TE TUPU NGĀTAHI
SUPPORTING GROWTH

Drury Arterial Network Assessment of Arboricultural Effects

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WAKA KOTAHI NZ TRANSPORT AGENCY

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Document Status

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1 Glossary of acronyms and defined terms

Table 1: Glossary of technical terms / acronyms

Acronym	Term
AEE	Assessment of Effects on the Environment
AT	Auckland Transport
AUPOIP	Auckland Unitary Plan Operative in Part
FTN	Frequent Transit Network
FUZ	Future Urban Zone
NIMT	North Island Main Trunk
NoR	Notice of Requirement (under the Resource Management Act 1991)
NZUP	New Zealand Upgrade Programme
SH1	State Highway 1
SH22	State Highway 22
Waka Kotahi	Waka Kotahi NZ Transport Agency
DP	District Plan section of the AUPOIP
RP	Regional Plan section of the AUPOIP
Protected tree	Tree or group of trees protected by the District Plan (DP) or Regional Plan (RP) sections of the AUPOIP requiring resource consent for tree alteration or removal

Table 2: Glossary of defined terms

Term	Meaning
Auckland Council	Means the unitary authority in the Auckland Region.
Drury Package	Five Notices of Requirement for the Drury Arterial Transport Network for Auckland Transport and Waka Kotahi NZ Transport Agency.

2 Executive Summary

This arboricultural assessment has been compiled following site visits and site tours that were undertaken for the collection of suitable data to inform an assessment of arboricultural effects of each Project within the Drury Package. The site visits involved recording details of all relevant trees (as described further in this report) within the proposed designations.

Trees were recorded singularly, or in groups where logical groupings can be made based on species, configuration, age-class or management type (e.g. bush areas, shelter belts). Sufficient information was gathered to allow assessment of the existing environment and consideration of the future environment. Factors affecting the future tree environment include, the quality and age of the tree, likelihood of land use change and property development and the trees' protection status under the AUPOIP.

Tree details are presented in spreadsheets and in aerial mapping formats (contained in the Appendices of this report).

The existing environment for the majority of the NoR projects is primarily rural, the exception being the live zoned area in Drury west and on Ōpāheke Road, the Drury industrial area and three recreation reserves. Tree cover associated with the existing rural and lifestyle block holdings typically include plantings of amenity trees, linear plantings for shelter and screening, mixed hedgerows and farm forestry woodlots for various purposes. The Drury industrial area contains a low density of trees, including few street trees and trees growing on the banks of the Hingaia Stream. Groups of trees have been identified on or adjacent to the Drury Sports Complex and the Ōpāheke Sports Park.

The future environment is likely to change significantly in the next 10 – 30 years as urbanisation occurs within the future urban zone that adjoins much of the proposed designations. Land clearance prior to earthworks associated with urbanisation will significantly reduce the number of trees present on the land in the future. Areas where the future environment will experience less change where trees are protected, such as within the Significant Ecological Areas (SEA), riparian margins or within open space land.

Protected tree removal associated with the transport upgrades within the Drury Package will be relatively few. Trees that make significant contributions to the environment will be designed around where practicable to avoid removal and significant effects on tree health. Tree Management Plans, recommended as a condition on the designations, are proposed to be developed where construction work impacts on protected trees and groups of trees within the proposed designations. Due to the changing nature of the environment and plan rules applicable to tree protection in rural vs urban land zoning, a detailed re-assessment of protected trees and their status under the AUPOIP is proposed to be conducted closer to the time of construction. Any trees, that trigger regional plan consenting requirements will also be assessed and managed through the future regional consent process for the Project.

Opportunities for planting within the new road layouts provides significant mitigation of effects arising from tree removal associated with the Projects. The long-term outcome of comprehensive street tree planting will be more trees in the public realm and increased amenity value within the road network.

Overall, the effects on trees protected by the District Plan by the proposed designations for road upgrades and the new Ōpāheke North-South FTN Arterial corridor will be minor and mitigated by replacement with new trees as part of the future transport environment.

2.1 NoR D1: Alteration to NZ Transport Agency designation 6707 – State Highway 22 (SH22) Upgrade

The existing environment adjacent to SH22 is of a rural nature, with trees generally clustered around homesteads and/or in shelterbelts. The trees within the proposed designation currently provide a range of amenity and landscape values.

