area (particularly to the west of the NIMT) being set back from the street edge. This results in disjointed connectivity and urban form. The set back will also increase visual prominence of the bridge. The proposed undercroft spaces (i.e., spaces under the bridge) may also generate adverse effects on landscape character as there is potential for these areas to be unsafe and have low amenity values. This will need to be a key consideration for the detailed design phase and will be addressed through the ULDMP.

Overall, the potential effects on landscape character during the operational phase are assessed to be **moderate adverse** in this location because:

- The proposal will provide improved transport connection through the area across the rail line to support anticipated urban growth;
- The new bridge and proposed streetscape cross section (particularly the mainline corridor) will provide the opportunity for enhanced streetscape amenity;
- Although new and large scale infrastructure is introduced, the scale of the proposal will not be out of context in relation to the anticipated scale of development enabled in this urban environment; and
- Mitigation measures can be implemented.

Following the implementation of the infrastructure and any mitigation required, there are also opportunities to consider reintegration of land that may no longer required post construction. This could include enabling the land to be redeveloped in accordance with the broader urban intensification direction and their underlying land use zoning.

#### Visual amenity

Any adverse effects on visual amenity are assessed to be **moderate adverse**. Although the proposal will introduce a new bridge element into this setting and will restrict some longer views along Walters Road, it will be viewed in the context of the emerging urban environment. Views and connections will

still be afforded along Walters Road, in fact, views of the wider area will be afforded from upon the bridge. The project works include mitigation measures with trees and planting to provide visual softening of the bridge and proposed abutments, and enhancement of the streetscape. Therefore, even though in cases such as the Takanini Town Centre carparking where views (particularly transient views) are acknowledged to be towards the new structure, these mitigation measures can minimise the level of effect.

### 11.3.4 Recommended measures to avoid, remedy or mitigate adverse landscape and visual effects

#### 11.3.4.1 Construction

The two assessments prepared for the Project recommend a number of measures to avoid, remedy or mitigate construction effects with the overall recommendations relevant to all project areas outlined below.

The primary mechanisms to respond to these recommendations are the ULDM, CEMP, Tree Management Plan (**TMP**) and CTMP which are proposed as conditions for all NoRs (refer to Volume 1). A SCEMP is also proposed to facilitate stakeholder / affected party discussions relating to the works, as well as a Project Information condition to provide a virtual source for updates and project details. The Mana Whenua Kaitiaki Forum condition also responds to recommendations below to provide opportunities for Manawhenua involvement in the process.

The key recommendations from the landscape and visual assessments include:

- Site compounds, construction yards, the storage of construction machinery and locations of any overburden areas should be located in visually discrete locations. At the very minimum screening of these elements is required during the construction period;
- Although only limited variation in topography, the earthworks required should reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform;
- Where practicable, during construction, install construction hoardings with interpretation panels in selected areas which are in close proximity and visible to the public (e.g. parks and commercial areas with multiple shops), to provide information about the Project and its progress;
- Provision of screening hoardings around the boundaries of site compounds that face on to adjacent properties. Screening should be designed to minimise the appearance of bulk and dominance, be aesthetically pleasing and reflect the context it is being introduced in. While screening may introduce a new visual feature adjacent to properties during construction, it will be a temporary feature and engagement with relevant affected landowners is recommended prior to works commencing to communicate the proposed mitigation and identify any concerns;
- Where practicable, during construction, establish site compound areas adjacent to the NIMT and away from the public road to reduce visual clutter;
- Provide opportunities for Manawhenua involvement in relation to various design components and nominated artists to provide visual storytelling on the construction hoardings;
- Where possible, mitigate effects related to lighting during nighttime works through the use of directional lighting to prevent glare / spill light falling on adjacent properties;
- Wherever possible, limit the removal of noteworthy trees and provide management of remaining vegetation in accordance with the arborist report;

- Open spaces adjacent to the designation boundaries should be cordoned off from construction impacts through the use of physical barriers. However, retain access for the community to connect to these open spaces and also the Takaanini train station; and
- Provide access to adjacent properties to maintain connections through the urban landscape.

#### 11.3.4.2 Operation

The assessments prepared for the Project recommend a number of measures to avoid, remedy or mitigate effects from the operation of the Project. The overall recommendations relevant to all project areas are outlined below.

The primary mechanisms to respond to these recommendations are the ULDM, TMP, Mana Whenua Kaitiaki Forum and Existing Property Access conditions which are proposed for all NoRs. A Designation Review condition is also proposed which will review the extent of the designation to identify any areas of designated land that is no longer needed for the ongoing operation, maintenance, or mitigation of the Project.

The key recommendations from the landscape and visual assessment include:

- Design the Project to integrate into the adjacent urban landscape context (this includes any land that may no longer be required post-construction). This relates to the emerging urban environment (responding to density and land uses), landscape character, and any open space zones;
- Investigate opportunities to integrate with existing and future open spaces (and also walking and cycling infrastructure) along the project areas;
- Reinstate driveways, accessways, private fences and garden plantings for existing remaining properties affected by the works;
- Adopt an outcomes-based approach to landscape mitigation that considers overall improvements to this urban landscape (including biophysical systems and processes), and enhances visual amenity;
- Continue to partner with Manawhenua in the ongoing design and implementation of landscape outcomes and support outcomes that contribute positively to Te Ao Māori cultural landscape;
- Develop a landscape management plan that focuses on:
  - Creating an indigenous vegetation palette in favour of indigenous species,
  - Selecting trees that are resilient to future predicted climate change,
  - Contributing to a connected green infrastructure that enhances ecosystem services,
  - Selecting and growing locally provenanced / eco-sourced indigenous species,
  - Using street trees to provide shade and soften the visual appearance of infrastructure in the corridor; and,
  - Creating a distinctive planting palette that contributes to the unique signature and identity of the urban landscape.
- Use of shade trees and attractive amenity plantings, generous open space, attractive hard landscape features, wayfinding, sculpture, and art could be incorporated to contribute to high landscape amenity;
- Design public access interfaces with bridge / ramp infrastructure to be of a human-scale;
- Provide spaces and furnishings along active mode routes that support respite, comfort, rest and social connections. These spaces could be activated through providing elements such as seating, sculptures, art and play elements;

- Adopt CPTED principles in future design, especially being mindful of the undercroft spaces beneath the respective bridges (also refer below);
- Use non-reflective and recessive colours and materials to prevent visual intrusion of the infrastructure elements;
- Design being mindful of potential light effects, e.g. avoid light spill;
- Select locations for hard infrastructure (such as transformers) that will not be visually intrusive. Notwithstanding, provide mitigation of these elements;
- Design structures to contribute positively to visual amenity for nearby residents who will view any infrastructure elements from close proximity. Consider the form, colour, bulk, textures and finishes to elements to create visual quality and interest. This also includes plant species selection.
  
- Specific to bridges and structures:
  - To be designed to visually integrate with the localised context and to minimise any potential adverse effects on urban landscape character and visual amenity of the area;
  - Bridges should be designed to contribute to local identity, demonstrating a sense of place. This relates to bridges and structures to demonstrate the character and appropriate scale;
  - Engagement with Manawhenua should be undertaken with the use of preferred te ao Māori design principles. Where appropriate, bridges and structures should be designed as features;
  - Where possible, provide associated landscape planting which will assist with visual softening and mitigation; and
  - Avoiding noise barriers where possible. If these are to be included, they should be designed to integrate into the localised environment to avoid visual prominence and adverse effects.
  
- Specific to bridge undercrofts:
  - Opportunities to design the edges and undersides of structures visible at close range to be visually interesting, aesthetically pleasing, contribute to a safe walking environment and assist (rather than obscure) wayfinding;
  - Considers how project users experience and perceive the new structures from shared paths, adjacent public spaces, local roads and private properties. Particularly from existing residential areas around both ends of the undercroft and from the space under the undercroft;
  - Opportunities to use the undercrofts of the bridge to provide informal community recreation spaces or spaces for the community to interact with (i.e., facilities such as a small ball court, sitting area and play elements could be designed into the space, subject to CPTED and contextual considerations);
  - Considers how the undercrofts could be used to support connectivity through this urban landscape;
  - Considers the use of light in the undercroft to enhance the quality and safety of these areas; and
  - Considers how the surfaces of the structures, associated elements (i.e. signage, light poles, etc) and their surroundings could be designed to discourage graffiti, be easily maintained and not trap litter.

## 11.4 Noise and Vibration

The Assessments of Construction Noise and Vibration Effects and Traffic Noise Effects, each included in Volume 4, respectively assess the likely construction noise and vibration effects and traffic

noise effects associated with the Project using the methods recommended in the NZS 6803 in accordance with the AUP:OP.

The following sections provide a summary of the assessment, including the methodology applied and recommended measures to manage effects. Any identified positive effects relating to noise and vibration are covered as part of part of Section 11.1 above.

## 11.4.1 Assessment methodology

### 11.4.1.1 Construction noise and vibration

The following methods were followed in the assessment of construction noise and vibration effects:

- Analysing the ambient noise level data from the surveys to determine if the recommended noise performance standards are appropriate;
- Reviewing the noise and vibration emission data for each construction task / process based on equipment data previously measured by Marshall Day Acoustics for similar activities. Data from appropriate noise and vibration standards (e.g., BS5228-1:2009) has also been considered, where relevant; and
- Predicted noise and vibration levels from construction based on relevant standards and guidelines and determined conservative setback distances where compliance with the relevant standards can be achieved. These setback distances have been plotted on the Project drawings and are shown in the appendices to the Assessment of Construction Noise and Vibration Effects.

### 11.4.1.2 Traffic noise effects

The Assessment of Traffic Noise Effects assessed traffic noise effects on people was based on the following points below:

- The noise criteria categories of NZS 6806 based on traffic on the Project roads only;
- The change in noise level causing adverse and positive effects, recognising:
  - The magnitude of change (on a population basis);
  - The predicted level of traffic on the Project roads and other local roads in the area; and
  - That rail noise produced by trains is not included in the predictions (because the Project does not in itself directly affect the operation of trains, and in particular the level of operational noise that trains make).
- The potential for people to be highly annoyed by the resulting traffic noise levels over the wider area, again based on both Project roads and local roads but excluding rail noise.

This three-pronged approach has been adopted because the measurable effects of a noise level increase in some cases may not reflect the full magnitude of the effect as experienced by people. For example, the measured change in noise level may be low but the resultant effect high in some instances, particularly adjacent to existing major roads with adjoining residential receivers. Similarly, gauging the effect on the wider community, particularly for a project where the overall traffic movements will change significantly through the change in access across the rail, can best be shown through the annoyance scale.

It is noted that the one of the assumptions adopted for the assessment predictions was the use of low noise road surface (i.e., AC14), as it is understood that all roads would carry more than 10,000 vehicles per day.

## 11.4.2 Construction effects

### 11.4.2.1 Construction noise effects

All the level crossings are located in well-established residential or commercial areas, with buildings in close proximity to construction works.

The potential adverse noise effects anticipated during construction are the following:

- **Construction noise (all project areas)** – with the largest effects anticipated from:
  - Removal of houses in the designation boundary – limited duration and localised, but close to remaining houses;
  - Earthworks to prepare alignment, service relocations, establishment of service lanes – longer duration but not in any one location for extended periods of time;
  - Bridge piling and installation – limited duration and localised effects but night/weekend works likely required; and
  - Final surfacing – likely to be done at night time. Limited duration along the alignments.
- **Night-time / long weekend construction noise (all project areas)** - Bridge construction across the NIMT will likely require night-time works during a block of line.
- **Construction noise (Manuroa Road project area)** – Works undertaken close to the existing early childcare centre facility at 18 Manuroa Road.
- **Construction noise (Taka Street project area)** – Works undertaken close to Takaanini Care Centre which is an aged care centre at 9 Taka Street.

### 11.4.2.2 Construction vibration effects

As above, all level crossings are located in well-established residential and commercial areas, with buildings in close proximity to construction works.

The potential adverse vibration effects anticipated during construction are the following:

- **Construction vibration (all project areas)** – with the largest effects anticipated from:
  - Demolition of houses inside designation – limited duration and localised, but close to remaining houses;
  - Road preparation: use of vibratory rollers – along all crossing alignments, therefore limited duration but affecting all immediately fronting houses; and
  - Construction of bridge piles and retaining walls.

The assessment undertaken however, determines that vibration effects are generally predicted to be compliant with Category B criteria.

### 11.4.3 Operational effects

The following sections provide a summary of the potential effects of traffic noise during operation of the Project.

The Project consists of both “altered roads” (Spartan Road, Manuroa Road, Taka Street and Walters Road crossings) and one “new road” (Manuia Road crossing). It is noted however, that Spartan Road does not cause a sufficient effect to qualify as an Altered Road in accordance with NZS 6806.

Existing Protected Premises and Facilities (**PPFs**) within 100m of the new road edge were assessed based on NZS 6806. The individual traffic noise level predications at these PPFs were compared with the noise criteria categories A, B and C of NZS 6806, and the anticipated noise level change due to the Project was calculated. The number of PPFs for each NoR and project area in the Do-Minimum scenario (i.e., with the Project) is shown in Table 11-11 below. The Do-Minimum scenario assumes no mitigation except for the low road noise surfacing.

