

VOLUME 4

# Takaanini Level Crossings Assessment of Arboricultural Effects

October 2023

Version 1

## Document Status

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## Revision Status

Version	Date	Reason for Issue
1.0	13/10/2023	Final for lodgement

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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
<b>AEE</b>	Assessment of Effects on the Environment report
<b>AT</b>	Auckland Transport
<b>AUP:OP</b>	Auckland Unitary Plan: Operative in Part
<b>Council</b>	Auckland Council
<b>DP</b>	District Plan
<b>GIS</b>	Geographic Information Systems
<b>NIMT</b>	North Island Main Trunk rail line
<b>NPS</b>	National Policy Statement
<b>NPS:UD</b>	National Policy Statement on Urban Development
<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>PC78</b>	Plan Change 78 to the Auckland Unitary Plan: Operative in Part
<b>PRZ</b>	Protected Root Zone
<b>Report</b>	Assessment of Arboricultural Effects
<b>RMA</b>	Resource Management Act 1991
<b>SH1</b>	State Highway 1
<b>Te Tupu Ngātahi</b>	Te Tupu Ngātahi Supporting Growth
<b>TLC / the Project</b>	Takaanini Level Crossings Project
<b>TMP</b>	Tree Management Plan
<b>ULDMP</b>	Urban and Landscape Design Management Plan
<b>Waka Kotahi</b>	Waka Kotahi New Zealand Transport Agency

## Executive summary

This Report has been prepared following site visits that were undertaken for the collection of suitable data to inform an Assessment of Arboricultural Effects for two Notices of Requirement (**NoR**) for the Takaanini Level Crossing project (**TLC / the Project**). The site visits and desktop review involved recording details of all relevant trees (as described further in this Report) within the proposed designation areas / project areas.

Trees were recorded singularly, or in groups where logical groupings could be made based on species, configuration and/or size. Sufficient information was gathered to allow an assessment of the existing environment and consideration of the future environment. Tree details are presented in table and in Geographic Information Systems (**GIS**) mapping formats (contained in the appendices of this Report).

The existing environment for the majority of the project areas are primarily urban with residential or commercial (including industrial) land uses. Tree cover associated with the existing urbanised area typically include plantings of amenity trees.

The future environment is likely to change over the next 10 to 15 years as intensification occurs along/around the project areas as a result of recent changes in national policy direction and changes to the Resource Management Act 1991 (**RMA**). This will likely result in a reduction of existing trees adjoining the corridors, on business and residentially zoned land, which are not afforded any protection in the Auckland Unitary Plan: Operative in part (**AUP:OP**).

A summary of the trees or vegetation requiring removal for each project area is provided in the table below with future discussion of the affected vegetation outlined in Section 4 of this Report:

NoR reference	Project areas	Total number of trees (within road reserve, open space zones or Notable Trees overlay)	Total number of trees for removal* (within road reserve, open space zones or Notable Trees overlay)	Works within the protected root zone of retained vegetation
NoR 1	Spartan Road	1	0	0
	Manuia Road	4	2	0
	Manuroa Road	2	2	0
	Taka Street	13	13	0
NoR 2	Walters Road	26	25	1
	<b>Total</b>	<b>46</b>	<b>42</b>	<b>1</b>

*\* Note: excluding pest plant species within the road reserve or those trees that are less than 4 m in height or 400 mm in girth within the road reserve or an open space zone (as removal of these trees are a permitted activity under the AUP:OP)*

Given that the Project is to be delivered in 10 to 15 years' time, a verification assessment at the time of implementation is recommended to ensure the current conditions are still relevant. Any future tree removal, tree planting or mass planted vegetation should be assessed at that time, with this Report intended to provide a baseline survey.

Mitigation measures commensurate with the anticipated effects on the environment from impacts on protected trees have been considered, with the aim of avoiding, remedying and mitigating effects on trees. It is recommended that a Tree Management Plan (**TMP**) be developed where construction work impacts on trees and groups of trees that are protected under the District Plan (**DP**) provisions. Replacement planting protocols are proposed to be developed further as part of the TMP where protected trees are to be removed.

Opportunities for replanting within the berms of the proposed cross section and land that may no longer be required post-construction provides significant mitigation of effects arising from tree removal associated with the Project. The long-term outcome of comprehensive street tree planting will be more trees in the public realm and increased amenity value within the project areas.

Overall, the effects on trees protected by the DP will be mitigated by replacement planting within the corridors and/or on adjacent land within the designation boundaries.

### Summary of Assessment of Effects and Recommendations

Effect	Assessment	Recommendation
<b>Construction</b>		
Removal of trees to enable the Project	As outlined in the table in the previous section, 42 trees are proposed for removal within the project area (this total excludes two pest plants and one tree that is less than 4 m in height or 400 mm in girth, which can be removed as a permitted activity under the AUP:OP).	A verification assessment at the time of implementation is recommended to ensure there has been no material change in conditions. Any additional future tree removal, tree planting or mass planted vegetation should be assessed at that time. This Report provides a baseline survey. The TMP will provide a mechanism to consider any changes from this baseline.  A tree transplant assessment is recommended for any trees considered worthy of relocation as part of the Project.
Effects on retained vegetation	Works are proposed within the protected root zone of one retained tree within the Walters Road project area.	It is recommended that a TMP be prepared prior to construction to address future tree removals, plantings and growth of areas of vegetation within the designation footprint.  The case of trees proposed for retention, the TMP is to include a rigorous suite of tree protection measures to ensure the ongoing health and longevity of those trees to be retained.
Replacement of trees lost in order to construct the Project	Replacement planting within the designation boundaries is recommended to take an	It is recommended that replacement planting protocols be developed further as part of the

Effect	Assessment	Recommendation
	<p>outcomes-based approach that considers overall improvements to landscape systems and processes, natural character, and visual amenity, rather than a quantitative approach which employs a like-for-like or ratio-based mitigation approach.</p> <p>While replacement planting for the Project is to be undertaken within the designation boundaries, additional opportunities for planting may also be available in the wider catchment (e.g., in other parks, open space and/or road reserve outside of the designation boundaries). These opportunities could be further identified with discussion with relevant stakeholders such as Auckland Council Parks and AT in future.</p>	<p>TMP where protected trees are to be removed.</p> <p>Arboricultural input should be sought at the detailed design phase. The specific tree locations and/or tree species are to be reviewed and input provided in order to achieve the best outcome in the long term.</p> <p>A detailed landscape plan with replacement planting is to be prepared as part of the Urban and Landscape Design Management Plan (<b>ULDMP</b>) and detailed design.</p>
<b>Operation</b>		
Tree trimming or alteration	Replacement trees may require maintenance to retain sight lines and the overhead and lateral clearances of general traffic lanes and the high-quality walking and cycling facilities	New street trees or mass planted vegetation (trees specifically) are planted no closer than 1 m to the future general traffic lanes.