The future environment for trees within and adjacent to SH22 is likely to be very different as urbanisation is expected to result in removal of trees as the land is developed and the environment changes to an urban land-use pattern.

At the northern end of the extent of NoR D1 a group of trees is within the Drury Sports Complex, where a proposed construction laydown area could have potential effects on trees protected by the District Plan. The potential for adverse effects on these trees can be avoided through implementation of tree protection measures that seek to ensure AUPOIP permitted activity standards are met. Specific tree protection measures should be developed during final design and pre-construction planning, when a tree management plan should be implemented in accordance with the recommended condition on the designation.

Overall, the effects of the upgrade of SH22 on trees protected by the District Plan will be negligible.

2.2 NoR D2: Jesmond to Waihoehoe West FTN Upgrade

The existing environment adjacent to Jesmond Road is of a rural nature, with large numbers of amenity trees clustered around homesteads and/or in shelterbelts or farm forestry applications. Trees have also been planted in the road reserve in several locations. The proposed new Bremner Road link contain a small number of farm shelter trees. Bremner Road, Norrie Road and adjacent land contains a variety of tree types including trees that are within Open Space zoned land and street trees that are protected by the District Plan. Waihoehoe West is a rural environment with trees generally clustered around homesteads and/or in shelterbelts.

The future environment for trees on land within and surrounding the designation is likely to be very different as urbanisation is expected to result in removal of trees when the land is rezoned for urban development in the future.

There are two historic place overlays adjacent to the designation that contain trees considered to be protected by the District Plan. While the ‘extent of place’ overlay has been avoided by the designation the rootzone of these trees may be affected by the works. The potential for adverse effects on these trees can be avoided through implementation of tree protection measures that seek to ensure AUPOIP permitted activity standards are met. Specific tree protection measures should be developed during final design and pre-construction planning, when a tree management plan should be implemented in accordance with the recommended condition on the designation.

Protected trees are required to be removed at the northern end of the Drury Sports Complex, where earthworks are required for the bridge over Ngakoroa Stream. The adverse effects of tree removal may be significant due to the size of the pine trees, however these trees have a short useful life

expectancy and low arboricultural value generally. Planting new trees as part of the proposed UDLMP (condition on the designation) will mitigate the effects of tree removal.

Other trees in the Drury Sports Complex may be avoided through implementation of tree protection measures, however further removal of trees is anticipated for the required earthworks and site laydown area. Planting new trees as part of the proposed UDLMP will mitigate the effects of tree removal. Specific tree protection measures should be developed during final design and pre-construction planning, when a tree management plan should be implemented.

Protected trees are also present on the unformed road and open space zoned land around Hingaia Stream, where the new road and bridge alignment require tree removal. The trees here are generally low quality and their removal will be mitigated by replanting in line with the UDLMP and ecological recommendations.

One group of protected trees on the road reserve at Waihoehoe Road West and on the corner of Great South Road, is affected by the road upgrade. The road widening is to occur generally on the northern side of the road. However, the bridge over the rail crossing will need to be reconstructed so it is likely that the trees will be impacted. The potential to retain these trees should be investigated in the future at detailed design before construction commences. If they can be retained, tree protection measures should be implemented that seek to meet the AUPOIP permitted activity standards. Specific tree protection measures should be developed during final design and pre-construction planning, when a tree management plan should be implemented in accordance with the recommended condition on the designation.

The new road layout includes road-side berms that provide an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will mitigate the effects of tree removal throughout the designation. Street tree planting will be defined under the ULDMP which is recommended as condition on the proposed designation.

Overall, the effects of the road upgrade from Jesmond Road to Waihoehoe Road West on trees protected by the District Plan will be minor.

2.3 NoR D3: Waihoehoe Road East Upgrade

The existing environment adjacent to Waihoehoe Road East is of a rural nature, with trees generally clustered around homesteads and/or in shelterbelts. The trees within the proposed designation currently provide a range of amenity and landscape values in the existing rural environment.

The future environment for trees within and adjacent to Waihoehoe Road East is likely to be very different as urbanisation is expected to result in removal of trees as the land is developed and the environment changes to an urban land-use pattern.

There are no trees that are protected by the District Plan identified within the proposed designation.

Overall, the effects of the upgrade of Waihoehoe Road East on trees protected by the District Plan will be negligible.