**Table 11-11: Number of PPFs in each project area and respective noise criteria in the Do-Minimum scenario**

NoR reference	Project area	Number of PPFs		
		Category A	Category B	Category C
<b>NoR 1</b>	Spartan Road	2	0	0
	Manuia Road	12	19	3
	Manuroa Road	85	0	0
	Taka Street	127	11	3
<b>NoR 2</b>	Walters Road	85	0	0

Overall, the change in noise level is predicted to be minimal due to the traffic generation itself. However, many dwellings are intended to be removed to make space for the Project. The removal of the first row of houses will result in noticeable to significant noise level changes to PPFs behind. Mostly, those PPFs would still receive noise levels within Category A (the preferred noise criteria category), however, a small number of PPFs would receive a noticeable noise level increase and/or noise levels within Category B or C.

For the majority of PPFs (255 of the total of 343 PPFs assessed across all crossings), the noise level changes due to the Project will be insignificant (ranging from +2 to -2 dB). A further 62 PPFs are predicted to receive noticeable to significant noise level reductions due to road closures and the elevation of the bridges providing shielding to houses below. The remaining 26 PPFs are predicted to receive noticeable to significant noise level increases, mostly where a new road crossing is constructed at Manuia Road, or where houses around the new bridges are removed, which reduces shielding of traffic noise for houses behind.

## 11.4.4 Recommended measures to avoid, remedy or mitigate adverse noise and vibration effects

### 11.4.4.1 Construction noise mitigation

The Construction Noise and Vibration Assessment Report recommends measures to avoid, remedy or mitigate construction noise and vibration effects with the overall recommendations outlined below. The primary mechanism to respond to these recommendations are the CNVMP and CNVMP Schedules which are proposed as condition (refer to Volume 1) for all NoRs.

A summary of the key recommendations from the Construction Noise and Vibration Assessment Report are as follows:

- Preparation of CNVMP which covers information such as:
  - Description of the works and anticipated equipment / processes;
  - Hours of operation, including times and days when construction activities would occur;
  - The construction noise and vibration standards for the Project;
  - Identification of receivers where noise and vibration standards apply;
  - Management and mitigation options, including any requirements to limit night works and works during sensitive times as far as practicable;
  - Methods and frequency for monitoring and reporting on construction noise and vibration;
  - Procedures for maintaining contact with stakeholders, notifying of proposed construction activities, the period of construction activities, and handling noise and vibration complaints;
  - Contact details of the site supervisor or Project manager and the Requiring Authority's Project Liaison Person (phone, postal address, email address);
  - Procedures for the regular training of the operators of construction equipment to minimise noise and vibration as well as expected construction site behaviours for all workers;
  - Identification of areas where compliance with the noise and/or vibration standards will not be practicable and where a Site-Specific Construction Noise and/or Vibration Management Schedule will be required;
  - Procedures for how remedial works will be undertaken, should they be required as a result of the building condition surveys; and
  - Procedures and timing of reviews of the CNVMP.

### 11.4.4.2 Operational traffic noise mitigation

The key recommendations made in the Traffic Noise Report to mitigate potential effects during the operational phase of the Project are outlined below. The primary mechanism to respond to these recommendations are the Low Noise Road Surface and Traffic Noise conditions proposed for all NoRs (refer to Volume 1). The Traffic Noise conditions in particular provide a process for determining the Detailed Mitigation Options (which could include consideration of measures such as barriers or building modification).

The key recommendations from the Traffic Noise Report are:

- **Traffic Noise (all project areas)** - Mitigation is already assumed in the form of low noise road surface. However, any future intensification of noise sensitive activities around the crossings should take account of the noise environment and provide suitable sound insulation and ventilation

on construction. Any existing PPFs receiving noise levels within Category C (Taka Street crossing) should be investigated for building modification mitigation; and

- **Manuia Road project area** - In addition to the use of low noise road surface, the barrier on the southern side of the bridge (over the NIMT) is recommended to be a height of 1.5m. The barrier should then be extended from the bridge edge for approximately 60m to the east at a height of 2m.

It is noted that the Land Use Integration Process condition is also proposed for both NoRs which provides a mechanism for future developers to request access traffic noise modelling contours to inform adjacent development. The designation once confirmed (including conditions and supporting schedules), will also be included in the AUP:OP which can be accessed and considered by future developers in the surrounding area.

## 11.5 Arboricultural

The Assessment of Arboricultural Effects Report (**Arboricultural Assessment**) included in Volume 4 assesses the actual and potential effects of the future construction and operation of the Project on existing trees protected<sup>20</sup> under the District Plan provisions and recommends ways of managing these effects.

The subsequent sections provide a summary of the arboricultural effects and proposed management measures. In addition to this assessment, the amenity and ecological values associated with trees proposed for removal are assessed in the landscape and visual assessment (at Section 11.3), and the terrestrial ecology assessment (at Section 11.6).

Any potential positive arboricultural effects are covered as part of Section 11.1 above.

### 11.5.1 Assessment methodology

The Arboricultural Assessment methodology involved recording details of all trees that may be impacted by the construction and operation of the Project within the proposed designation areas.

For completeness, all trees that fall within the designation boundaries that are within road reserve, open space zones, or the notable tree overlay were recorded, and their protection status based on the current Regional Plan or District Plan were subsequently identified. Trees in road reserve or open space zones (i.e., subject to District Plan controls) that are either a pest species located in the road reserve or are less than 4m in height and / or 400mm in girth were recorded, however their removal is a Permitted activity under the AUP:OP.<sup>21</sup> No trees subject to Regional Plan provisions were identified in the assessment, however, it is noted that trees subject to Regional Plan provisions would be managed through a future resource consenting process.

Sufficient information was gathered to allow an assessment of the existing environment and consideration of the future environment. Due to the changing nature of the environment, the Arboricultural Assessment provides a baseline assessment to identify the potential adverse effects from the Project. A verification assessment at the time of implementation is anticipated to ensure the current conditions of the identified protected trees or groups of trees are still relevant.

<sup>20</sup> Protected trees in relation to this assessment and as per the Assessment of Arboricultural Effects Report refers to trees that would trigger consent under the District Plan provisions to remove them or undertake works within their root protection zone.

<sup>21</sup> As per Activity Table E26.4.3.1 (A82) and (A91).

## 11.5.2 Construction effects

The Project is identified to result in potential adverse arboricultural effects on trees within Open Space zoned land, road reserve and the Notable Tree overlay, which are protected by District Plan provisions.

The Arboricultural Assessment identifies that potential adverse arboricultural effects from the construction phase of the Project may arise from:

- The removal of a total of 40 protected trees located within Open Space zones and road reserve across the Manuia Road, Manuroa Road, Taka Street and Walters Road project area;
- The removal of two established English Oak trees within the Notable Tree overlay on private property within the Manuroa Road project area; and
- Construction works being undertaken within the protected root zone of one established London Plane tree located on road reserve within the Walters Road project area.

Table 11-12 below summarises the number of protected trees potentially impacted within each project area. A full tree schedule is provided in the appendices of the full Arboricultural Assessment included in Volume 4.

**Table 11-12: Summary of trees requiring removal and works within the protected root zone.**

Project area	Number of protected trees requiring removal	Works within the protected root zone of retained vegetation
Spartan Road	0	0
Manuia Road	2	0
Manuroa Road	2	0
Taka Street	13	0
Walters Road	25	1
<b>Total</b>	<b>42</b>	<b>1</b>

Of particular note and as identified above, two notable trees growing within the Manuroa Road project area (at 15 Manuroa Road) will require removal to facilitate the construction of the new active modes bridge. As scheduled trees, they are considered under the AUP:OP to have arboricultural benefits that should be retained for future generations and have wider amenity benefits. They are well-established and are two of the only remaining trees of such scale and stature within the immediate area. As such, the removal of the trees would inherently result in a loss of arboricultural value.

Notwithstanding this, the Arboricultural Assessment identifies the following:

- The trees are exotic species and mature English Oak in Auckland have in recent years suffered from ailments associated with the increases in yearly median temperatures. Such ailments include a reduction in vigour and vitality, or in extreme cases a decrease in canopy health or onset decay;
- While currently in good health at the time of assessment, a number of large wounds were visible near the base of the trees;

- The scheduled trees are located within private residential land comprised primarily of hard surface, occupied by residential dwellings and with further intensification potential (under PC78 and NPS:UD direction). These factors have the potential to:
  - Compromise the optimal current and future growing environment, with further intensification having the potential to create further pressure on the trees;
  - Pose challenges for maintenance, and its ability to be accessed by the public and contribute to amenity value beyond its immediate locality; and
- The proposed works within the Manuroa Road project area have resulted from an extensive optioneering process. To construct the anticipated infrastructure (particularly the ramps) and provide access to the physical works footprint, construction vehicles including cranes and other machinery/equipment will likely need to locate in the area where the trees (including their dripline/rootzone) are situated. There are limitations/constraints with using land to the east of the proposed ramps for construction due to the NIMT. The likely impact on the dripline/rootzone must also be considered in terms of whether removal or retention is the best option.

Overall, the loss of these trees should be considered in light of the factors above. Overall, while there is a potential loss of arboricultural value attributed to the removal of these notable trees, there are measures to mitigate the potential adverse effects (refer to Section 11.5.4 below)

Other protected trees potentially impacted by the Project including those within Takaanini Reserve (within the Taka Street project area) and along Walters Road will also result in adverse amenity and ecological effects on the surrounding environment. This is due to the loss of tree canopy cover and associated ecosystem services benefits and the amenity values attributable to the trees. Mitigation measures as described in Section 11.5.4 below should be implemented to mitigate the potential adverse effects.

The proposed works within the Walters Road project area may also result in construction being undertaken within the protected root zone of the existing London Plane street tree. This tree is intended to be retained. Construction works not undertaken in accordance with best arboricultural practice could result in the tree being damaged or the complete loss of the tree. As such, protective measures should be adopted to minimise the risk and values of this tree.

### 11.5.3 Operational effects

The maintenance of sight lines and the overhead and lateral clearances of general traffic lanes, including walking and cycling facilities, is the only potential operational effects of the Project on arboriculture. Ongoing maintenance of street trees and trees retained adjacent to the corridor is a standard operational requirement. Once the Project has been constructed, no further effects on trees are anticipated.

### 11.5.4 Recommended measures to avoid, remedy or mitigate adverse arboricultural effects

Proposed measures to manage the potential effects of the Project on trees are discussed below.

#### 11.5.4.1 Construction

The Arboricultural Assessment sets out a range of measures to avoid, remedy or mitigate construction effects of the Project. The overall recommendations are outlined below. In response to

these recommendations, a TMP and ULDMP are proposed as conditions for all NoRs (refer to Volume 1).

The key recommendations from the arboricultural assessment include:

- Preparation of a TMP which covers information such as:
  - Confirmation that protected trees identified 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; and
  - Detailing methods for all work within the root zone of trees that are to be retained in line with appropriate arboricultural standards.
- Preparation of a ULDMP which covers information such as:
  - The final landscape design including the location and type of replacement planting; and
  - Detail of methodologies to establish new trees within the road reserve, including creation of quality below ground environments, correct planting and appropriate maintenance.

Mitigation measures are recommended to take an outcomes-based approach that considers overall improvements to landscape systems and processes, natural character, and visual amenity, rather than a quantitative approach. It is also recommended that the final landscape design be reviewed by a consultant arborist and arboricultural input provided prior to implementation to assist with the assessment of locations and tree species that would be considered suitable for new tree planting from a long-term perspective.

#### 11.5.4.2 Operational

In terms of recommended measures to mitigate operational effects, the Arboricultural Assessment sets out one measure which should be considered at the time of detailed design:

- Any new street trees or mass planted vegetation (trees specifically) are planted no closer than 1m to the future general traffic lanes. This will ensure retention of sightlines and overhead and lateral clearances of general traffic lanes as well as the high-quality walking and cycling facilities.

This recommendation is responded as part of the ULDMP which provides a process of determining location and type of planting. As above, the ULDMP is a condition proposed for all NoRs.

## 11.6 Terrestrial Ecology

The Assessment of Ecological Effects Report (**Ecological Assessment**), included in Volume 4, assesses the actual and potential terrestrial ecological effects of the Project on the environment, where these relate to District Plan matters. The subsequent sections provide a summary of the terrestrial ecology effects and proposed management measures.

Any potential positive ecological effects are covered as part of part of Section 11.1 above.

## 11.6.1 Assessment methodology

### EclA Assessment

The assessment follows the approach outlined in the Ecological Impact Assessment (**EclA**) Guidelines published by the Environmental Institute of Australia and New Zealand (**EIANZ**). This provides a standardised matrix framework to assess the ecological value of identified features and evaluate the magnitude of potential effects that the Project could have on these features.

### Assessment of District Plan Matters and Approach to Regional Matters

The Ecological Assessment assesses District Plan matters only. The Regional Plan matters will be subject to assessment during a future consenting phase with supporting EclA.

### Wildlife Act

The Wildlife Act 1953 includes specific provisions for activities that may disturb, injure, or kill native animals. These matters have been considered in the EclA in relation to the future construction of the Project.

The Wildlife Act matters have been considered in relation to the future construction phase of work.

## 11.6.2 Construction effects

The construction activities associated with the Project works have the potential to cause adverse effects on ecological features if they are not mitigated. This can include the removal of vegetation, permanent loss of habitat/ecosystem, fragmentation, and edge effects. Construction effects could also have impacts on native fauna including loss of foraging habitat and mortality/injury. It is assumed that after vegetation clearance has occurred that construction activities will cause disturbance and displacement to the existing native fauna (birds). This effect is likely to happen in habitats adjacent to the project areas or underneath structures such as bridges.

The following sections detail the potential magnitude of effect and subsequent level of effect on ecological features.