# 1 Introduction

## 1.1 Purpose and scope of this Report

This Assessment of Arboricultural Effects Report (**Report**) has been prepared to inform the Assessment of Effects on the Environment (**AEE**) for two Notices of Requirement (**NoR**) being sought by Auckland Transport (**AT**) for the Takaanini Level Crossings Project (**TLC / the Project**) under the Resource Management Act 1991 (**RMA**). The Project proposes to construct five new bridges across five project areas: NoR 1 relates to four of the proposed project areas (referred to as Spartan Road, Manuia Road, Manuroa Road and Taka Street) while NoR 2 relates to the remaining project area (referred to as Walters Road). Specifically, this Report considers the actual and potential effects associated with the construction and operation of the TLC on the existing and likely future environment as it relates to Arboricultural Effects and recommends measures that may be implemented to avoid, remedy and/or mitigate these effects.

This Report should be read alongside the AEE, which contains further details on the history and context of the TLC. The AEE also contains a detailed description of works to be authorised within each NoR, and the typical construction methodologies that will be used to implement this work. These have been reviewed by the author of this Report and have been considered as part of this assessment of Arboricultural Effects. As such, they are not repeated here. Where a description of an activity is necessary to understand the potential effects, it has been included in this Report for clarity.

## 1.2 Report Structure

The structure of the Report is set out in Table 1 below. The assessment considers the actual and potential effects of the Project as a whole in the first instance. Where required, the assessment then focusses on the actual and potential effects arising within 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 North Island Main Trunk line (**NIMT**) moving north to south.

**Table 1: Report Structure**

Sections	Section number
Description of the TLC	2
Overview of the methodology used to undertake the assessment and identification of the assessment criteria and any relevant standards or guidelines	3
Identification and description of the existing and likely receiving arboricultural environment	4.1
Assessment of general arboricultural matters for the overall TLC network and project areas	4.2, 4.3, 4.4, 4.5, 4.6
Overall conclusion of the level of potential adverse arboricultural effects of the TLC.	5

## 2 Project Description

The overall Project proposes the removal and/or replacement of four existing road over rail level crossings at Spartan Road, Manuroa Road, Taka Street and Walters Road in Takaanini. As further discussed in the AEE, the Project responds to functionality and safety issues anticipated at these crossings from the increasing number of train movements along the NIMT. The Project and indicative design also take into account the long-term planned expansion of the NIMT from the current two rail tracks to up to four tracks. The increased rail frequency will lead to greater barrier arm down-time and therefore increased severance and congestion in the area.

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. The bridges and associated works/improvements are located across five project areas and will be progressed as two NoR packages (refer to Figure 1 and Table 2).

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.7.8 m;
- 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.

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

**Table 2: The TLC project areas and NoR packages**

NoR Reference	Project area	Description	Requiring Authority
Takaanini Level Crossings Project NoR 1	<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.	
Takaanini Level Crossings Project NoR 2	<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: Overview of the Project, project areas and extent of the NoRs




## 2.1 NoR 1 – Spartan Road, Manuia Road, Manuroa Road and Taka Street

### 2.1.1 Spartan Road project area

As set out in Table 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: 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 cul-de-sacs (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>• 50 km/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>The diagram illustrates a cross-section of an 'Active Mode Bridge'. It features a central pedestrian lane on the left, highlighted in blue with a white walking figure icon, and a central cyclist lane on the right, highlighted in green with a white bicycle icon. Above the pedestrian lane, a grey silhouette of a person is shown with an upward-pointing arrow. Above the cyclist lane, a grey silhouette of a person on a bicycle is shown with a downward-pointing arrow. The bridge is supported by two grey pillars on either side. Below the diagram, the text 'ACTIVE MODE BRIDGE' is written in bold blue capital letters.</p> <p><b>ACTIVE MODE BRIDGE</b></p>

### 2.1.2 Manuia Road project area

As set out in Table 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 4: Overview of the Manuia Road project area

NoR 1 – 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> </ul>

	<ul style="list-style-type: none"> <li>• New roundabout intersection at Oakleigh Avenue/ Manuia Road / Hitchcock Avenue with active mode facilities and tie in works.</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 a central two-lane road (yellow with white triangles), flanked by green bicycle lanes and blue pedestrian paths. The bottom diagram, labeled "TWO LANE ARTERIAL", shows a similar cross-section but with a central green median strip between the two road lanes, and trees on the outer edges.</p>

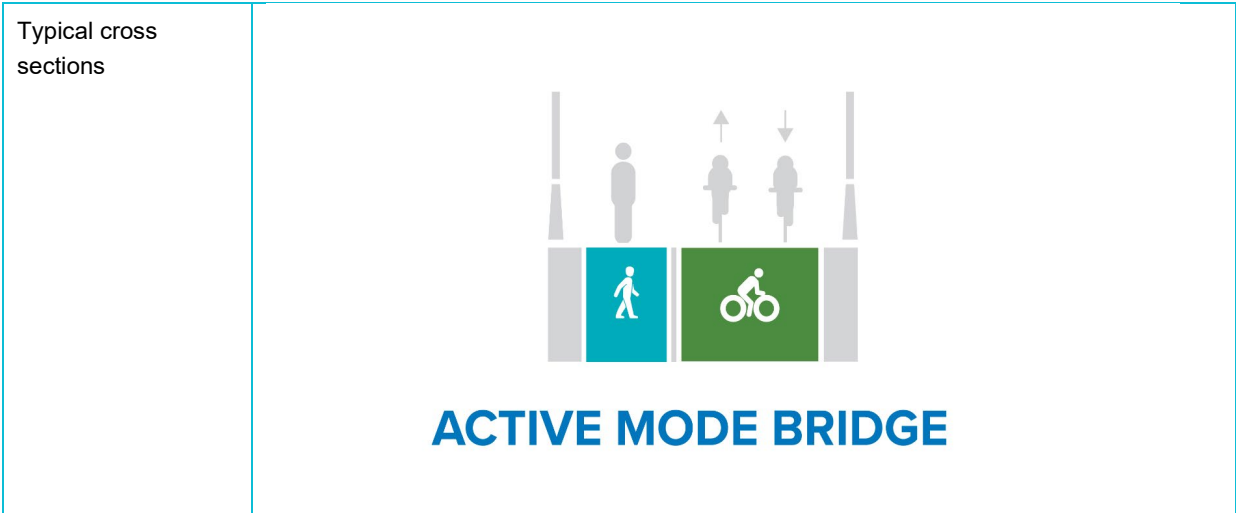
### 2.1.3 Manuroa Road project area

As set out in Table 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 5: Overview of the Manuroa Road project area**