2.4 NoR D4: Ōpāheke North-South FTN Arterial

The existing environment within the alignment of the new Ōpāheke N-S FTN Arterial is of a rural nature, with trees generally clustered around homesteads and/or in shelterbelts. However, these trees are not protected by the district plan. The trees within the proposed designation currently provide a

range of amenity and landscape values. Several riparian zones contain trees that may contribute land stability and ecological functions. Any tree removal associated with the Project in riparian areas will be the subject of a future resource consent process.

The future environment adjacent to the Ōpāheke N-S FTN Arterial is likely to be very different as anticipated urbanisation is likely to result in removal of trees as the land is developed and the environment changes to an urban land-use pattern.

There are no trees that are protected by the District Plan identified within the proposed designation and therefore the effects of the designation on trees protected by the District Plan will be negligible.

2.5 NoR D5: Ponga Road and Ōpāheke Road Upgrade

The existing environment adjacent to Ponga Road and Ōpāheke Road is of a rural nature, with trees generally clustered around homesteads and/or in shelterbelts. The trees within the proposed designation currently provide a range of amenity and landscape values in the existing rural environment. Several riparian zones contain trees that may contribute land stability and ecological functions.

Trees outside the Ōpāheke Sports Park at the western end of the rural road upgrade are likely to be affected by installation of a new stormwater wetland. Protected trees are likely to require removal, where earthworks and access are required for the stormwater infrastructure. The adverse effects of tree removal may be significant due to the size and quality of the trees. Planting new trees as part of the UDLMP recommended as a condition on the designation will however mitigate the effects of this tree removal.

Other trees adjacent to the Ōpāheke Sports Park and Hays Creek may be avoided through implementation of tree protection measures that seek to ensure AUPOIP permitted activity standards are met. Specific tree protection measures should be developed during final design and pre-construction planning, when a tree management plan should be implemented in accordance with the recommended condition of the designation.

The future environment for trees within and adjacent to Ponga Road and Ōpāheke Road is likely to be very different as urbanisation is expected to result in removal of trees as the land is developed and the environment changes to an urban land-use pattern.

Several trees have been planted in the road reserve adjacent to Ponga Road. Removal of these Council-owned trees will result in adverse effects, which will be mitigated by planting within new road-side berms within the new road layout.

The new road layout includes road-side berms that provide an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will mitigate the effects of tree removal throughout the proposed designation.

Overall, the effects of the road upgrade from Ponga Road to Ōpāheke Road on trees protected by the District Plan will be minor.

3 Introduction

This report has been prepared for the Drury Arterial Network Notices of Requirement (NoRs) for Auckland Transport (AT) and Waka Kotahi NZ Transport Agency (Waka Kotahi) (the "Drury Package"). The NoRs are to designate land for future strategic transport corridors as part of the Supporting Growth Programme to enable the future construction, operation and maintenance of transport infrastructure in the Drury-Ōpāheke area of Auckland.

The Auckland Council Drury-Ōpāheke structure plan area is expected to grow over the next 30 years and is estimated to provide about 22,000 houses and about 12,000 jobs with a population of about 60,000. The Drury Package will provide route protection for the local arterials, which include walking, cycling and public transport (including the Frequent Transit Network (FTN)), needed to support the expected growth in Drury. This report assesses the arboricultural effects of the proposed Projects, that together comprise the Drury Package, as shown in Figure 3-1.

Table 3-1 Drury Package: Notices of Requirement and Projects

Notice	Project
NoR D1	Alteration to NZ Transport Agency designation 6707 – State Highway 22 (SH22) Upgrade
NoR D2	Jesmond to Waihoehoe West FTN Upgrade
NoR D3	Waihoehoe Road East Upgrade
NoR D4	Ōpāheke North-South FTN Arterial
NoR D5	Ponga Road and Ōpāheke Road Upgrade

The Drury Package has been developed through an alternatives assessment. Corridor alternatives and route refinements were assessed by a multi-disciplinary team against a programme wide Multi-Criteria Assessment. This assessment phase was completed in February 2020, and further design changes have been adopted through the Assessment of Environmental Effects (AEE) process for the Drury Package, in response to a range of construction and environmental considerations.