### 11.6.2.1 Terrestrial vegetation

Vegetation will be removed across all Project areas, subject to District Plan rules which require consent for tree removals within road reserves and open space zones. Effects on District Plan vegetation have been considered in the Arboriculture Assessment (summarised in Section 11.5 of this AEE) and were reviewed for the purpose of the Ecological Assessment. This vegetation is predominantly exotic street trees and is of low ecological value. The magnitude of effect of District Plan vegetation removal is therefore considered to be **Negligible**.

### 11.6.2.2 Birds

Construction activities on district vegetation may have a moderate level of effect on native birds, as there is a definite presence of native birds associated with the district plan vegetation and a high probability that these effects could occur. District Plan vegetation clearance will still need to be managed in accordance with the Wildlife Act in relation to native birds.

Beyond district vegetation clearance, the construction activities could potentially displace indigenous forest birds from suitable nesting and foraging habitat within the Project area, due to noise, vibration, and lighting disturbance. With regard to both Threatened and At-Risk (**TAR**) species and non-TAR species, the overall level of effect due to construction disturbance is assessed as low prior to mitigation. Therefore, no impact management for bird species is required to mitigate construction effects.

### 11.6.2.3 Lizards

Copper skink (TAR) is likely to be present within a wide range of habitats impacted by the proposed designation boundaries. There is the potential that site clearance required for construction could kill or injure indigenous lizard species and result in habitat loss. Any vegetation clearance where copper skink are likely to occur will be managed in accordance with the Wildlife Act, including permits to salvage lizards.

### 11.6.3 Operational effects

The operational activities associated with the Project have the potential to cause adverse effects on ecological features. The potential operational effects are:

- Loss in connectivity to indigenous fauna (birds) due to light, noise, and vibration effects from the operation of the road, leading to fragmentation of habitat; and
- Disturbance and displacement of indigenous fauna and their nests (birds) due to light, noise, and vibration effects from the operation of the road.

These operational effects were assessed as having low overall level of effect for both TAR and non-TAR species.

### 11.6.4 Recommended measures to avoid, remedy or mitigate adverse effects on terrestrial ecology

#### 11.6.4.1 Construction

No specific measures are recommended as there were no District Plan ecological effects where the level of effect from the Project was assessed to be Moderate or higher.

It is however noted that District Plan vegetation clearance will need to be managed in accordance with the Wildlife Act in relation to native birds. Management controls during vegetation clearance should include the avoidance of the bird nesting season (September to February) where practicable or nesting bird checks when construction is occurring within the nesting season.

#### 11.6.4.2 Operational

Although a loss of connectivity, disturbance and displacement may be experienced by indigenous fauna; the removal of predominantly exotic (terrestrial) vegetation of low ecological value results in negligible to very low effects on fauna. Therefore, no measures are identified as necessary to mitigate the potential operational effects on terrestrial ecology.

## 11.7 Flooding

The Assessment of Flooding Effects Report (**Flooding Assessment**), included in Volume 4, assesses the actual and potential effects of the future construction and operation of the Project as it relates to flood hazard effects. Flood hazard effects have been assessed as a subset of stormwater effects, noting that flood hazard effects are the specific effects authorised by designations (i.e. would otherwise trigger a District Plan resource consent requirement under section 9(3) of the RMA). Other stormwater matters, including stormwater discharge quality, stormwater quantity (including retention/detention), and effects on streams are RP matters that will be considered as part of a future consenting process, and accordingly are not assessed.

The future mitigation of stormwater effects (stormwater discharge quality and retention/detention) has been indicatively considered to ensure that sufficient is available within the proposed designation boundaries to provide for potential future requirements.

Any potential positive environmental effects identified in the Assessment of Flood Hazard Effects are covered as part of part of Section 11.1 above.

### 11.7.1 Assessment methodology

The methodology for the assessment is summarised as follows:

- A desktop assessment was undertaken to identify potential flooding locations, in particular the Auckland Council and Te Tupu Ngātahi GIS viewers to identify where existing buildings are near/within existing floodplains, and where the Project involves work near stream crossings and major overland flow paths;
- Flood effects have been identified using the latest Auckland Council flood model (InfoWorks ICM) and a qualitative effects assessment of the flood displacement and conveyance disruption has been carried out;
- Inspection of other flood modelling sources (updates and adjacent projects) to identify, refine, and validate flood assessments. At key cross drainage locations such as bridges or culverts and where there are noticeable changes in flood extents or levels, consideration was given to flood hazard issues;
- Review of all external drainage flow paths entering the Project areas and assessing the effects of the development on the upstream flood levels. Mitigation optioneering was required where effects were found to be insignificant; and
- Hui with Manawhenua and listening to concerns regarding flooding of the catchments.

As noted in the full assessment, the Project stormwater specialist was satisfied that there is a range of mitigation options (summarised below) available within the proposed designation footprint to adequately manage flood effects resulting from the works without numerical flood modelling to validate the outcomes. Numerical flood modelling may be required to confirm the outcomes of this report at the resource consent stage. Moreover, it is noted that there may be significant change in the catchments resulting from the densification anticipated to be enabled through the NPS:UD and PC78. This further underlines the potential need for numerical flood modelling at a later stage to reflect the catchment characteristics at the time of implementation and to confirm proposed mitigation.

Finally, it is noted that stormwater and flooding considerations are based on a concept design and proposed designation boundary which includes sufficient space to respond to the future environment.

The effects assessment is premised on the Project being able to meet a series of flooding outcomes which are summarised at Section 11.7.4.2 below.

### 11.7.2 Construction effects

Based on the location of works in terms of overland flows or known flood extents in the vicinity, the proposed construction works which could result in flooding effects include:

- Construction of new culvert crossings or upgrading of existing culvert or bridge crossings;
- Realignment of existing overland flowpaths;
- Works which result in raising levels within existing floodplains; and
- Storage of materials and use of lay down areas within floodplains.

### 11.7.3 Operational effects

The anticipated infrastructure within the five project areas will generate similar operational flood effects based on the degree of floodplain volume displacement or the presence of an obstructed overland flowpath. Each crossing is discussed separately below.

#### 11.7.3.1 Spartan Road and Manuroa Road

Anticipated works on these roads do not include any major earthworks or alterations to overland flowpaths. Flood effects at Spartan Road and Manuroa Road will be minimal as there is negligible to zero storage displacement nor redirection of flow paths. No operational flood effects are expected at these locations.

#### 11.7.3.2 Manuia Road, Taka Street, and Walters Road

Localised increases in flood levels are expected due to the displacement caused by fill earthworks needed for the Project in each of these three locations. Compensatory cut earthworks will therefore be required to maintain flood neutrality. In addition:

- At **Manuia Road**, a culvert is required for flowpath continuity on the eastern side of the NIMT, and a widened bridge across the rail will allow the overland flowpath to continue along the NIMT to the south. Residential properties adjacent to the proposed crossing at Portrush Lane are anticipated to only have a low-to-negligible sensitivity to flooding given that they are approximately 1.4m higher in elevation than the aforementioned culvert;
- At **Taka Street**, the greatest depth of flooding is noted at the western end of the Project extent. A culvert is required for flowpath continuity to the west of the NIMT, and a widened bridge across the rail will allow the overland flowpath to continue along the NIMT to the south. Some residential properties at the western end of the Project extent are presently vulnerable to flood effects, which makes them vulnerable to flood effects with the Project. The culvert and offset storage areas will need to be optimised at detailed design to ensure flood neutrality can be maintained; and
- At **Walters Road**, flood depths within the road footprint area are minimal, and displacement effects are expected to be negligible. The overland flowpath at the Arion Road-Walters Road intersection will be altered by the change in road elevation which may cause flood effects to nearby upstream residential properties.

## 11.7.4 Recommended measures to avoid, remedy or mitigate adverse flooding effects

The sections to follow provide the proposed measures to manage the flood hazard effects.

### 11.7.4.1 Construction

The Flooding Assessment recommends measures to avoid, remedy or mitigate construction effects with the overall recommendations outlined below. The primary mechanism to respond to these recommendations is the CEMP condition (refer to Volume 1) which is proposed as a condition for all NoRs.

The key recommendations from the Flooding Assessment are as follows:

- Preparation of a CEMP addressing key matters that include (but are not limited to):
  - Siting construction yards, laydown areas and stockpiles outside the predicted flood plains;
  - Maintaining overland flow paths around / through areas of work;
  - Minimising the physical obstruction to flood flows at the road sag points;
  - 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;
  - Actions to take in response to heavy rain warnings which may include reducing the conveyance of materials and plant that are considered necessary to be stored or sited within the predicted flood plain or significant overland flow path;
  - Carrying out earthworks during the summer / dry months to reduce the risk of flooding; and
  - Managing the overland flow paths to make sure flows are not diverted toward existing buildings or properties.

### 11.7.4.2 Operational

The Flooding Assessment recommends measures to avoid, remedy or mitigate effects anticipated during the operational phase of the Project. The primary mechanism for responding to these recommendations is the Flood Hazard condition proposed for all NoRs (refer to Volume 1).

In summary, the Flooding Assessment recommendations included:

- That during detailed design that flood modelling be carried out and mitigation measures are implemented (as required) to achieve the outcomes listed below:
  - No increase in flood levels in a 1% AEP event for existing authorised habitable floors that are already subject to flooding or have a freeboard less than 150mm;
  - No more than a 10% reduction in freeboard in a 1% AEP event for existing authorised habitable floors with a freeboard over 150mm (that is, if existing freeboard was 500mm, an acceptable change would be to reduce freeboard to 450mm);
  - No increase in 1% AEP flood levels for existing authorised community, commercial, industrial and network utility building floors that are already subject to flooding;
  - No more than a 10% reduction in freeboard in a 1% AEP event for existing authorised community, commercial, industrial and network utility building floors;
  - No increase of more than 50mm in flood level in a 1% AEP event on land zoned for urban or future urban development where there is no existing habitable dwelling;

- No new flood prone areas (with a flood prone area defined as a potential ponding area that relies on a single culvert for drainage and does not have an OLFP); and
- No more than a 10% average increase of flood hazard (defined as flow depth times velocity) for the main access to authorised habitable dwellings. The assessment shall be undertaken for the 1% AEP rainfall event.

Mitigation measures which may be implemented include:

- Maintaining existing road levels within the corridor at overland flow paths and floodplains;
- Channelising existing overland flow paths to discharge under the bridge across rail roads to increase capacity reduce flood effects. This is a common approach where flood flow is parallel to the existing NIMT railway line in a non-channelised flowpath;
- Adding new culverts or pipe systems to manage changes to flood levels and increased road heights (substituting the loss of flow over the road for more flow capacity under the road);
- Adding more live storage capacity at the upstream end of culverts by excavating the local area ground. This compensates for the culvert headwater effects to maintain a neutral flood hazard on upstream land; and
- Integrating development stormwater design requirements with adjacent development or wider upgrades to public infrastructure upstream and downstream of the proposed corridor.

Specific mitigation is described below for Manuia Road, Taka Street and Walters Road which may have potential adverse flooding effects as noted above.

- **Manuia Road and Taka Street** – Culvert with a flood offset storage area has been implemented in the design to compensate for storage loss and allow the overland flow-path through the project area to continue as well as offsetting localised culvert headwall effects; and
- **Walters Road** – The addition of a new culvert should include an inlet structure to relieve ponding due to elevated and widened design at Walters Road intersection.

## 11.8 Social impact

The SIA, included in Volume 4, identifies and assesses the potential social impacts of the pre-construction, construction, and operational phases of the Project and recommends strategies to manage these impacts.

The positive social impacts of the Project are set out in Section 11.1 above.

### 11.8.1 Assessment methodology

The process undertaken to complete the SIA included the following steps:

- Literature review on the social impacts of rail level crossing removal and grade-separation projects in Australasia;
- Undertaking site visits;
- Establishing an initial social baseline through scoping of social impact categories, social areas of influence, and potential social impacts;
- Updating the social baseline following:
  - Review of relevant technical reports including the Construction Noise and Vibration Assessment, the Traffic Noise Assessment, and the Landscape and Visual Assessment;

- Interviewing key SIA stakeholders;
- Manawhenua engagement through multiple Hui; and
- Systematically identifying and evaluating the social impacts based on the above scoping process during the pre-implementation (planning), construction, and operational phases of the Project.

The SIA notes a number of key underlying assumptions. These include the assumptions regarding construction durations (documented in Section 9.2 of this AEE), and the existing and future environment (documented in Section 9.7 of this AEE).

It should be noted that the SIA is not limited to an assessment of actual and potential effects (as defined under the RMA) and instead provides a broader assessment of social impacts. By extension, the SIA includes some conclusions and recommendations which do not fall within the RMA regulatory regime and have been identified as other opportunities where this is the case. Table 7-1 in the SIA conclusion sets out the key impacts that fall within the RMA scope and beyond (i.e., other opportunities) and the respective Project responses to these impacts.

### 11.8.2 Pre-construction effects

The Project may result in a range of potential adverse effects as identified in the SIA that are considered to arise during the planning and/or pre-construction phases. One of these impacts include changes to people's way of life. As properties within the proposed designation boundaries are acquired for the Project, people and business are likely to move away from the area if alternative sites cannot be found. Within the project areas, a number of businesses that are considered important to the community will potentially be lost, including:

- Three early childhood education centres (i.e., one within the Taka Street project area and two within the Walters Road project area);
- Skills Update Training and Education Centre (within the Walters Road project area); and
- The BP Service Station on Great South Road (within the Manuia Road project area) providing fuel, including heavy vehicle refuelling, small vehicle cleaning and retain activity.

A loss of businesses will mean changes to routines and convenience for some residents. These residents will then need to access those same goods and services from businesses located further away. In particular, the loss of early childhood education (**ECE**) facilities is likely to have significant impact on the local and wider community.