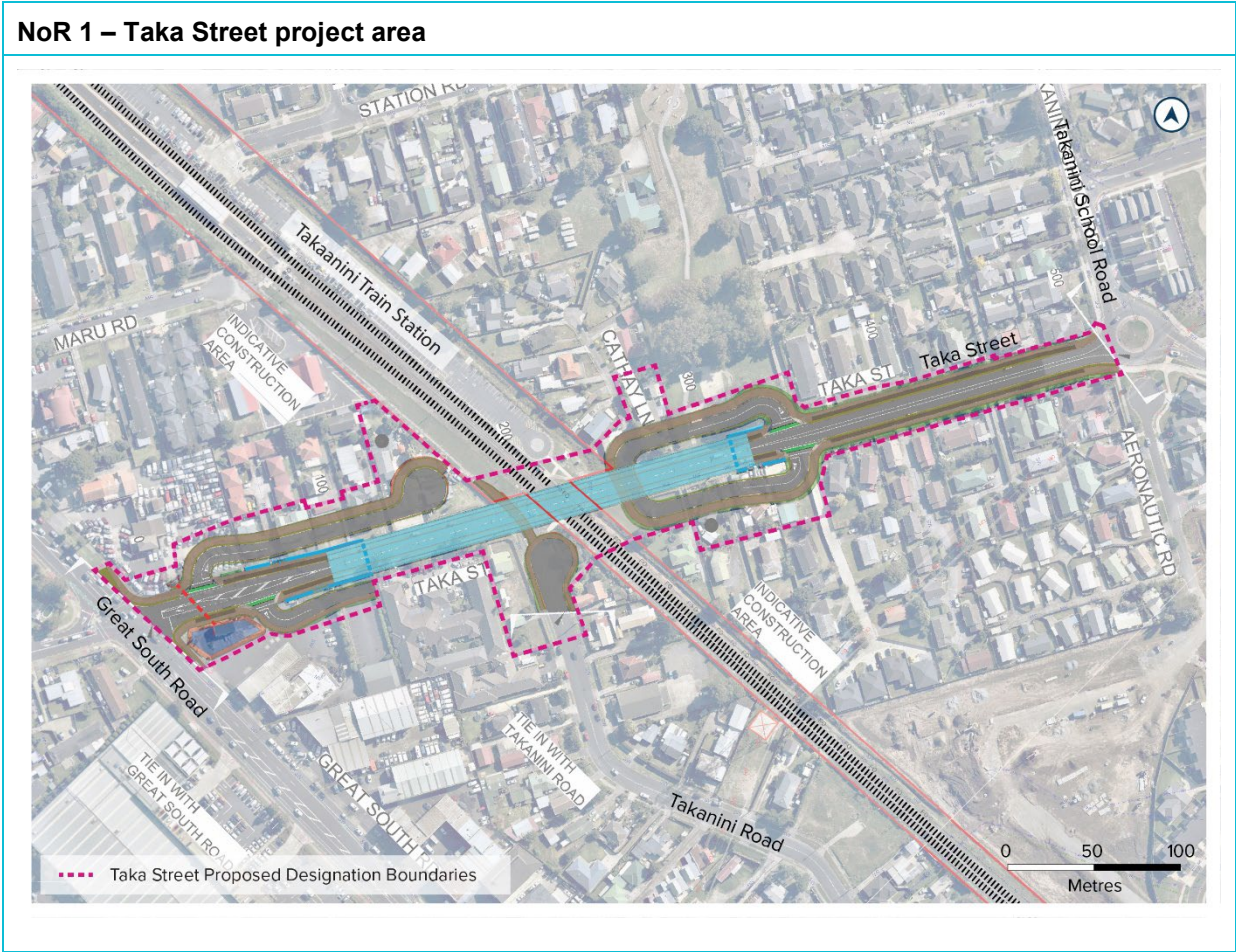
<b>NoR 1 – Manuroa Road project area</b>	
<b>Key features</b>	
Overview	<ul style="list-style-type: none"> <li>• Closure of the existing road corridor to vehicular traffic across the NIMT.</li> <li>• Construction of an active mode bridge across the NIMT.</li> <li>• Construction of cul-de-sacs (accommodating 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>




### 2.1.4 Taka Street project area

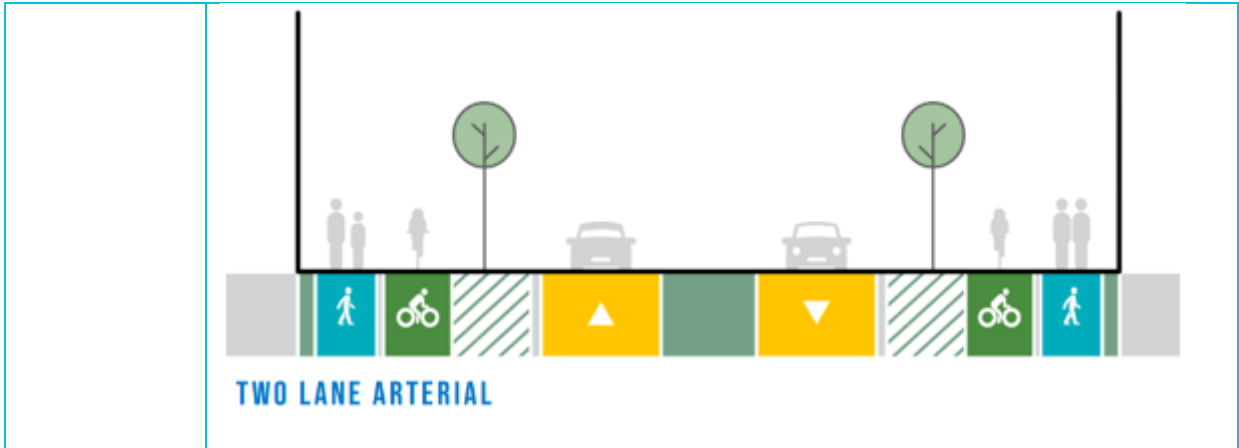
As set out in Table 6 below, the proposed works within the Taka Street project area include closure of the existing level crossing and replacement with a new grade-separated road crossing (bridge) across the NIMT. The new bridge will accommodate one vehicle lane in each direction and active mode facilities.

Table 6: Overview of the 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 Street corridor and allows access to existing properties to remain and Takaanini Station.</li> <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 allows access to existing properties to remain including Takaanini Reserve and Cathay Lane.</li> </ul> </li> </ul>
Intersections	<ul style="list-style-type: none"> <li>None</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>