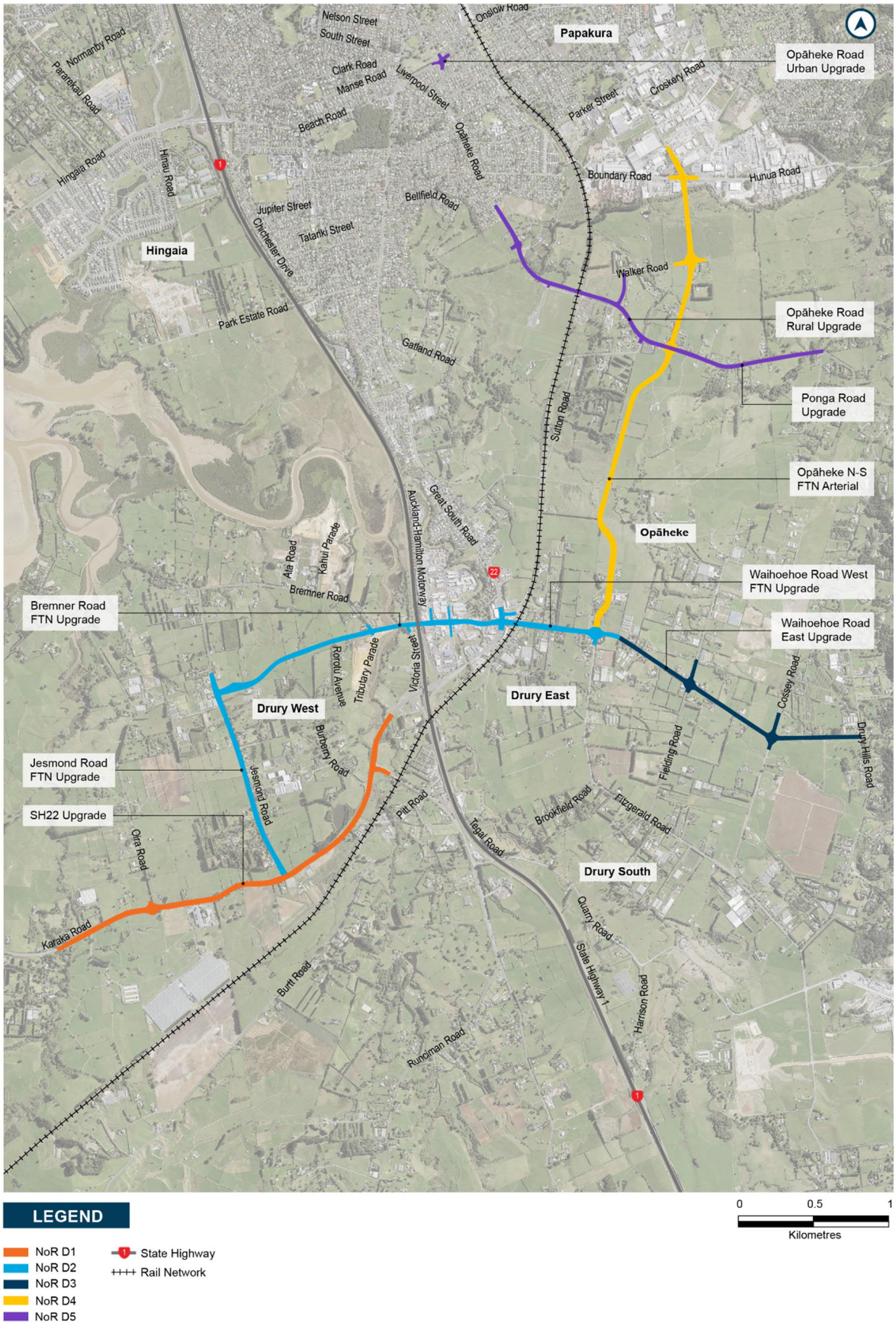


Figure 3-1 Drury Package Projects and Notices of Requirement

3.1 Background

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

The Supporting Growth Programme is a collaboration between AT and Waka Kotahi to plan transport investment in Auckland's future urban zoned areas over the next 10 to 30 years. AT and Waka Kotahi have partnered with Auckland Council, Manawhenua and KiwiRail Holdings Limited (KiwiRail) and are working closely with stakeholders and the community to develop the strategic transport network to support Auckland's growth areas.

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

3.2 Drury Package

The Drury Package proposes an arterial network to support the expected future growth in Drury-Ōpāheke. The Drury Package comprises five separate projects which together form the Drury Arterial Network. The network includes provision for general traffic, walking and cycling, and frequent public transport. Overall, the Drury Package aims to improve connectivity within and through the Drury-Ōpāheke area, providing high quality, safe and attractive transport environments.