As properties are acquired, in the period prior to construction, some properties might remain vacant. These properties can attract anti-social behaviour which can adversely affect people's perceptions of personal safety.

Over the period prior to construction, people's health will potentially be affected through increased stress and anxiety for landowners and occupiers, business owners and operators and those employed by directly affected businesses. Directly affected property owners and occupiers, including business owners and operators, can remain on their properties in the period prior to construction. However, having a designation on a property does place some restrictions<sup>22</sup> on how the property can be used, particularly in relation to changes or improvements. To some landowners, this can be felt to

<sup>22</sup> In accordance with section 176(1)(b) of the RMA, anyone (other than a requiring authority with a designation) is restricted from carrying out work on the designated land that would prevent or hinder the designated work without first obtaining the requiring authority's consent.

be an impact on their personal and property rights. This feeling might also be present during the acquisition stage if properties have to be compulsorily acquired.

As businesses close and leave the area it will also result in a loss of employment and livelihood for people working within those businesses, unless the businesses are able to relocate and retain their existing staff. There could also be a loss of exposure or visibility for these displaced or relocated businesses.

### 11.8.3 Construction effects

Construction activity can impact people's way of life as a result of changes, both temporary and permanent to existing travel patterns. Roads that don't usually have a lot of activity may be used as temporary detours which could affect the amenity of those streets, but also the ability for those residents and businesses to undertake their typical activities (leading to a sense of disruption). With the closure of Spartan Road and Manuroa Road crossings, traffic, including vehicle traffic, will potentially need to divert via residential areas. There is also a loss of some existing access routes to the Takanini Hall on Takanini Road due to the closure of Takanini Road onto Taka Street.

Parking and access to some businesses or facilities that are important to the community will be impacted during construction. This is particularly evident with on-street parking at Taka Street and access to businesses in the Manuia Road and Walters Road project areas. Some access to the Gateway Takanini retail / service area (Manuia Road project area), the Southgate shopping centre and Takanini Town Centre (both within the Walters Road project areas) will be restricted. However, all these shopping centres have alternative existing access that will be unaffected.

The 90-bed aged care centre on Taka Street is noted as being particularly sensitive to the impacts of construction activity. The facility has one of the dementia wards in South Auckland and the impacts to daily routine for residents will differ depending on the needs and abilities of individual residents. It is likely that sleep and rest patterns will be disrupted during the day when active construction activity is taking place. Access and parking (both on-street and off-street) is of particular importance for the site, with visitors frequently coming and going. Safe and convenient access to Takanini Station is also identified as important during construction with visitors, staff and some residents using the Station. Some of the aged care residents are noted as having varying mobility needs and limitations.

People living and working in areas subject to construction can feel less safe, especially at night. Changes to access and sightlines as a result of hoardings can reduce access to and the visibility of businesses leading to a potential loss of business for some. Access to Takaanini Reserve from Taka Street during construction will need to be considered as a lack of a 'thoroughfare' during construction could lead to anti-social behaviour / safety concerns.

Noise, dust, and vibration can also reduce the amenity of the area, especially community facilities, sensitive receivers and open spaces. Privacy issues and shading from the construction work (e.g., overlooking from construction works and temporary structures) could also be experienced, particularly for those properties immediately adjacent to the project areas. In particular, construction within the Taka Street project area could result on amenity effects on Takaanini Reserve as well as the aged care centre. Construction within the Manuia Road project area could also reduce the amenity for neighbouring residents on Portrush Lane.

### 11.8.4 Operational effects

The SIA notes the following potential adverse effects arising during the operation of the Project:

- Permanent changes to access for properties and some intersections and roads;
- Potential community severance and amenity impacts as a result of bridge structures including Walters Road and Taka Street;
- Potential risk of anti-social behaviour in the undercroft spaces of the bridges; and
- Potential nuisance from lighting and traffic noise from bridges.

### 11.8.5 Recommended measures to mitigate, remedy, or avoid adverse social impact effects

The following sections discuss the proposed measures to manage potential social impact effects. The proposed conditions will be the primary mechanism for addressing the impacts of the Project within the RMA regulatory framework. However, other opportunities outside the RMA have also been identified (as outlined in Table 7-1 of the SIA) which can also respond to some of the identified impacts. This includes the PWA process and other AT internal policies.

#### 11.8.5.1 Pre-construction

The SIA recommends a number of measures to address potential impacts arising during the pre-construction phase. As above, the primary mechanism to respond to these recommendations are the following conditions (refer to Volume 1) proposed for all NoRs:

- **Project Information** source– this provides a way for landowners, occupiers, business owners and operators/employers to ensure they are informed of any updates on the Project. It can also include information on what can continue to be undertaken on property while a designation is in place and the process for any approvals required; and
- **SCEMP** - once the detailed design commences, the SCEMP will be implemented to facilitate engagement with directly affected parties and stakeholders.
- **Land Use Integration Process** – provides a mechanism to encourage and facilitate the integration of master planning and land use development activity on land directly affected or adjacent to the designation. Developers or Development Agencies can request information on Project design details (e.g., boundary treatment and alignment of the roads) as well as a process for the Requiring Authority to undertake a technical review or provide comments on their proposals.

Additional mechanisms (beyond the RMA framework) will also support these conditions such as the PWA process and AT internal policies to support affected landowners.

#### 11.8.5.2 Construction phase impacts

The SIA recommends a number of measures to address potential impacts arising during the construction phase. The primary mechanism to respond to these recommendations include the following key conditions (refer to Volume 1) put forward for both NoRs:

- **Project information condition** – as described above.
- **SCEMP** – as described above.

- **Mana Whenua Kaitiaki Forum** – this provides opportunities for Manawhenua to be involved in how the Project should be designed and implemented (including construction work), including how to incorporate Manawhenua values and outcomes.
- **CTMP** – this will provide a mechanism to identify measures to ensure safety of all transport users, timing of works and traffic movements, access and detour routes (including pedestrians and cyclists), provision of access to property and/or private roads, methods for communicating traffic management measures to affected road users, auditing requirements and details of minimum network performance parameters.
- **CEMP** – sets out the management procedures and construction methods to be undertaken including staging approach and proposed hours of work, location of construction yards when adjacent to residential areas (including temporary screening), and methods for providing for health and safety of the general public.
- **CNVMP and schedules** – provides the mechanism for the development and implementation of the Best Practicable Option for the management of construction noise and vibration effects.

As described above, other mechanisms (beyond the RMA framework) such as internal AT policies for managing acquired properties and landowner engagement could also provide additional opportunities for responding to impacts.

### 11.8.5.3 Operational social impacts

The SIA recommendations for responding to impacts arising during the operation of the Project are outlined below. The primary mechanism to respond to these recommendations include the following key conditions (refer to Volume 1) put forward for both NoRs:

- **ULDMP** – this provides a mechanism for determining how the Project will integrate with the adjacent urban and landscape context, provide appropriate walking and cycling connectivity, provide for inclusive access, and promote a sense of personal safety. The matters to be addressed in the ULDMP help to respond to severance and amenity impacts resulting from the new bridges and infrastructure as well as safety in design measures, lighting, anti-graffiti measures and universal access.
- **Existing Property Access** – addresses potential impacts on existing property access.
- **Designation Review** – provides a mechanism to identify areas of designated land that is no longer required for ongoing operation, maintenance and mitigation of the Project. As such, enabling land no longer required for the Project to no longer be subject to designation / route protection.

## 11.9 Property

Potential adverse effects on existing private properties and businesses have been reduced, where practicable through the development of the Project concept design and the proposed designation boundary. Notwithstanding this, a functional and operational need for the Project has been identified to address the demand for east-west connections in the Takaanini area. Where impacts on properties and businesses cannot be avoided, the potential effects are discussed in this section and detailed in the SIA (summarised in section 11.8 above).

The proposed NoRs require land to provide a sufficient footprint to enable the construction and operation of the Project. The land required for the Project is shown in the general arrangement layout plans included with the application (refer to Volumes 1 and 3). Land required for the permanent work

will be acquired prior to construction. Following the completion of construction, the designation boundary will be reviewed through the Designation Review condition proposed (refer to Volume 1) and any land that is not required for the permanent work or for the on-going operation, maintenance or mitigation of effects of the Project will be reinstated in coordination with directly affected landowners or occupiers.

This will include:

- Reinstatement of construction areas and reintegrating with the surrounding landform;
- Reinstatement of parking spaces, driveways, accessways, fences and gardens; and
- Integration of batters and cut/fill slopes with the landscape.

These matters will be discussed prior to and during construction with directly affected landowners and will follow the provisions under the PWA which is a process separate from the requirements of the RMA. Proposed conditions (refer to Volume 1) such as the Existing Property Access and ULDMP conditions will also help address some of the above matters alongside the PWA process.

## 11.10 Archaeological and Built Heritage

The Assessment of Effects on Archaeology and Built Heritage Report (**Archaeology Assessment**) is included in Volume 4 and assesses the actual and potential effects of the future construction and operation of the Project as it relates to archaeology and historic heritage effects. This section does not provide an assessment of Māori cultural values (as it is for Manawhenua to undertake this assessment).

### 11.10.1 Assessment methodology

The Archaeology Assessment methodology outlined in this section assesses the Project in the context of the existing and future environment. The approach to the assessed environment can be found in Section 3.2 of the Archaeology Assessment. The following digital data sources were consulted during research:

- Site records from the New Zealand Archaeological Association (**NZAA**) Site Recording Scheme (**SRS**) were obtained from ArchSite;
- Records of previous archaeological investigations on Takaanini and in the wider vicinity were obtained from the Heritage New Zealand Pouhere Taonga (**HNZPT**) digital library;
- Historic maps and plans held by Land Information New Zealand (**LINZ**) were accessed using QuickMap;
- Aerial Photographs held by LINZ, Auckland Council and in other online archives were searched.
- Historic aerials were accessed from Retrolens; and
- The Auckland Council Cultural Heritage Inventory (**CHI**) and the Auckland Council GeoMaps GIS viewer were searched for any areas of cultural significance in the vicinity.

The assessment found that, according to NZAA SRS (New Zealand Archaeological Association – Site Recording Scheme) there are three recorded archaeological sites within 500m of the Project areas. The three sites include R11/2071 – the reported burial site of Ihaka Takaanini, R11/2071 – a recreation area, and R12/1 – a midden/settlement.

Four items were also discovered to be listed on the Auckland Council CHI, including 20287 and 20288, which are ‘mileposts’ and 19740 and 19748, which are locations associated with the Walsh

Brothers historic flight. Of these four, all were outside of the designation boundaries except for CHI item 20287 (Milepost 17). However, on a site visit it was concluded that there was no remaining evidence of this listed item (CHI item 20287 – Milepost 17).

It was established that across the overall network, the land has been extensively developed and modified with roads, the NIMT railway, housing, and commercial and industrial buildings. No evidence of archaeology was visible at areas with exposed ground whilst undertaking site visits.

The Project does not affect any scheduled or nationally listed built heritage places of historic heritage significance.

### 11.10.2 Construction effects

The Project area overall is highly modified. No evidence of archaeology was observed, and no items have come to light during the desktop portion of the study. There is no reasonable cause to suspect that the proposed works will affect any in situ archaeology or heritage.

### 11.10.3 Operational effects

As above, the Project area overall is highly modified, no evidence of archaeology was observed, and no items have come to light during the desktop portion of the study. There is no reasonable cause to suspect that the proposed works will affect any in situ archaeology or heritage.

### 11.10.4 Recommended measures to avoid, remedy or mitigate adverse archaeological and built heritage effects

For both the construction and operational phases of the Project, no measures to avoid, remedy or mitigate any effects are required as there is no reasonable cause to suspect archaeological or heritage features will be impacted by the Project.

## 11.11 Network Utilities

The table below summarises the major existing network utility assets within and around the Project area, and shows that some of the land to be designated for the Project is subject either to existing designations or overlays in the AUP:OP (in the case of Transpower National Grid assets).

**Table 11-13: Summary of network utilities within the proposed designation boundaries**

Utility Provider	Asset	Designation	Relevant zones or overlays providing for asset
KiwiRail Holdings Ltd	North Island Main Trunk Railway Line	6302	Strategic Transport Corridor Zone
Waka Kotahi NZ Transport Agency	State Highway 1	6706	
Transpower New Zealand Limited	National Grid transmission lines	-	National Grid Corridor Overlay
Vector Ltd	Medium voltage overhead lines	-	-
Chorus Ltd	Communication lines	-	-

Some of the land to be designated for the Project is already subject to existing designations which are generally other network utility operators (refer to Table 11-13 above). Of particular note are the designations for the NIMT (Reference 6302) and SH1 (Reference 6706).

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

This written approval is required in order for AT to be able to undertake works in accordance with the proposed designations (as the designations, once confirmed in the AUP:OP, will be newer). The written approval is not required in order to designate the land for those later works. For this reason, written approval under section 177(1)(a) of the RMA has not yet been obtained.

As noted in Section 10 of this AEE, initial consultation and engagement on the Project with all affected network utility operators has been undertaken and is anticipated to be ongoing as the Project is developed. This will be further supported by the requirements of the NUMP, which is proposed as condition for all NoRs (refer to Volume 1). The NUMP will assist in setting a framework for further engagement, and for protecting existing infrastructure assets that are located near the TLC project areas.

## 11.12 Effects on Cultural Sites, Landscapes, and Values

This section draws on engagement that has been undertaken with Manawhenua and inputs provided by Manawhenua representatives during optioneering, concept design, and assessment of the Project. In developing the designation boundaries and indicative design, recognition has been given to both the relationship of Tangata Whenua to their lands, culture, and traditions in the Takaanini area; and the commitment to partnership between Manawhenua and AT (as a representative of the Crown) founded through Te Tiriti o Waitangi.