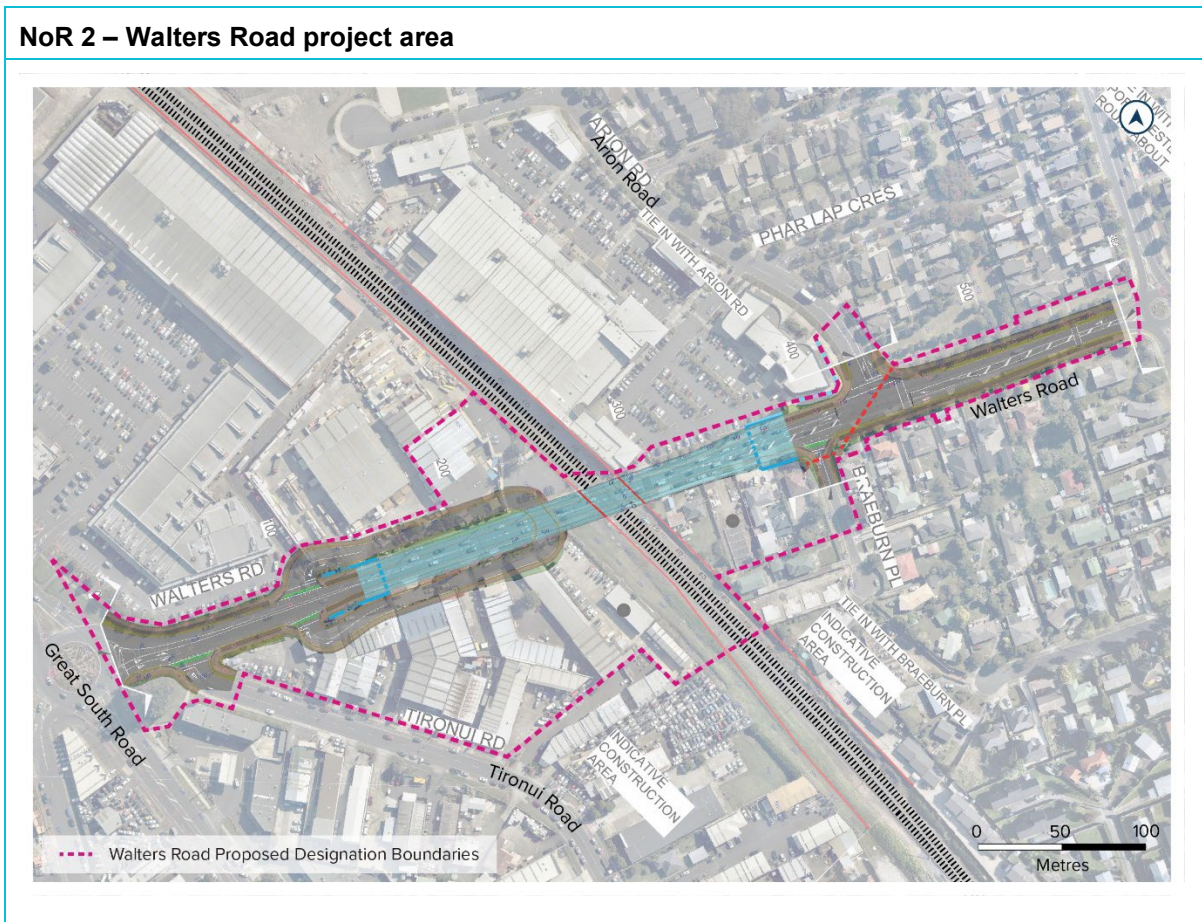



## 2.2 NoR 2 – Walters Road

### 2.2.1 Walters Road project area

As set out in Table 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 lanes in each direction and active mode facilities.

Table 7: Overview of 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 allows access to remaining properties.</li> </ul>
Intersections	<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>
Stormwater infrastructure	<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>
Typical cross sections	 <p>The diagram illustrates a cross-section of a two-lane arterial bridge. It features a central roadway with two lanes for vehicles, each marked with a yellow triangle pointing in opposite directions. On either side of the roadway are dedicated lanes for active modes: a green lane for bicycles and a blue lane for pedestrians. Silhouettes of a person walking, a person on a bicycle, and two cars are shown above the respective lanes. The entire bridge structure is flanked by vertical posts representing retaining walls or abutments.</p> <p><b>TWO LANE ARTERIAL BRIDGE</b></p>



## 3 Assessment Methodology

### 3.1 Preparation for this Report

A specialist briefing pack was supplied to the author in August 2022. This information was reviewed prior to the initial site visit.

The initial site visit was undertaken with the members of the Project team in August 2022. During this visit, the Project was discussed in detail, with each proposed crossing analyzed.

A subsequent site individual visit was undertaken in October 2022 to record specific tree and vegetation information for each project area.

### 3.2 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. Trees in this instance will be any woody plant that is 4 m or greater in height, or that may reach this dimension in the future. In particular, trees that are subject to controls under the AUP:OP, under either the District Plan or Regional Plan provisions were recorded (e.g. if scheduled (i.e. a Notable Tree), within the road reserve, open space zone or located in an AUP:OP overlay).

For completion, 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 4 m in height and/or 400 mm in girth were recorded, however their removal is a permitted activity under the AUP:OP<sup>1</sup>. As such, an assessment of effects and potential mitigation is not required for these trees. Those trees protected<sup>2</sup> through District Plan provisions are discussed in this Report in terms of an assessment of effects and potential mitigation measures to address these effects.

Trees within the designation boundaries that are protected through Regional Plan provisions are typically identified and considered in this NoR process to help inform the indicative design (though they would still be subject to a future Regional Plan consenting process). In the case of this Project, there are currently no trees within the proposed designation boundaries that are protected through Regional Plan provisions<sup>3</sup>.

Specifically, this assessment was undertaken using the following methodology:

- A specialist briefing pack was supplied to the author in August 2022. This information was reviewed prior to the initial site visit;
- A high-level desktop survey of all trees and vegetation affected by the Project was undertaken. A high-level route and works footprint plan set were used to inform the initial survey in order to

<sup>1</sup> As per Activity Table E26.4.3.1 (A82) and (A91)

<sup>2</sup> Protected trees in the context of this Report refers to trees that would trigger resource consent under the District Plan provisions to remove them

<sup>3</sup> There are currently no trees within the designation boundaries located within a Rural Zone, riparian area, coastal area, or Significant Ecological Area overlay.

assess the presence of street trees, large areas of densely planted vegetation or significant individual trees (such as Notable Trees);

- Site visits as discussed in Section 3.1 of this Report above; and
- This arboricultural assessment was then prepared to summarise the anticipated arboricultural effects. This Report provides a recommended mitigation strategy, assessment of arboricultural effects in terms of the AUP:OP provisions pertaining to trees and vegetation on roads and open space zoned land and general recommendations from an arboricultural perspective to inform supporting documentation.

### 3.3 Statutory context

#### 3.3.1 Notice of Requirement – District Plan requirements

This assessment has been prepared to support the AEE and NoR process. If confirmed, the designation will authorise the District Plan land use components of the Project. Accordingly, when assessing the actual or potential effects on the environment of allowing the requirement in terms of section 171 of the RMA, this assessment has been limited to matters that would trigger a District Plan consent requirement. As noted above, there are currently no trees within the proposed designation boundaries that are protected through Regional Plan provisions.

Trees subject to controls under the District Plan provisions of the AUP:OP have been listed in the table and plotted on site plans in the Appendices of this Report (refer to Appendix A and Appendix B). The tables and site plans assist to identify the trees that would trigger consent under the District provisions of the AUP:OP and the potential arboricultural effects of the construction of the Project.

Table 8 below sets out the relevant rules and provisions for the Project under the District Plan jurisdiction of the AUP:OP.

**Table 8: Rules and provisions relevant for the Project under the District Plan (tree-related activities)**

AUP:OP jurisdiction	Reference	Rule	Where rule applies	Activity status
DP	E26.4.3 Activity Table	All activities (must) obtain the approval of the Tree Asset Manager	Trees in roads and on open space zones	Mandatory requirement
DP	E26.4.3.1 (A82)	Pest Plant removal	Trees in roads	Permitted Activity
		Pest Plant removal of any tree less than 4m in height and less than 400mm in girth	Trees on open space zones	Permitted Activity
DP	E26.4.3.1 (A83)	Tree trimming or alteration	Trees in roads and on open space zones	Permitted Activity
DP	E26.4.3.1 (A84)	Tree trimming or alteration that does not comply with Standard E26.4.5.1 (Trees in streets and	Trees in roads and on open space zones	Restricted Discretionary Activity