Each Project within the Drury Package will be designated separately as follows:

- **NoR D1:** Alteration to Waka Kotahi NZ Transport Agency designation 6707 - State Highway 22 (SH22) Upgrade
- **NoR D2:** Jesmond to Waihoehoe West FTN Upgrade
- **NoR D3:** Waihoehoe Road East Upgrade
- **NoR D4:** Ōpāheke North-South FTN Arterial (Ōpāheke N-S FTN Arterial)
- **NoR D5:** Ponga Road and Ōpāheke Road Upgrade

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

3.3 Purpose and Scope of this Report

This report provides an assessment of arboricultural effects associated with the construction, operation and maintenance of each Project in the Drury Package. This assessment has been prepared to inform the AEE for the NoRs.

The purpose of this report is to:

- Identify and describe the existing and likely future tree environment;
- Identify and describe the actual and potential arboricultural effects of the Projects;
- Recommend measures as appropriate to avoid, remedy or mitigate potential adverse arboricultural effects (including any conditions/management plan required); and
- Present an overall conclusion of the level of potential adverse arboricultural effects of each of the Projects after recommended measures are implemented.

The key matters addressed in this report are as follows:

- Description of the Projects as they relate to arboriculture;
- Overview of the methodology used to undertake the assessment and identification of the assessment criteria and any relevant standards or guidelines;
- Identification and description of the existing and likely future tree environment;
- Description of the actual and potential positive arboricultural effects of each project;
- Description of the actual and potential adverse arboricultural effects of construction of each project;
- Description of the actual and potential adverse arboricultural effects of operation of each project;
- Recommended measures to avoid, remedy or mitigate potential adverse arboricultural effects (including any conditions/management plan required); and
- Overall conclusion of the level of potential adverse arboricultural effects of each of the projects after recommended measures are implemented.

3.4 Report Structure

This report is structured to reflect the key matters listed above in Section 3.3.

In order to provide a clear assessment of each Project, descriptions and assessments have been separated to reflect each of the notices sought.

3.5 Preparation for this Report

This report has been prepared following site visits and two site tours with Supporting Growth Alliance team members and Council stakeholders. The site tours were conducted on 3 March, 11 March and 17 July 2020.

The site assessments carried out in March etc involved visual surveying of trees visible from the public road reserve that are within and adjacent to the proposed designations and from within private properties where access was permitted.

3.6 Statutory Context

3.6.1 Notice of Requirement – district plan requirements

This assessment has been prepared to support the NoR process for the Projects. If confirmed, the designations will authorise the District Plan land use components of the Projects. 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. Where regional consenting requirements are triggered, these will not be authorised by the designation, and will require further regional consents.

In order to demonstrate the split between regional and District Plan matters, protected trees (under either the regional or district provisions of the AUP) have been listed in tables and plotted on site plans in the Appendices of this report. The tables and site plans assist to identify the potential arboricultural effects of the construction of the projects, and whether these are regional, or District Plan matters under the AUP. As can be seen from the tree details provided, the majority of arboricultural matters are regulated by the regional provisions of the AUP which will require authorisation in a future consenting process.

3.6.2 Future Regional Resource Consents

No regional resource consents are currently being sought for the proposed Drury Package. These will be sought at a later date, before construction commences. Although regional consents are not being sought at this time, arboricultural effects arising in respect of activities that require regional consents have been considered as part of this assessment to inform design, options assessment and the proposed designation footprint. This information is presented in Section 10 – Regional Consent Considerations. While arboricultural effects in respect of regional consent matters have been considered for these limited purposes, a detailed assessment of Regional Plan matters is not proposed to be undertaken at this NoR phase.

3.6.3 Existing and Future Zoning Considerations

Currently, Regional Plan rules in the AUP for rural areas protect trees that are 6m or greater in height or 600mm and greater in girth, according to E26.3.3.1 Activity table and applicable Standard E26.3.5.2 (1). As the underlying zoning of the land changes from rural to urban, the protection status of these trees under the regional plan rules will be lifted, as the rule applies to rural zones and there are no equivalent rules that protect such trees in the urban environment/zones. Trees that meet the relevant specifications are “protected” to the extent that resource consent is required to authorise their removal.