The Project does not affect any identified properties or land currently being negotiated under Treaty settlements, land returned under a Treaty settlement, Marae, Māori freehold lands, Tupuna Maunga Affected Areas, Tangata Whenua Management Areas, Sites of Significance to Manawhenua identified in the AUP:OP and / or Auckland Council GIS. The sites are also not within the coastal environment under the Marine and Coastal Area (Takutai Moana) Act 2011, and there are therefore no customary marine title areas / groups or protected customary rights that need to be considered in relation to the Project.

### 11.12.1 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 area.

Te Tupu Ngātahi maintains a Manawhenua forum (for operational and kaitiaki level discussions), with specific discussion on the future network proposed by Te Tupu Ngātahi for Takaanini. This has involved presenting to Manawhenua on a regular basis, seeking input on the project development and potential effects on cultural values. This has informed the corridor alignments and the mitigation measures proposed.

As identified in the engagement summary (see Section 10.3.1 of this AEE), all nineteen iwi groups in Auckland (based on the Auckland Council database) were invited to participate at the beginning of Te Tupu Ngātahi. As project interests became more locally specific, iwi interests became more focused. Iwi with specific interests in the Takaanini area and who regularly attended Project hui include Te Ākitai Waiohua, Ngāti Tamaoho, Ngaati Whanaunga, Ngāti Tamaterā, Ngāti Maru, Ngaati Te Ata Waiohua, and Ngāi Tai ki Tāmaki.

### 11.12.2 Manawhenua feedback

The Project Team engaged with Manawhenua on the Takaanini programme prior to and during wider community engagement, primarily through Te Tupu Ngātahi Manawhenua forum, with Manawhenua also attending Project-specific workshops.

Manawhenua confirmed that they were generally supportive of the proposed long-term transport network but highlighted a number of considerations to the Project Team, including:

- The importance of Papakura Stream – a key feature to consider where a preference to avoid in-stream works was communicated;
- Wetlands - works should avoid any wetlands as much as possible, especially the identified wetland at the corner of Spartan Road and Oakleigh Avenue;
- Overland flow path diversions – concerns around how overland flow paths will be diverted and the importance of good treatment;
- Safety concerns with Manuroa Road – noted that safety at Manuroa is already challenged and within a residential area. Treatment of Manuroa Road highlighted as an area of interest; and
- Visual effects - Concerns on the visual effects of new bridge structures and how this is reflected in assessments/ documentation.

These were acknowledged by the Project Team and considered as part of the optioneering process (refer to the Alternatives Assessment in Appendix A), subsequent assessment of effects (as discussed in this AEE and the technical assessments in Volume 4) and the proposed conditions (Volume 1). For example:

- The Project has avoided a proposed crossing / connection within the Papakura Stream – no stream works are anticipated as part of the Project;
- The Project avoids any potential works within the identified wetlands. The proposed designation boundaries for the Spartan and Manuia Road project areas do not extend across the wetlands.
- The proposed designation boundaries accommodate overland flowpaths and does not preclude good treatment from being implemented as part of the future design process; and
- Proposed conditions such as the ULDM will provide a mechanism to respond to concerns with Manuroa Road and visual effects.

### 11.12.3 Invitation to provide Cultural Values Assessments

The Project Team invited all Manawhenua groups to prepare Cultural Values Assessments (**CVA**) for the project in November 2022. Invitations to produce a CVA for the Project were accepted, and CVAs were provided by Ngaati Te Ata Waiohua, Ngaati Whanaunga, and Te Ākitai Waiohua. Both Ngaati Te Ata Waiohua and Ngaati Whanaunga provided CVAs in the form of report/ documentation, whereas Te Ākitai Waiohua provided an in person oral CVA to the Project Team.

### 11.12.4 Ngaati Te Ata Waiohua

Ngaati Te Ata Waiohua was supportive of their recommendations being provided for and to be reflected accordingly within this AEE. However, Ngaati Te Ata Waiohua did not support the CVA being appended or provided to Council to avoid information contained being misinterpreted or mistreated. Below sections summarise and, in some cases, respond to the ongoing engagement, outcomes sought, monitoring recommendations and mitigation recommendations which Ngaati Te Ata Waiohua included in their conclusions and recommendations.

#### Ongoing engagement

Ngaati Te Ata Waiohua outlined that the CVA provided represents only a starting point for initial engagement and will require further engagement and dialogue with Te Tupu Ngātahi. Further discussion will be needed around the implications of the Project to identify information gaps in Ngaati Te Ata Waiohua thinking (prior to receiving Project technical reports), raise issues or opportunities they had not foreseen, and clarify and reach agreement of those issues as identified in their assessment. It is intended that this process will assist with ongoing decision making from all relevant parties involved and ensure that Ngaati Te Ata Waiohua issues, concerns, interests, and values are provided for, including resource consent requirements.

Ngaati Te Ata Waiohua recommended that they are informed of the results of all monitoring and consent related assessments/ documents as they are made available for the Project moving forward. This can be achieved by beginning and maintaining an open line of communication beyond the current Manawhenua hui and is provided for in the proposed conditions by the requirement for a Manawhenua Partnership Forum. Reviewed specialist monitoring reports / specialist assessment reports can be shared confidentially in this space, ensuring that Ngaati Te Ata Waiohua are informed on the Project as it moves forward. This will also allow Ngaati Te Ata Waiohua to respond to any significant changes to the Project and reserve their right to reconsider any of their earlier decisions.

Further engagement and resourcing for the ongoing landscape design and stormwater management plans is sought by Ngaati Te Ata Waiohua. They also seek further involvement in the development of the Erosion Sediment Control Management Plan to ensure adverse effects are avoided.

Ngaati Te Ata Waiohua established that they do not support the NPS:UD and this must be a high priority understanding and at the forefront of the relationship with Te Tupu Ngātahi going forward. NPS-UD provisions will allow for greater height and density of urban development, especially in walkable catchments of PT. Ngaati Te Ata Waiohua does not support the NPS-UD due to the potential of the enabled urban form to impede on the cultural and visual qualities of the cultural landscape.

#### Outcomes sought

Several outcomes were identified in the CVA of Ngaati Te Ata Waiohua and are outlined below:

- Environmental and cultural preferences are provided for;
- Designation and associated works must not encroach on any recorded archaeological sites;
- No importation of fill and any excess fill (cut/fill) is to be used onsite;
- A Climate Adaption Plan is developed for the Project in Partnership with Ngaati Te Ata Waiohua;

- Te Tupu Ngātahi to ensure that Ngaati Te Ata Waiohua iwi have social and economic opportunities within the project and explore post construction opportunities for the maintenance of the project sites; and
- That “Takaanini” as spelt in its double vowel form is formally adopted for the Project going forward and that the name is reinstated in all communications and signage going forward.

The CVA also included the support of Ngaati Te Ata Waiohua’s of the promotion of innovative green business initiatives and practices, as well as the reuse, recycling, and repurposing of materials to minimise waste to landfill.

## Monitoring recommendations

Ngaati Te Ata Waiohua have recommended that:

*“cultural monitoring must be provided for as part of the resource consent conditions and must include the following: resourcing of monitor/s, cultural inductions, karakia whakawaatea (blessings) and access and induction to the site/s. If any sensitive material is discovered onsite, all works must cease and Ngaati Te Ata Waiohua (Pāora Puru) must be notified immediately for the appropriate tikanga to be undertaken.”*

The response by Te Tupu Ngātahi to this recommendation is included in the conditions as the Cultural Monitoring Plan (**CMP**). The CMP also includes the implementation of Accidental Discovery Protocol (**ADP**), where details of personnel to assist with management of any cultural affects are required. Ngaati Te Ata Waiohua wish to be included in the partnership and development of the Accidental Discovery Protocols, ensuring that the protocols are clearly understood and adhered to by all relevant parties and included in resource consent conditions.

Ngaati Te Ata recommended that an ecological assessment be conducted for the project to better understand the ecological importance of the area and identify any potential ecological impacts that may be caused by the Project. Ngaati Te Ata Waiohua also expressed their aspirations regarding the consideration of cumulative effects when making decisions on future development projects.

## Mitigation

Ngaati Te Ata Waiohua had several recommendations to mitigate potential adverse effects of the Project. Areas of mitigation relate to local waterways and inlets, freshwater quality, promotion of best practice management, inclusion of indigenous biodiversity enhancement, restoration and regeneration of the local waterways and wetlands, and construction and deconstruction plans to ensure no material or debris enter into the Coastal Marine Area and or estuarine area.

Any mitigation plantings are recommended to be locally eco-sourced vegetation which is appropriate for the proposed site conditions. Native vegetation choices should include species that encourage flora and fauna and habitat uptake. With regards to freshwater quality, Ngaati Te Ata Waiohua recommend a stronger emphasis on utilising nature-based solutions and traditional methods of monitoring to protect and enhance Te Mauri o Te Wai.

### 11.12.5 Ngaati Whanaunga

Te Tupu Ngātahi received the CVA of Ngaati Whanaunga for the TLC project in August 2023. Ngaati Whanaunga provided an assessment that outlined the project, summarised and took into consideration project engagement documents and technical reports, and then provided an

assessment of cultural effects and their methodology for this. Ngaati Whanaunga identified that the project would have key benefits such as addressing existing transport deficiencies and proposed replacement plantings as part of the road corridor and on adjacent land. Ngaati Whanaunga made several recommendations on the project as seen in the sections below.

### **Planting related recommendations**

Ngaati Whanaunga made two recommendations with regards to planting (at detailed design phase) associated with the Project. The first was a recommendation that native plant species that provide resources for native keystone pollinators and dispersers should be selected for replacement planting. The second planting associated recommendation for the Project was to select native species that were used for traditional practices such a Rongoa, providing materials for buildings, arts, and other cultural expression. Ngaati Whanaunga also expressed an aspiration for the history of Kauri in the area to be celebrated.

### **Engagement recommendations**

Ngaati Whanaunga communicated the importance of further engagement with residents, business owners, and themselves with regards to working proactively to address any noise, vibration and social impacts of the Project. To ensure this, Ngaati Whanaunga have requested an opportunity to review and input into project management plans including (amongst others): Community and Stakeholder Engagement Strategy; Community and Stakeholder Management Plan; Development Response Plan; Community Health and Wellbeing Strategy; and a Property Management Strategy.

### **Pre-construction, construction and associated works recommendations**

Ngaati Whanaunga made two main recommendations regarding the pre-construction/ construction phase of the Project. Ngaati Whanaunga made a pre-construction recommendation regarding the potential presence of copper skink within the project areas. It was recommended that Ngaati Whanaunga are provided an opportunity to help translocate copper skink prior to construction and resultant destruction of their habitats. With regards to construction and associated works, Ngaati Whanaunga addressed their support for the inclusion of the Accidental Discovery Protocols and therefore recommend that they are provided the opportunity to review / have input into the protocols.

#### **11.12.6 Te Ākitai Waiohua**

In December 2022, the Project Team including technical specialists attended a collaborative workshop where an oral CVA was provided by the iwi representative of Te Ākitai Waiohua for the Project. Through this korero, the Project Team and technical specialists gained a deeper understanding of the inextricable connection Te Ākitai Waiohua have with the area. This is also recognised through the name of the Takaanini suburb which originates from a Rangatira (chief) of Te Ākitai Waiohua, Ihaka Wirihana Takaanini.

In recognition of the cultural landscape (and associated narratives), the Project Team have worked with Te Ākitai Waiohua and Iwi Manawhenua as partners through the development of the NoRs for the Project. This has included the identification of project specific outcomes to acknowledge and respond to the cultural landscape through the development of the NoR conditions.

### 11.12.7 Recommended measures to avoid, remedy, or mitigate adverse effects relating to cultural sites, landscape and values

In response to the general feedback received throughout the development of the Project, and the CVAs received, a suite of conditions are proposed which includes provision for:

- Establishment of a **Mana Whenua Kaitiaki Forum** twelve months prior to the start of detailed design to provide a forum for Manawhenua participation as partners in all phases of the Project, including how Manawhenua will provide design input, how Manawhenua will be engaged in the preparation of management plans and future consenting processes, and how mātauranga Māori and tikanga Māori will be recognised in all phases of the Project;
- Requirement to invite Manawhenua to prepare a **Cultural Advisory Report (CAR)** for the Project six months prior to the start of detailed design to assist in understanding and identifying Ngā Taonga Tuku Iho ('treasures handed down by our ancestors') affected by the Project;
- Requirement that a CMP is prepared prior to the start of construction works by a suitably qualified person identified in collaboration with Manawhenua with the objective of identifying methods for undertaking cultural monitoring to assist in the management of any cultural effects during construction works; and
- Provision for Manawhenua involvement and opportunities to feed back on the preparation of relevant management plans required under other conditions, including the ULDMP.

This condition suite will provide for the continuation of the Manawhenua partnership established to date in future phases of the Project.

### 11.13 Summary of recommended mitigation and condition response

Table 11-14 provides a summary of the proposed condition responses to address the actual and potential adverse effects of the Project as discussed in Sections 11.2 to 11.12 above.