AUP:OP jurisdiction	Reference	Rule	Where rule applies	Activity status
		open space zones) or Standard E.26.4.5.3 (Notable Trees)		
DP	E26.4.3.1 (A87)	Works within the protected root zone that comply with Standard E26.4.5.2	Trees in roads and on open space zones	Permitted Activity
DP	E26.4.3.1 (A88)	Works within the protected root zone not otherwise provided for	Trees in roads and on open space zones	Restricted Discretionary Activity
DP	E26.4.3.1 (A89)	Tree removal of Notable Trees	Notable Tree overlay	Discretionary
DP	E26.4.3.1 (A91)	Tree alteration or removal of any tree less than 4m in height and/or less than 400mm in girth	Trees in roads and on open space zones	Permitted Activity
DP	E26.4.3.1 (A92)	Tree alteration or removal of any tree greater than 4m in height and/or greater than 400mm in girth	Trees in roads and on open space zones	Restricted Discretionary Activity
DP	E26.4.3.1 (A93)	Tree trimming, alteration or removal not otherwise provided for	Trees in roads and on open space zones	Discretionary Activity

## 4 The TLC NoRs – Overall network

This section assesses arboricultural matters across the entire TLC network i.e., the combination of road closures and / or grade separated crossings across the five project areas. This section also recommends measures to avoid, remedy, or mitigate actual or potential adverse effects considering the network as a whole. Where appropriate, the following sections include project-area specific assessment and recommendations.

### 4.1 Assessment features

The Project is to be constructed within an existing urban environment comprising mainly of residential and commercial (including industrial) land uses. Across the five project areas, there is a total of 46 single trees which are subject to District Plan controls under the AUP:OP (i.e., located within road reserve, open space zones or within the Notable Tree overlay). However, three of these trees can be removed as a permitted activity under the AUP:OP as they are either pest species within the road reserve or are less than 4 m height and/or 400 mm in girth. Details of all trees and groups of trees within the designation boundaries are described in the subsequent sections and set out in Appendix A.

Overall, trees subject to District Plan controls are largely concentrated in two of the five project areas, within the extents of the Taka Street (NoR 1) and Walters Road (NoR 2) project areas.

#### 4.1.1 Spartan Road

There is a single tree located within the road reserve within the Spartan Road project area. This street tree is identified as a single Brazilian Pepper tree (*Schinus terebinthifolius*) (Tree 1). These tree species are considered to be a pest plant under the AUP:OP and as such does not require resource consent to be removed.<sup>4</sup> The tree is growing just north of the existing State Highway 1 (SH1) south bound offramp adjacent to the Halls transport boundary.

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<sup>4</sup> As per Activity Table E26.4.3.1(A82)

### 4.1.2 Manuia Road

A single Peach (*Prunus sp.*) (Tree 2) street tree is growing on Manuia Road (adjacent to No 7) as shown in Figure 2 below.



**Figure 2: Peach Tree growing adjacent to 7 Manuia Road**

Two (2) small resident planted street trees (Trees 3 and 4) and a Japanese Spindle Tree-hedge (Tree 5) are also growing within the road reserve on the northern side of the proposed works area, adjacent to 15 Oakleigh Avenue (refer to Figure 3 and Figure 4 below).

Tree 3 is a Cherry (*Prunus sp.*) street tree currently 3 m in height and 300 mm in girth. As it does not exceed the protected threshold of 4 m in height or 400 mm in girth, removal of this tree under the AUP:OP can be undertaken as a permitted activity<sup>5</sup>. Tree 5 is also noted as a pest plant species and can be removed as a permitted activity under the AUP:OP.

Tree 4 is a Golden Thuja (*Thuja occidentalis sp.*) street tree currently 3m in height and 600mm in girth. It is growing adjacent to the northern site boundary of 15 Hitchcock Road.

<sup>5</sup> As per Activity Table E26.4.3.1(A91)



Figure 3: Trees 3 & 4 adjacent to 15 Oakleigh Avenue



Figure 4: Japanese Spindle Tree-hedge (Tree 5) fronting Oakleigh Avenue



### 4.1.3 Manuroa Road

The Manuroa Road project area is devoid of any street tree plantings, with the only trees within the project area growing on private property.

The trees on private property and within the project area include two (2) large Notable English Oak trees that form one continuous canopy (Group 6) (AUP ID 2265) growing within 15 Manuroa Road (refer to Figure 5 below). These trees are prominent specimens which overhang the existing shared driveway in an area of open grass. The trees were in good physiological health at the time of my site visit. However, a number of large wounds were visible near the base of the trees, likely as a result of poor limb pruning historically.



Figure 5: Notable Oak trees growing as a continuous canopy within 15 Manuroa Road

### 4.1.4 Taka Street

The main trees and vegetation standing within this project area include nine (9) trees growing within Takaanini Reserve along with four (4) Claret Ash street trees growing adjacent to 9-13 Taka Street. These trees are all subject to protection under the AUP:OP (DP).

The trees within Takaanini Reserve include two main groupings of vegetation as noted below:

- Area 1 – Six (6) Tī kōuka / Cabbage Trees (*Cordyline australis*) growing in a small island adjacent to the existing skate park (Group 7)
- Area 2 – Three (3) mature exotic trees which include a Tulip tree (*Liriodendron tulipifera*), Cottonwood Poplar (*Populus deltoides*) and a Common Ash (*Fraxinus excelsior*) (Group 8)

These tree groupings are shown in Figure 6 below.



**Figure 6: Area of vegetation within Takaanini Reserve (Group 7 & 8)**

As previously mentioned, four (4) Claret Ash (*Fraxinus oxycarpa* ‘Raywoodii’) street trees (Trees 9-12) are growing adjacent 9-13 Taka Street within road reserve (refer to Figure 7 below).

Three of the four trees have been pruned historically for the overhead powerlines, resulting in long lateral branches overhanging the existing carriageway and private property.

The fourth tree is a smaller specimen and was likely planted more recently.



**Figure 7: Trees 9 – 12 as seen looking east**



### 4.1.5 Walters Road

The designation boundaries include an area of road reserve on the corner of Walters Road and Great South Road in which a large London Plane (*Platanus x acerifolia*) (Tree 13) is growing (refer to Figure 8 below). This tree is subject to controls under the AUP:OP(DP). The Project team have indicated that while this tree is within the designation boundaries, it can be retained.

This tree is a significant specimen in good health and is growing in an area of open grass which is relatively un-modified.



**Figure 8: Significant London Plane tree at the intersection of Walters Road and Great South Road**

Further to the east, to the south of the existing level crossing, one (1) Tarata (*Pittosporum eugenioides*) tree (Tree 14) is growing adjacent to the boundary of 15 Walters Road within Open Space zoned land (19R Walters Road) and subject to AUP:OP(DP) controls.

A second Tarata growing adjacent to the existing footpath appears to be on road reserve. However, the trunk of this tree is growing within private property and is therefore not subject to AUP:OP controls and not included in Appendix A.

The two Tarata trees are shown in Figure 9 below.



**Figure 9: Two Tarata adjacent to 15 Walters Road**

Directly to east of the existing level crossing, a row of nine (9) Himalayan Silver Birch (*Betulus utilis* ‘*Jacquemontii*’ trees (Group 15) are growing within a garden area fronting road reserve (refer to Figure 10 below). These semi mature trees are in shared ownership with AT and are in good health and condition. They are subject to AUP:OP(DP) controls.