Conversely, as the underlying zoning of the land changes from rural to urban, the protection status of trees within the road reserve also changes so that trees greater than 400mm in girth or 4 metres in height in urban zones will require consent to remove under the relevant rules in E26.4.3.1 Activity Table.

3.6.4 Regional Plan and District Plan rules

The following tables set out the relevant rules that apply tree protection for the Drury Package under the District Plan (DP) and the Regional Plan (RP) jurisdiction of the AUPOIP.

AUPOIP jurisdiction	Reference	Rule	Where rule applies	Activity Status
DP	D17.4.2 (A26)	Removal of trees greater than 3m in height or greater than 300mm girth	within the scheduled extent of place of Category B historic places	Discretionary
RP	E26.3.3.1 (A76)	Vegetation alteration or removal that complies with Standards E.26.3.5.1 to E.26.3.5.4 (See note)	rural zones, coastal areas and riparian areas and SEA overlays	Permitted
RP	E26.3.3.1 (A77)	Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4 (See note)	rural zones, coastal areas and riparian areas and SEA overlays	Restricted Discretionary
RP	E26.3.3.1 (A78)	Vegetation alteration or removal not otherwise provided for	rural zones, coastal areas and riparian areas and SEA overlays	Discretionary Activity
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 (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 open space zones) or Standard E.26.4.5.3 (Notable Trees)	trees in roads and open space zones	Restricted Discretionary Activity
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
DP	E26.4.3.1 (A90)	Tree trimming, alteration or removal on roads adjoining rural zones and on roads adjoining the Future Urban Zone (See Note 2)	trees in roads	Permitted Activity

Assessment of Arboricultural Effects

AUPOIP jurisdiction	Reference	Rule	Where rule applies	Activity Status
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 (See note 2)	trees in roads and on open space zones	Restricted Discretionary
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

Notes:

1. Standard *E26.5.3.2 Vegetation alteration or removal* states:[2]

   (1) Must not include trees over 6m in height, or 600mm in girth unless their removal is otherwise permitted by a rule in this Plan.

   (2) Must not result in the removal of more than 20m^2 of vegetation within a significant ecological area, except within the formation width of the road.

   (3) Must not result in the removal of more than 50m^2 of vegetation within a coastal area or riparian area not identified as a significant ecological area.

   (5) Must not result in the removal of more than 500m^2 of vegetation within the legal road or the formation width of the road in a rural zone.

   (6) Must not result in the removal of more than 250m^2 of vegetation outside the legal road or the formation width of the road in a rural zone.

2. In relation to trees on roads, the apparent contradiction between clauses (A90) and (A92) of Activity Table E26.4.3.1 has been queried with Auckland Council's Senior Regulatory Arborist, Gavin Donaldson. The understanding is that tree trimming, alteration or removal on roads adjoining rural zones and future urban zones is a permitted activity, however, a tree owner approval would still be required.

[2] E26.3.5.1 (RP) relates to vegetation alteration or removal for the operation, maintenance and repair of access tracks and fences for network utilities; and E26.3.5.3 and E26.3.5.4 provide permitted activity standards for vegetation management in the ONF, ONL, ONC and HNC Overlay.

4 Assessment Methodology

Chapter Summary

The arboricultural assessment methodology involved recording details of all trees that may be impacted by the construction and operation of the Drury Arterial Network within the proposed designations. Trees in this instance will be any woody plant that is 4m or greater in height, or that may reach this dimension in the future. In particular, trees that are protected by the AUPOIP, under either the DP or RP were recorded (e.g. if scheduled, within the road reserve or Auckland Council park or located in an AUP overlay).

Details of trees were collected and geo-referenced on a mobile device. Trees were recorded singularly, or in groups where logical groupings can be made based on species, configuration, age-class or management type (e.g. bush areas, shelter belts). Information gathered on each tree or tree group includes, geolocation coordinates, species or species list, size class, age class, health and form classifiers. In order to describe the current environment**,** the functions and values of existing trees and tree groups were evaluated and recorded.

For consideration of the likely future environment an assessment of whether the tree/group is likely to improve, decline or remain the same condition within the coming decades was made. Consideration of whether the tree/trees is/are likely to remain as part of the future environment was recorded, based on protection status under existing zoning and overlays and the likely change to land use that the location will experience.