**Table 11-14: Summary of condition response to address the actual and potential effects of the Project**

Matter	Condition
Transport	<ul style="list-style-type: none"> <li>• Construction Traffic Management Plan</li> <li>• Construction Environmental Management Plan</li> <li>• Stakeholder Communication and Engagement Management Plan</li> <li>• Project Information</li> <li>• Outline Plan</li> <li>• Urban Landscape and Design Management Plan</li> <li>• Existing Property Access</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>• Construction Environmental Management Plan</li> <li>• Urban Landscape and Design Management Plan</li> <li>• Tree Management Plan</li> <li>• Construction Traffic Management Plan</li> <li>• Stakeholder Communication and Engagement Management Plan</li> <li>• Project Information</li> <li>• Mana Whenua Kaitiaki Forum</li> </ul>

Matter	Condition
	<ul style="list-style-type: none"> <li>• Existing Property Access</li> <li>• Designation Review</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>• Construction Noise and Vibration Management Plan and Schedules</li> <li>• Land Use Integration Process</li> <li>• Low Noise Road Surface</li> <li>• Traffic Noise conditions (which includes Best Practicable Options assessment for identified PPFs).</li> </ul>
Arboriculture	<ul style="list-style-type: none"> <li>• Tree Management Plan</li> <li>• Urban Landscape and Design Management Plan</li> </ul>
Terrestrial ecology	No specific conditions proposed as no effects were identified that required impact management.
Flooding	<ul style="list-style-type: none"> <li>• Construction Environmental Management Plan</li> <li>• Flood Hazard</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Project Information</li> <li>• Stakeholder Communication and Engagement Management Plan</li> <li>• Mana Whenua Kaitiaki Forum</li> <li>• Construction Traffic Management Plan</li> <li>• Construction and Environmental Management Plan</li> <li>• Construction Noise and Vibration Management Plan and Schedules</li> <li>• Urban Landscape and Design Management Plan</li> <li>• Land Use Integration Process</li> <li>• Existing Property Access</li> <li>• Designation Review</li> </ul>
Archaeology and heritage	No specific conditions proposed as no effects were identified that required mitigation.
Network utilities	<ul style="list-style-type: none"> <li>• Network Utilities Management Plan</li> </ul>
Property	<ul style="list-style-type: none"> <li>• Designation Review</li> <li>• Existing Property Access</li> <li>• ULDMP</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>• Cultural Advisory Report</li> <li>• Cultural Monitoring Plan</li> <li>• Mana Whenua Kaitiaki Forum</li> <li>• Stakeholder Communication and Engagement Management Plan</li> <li>• Urban Landscape and Design Management Plan</li> </ul>

## 12 Statutory Assessment

The following sections provide an assessment of the NoRs against:

- Section 171(1)(a) of the RMA;
- Section 171(1)(d) of the RMA; and
- Part 2 of the RMA.

It is noted that the requirements of sections 171(1)(b) and 171(1)(c) are addressed in Sections 5 and 6 of this AEE respectively, and accordingly are not repeated here.

### 12.1 Section 171(1)(a) – Relevant statutory provisions

Section 171(1)(a) of the RMA requires territorial authorities, subject to Part 2 of the Act, to consider the environmental effects of NoRs having particular regard to any relevant provisions of:

- A national policy statement;
- A New Zealand coastal policy statement;
- A regional policy statement or proposed regional policy statement; and
- A plan or proposed plan.

In accordance with section 171(1)(a) of the RMA, an assessment of the Project in the context of the relevant statutory provisions has been undertaken. Table 12-1 outlines the statutory provisions that are considered relevant to the NoRs. Table 12-2 then provides a full assessment of the Project against these matters, and is organised thematically under the following headings:

- Enabling infrastructure;
- Urban growth, urban form, and amenity;
- Ecology and Natural Heritage;
- Historic Heritage;
- Manawhenua; and
- Natural Hazards.

As noted previously, only designations for the proposed NoR works are sought at this time. However, as also outlined previously, all relevant national, regional and district consenting matters and/or environmental features were considered for the purposes of informing the options assessment and design footprint for the NoRs. The following policy assessment focusses on key national, regional and district policy and plan matters relevant to the assessment of the proposed NoRs.

**Table 12-1: Statutory documents assessed**

Type of statutory provision (s171(1)(a))	Relevance / Relevant Plans and Provisions
National Policy Statements (NPS)	<p>The following NPS's are considered relevant to the Project:</p> <ul style="list-style-type: none"> <li>• National Policy Statement on Urban Development.</li> <li>• National Policy Statement on Freshwater Management.</li> <li>• National Policy Statement on Electricity Transmission.</li> <li>• National Policy Statement on Indigenous Biodiversity.</li> </ul>

Type of statutory provision (s171(1)(a))	Relevance / Relevant Plans and Provisions
New Zealand Coastal Policy Statement	The Project is not located within the coastal environment. This document is therefore not relevant to this application.
Regional Policy Statement or Proposed Regional Policy Statement	<p>The Auckland Regional Policy Statement (<b>RPS</b>), contained in Chapter B of the AUP:OP, is relevant to this application. In particular:</p> <ul style="list-style-type: none"> <li>• B2 - Tāhuhu whakaruruhau ā-taone - Urban growth and form</li> <li>• B3 - Ngā pūnaha hanganga, kawekawe me ngā pūngao - Infrastructure, transport and energy</li> <li>• B4 - Te tiaki taonga tuku iho - Natural heritage</li> <li>• B6 – Mana Whenua</li> <li>• B7 - Toitū te whenua, toitū te taiao - Natural resources</li> <li>• B10 - Ngā tūpono ki te taiao - Environmental risk</li> </ul>
Plans or Proposed Plans	<p>The following district plan provisions in the AUP:OP are relevant to this application:</p> <ul style="list-style-type: none"> <li>• Chapter D – Overlays <ul style="list-style-type: none"> <li>• D1 – High-use Aquifer Management Areas Overlay</li> <li>• D13 – Notable Trees Overlay</li> <li>• D26 – National Grid Corridor Overlay</li> </ul> </li> <li>• Chapter E – Auckland-Wide <ul style="list-style-type: none"> <li>• E12 – Land disturbance – District</li> <li>• E15 - Vegetation management and biodiversity</li> <li>• E17 – Trees in roads</li> <li>• E26 – Infrastructure</li> <li>• E27 – Transport</li> <li>• E36 – Natural Hazards and Flooding</li> </ul> </li> </ul>

Note the following abbreviations are used in the Table 12-2 below:

- **AUP:OP** = Auckland Unitary Plan Operative in Part;
- **DP** = District Plan provisions;
- **NPS:ET** = National Policy Statement on Electricity Transmission;
- **NPS:FM** = National Policy Statement on Freshwater Management;
- **NPS:UD** = National Policy Statement on Urban Development;
- **RP** = Regional Plan provisions; and
- **RPS** = Regional Policy Statement.

**Table 12-2: Assessment of the TLC Project against relevant objectives and policies**

Plan / policy document	Key Objectives and Policies	Summary and Assessment
<b>Theme 1 – Enabling Infrastructure while managing its adverse effects</b>		
AUP:OP (RPS)	B3.2.1(1), B3.2.1(2), B3.2.1(3), B3.2.1(4), B3.2.1(8) B3.2.2(1), B3.2.2(3), B3.2.2(6), B3.2.2(8) B3.3.1(1) B3.3.2(1), B3.3.2(2), B3.3.2(3), B3.3.2(7)	<p><b>Summary of relevant Objectives and Policies</b></p> <ul style="list-style-type: none"> <li>• The objectives and policies in both Chapters B3 and E26 of the AUP:OP recognise the essential role that infrastructure has in enabling social, economic, cultural, and environmental well-being. The provisions recognise the importance of transport infrastructure in the movement of people, goods, and services, in realising a quality compact urban form, and in enabling growth. Accordingly, the provisions anticipate and enable the planning (i.e. route protection), construction, operation, and maintenance of transport infrastructure.</li> <li>• As well as enabling infrastructure in general terms, the objectives and policies in these chapters specifically seek to enable infrastructure networks that are safe, resilient, effective, and efficient.</li> </ul>
AUP:OP (RP/DP)	E26.2.1(1), E26.2.1(2), E26.2.1(3), E26.2.1(4), E26.2.1(5), E26.2.1(9) E26.2.2(1), E26.2.2(4), E26.2.2(5), E26.2.2(6), E26.2.2(14), E26.2.2(15) E25.2(1), E25.2(4), E25.3(2), E25.3(11)	<ul style="list-style-type: none"> <li>• In enabling infrastructure, these provisions also anticipate that the construction, operation, and maintenance of infrastructure can have a range of adverse environmental effects which should be avoided, remedied, or mitigated. The objectives and policies also acknowledge that infrastructure can have functional and operational needs to locate in particular environments, including areas of identified value relating to natural heritage, natural resources, Manawhenua, the coastal environment, historic heritage, and special character. Accordingly, the plan directs that the effects of infrastructure are to be assessed in the context of the wider need for and benefits of the infrastructure proposed.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• As described in Section 3.1 of the AEE, existing level crossings in Takaanini result in congestion, severance, and an elevated level of safety risk. These issues will be exacerbated by increases in east-west travel demand resulting from urban growth; and planned increases in the frequency of rail services which in turn will necessitate increased barrier arm down-time. The Project provides for bridge infrastructure to enable the grade-separation of road and rail. Grade-separation will</li> </ul>

Plan / policy document	Key Objectives and Policies	Summary and Assessment
	E12.2(1), E12.3(1), E12.3(3), E12.3(4), E12.3(5), E12.3(6)	<p>result in a network of safe east-west crossings across the NIMT which will increase the accessibility, connectivity, and capacity of the local transport network; and will ensure that rail services on the NIMT can operate more frequently without impeding east-west journeys. The Project therefore has significant benefits, and accordingly meets the objectives and policies which predicate the need to enable the planning (i.e. route protection) and delivery of infrastructure on the basis that it is a beneficial public good.</p> <ul style="list-style-type: none"> <li>• The Project will result in a safer and more resilient transport network for Takaanini. At-grade level crossings pose inherent safety risks for all users, and the operation of barrier arms compromises the resilience and continuity of service on both the road and rail networks. The grade-separation provided for by the Project will alleviate these safety and resilience issues. Accordingly, the Project meets the objectives and policies which seek to enable infrastructure networks that are safe, resilient, effective, and efficient.</li> <li>• As documented in Section 5 of the AEE and the Assessment of Alternatives (refer to Appendix A) the concept design and optioneering undertaken for the Project has sought to avoid areas/features of value identified in the AUP:OP relating to natural heritage, natural resources, Manawhenua, the coastal environment, historic heritage, and special character. As part of this process, a functional and operational need for the location of the infrastructure has been established.</li> <li>• The Project does not physically impact on any of the aforementioned features apart from two notable trees which fall within the NoR boundaries in the Manuroa Road location. Efforts have been made through the alternatives assessment and concept design to avoid these trees. However, the trees have been included within the NoR boundaries given that a functional and operational need for the infrastructure has been established, and a relatively high likelihood they will be affected by the Project due to the construction requirements. Section 11.5 of the AEE and the supporting Arboricultural Assessment assesses the conditions and specific merits of the notable trees, and the potential arboriculture value lost if the trees are removed. For the identified potential effects, a TMP and ULDMP have been offered as conditions to secure a future process to confirm and implement suitable mitigation. This approach also supports opportunities to adopt a more outcomes-based approach to mitigation rather than a typical like-for-like or ratio-based approach. The Project is therefore consistent with objectives and policies which seek the avoidance, remediation, and mitigation of the effects of infrastructure on features of identified value.</li> <li>• Potential construction and operational noise and vibration effects have been identified. The proposed conditions provide for suitable mitigation measures to be identified through the proposed conditions which include the CNVMP and a suite of traffic noise conditions. Mitigation measures identified through these conditions will ensure the Project is consistent with the relevant identified objectives and policies of Chapter E26.</li> <li>• The construction and operation of the Project will have adverse construction and operational effects that cannot be avoided. These include adverse landscape and visual effects resulting from the bridge structures, the aforementioned loss of notable trees, traffic effects resulting from both construction and operational changes to the transport network, and both construction and operational noise and vibration effects. The proposed conditions (see <b>Volume 1</b>) provide for suitable mitigation measures to manage these effects, noting that these effects are anticipated where a functional and operational need for the infrastructure can be established. The Project is therefore consistent with the objectives and policies which seek the avoidance, remediation, and mitigation of the effects of infrastructure; noting that the provisions direct that adverse effects are to be assessed in the context of the wider need for and benefits of the infrastructure proposed.</li> </ul>