**Figure 10: Row of Himalayan Silver Birch Trees**

On to the northern side of the existing Walters Road carriageway, a row of fifteen (15) Sweet Gum (*Liquidambar styraciflua*) trees (Group 16) are growing within road reserve to the east of Arion Road (refer to Figure 11 below). As such are subject to AUP:OP(DP) controls.

These trees are semi-mature specimens in moderate to good condition and are growing in a grassed portion of road reserve to the north of the main Walters Road carriageway.





Figure 11: Row of Sweet Gum trees on the northern side of the Walters Road Carriageway

## 4.2 Positive arboricultural effects

When considering the wider existing street environment, the current berm plantings in all five project areas are very poor, with the only significant street tree plantings being the row of four (4) Claret Ash on the eastern side of Taka Street (adjacent to 9-13 Taka Street), the London Plane tree on the corner of Walters and Great South Road and the row of Himalayan Silver Birch and Sweet Gum at the eastern end of Walters Road.

There are currently no formal street trees planted along Spartan Road, Manuia Road, Manuroa Road, Taka Street (to the east of the existing level crossing) or the western end of Walters Road.

The full extent of planting cannot be determined at this stage of the process, due to the likely construction timeline for the Project being 10 to 15 years into the future. However, the positive effects associated with the Project includes the potential to improve existing street environment amenity through planting of areas within the designation boundaries. In particular this could include increased berm planting, with opportunities along the mainline corridors as shown in the indicative cross sections of this Report in Table 3 - Table 7 above. There may also be opportunities for replanting on land within the designation boundaries that may no longer be needed post-construction works. This may include within Takaanini Reserve and/or on the battered slopes anticipated as part of the Manuia Road works.

## 4.3 Assessment of construction effects

### 4.3.1 Spartan Road

The works within the Spartan Road project area will require the removal of one street tree (Tree 1). As noted in Section 4.1.1 of this Report above, this tree is a pest plant and can be removed as a permitted activity under the AUP:OP. As such, no adverse arboricultural effects are anticipated from its removal.

### 4.3.2 Manuia Road

The works within the Manuia Road project are likely to require the removal of four trees located within the road reserve (Trees 2 – 5). As noted in Section 4.1.2 of this Report above, one of the street trees/hedge (Tree 5) is a pest species (Japanese Spindle Tree) and can be removed as a permitted activity under the AUP:OP. Another tree (Tree 3) can also be removed as a permitted activity as it is less than 4 m in height or 400 mm in girth. The removal of these trees will not generate any adverse arboricultural effects.

The other two trees within the road reserve (Trees 2 and 4) are of low arboricultural value and currently provides a relatively minor ecological and ecosystem benefit function within the existing environment. Trees 2 and 4 are non-native species.

### 4.3.3 Manuroa Road

The two existing English Oak trees (Group 6) located within the Manuroa Road project area will likely require removal to facilitate construction (and operation) of the Project. These trees are scheduled as notable trees and are subject to protection under the AUP:OP (DP) controls. 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 trees are exotic species and currently sit within private residential land comprised primarily of hard surface and occupied by residential dwellings. These factors compromise the optimal current and future growing environment. The trees' location on private land makes it more challenging to maintain, access and contribute amenity value beyond its immediate locality. The up-zoning of the site anticipated under Auckland Council's Plan Change 78 (**PC78**), which responds to the National Policy Statement on Urban Development (**NPS:UD**), also enables further residential intensification. This may create further pressure on the trees in the future.

Furthermore, the future health and condition of the subject trees will require assessment to determine their suitability for retention in the future design. It is important to note that in Auckland, mature to over mature English Oak trees have in recent years begun to suffer 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 of decay.

It is noted that the indicative proposed infrastructure has resulted following an optioneering and alternatives assessment process (refer to Assessment of Alternatives section in the AEE). To construct the 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 and thus why tree removal is sought in this case.

Replacement planting can be provided within the designated area, provided suitable land that may no longer be required post-construction is used for this purpose. As referenced in Section 4.4 and 4.7 of this Report it is recommended that mitigation planting be undertaken through an 'outcomes'-based approach. In the event of tree removal, it is recommended that the canopy of the two trees be

calculated, with the new plantings to either replicate or improve on the area of canopy lost (in square metres).

#### 4.3.4 Taka Street

The anticipated earthworks and physical structures associated with the future vehicle bridge will require the removal of a grouping of mixed indigenous and exotic trees growing within Takaanini Reserve (24R Taka Street) (Groups 7 and 8). Four street trees (T9 – T12) will also require removal.

The most significant of those trees proposed for removal are the Tulip Tree and Cottonwood Poplar. These trees provide net benefits in terms of wider ecosystem service benefits for shade, local avian habitat and their function in the amelioration of stormwater in an urban environment.

However, these trees are large exotic specimens which have a more limited lifespan or function when considered against the pressures of urban land use, functional infrastructure and the need to enhance and improve the function of green space areas.

While not discounting those points raised above, it is important to consider the future receiving environment and the ability for these trees to function in a more intensive environment. Considering the scale, location and established nature of these trees, like-for-like mitigation within the designation boundaries is unlikely to be practicable or an appropriate mitigation option. The benefits that these trees provide could be mitigated by planting new trees either in an alternative area within the park and/or designation boundaries. The actual canopy area lost (in square metres) should be considered when determining the replacement planting in future.

This could be in the form of either structured amenity tree plantings or a mass planted indigenous palette with the intension to form an 'ecosystem' rather than a homogeneous mitigation or maintaining the 'status quo.'

Over time, provided such plantings were executed well, there is the potential for such areas to provide a net gain in benefits, with 'ecosystem' type plantings able to establish faster, suffer less attrition, and provide greater ecological and ecosystem service benefits into the future.

In relation to the four street trees on Taka Street (Trees 9 – 12), while mitigation is not possible as direct replacements, due to the infrastructure requirements and designation constraints, the loss of arboricultural value from these trees could be mitigated through new tree planting within the designation boundaries such as on road reserve or areas that may no longer be required post-construction. Overall, the replacement planting should consider the best outcome from a wider catchment perspective. The same approach to replacement planting recommended for trees lost in Takaanini Reserve should also be adopted in this case.

While replacement planting that may be required for the Project is to be achieved within the designation boundaries, additional opportunities for planting could also be available outside of the designation boundaries subject to further discussion with the relevant stakeholders (e.g., AT, Council Parks Team). This could include Takaanini Road immediately to the southeast of their growing location (but outside of the designation).

### 4.3.5 Walters Road

As the full works extent along Walters Road is yet to be determined, some trees within the road reserve (Groups 15 and 16) or in open space zone land (Tree 14) (as identified in 4.1.5 above) are assumed for removal as part of this assessment and as the worst-case scenario.

However, the significant London Plane street tree (Tree 13) growing within road reserve at the corner of Walters Road and Great South Road can be retained as part of any future works. Some works within the Protected Root Zone (**PRZ**) of this tree are expected as part of infrastructure upgrades. All works are to be assessed and quantified as part of the TMP process and supervised by a works arborist, as required, in accordance with best arboricultural practice. At the eastern end of Walters Road, the row of Liquidambar street trees (Group 16) is also proposed for removal. This row of trees is a local visual amenity asset which also provides ecosystem service benefits as a greenspace asset.