Plan / policy document	Key Objectives and Policies	Summary and Assessment
<b>Subtheme 1a – Enabling Infrastructure (National Grid)</b>		
NPS:ET	Objective 1 Policy 10	<p><b>Summary of relevant Objectives and Policies</b></p> <ul style="list-style-type: none"> <li>The objectives and policies in the NPS:ET and chapters D26 and E26 of the AUP:OP relevantly seek that the national significance of the electricity transmission network (national grid) is recognised and provided for, and that the adverse effects of other activities on this network are managed to ensure the security of electricity supply. To this end, the AUP:OP includes the National Grid Corridor Overlay which regulates activities within the footprint of national grid assets.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>An area of approximately 230m<sup>2</sup> (approximately 28m in length) at the eastern end of the Taka Street NoR extent falls within the National Grid Corridor Overlay. The area is required to provide for the active mode facilities and tie-in to the intersection of Taka Street, Takanini School Road, and Kauri Heart Avenue proposed as part of the Project.</li> <li>These activities apply to a very small area of both the proposed designation and overlay, and do not fall within the definition of activities sensitive to the national grid. No impacts on national grid infrastructure are anticipated, and no pylons/support structures are located in this location. Accordingly, the activities are permitted under the D26 provisions; and the Project is consistent with the relevant objectives and policies of the AUP:OP.</li> </ul>
AUP:OP (RPS/RP/DP)	B3.2.1(7) D26.2(1), D26.2.3(1) E26.2.1(7)	
<b>Theme 2 – Urban growth, urban form, and amenity values</b>		
NPS:UD	Objectives 1, 2, 3, 4, 6, 8 Policies 1, 2, 5, 6, 10	<p><b>Summary of relevant Objectives and Policies</b></p> <ul style="list-style-type: none"> <li>The NPS:UD, and the objectives and policies in Chapters B2 and B3 of the AUP:OP, seek to provide for well-functioning urban environments. This umbrella term encompasses the need to plan/provide for sufficient development capacity to meet growth needs, the need to promote safe multi-modal accessibility in urban areas, the need to integrate urban development with infrastructure planning and funding decisions, and the need for urban environments to be conducive to reductions in greenhouse gas emissions. Objectives and policies in Chapters E26 and E27 further seek to ensure that land use and all modes of transport are integrated in a manner that realises the benefits of an integrated network and manages the adverse effects of traffic generation.</li> <li>More specifically, the objectives and policies in Chapter E27 clearly direct that road and rail crossings should operate safely with neighbouring land use, and that new level crossings are discouraged. These provisions by extension are generally supportive of efforts to remove existing level crossings from the transport network and reinforce that level crossings are not a well-functioning part of the existing transport system.</li> <li>Provisions in Chapters B2 and E26 both direct that infrastructure should avoid, remedy, and mitigate its adverse effects on the amenity values of properties adjoining the infrastructure. This is particularly in commercial/centre environments where the need for development to integrate with land use and contribute to attractive urban environments is identified.</li> </ul>
AUP:OP (RPS)	B2.2.1(1), B2.2.1(2), B2.2.1(3), B2.2.1(4), B2.2.1(5), B2.2.2(2), B2.2.2(4), B2.4.2(6), B2.2.2(7),  B2.3.2(1), B2.3.2(2), B2.3.2(4)  B3.2.1(5)  B3.3.1(1); B3.3.2(1), B3.3.2(2), B3.3.2(3), B3.3.2(4), B3.3.2(5)  B2.5.1(2); B2.5.2(2)	

Plan / policy document	Key Objectives and Policies	Summary and Assessment
AUP:OP (RP/DP)	<p>E26.2.1(3), E26.2.1(5), E26.2.1(9)</p> <p>E26.2.2(4), E26.2.2(5), E26.2.2(6), E26.2.2(15)</p> <p>E27.2(1), E27.2(2), E27.2(3), E27.2(4), E27.2(5), <del>E27.2(6)</del>, E27.2(16), E27.3(28)</p>	<p>Notwithstanding this, other provisions in the same chapters anticipate the adverse effects of infrastructure, and direct that these effects are assessed in the context of the wider need for and benefits of the proposed infrastructure.</p> <ul style="list-style-type: none"> <li>Moreover, it is noted that the NPS:UD policy framework explicitly states that urban environments including their amenity values develop and change over time; and that the planned urban form may involve significant physical changes to an area. The planned urban form in turn has an interdependent relationship with the infrastructure required to support it.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>As noted above, existing level crossings in Takaanini cause congestion, severance, and safety issues, which in turn will be exacerbated by both planned urban growth and increases in rail service frequency to serve growth in travel demands. The Project is therefore necessitated by both existing deficiencies in the transport network, and by the local and regional travel demands resulting from planned urban growth. The benefits of grade-separation are therefore consistent with the overarching objective of a well-functioning urban environment, in particular the ability to support planned urban growth and safe multi-modal accessibility.</li> <li>By definition, the Project proposes grade-separation of existing level crossings. Accordingly, it is directly consistent with the objectives and policies in Chapter E27 of the AUP:OP which discourage level crossings.</li> <li>The Project proposes active mode facilities, will improve reliability and travel times for local journeys including buses, and will facilitate more frequent rail public transport services by eliminating modal conflict at level crossings. The Project therefore contributes towards mode shift for both local and regional trips and is accordingly consistent with policy direction that seeks to reduce greenhouse gas emissions from the transport system.</li> <li>The bridge infrastructure proposed will constitute a change to the physical environment, will result in localised adverse visual effects, and the loss of existing open space and vegetation that contribute to amenity values in the Takaanini area. As documented in the Alternatives Assessment, the Project has established a functional and operational need for both the location and size of the bridge infrastructure. In particular, the height and length of the structures is dictated by required rail clearances and road gradients. The structures will need to be integrated with their residential, commercial, industrial, and open space surrounds (particularly at Taka Street and Walters Road), and an ULDMP is offered as a condition to this end. It is further anticipated that viewing audiences will acclimate to the visual changes over time. The Project is therefore consistent with policy direction seeking that adverse amenity and visual effects are avoided, remedied, or mitigated.</li> <li>The provisions of Chapters B2 and E26 of the AUP:OP anticipate the adverse effects of infrastructure, and direct that these effects are assessed in the context of the wider need for and benefits of the proposed infrastructure. Moreover, the NPS:UD policy framework provides that urban environments including their amenity values develop and change over time; and that the planned urban form may involve significant physical changes to an area. The Project proposes conditions which provide for the identification of mitigation for these effects, has established a functional and operational need for the location and size of the bridge infrastructure, and has significant benefits. Accordingly, it is consistent with these objectives and policies.</li> </ul>
<b>Theme 3 – Manawhenua</b>		

Plan / policy document	Key Objectives and Policies	Summary and Assessment
AUP:OP (RPS)	B6.2.1(1), B6.2.1(2) B6.2.2(1) B6.3.1(2), B6.3.1(3) B6.3.2(1), B6.3.2(3), B6.3.2(4) B6.5.1(1), B6.5.1(2), B6.5.1(4), B6.5.1(5) B6.5.2(1), B6.5.2(2), B6.5.2(6), B6.5.2(8), B6.5.2(9) E12.2(1), E12.3(4)	<p><b>Summary of relevant Objectives and Policies</b></p> <ul style="list-style-type: none"> <li>The objectives and policies in Chapter B6 of the AUP:OP seek recognition and provision for the principles of the Te Tiriti o Waitangi / the Treaty of Waitangi, and identify that this should occur through the active participation of Manawhenua in resource management planning processes as kaitiaki. The provisions further seek to ensure that Manawhenua cultural values are assessed and provided for through planning processes, and consequently that environmental health / mauri of natural and physical resources is ultimately enhanced.</li> <li>The provisions also seek to protect the relationship of Manawhenua with environmental features scheduled in the plan, including sites and places of significance to Manawhenua, as well as natural heritage and natural resource features. This includes features already identified in the plan, and features that are newly identified.</li> <li>The objectives and policies seek to ensure that mātauranga Māori and tikanga Māori protocols are followed when Manawhenua cultural heritage features are discovered during the subdivision, use, and development of land. The earthworks provisions further require impacts on Manawhenua cultural heritage discovered in undertaking land disturbance to be managed.</li> <li>Finally, the provisions seek that Manawhenua cultural heritage information disclosed through resource management planning processes are treated with appropriate sensitivity.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>Since its establishment, Te Tupu Ngātahi has sought to give effect to the principles of Te Tiriti o Waitangi / the Treaty of Waitangi. As discussed in Section 10.3 of the AEE, Manawhenua are actively involved as partners of Te Tupu Ngātahi. The Project Team has had regular direct engagement with Manawhenua representatives throughout the development of the business cases and planning application for the Project through Hui. These Hui have provided numerous opportunities for korero, knowledge sharing, and the exercise of Kaitiakitanga; particularly regarding outcomes that the Project needs to achieve in respect of the cultural landscape and values. Information has also been shared in written CVAs and through oral histories. The partnership between Te Tupu Ngātahi and Manawhenua on the Project to date has therefore been consistent with the objectives and policies of Chapter B6.</li> <li>Conditions providing for an ongoing partnership relationship with Manawhenua throughout the detailed design and implementation of the Project are proposed. Continuing this relationship recognises and ensures that Manawhenua have the ability as partners to guide and advise on Project-specific opportunities to acknowledge and respond to the cultural landscape, which sits beyond the technical expertise and effects assessment set out in Section 11 of the AEE.</li> <li>The Project area is not known to contain any Māori land, Treaty Settlement Land, or documented sites of significance to Manawhenua. Any accidental discoveries during construction will follow the accidental discovery protocols set out in Chapter E12 of the AUP:OP. Moreover, the conditions also provide for a CMP, CAR, and Mana Whenua Kaitiaki Forum which will collectively ensure processes are in place to manage impacts on Manawhenua cultural heritage.</li> </ul>
<b>Theme 4 – Ecology and Natural Heritage</b>		

Plan / policy document	Key Objectives and Policies	Summary and Assessment
NPS:FM	Objective 1 Policies 1, 15	<p><b>Summary of relevant Objectives and Policies</b></p> <ul style="list-style-type: none"> <li>The objectives and policies of the NPS:FM broadly seek that freshwater is managed in a way which prioritises the health of water bodies. The provisions of Chapters B7 and E1 of the AUP:OP further seek that degraded freshwater systems are enhanced, the loss of freshwater systems is minimised, that adverse effects of land use changes on freshwater are avoided, remedied, and mitigated; and that freshwater quality is progressively improved in degraded areas. To these ends, the E1 provisions contain a number of objectives and policies on integrated stormwater management system design (which in turn inform the requirements for high-use roads set out in E9).</li> <li>The objectives and policies of the NPS:IB seek to ensure that indigenous biodiversity is maintained with no overall loss of indigenous biodiversity after the commencement date, and provides for the use of Significant Natural Areas (<b>SNA</b>) as a mechanism to protect significant indigenous vegetation and habitats of indigenous fauna. The objectives and policies of Chapters B7 and E15 similarly seek to protect, maintain, and enhance areas of significant indigenous biodiversity from the effects of subdivision, use, and development. These features are most clearly identified in the plan through Significant Ecological Areas (<b>SEA</b>). The policies of Chapter E15 further recognise that it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values where a functional or operational need for the infrastructure has been established.</li> <li>The provisions of Chapter E17 of the AUP:OP further direct that upgrades to the transport system maintain the ecological and amenity values of street trees, including the protection of scheduled notable trees.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>Through optioneering and design, the Project has avoided direct physical effects on freshwater bodies including streams and wetlands. While the infrastructure will have effects on the quantity and quality of stormwater discharged to freshwater bodies, the concept stormwater design provided for through the designation includes allowances for stormwater treatment devices meeting the requirements of Chapter E1 and E9 of the AUP:OP and by extension the relevant guideline documents for stormwater management devices. The designation therefore ensures that there is sufficient space for stormwater management devices needed to meet future regional consenting requirements. The Project has therefore appropriately considered and provided for the requirements of Chapters B7 and E1 of the AUP:OP, and the NPS:FM; and has identified suitable measures for the future management of effects resulting from the functional and operational need of the infrastructure to locate on the proposed sites.</li> <li>The Project has avoided impacts on any identified SEAs, and no significant effects on terrestrial ecology have been identified. It is however acknowledged that the Project is likely to require the removal of existing vegetation and trees within the Project extents to enable construction of the new infrastructure. This includes street trees, trees within open spaces and two notable trees. Given that a functional and operational need for the location of the proposed infrastructure has been established, avoidance of these trees has not been possible through location or design. While there is an initial loss in value, the Project proposes a TMP and ULDMP as part of the condition set to secure a future process for mitigating these effects. These adaptive management conditions constitute an outcomes-based approach that considers overall improvements to natural character, ecological value, and visual amenity that may be achieved through the Project. The</li> </ul>
NPS:IB	Objective 1 Policy 6, Policy 7	
AUP:OP (RPS)	B7.2.1(1), B7.2.1(2) B7.2.2(5) B7.3.1(1), B7.3.1(2), B7.3.1(3) B7.3.2(1), B7.3.2(6)	
AUP:OP (RP/DP)	D13.2(1) D13.3(2) E1.2(1), E1.2(3), E1.3(8), E1.3(9), E1.3(10), E1.3(11), E1.3(12), E1.3(13), E1.3(14) E15.2(2) E15.3(7) E17.2(3) E17.3(1)	

Plan / policy document	Key Objectives and Policies	Summary and Assessment
		Project has therefore appropriately considered and provided for the requirements of chapters B7, E15, and E17 of the AUP:OP.
<b>Theme 5 – Natural Hazards</b>		
NPS:UD	Objective 8; Policy 1	<b>Summary of relevant Objectives and Policies</b>
AUP:OP (RPS)	<p>B3.2.1(3), B3.2.2(9)            B10.2.1(1), B10.2.1(2),            B10.2.1(3), B10.2.1(4)            B10.2.2(3), B10.2.2(4),            B10.2.2(7), B10.2.2(12).            E26.2.1(5), E26.2.2(15)</p> <p>E36.2(1), E36.2(2),            E36.2(4), E36.2(5),            E36.3(3), E36.3(13),            E36.3(14), E36.3(15),            E36.3(21), E36.3(23),            E36.3(29), E36.3(30).</p>	<ul style="list-style-type: none"> <li>Chapter B3 of the AUP:OP contains a policy providing that infrastructure with a functional or operational need to locate in a natural hazard area should ensure that its location and design minimises risk from natural hazards; and that risks that cannot be avoided by location or design should be mitigated to the extent practicable. Similarly, the provisions of Chapters B10, E26, and E36 require that the risks to infrastructure from natural hazards are not increased; and to this end that planning applications for infrastructure projects adequately assess natural hazards risks and minimise risk through location and design.</li> <li>Moreover, the NPS:UD policy framework requires that well-functioning urban environments are resilient to the effects of climate change.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>As noted above, a functional and operational need for the Project location has been established through optioneering and design. The primary natural hazard risk identified in the context of the resultant Project area is flooding. The Flooding Assessment in Volume 4 (and summarised in Section 11.7 of the AEE) identifies that the design and assessment parameters adopted for the Project have appropriately accounted for natural hazards objectives and policies and have considered the effects of climate change. The Project design has sought to ensure the new infrastructure achieves flood neutrality for surrounding areas and provides for volumetric compensation and new culverts where there are risks of minor flood displacement. Accordingly, the Project is consistent with relevant objectives and policies of the NPS:UD, and Chapters B3, B10, E26, and E36 of the AUP:OP.</li> <li>Moreover, the Assessment of Alternatives (refer to Appendix A) identified flood risk as one of the factors in favour of the preferred bridge as the form of grade-separation rather than an underpass which was assessed as being a greater flood risk.</li> <li>The proposed flood hazard condition sets out the outcomes that must be achieved by the Project in respect of flood effects. The outcomes set out in the condition are considered consistent with the outcomes sought by the relevant objectives and policies.</li> </ul>

## 12.2 Section 171(1)(d) – Other Matters

Section 171(1)(d) requires the territorial authority to have particular regard to “any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement”. It is considered that there are no further matters under section 171(1)(d) that are reasonably necessary to make a recommendation on the NoR.

Notwithstanding this, Section 12.2.1 below summarises a range of policy considerations which fall outside the bounds of the s171(1)(d) requirements, but which nonetheless have been considered in the development of the Project.

### 12.2.1 Other policy considerations

Other legislation and policy that has been considered in the development of the Project and will inform future implementation is set out in Table 12-3 below.

**Table 12-3: Other legislation, strategies, and policies**

National legislation and policies
<p><b>Government Policy Statement on Land Transport (GPS) for 2021/22-2030/31</b></p> <ul style="list-style-type: none"> <li>• The GPSLT is a policy document prepared under the Land Transport Management Act 2003 (<b>LTMA</b>) which outlines how Government transport policy priorities will inform transport investment over the next ten years.</li> <li>• The current GPSLT strategic priorities are safety, access, climate change, and freight connections.</li> <li>• The Project is strongly aligned with these strategic priorities given that it: <ul style="list-style-type: none"> <li>• Will achieve grade-separation of existing road-rail level crossings which will result in a significantly safer transport network in the area by removing modal conflicts.</li> <li>• Will enhance accessibility by providing safe and reliable east-west road connections across the NIMT in Takaanini; and by facilitating greater rail frequencies by removing modal conflicts.</li> <li>• Will contribute to greenhouse gas reduction targets given that the project includes active mode facilities, will improve reliability/travel times for local journeys including buses, and will facilitate more frequent rail PT services by eliminating modal conflict.</li> <li>• Will result in better freight connections into the Takaanini industrial area.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Climate Change Response Act 2022 (CCRA) and Emissions Reduction Plan (ERP) 2022</b></li> </ul> <ul style="list-style-type: none"> <li>• The CCRA sets a long-term target (net zero GHG emissions by 2050) and a system of emissions budgets and emissions reduction plans to achieve it. The CCRA sets an overarching legal framework to drive domestic emissions reductions, which binds AT and Waka Kotahi.</li> <li>• Section 5ZN of the CCRA provides that a person or body in exercising or performing a public function power or duty under law may take into account the 2050 target, emissions budget, or ERP.</li> <li>• In May 2022 the Government published the first three emissions budgets (2022-25, 2026-30, and 2031-35) and the first ERP. The ERP set the following transport-specific targets: <ul style="list-style-type: none"> <li>• Reduce VKT by 20% by 2035</li> <li>• Increase zero emissions vehicles to 30% of the fleet by 2035</li> <li>• Reduce emissions from freight by 35% by 2035</li> <li>• Reduce emissions intensity of transport fuel by 10% by 2035.</li> </ul> </li> <li>• The VKT target is the most pertinent to the development of transport infrastructure projects.</li> </ul>

<p><b>National legislation and policies</b></p> <ul style="list-style-type: none"> <li>To this end, the Project is well-placed to contribute to the target because it includes active mode facilities, will improve reliability/travel times for local journeys including buses, will eliminate east-west severance and improve active mode connectivity across the NIMT, and will facilitate more frequent rail PT services by eliminating modal conflict.</li> </ul>
<p><b>Regional strategies and policies</b></p>
<p><b>Auckland Regional Land Transport Plan (RLTP) 2018-2028</b></p>
<ul style="list-style-type: none"> <li>The RLTP is a policy document prepared under the LTMA which outlines transport investment priorities for Auckland over a ten-year period.</li> <li>The RLTP includes an unprioritised funding allocation for road / rail level crossing grade separations across the Auckland network. Route protection for the removal/grade-separation of level crossings in Takaanini is therefore strongly aligned with RLTP funding priorities.</li> </ul>
<p><b>Auckland Transport Alignment Project 2021-2031</b></p>
<ul style="list-style-type: none"> <li>Auckland Transport Alignment Project 2021-2031 (<b>ATAP</b>) is a joint project involving Auckland Council, AT, Ministry of Transport (<b>MoT</b>), Waka Kotahi, Treasury, and the State Services Commission to identify joint central and local government priorities for transport investment in Auckland.</li> <li>The most recent (2021-31) iteration of ATAP includes an unprioritised funding allocation for road/rail level crossing grade separations across the Auckland network. Route protection for the removal/grade-separation of level crossings in Takaanini is therefore strongly aligned with ATAP funding priorities.</li> </ul>
<p><b>Auckland Plan 2050</b></p>
<ul style="list-style-type: none"> <li>The Auckland Plan is the spatial plan mandated by section 79 of the Local Government (Auckland Council) Act 2009, the purpose of which is to contribute to Auckland's social, economic, environmental, and cultural well-being through a comprehensive and effective long-term strategy for Auckland's growth and development.</li> <li>The transport and access provisions of the Plan identify investment in grade-separation of road and rail level crossings as important to achieving a safer transport network. The Project is therefore well aligned with the Auckland Plan.</li> </ul>
<p><b>Vision Zero for Tāmaki Makaurau: a transport safety strategy and action plan to 2030</b></p>
<ul style="list-style-type: none"> <li>Vision Zero is Auckland's transport safety strategy which states there will be no deaths or serious injuries on the transport system by 2050. The current Vision Zero safety strategy and action plan document identifies actions to work towards this target with a 2030 planning horizon.</li> <li>This document identifies planning for the grade-separation of road-rail level crossings as an action under the PT safety actions for the short-term. The Project is therefore well-aligned with this document.</li> </ul>
<p><b>Te Tāruke-ā-Tāwhiri: Auckland's Climate Action Framework and Plan</b></p>
<ul style="list-style-type: none"> <li>Te Tāruke-ā-Tāwhiri is a non-statutory climate change mitigation and adaptation plan developed by Auckland Council to apply to Auckland regionally. It sets a target of halving Auckland's greenhouse gas emissions by 2030 and reaching net-zero emissions by 2050.</li> <li>As noted above, the Project is well-placed to contribute to these targets because it includes active mode facilities, will improve reliability/travel times for local journeys including buses, will eliminate east-west</li> </ul>

<b>National legislation and policies</b>
severance and improve active mode connectivity across the NIMT, and will facilitate more frequent rail PT services by eliminating modal conflict.
<ul style="list-style-type: none"> <li>• <b>Local Plans</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Papakura Local Board Plan 2020</b></li> </ul>
<ul style="list-style-type: none"> <li>• The Project is situated within the Papakura Local Board area.</li> <li>• The current (2020) Local Board plan includes “continue to advocate to AT for separating rail and road level crossings in Takaanini” as an action. The Project is therefore strongly aligned with Local Board aspirations.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Manurewa-Takaanini-Papakura Integrated Area Plan 2018</b></li> </ul>
<ul style="list-style-type: none"> <li>• This document is an integrated spatial plan for the Manurewa, Takaanini, and Papakura areas prepared jointly by Auckland Council Plans &amp; Places, the Manurewa and Papakura Local Boards, the Southern Initiative, and the Arts Community and Events Department.</li> <li>• The plan includes “investigate grade-separated road/rail connections at Walters Road and Taka Street” as an action. The Project is therefore strongly aligned with plan.</li> </ul>

## 12.3 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 Project promotes sustainable management, consideration of sections 6, 7 and 8 of the RMA is required before drawing any conclusions regarding consistency with section 5 of the RMA.

The following section provides an assessment of the effects of the Project subject to Part 2 of the RMA.

### 12.3.1 Matters of national importance

Section 6 of the RMA states that in achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for specified matters of national importance. We consider the following matters of national importance to be relevant to the Project, see Table 12-4 below:

Table 12-4: Matters of national importance

Matter of national importance	Assessment
The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.	The Project does not impact on the coastal environment (including the coastal marine area), wetlands, and lakes and rivers.
The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development.	The Project avoids outstanding natural features and landscapes.
The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.	<p>The Project traverses a predominantly urban environment and avoids significant ecological areas.</p> <p>The level of adverse ecological effects anticipated from the Project are also low and are not of a level that would require any further mitigation measures.</p>
The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers.	The Project does not impact public access to and along the coastal marine area, lakes and rivers.
The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	<p>Manawhenua have been actively involved throughout the development of the Project. This has included through the alternatives assessment and identification of the Project. The Project is not known to contain Māori land, Treaty Settlement Land, or documented sites of significance to Manawhenua.</p> <p>The partnership with Manawhenua has involved the identification of opportunities to acknowledge and respond to the cultural landscape across the Project and restore and enhance the natural and cultural landscapes.</p> <p>The Project has also recognised Manawhenua cultural values, particularly with regards to the mauri of, and the relationships of Manawhenua with natural and physical resources including freshwater, land, air and coastal resources. Significant adverse effects on these values are required to be avoided, with adverse effects avoided, remedied or mitigated as appropriate.</p> <p>The Project proposes conditions to provide for an ongoing relationship with Manawhenua throughout the detailed design and implementation of the Project. It also ensures that Manawhenua have the ability as partners to guide and advise on Project specific opportunities to acknowledge and respond to the cultural landscape. It is acknowledged that the cultural landscape and narrative sits beyond the technical expertise and assessment provided in Sections 11.1 - 11.9 above.</p>
The protection of historic heritage from inappropriate subdivision, use, and development.	The Project will not adversely affect scheduled historic heritage sites.

Matter of national importance	Assessment
The protection of protected customary rights.	The Project does not impact upon any known protected customary rights.
The management of significant risks from natural hazards.	<p>A number of design measures to provide resilience to flooding and climate change have been adopted across the Project. The flooding assessment has appropriately adopted a conservative climate change-adjusted rainfall scenario and Maximum Probable Development (<b>MPD</b>) as assessment parameters for identifying flood effects; and the project design has ensured that new infrastructure achieves flood neutrality for surrounding areas.</p> <p>There is sufficient space within the proposed designation footprint for stormwater and flood mitigation.</p>

### 12.3.2 Other matters

Section 7 of the RMA states that, in achieving the purpose of the RMA, particular regard shall be had to specified other matters. We consider the following other matters in Table 12-5 below to be relevant to the Project.

**Table 12-5: Other matters that are relevant to the Project**

Other matter	Assessment
Kaitiakitanga	Manawhenua have been actively involved through the NoR phase of the Project and will continue to exercise kaitiakitanga through the future phases of the Project. This includes the preparation of management plans and the involvement of Manawhenua as partners in the detailed design and consenting phases of the Project.
The ethic of stewardship	This has been recognised through engagement with key stakeholders, business associations, community groups and the wider community who exercise stewardship over particular resources.
The efficient use and development of natural and physical resources	Through the assessment of alternatives process, the Project was determined to be the most efficient use of natural and physical resources, particularly as it utilises existing transport corridors.
The efficiency of the end use of energy	Not considered relevant to the Project.
The maintenance and enhancement of amenity values	The Project has sought to maintain and enhance amenity values through the alternatives assessment and the development of the concept design. This will primarily be achieved through the implementation of the ULDMP which is a condition on the proposed designations.

Other matter	Assessment
Intrinsic values of ecosystems.	The recommended option and concept design has sought to avoid adverse effects on ecosystems as far as practicable while providing sufficient width within the proposed designation boundaries for further refinement during detailed design.
Maintenance and enhancement of the quality of the environment.	The Project has sought to maintain and enhance the quality of the environment through the implementation of the ULDMP which is a condition on the proposed designations.
Any finite characteristics of natural and physical resources.	Not considered relevant to the Project.
The protection of the habitat of trout and salmon.	Not considered relevant to the Project.
The effects of climate change.	The Project responds to the effects of climate change and the reduction of greenhouse gas emissions by providing improved reliability for PT and high-quality walking and cycling facilities.
The benefits to be derived from the use and development of renewable energy.	Not considered relevant to the Project.

### 12.3.3 Te Tiriti o Waitangi | Treaty of Waitangi

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

Manawhenua have been involved as a partner throughout the development of the Project. To date this has involved identifying the recommended Project corridor, input into the technical assessments and the development of the NoR conditions.

Manawhenua will be involved as partners in the future phases of the Project, and this has been provided for through the conditions on the proposed designation.

Accordingly, the Project is considered to have taken into account the principles of Treaty of Waitangi (Te Tiriti o Waitangi).

### 12.3.4 The purpose of the Act

Section 5 of the RMA sets out the purpose of the RMA which is to promote the sustainable management of natural and physical resources.

The Project will result in some adverse effects as discussed in Section 11 above, however, when considering the significant regional and local benefits of the Project, and the measures proposed to avoid, remedy and mitigate the adverse effects, the Project achieves the purpose and principles of the RMA.

## Appendix A: Assessment of Alternatives