While there is some loss of arboricultural value from the removal of the trees identified within the Walters Road project area (Group 15, Group 16 and Tree 14), the effects could be mitigated through new tree planting within the designation boundaries such as on road reserve or areas that may no longer be required post-construction.

## 4.4 Recommended measures to avoid, remedy or mitigate construction effects

As noted previously, the removal of trees for the various activities in each works area will be required.

New street tree planting opportunities will be created through the creation of a new berm on either side. As noted in Section 4.3 of this Report, there may also be opportunities for replanting on land within the designation boundaries that may no longer be needed post-construction. This could include land within Takaanini Reserve and/or on the battered slopes anticipated as part of the Manuia Road works.

Replacement planting is recommended to adequately mitigate the loss of those trees to be removed as part of the project.

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 which employs methods such as like-for-like and 2:1 ratios for mitigation planting in most cases, where a superior outcome outside of the 'accepted norms' can be achieved. An outcomes-based approach considers the landscape as a connected, living system which the Project has the potential to help restore and is more aligned with current understanding of the role that landscape plays in creating more resilient, climate-adapted cities and settlements.

While mitigation for the Project is to be undertaken within the designation boundaries, it is noted that additional opportunities for planting may also be available in the wider catchment (e.g., in other Parks and road reserve outside of the designation boundaries). These potential opportunities could be further identified with discussion with the relevant stakeholders such as Auckland Council Parks and AT in future. A TMP should be developed prior to construction to identify existing trees protected under the District Plan provisions that require removal and detail methods for all work within the root zone of trees that can be retained. The TMP should include:

- Confirmation that protected trees identified in **Appendix A** 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.

Where protected trees can be retained and incorporated into the future design, it is recommended that any new infrastructure be positioned as far from the tree as possible. A TMP would be prepared for any works adjacent to the tree if retained.

The TMP must include specialist investigation and input into the detailed design phase of the bridge and associated hard surface construction, to ensure that if the tree can be retained, it is adequately protected, and a suitable setback is provided from the tree's upper canopy so as to minimise future conflicts.

Replacement planting will be decided through planting details for the Project under the ULDMMP proposed as a condition on the designation. The ULDMMP should also include detail of methodologies to establish new trees within the road reserve, including creation of quality below ground environments, correct planting and appropriate maintenance.

It is 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.

For the NoRs, the TMP will be limited to the identification of trees protected under the District Plan. Consideration of tree transplanting should be included in the TMP, where good quality trees in the road reserve are identified for removal. A verification assessment of the quality of the trees and the feasibility of transplantation should form part of the TMP.

## 4.5 Assessment of operational effects

Operational effects of the Project are largely limited to the maintenance of sight lines and the overhead and lateral clearances of general traffic lanes, bridge structures and high-quality walking and cycling facilities. The required clearances will largely be limited to existing retained vegetation and newly planted vegetation within the proposed berm area, which will only require management in the medium term.

## 4.6 Recommended measures to avoid, remedy or mitigate operational effects

It is recommended that any new street trees or mass planted vegetation (trees specifically) are planted no closer than 1 m to the future general traffic lanes to enable unrestricted future growth.

Once the Project has been constructed, no further effects on trees are anticipated. Ongoing maintenance of street trees and trees retained adjacent to the corridor is a standard operational requirement.

## 4.7 Summary and Conclusions

Table 9: Summary of Assessment of Effects and Recommendations - Overall network

Effect	Assessment	Recommendation
<b>Construction</b>		
<p>Removal of trees to enable the Project</p> <p>Works within the root zone of retained trees</p>	<p>The removal of 45 individual trees (including 1 hedge) and works within the protected root zone of one tree is anticipated to enable the Project across all 5 project areas. It is noted that of these trees, two are pest species and one is less than 4 m in height or 400 mm in girth which can be removed as a permitted activity under the AUP:OP.</p>	<p>Replacement planting within the designation boundaries should consider the best outcome from a wider catchment perspective with the intent to not just 'replace' the lost trees but also provide an improved and enhanced environment for the wider project area. This could be achieved through plantings within existing open space or other land areas within the designation boundaries that may no longer be required post-construction. This is coupled with improved streetscape plantings within the designation boundaries including improving street tree canopy cover, physical planting environments and densities.</p> <p>While replacement planting is to be undertaken within the designation boundaries, additional opportunities for planting may also be available in the wider catchment (e.g., in other parks, open space and/or road reserve outside of the designation boundaries). These opportunities could be further identified with discussion with relevant stakeholders such as Auckland Council Parks and AT in future.</p> <p>Replacement planting will be confirmed through planting details contained in the ULDMP.</p> <p>The methodology for protection of those trees proposed for retention within and adjacent to the works area is to be included in the TMP.</p>
<b>Operational</b>		
<p>Tree trimming or alteration</p>	<p>Replacement trees may require maintenance to retain sight lines the overhead and lateral clearances of general traffic lanes and the high quality walking and cycling facilities</p>	<p>New street trees or mass planted vegetation (trees specifically) are planted no closer to the future general traffic lanes than 1 m. This is to be addressed in the ULDMP.</p>



## 5 Conclusions

The existing environment for the majority of the Project is urban with residential and commercial (including industrial) land uses. Tree cover associated with the existing urbanised area typically include plantings of amenity trees and vegetation within the road reserve and open space zones.

The future environment is likely to change over the next 10 – 15 years as intensification occurs along the corridor as a result of recent changes in national policy direction and changes to the RMA. This will likely result in a reduction of trees adjoining the corridor, on business and residentially zoned land, which are not afforded any protection in the AUP:OP.

A summary of the trees or vegetation requiring removal for each project area, which are subject to District Plan provisions in the AUP:OP is provided in Table 10 below:

**Table 10: Summary of effects, assessment and recommendations**

NoR reference	Project areas	Total number of trees (within road reserve, open space zones or Notable Trees overlay)	Total number of trees for removal* (within road reserve, open space zones or Notable Trees overlay)	Works within the protected root zone of retained vegetation
NoR 1	Spartan Road	1	0	0
	Manuia Road	4	2	0
	Manuroa Road	2	2	0
	Taka Street	13	13	0
NoR 2	Walters Road	26	25	1
	<b>Total</b>	<b>46</b>	<b>42</b>	<b>1</b>

*\* Note: excluding pest plant species within the road reserve or those trees that are less than 4 m in height or 400 mm in girth within the road reserve or an open space zone (as removal of these trees are a permitted activity under the AUP:OP)*

It is recommended that a TMP be developed where construction work impacts on trees and groups of trees that are protected under the District Plan provisions. Replacement planting protocols are proposed to be developed further as part of the TMP where protected trees are to be removed.

Opportunities for replanting within the berms of the proposed cross section provide mitigation of effects arising from tree removal associated with the Project. Opportunities within the designation boundaries are also available within land that may no longer be required post-construction work, open space zoned land and/or battered slopes anticipated as part of the works. The long-term outcome of comprehensive street tree and replacement planting will be more trees in the public realm and increased amenity value within the project areas.

Overall, the effects on trees protected by the District Plan by **NoR 1 and NoR 2** for the Project will be mitigated by replacement with new trees and mass planted vegetation as part of the corridor and on adjacent land.



# 1 Appendix A – Tree Details

## APPENDIX A – TREE AND VEGETATION INVENTORY

### 1.0 Categories

The following categories have been used within the tree survey tables and, where appropriate, the criterion used to define each category is defined.

- **Status:** Description of how the tree(s) would be impacted by the Project and what would be required to enable the Project.
- **Tree No.:** refers to the number assigned to a tree or group of trees, also identified as such on the accompanying tree location plan located in Appendix B of this assessment.
- **Vegetation Type:** Defines if tree is isolated (single tree) or bunched with other trees (Group of Trees).
- **Consideration under the AUP:OP:** Refers to the relevance of the tree under the AUP:OP i.e., whether it is subject to controls for being within the road reserve, an open space zone or Notable Tree overlay
- **Location:** Legal Street/Road that Single Tree/Group of Trees is located on and the specific Project area.
- **Species:** The genus and species, and cultivar or variety where known is given. Where the species is unknown the tree is identified as (Genus) sp. The generally accepted common, or Māori, name of the tree is also given in brackets.
- **Age:** refers to the maturity of the tree
- **Height:** refers to the height of the tree in metres (approximate).
- **Girth:** approximate in metres
- **Crown Spread (Radius):** refers to the radius of crown spread of the tree in metres (approximate).
- **Condition:** Refers to the overall physical appearance of the tree compared to that typical for the species.

**The condition is described as:**

- **Good** – Good branch structure, full healthy canopy but possibly including some suppressed or damaged branches.
- **Fair** – Average branch structure, slightly reduced leaf cover, minor dead wood or isolated major dead wood.
- **Poor** – Poor structure, overall sparse leafing and/or extensive dieback. In decline.
- **Comments:** Any comments relating to each specific tree i.e., whether it can be removed as a Permitted activity under the AUP:OP or mitigation recommendations

## Tree and Vegetation Inventory

Status	Tree No.	Vegetation Type	Consideration under the AUP:OP	Location	Species	Age	Height (m)	Girth (mm)	Crown spread radius (m)	Condition	Comments
Within footprint of works and likely construction requirements - remove	Tree 1	Single tree	Road Reserve	Spartan Road (Spartan Road project area)	Schinus terebinthifolius (Brazilian Pepper Tree)	Mature	8.0	1400	6	Fair	Pest plant species – removal is a Permitted Activity under the AUP:OP (E26.4.3.1(A82)).  Likely self-seeded.
Within footprint of works and likely construction requirements – remove	Tree 2	Single tree	Road Reserve	Manuia Road (Manuia Road project area)	Prunus sp. (Peach)	Semi - mature	5.5	800	4	Fair	Opportunity for further review and replacement planting protocols to be developed as part of TMP.
Within footprint of works and likely construction requirements – remove	Tree 3	Single tree	Road Reserve	Oakleigh Avenue (Manuia Road project area)	Prunus sp. (Cherry)	Young	3.0	300	1.8	Fair	Does not currently meet protected thresholds of 400mm girth or 4m in height – removal is currently a Permitted Activity under the AUP:OP (E26.3.3.1(A91)).  Small resident planted tree.
Within footprint of works and likely construction requirements – remove	Tree 4	Single tree	Road Reserve	Oakleigh Avenue (Manuia Road project area)	Thuja occidentalis sp. (Golden Thuja)	Semi-mature	3.0	600	2.5	Fair	Opportunity for replacement planting protocols to be developed as part of TMP.

Status	Tree No.	Vegetation Type	Consideration under the AUP:OP	Location	Species	Age	Height (m)	Girth (mm)	Crown spread radius (m)	Condition	Comments
Within footprint of works and likely construction requirements – remove	Tree 5	Hedge	Road Reserve	Oakleigh Avenue (Manuia Road project area)	Euonymus japonicus (Japanese Spindle Tree)	Mature	3.5	400-600	N/A	Fair	Pest plant species – removal is a Permitted Activity under the AUP:OP (E26.4.3.1(A82)).
Within footprint of works and likely construction requirements – remove	Group 6	Group of Trees (2)	Notable Tree Overlay	Manuroa Road (Manuroa Road project area)	Quercus robur (English Oak)	Mature	20	6500	27 east/west	Good	Opportunity for further review and replacement planting protocols to be developed as part of TMP.
Within footprint of works and likely construction requirements – remove	Group 7	Group of Trees (6)	Open Space	Taka Street (Taka Street project area)	Cordyline australis (Cabbage Tree)	Semi-mature	6-8	450-800	1.0-3.0	Fair-Good	A cluster of (4) trees and (2) larger trees. Opportunity for replacement planting protocols to be developed as part of TMP.
Within footprint of works and likely onstruction requirements – remove	Group 8	Group of Trees (3)	Open Space	Taka Street (Taka Street project area)	Liriodendron tulipifera (Tulip Tree) Fraxinus excelsior (Common Ash) Populus deltoides	Mature	16 18 28	2500 2200 5000+	10-30	Fair-Good	A grouping of (3) trees growing to the east of the skate park. Opportunity for replacement planting protocols to be developed as part of TMP.



Status	Tree No.	Vegetation Type	Consideration under the AUP:OP	Location	Species	Age	Height (m)	Girth (mm)	Crown spread radius (m)	Condition	Comments
					(Cottonwood Poplar)						
Within footprint of works and likely construction requirements - remove	Tree 9	Single Tree	Road Reserve	Taka Street (Taka Street project area)	Fraxinus oxycarpa 'Raywoodii' (Claret Ash)	Mature	10	1000	2.5-12.0	Fair	Four (4) street trees growing within the grass berm. Opportunity for replacement planting protocols to be developed as part of TMP.
	Tree 10	Single Tree				Young	4	140			
	Tree 11	Single Tree				Mature	12	1800			
	Tree 12	Single Tree				Mature	12	1400			
Within designation – Tree to be retained but potential works within PRZ	Tree 13	Single Tree	Road Reserve	Walters Road (Walters Road project area)	Plantanus x acerifolia (London Plane)	Mature	30+	5000+	25	Good	TMP to include assessment of future works and how tree protection methodologies are to be applied.
Within Designation – works to be confirmed	Tree 14	Single Tree	Open Space	Walters Road (Walters Road project area)	Pittosporum eugenioides (Tarata)	Semi-mature	6.0	600	3	Good	Single self-seeded specimen. Relatively low arboricultural value. Opportunity for replacement planting protocols to be developed as part of TMP.

Status	Tree No.	Vegetation Type	Consideration under the AUP:OP	Location	Species	Age	Height (m)	Girth (mm)	Crown spread radius (m)	Condition	Comments
Within footprint of works and likely construction requirements - remove	Group 15	Group of Trees (9)	Road Reserve	Walters Road (Walters Road project area)	Betula utilis 'Jacquemontii' (Himalayan Silver Birch)	Young	5.0	400	4	Good	Opportunity for replacement planting protocols to be developed as part of TMP.
Within footprint of works and likely construction requirements – remove	Group 16	Group of Trees (15)	Road Reserve	Walters Road (Walters Road project area)	Liquidambar styraciflua (Sweet Gum)	Semi-mature	8-12	600-1800	4-10	Fair-Good	Opportunity for replacement planting protocols to be developed as part of TMP.

## 2 Appendix B – Tree Location Maps