The protection status of trees was recorded, based on the current Regional Plan or District Plan rules that apply to the tree/s growing location. Those trees protected through District Plan provisions are discussed in this report in terms of an assessment of effects and potential mitigation measures to address these effects. Those trees protected through Regional Plan provisions are included in this report to inform the indicative design, options assessment and proposed designation boundary. Any regional consent requirements in relation to removal or works proximate to such trees will be dealt with in a future consent process.

Details of trees and tree groups are presented in spreadsheet form and on site plans in the Appendices of this report.

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. As a recommended condition of the designation, tree management plans are required to be developed where construction work impacts on trees and groups of trees that are protected under the District Plan provisions (trees protected under Regional Plan provisions will be addressed as part of a future resource consent process). Replacement planting protocols are proposed to be developed as part of tree management plans where protected trees are to be removed.

4.1 Assessment Methodology for all Notices of Requirement

The existing tree environment was established by collecting details of all trees within and immediately adjacent to the proposed designations. The methodology for the arboricultural assessment involved a survey of trees and groups of trees from the existing formed roads and private properties where access was permitted. Trees were grouped into logical groups based on age-class, ownership, species and growing location. Trees were recorded as either a Single tree, a Group or a Hedge/shelterbelt. The following information was collected for each data point (recorded on a custom-made app on Fulcrum platform and mobile device):

- Species of tree, using botanical name
- Dimensions – either size of single trees or the approximate area that a group or linear stand covers.
- Classification of tree vitality
- Classification of tree/group age class
- Check list of values that the tree contributes to the environment from a pre-defined list that includes:
    - Amenity
    - Carbon sink
    - Community identity
    - Exotic species
    - Screening
    - Soil / erosion protection
    - Highly Visible
    - Native species
    - Part of Group
    - Specimen tree/s
    - Stormwater reduction
    - Wildlife Habitat
    - Other
- Consideration of the relative vitality of the tree/group as to whether the tree will increase or decrease in size/vitality over given time periods (0-10, 10-20 and 20+ years).
- Consideration of the values of the tree/group as to whether their environmental contribution will increase or decrease in size/vitality over given time periods (0-10, 10-20 and 20+ years).
- Consideration of the life expectancy of the tree/group, including whether the tree is threatened by development if the land-use pattern changes as anticipated.
- Check list for tree protection status (Yes/No).
- If protection status is yes, what are the triggers for protection that apply, from a predefined list:

- Road (District Plan rule)
- Open Space zone (District Plan rule)
- Heritage place (District Plan rule)
- Significant Ecological Area (SEA) (Regional Plan rule)
- Riparian margin (Regional Plan rule)

- Photographs were taken of trees and tree groups as a record of their location and condition.

In this report, the protected trees are split into those protected by District Plan or Regional Plan provisions in the AUPOIP. This report considers all trees but only assesses the effects of those trees covered by District Plan matters as regional consents will be sought at a later date. Those trees protected by Regional Plan rules have been identified to inform the indicative design, options assessment and proposed designation boundary. These are discussed in section 10 relevant to each proposed designation.

5 NoR D1: Alteration to Designation 6707 - State Highway 22 Upgrade

Chapter Summary

The existing rural environment adjacent to SH22 contains no trees that are protected by the District Plan. A group of protected trees on open space land within the Drury Sports Complex at the northern end of the proposed designation can be avoided through implementation of tree protection measures as part of a tree management plan that is recommended as a recommended condition of the designation to be implemented during final design and pre-construction planning.

Overall, the effects of the upgrade of SH22 on trees protected by the District Plan will be insignificant.

5.1 Project Description

5.1.1 Project Overview

The State Highway 22 (SH22) Upgrade (NoR D1) consists of the widening of SH22 to a four-lane arterial with separated walking and cycling facilities. The Project extends approximately 3.08km from the State Highway 1 (SH1) Drury Interchange in the east, and the extent of the FUZ between Woodlyn Drive and Oira Road in the west. The intersections at Jesmond Road and Great South Road will be signalised and a roundabout is proposed at Oira Road. An overview of the concept design is provided in Figure 5-1.

As the surrounding area is urbanised over time and alternative routes are implemented (particularly the proposed Pukekohe Expressway), the function of SH22 will change from a rural state highway to provide an appropriate urban arterial connecting the growth areas of Drury West to the wider network and centres, including providing a frequent transport bus network. This is likely to include a reduction in the speed limit to 50kph. SH22 will improve future connectivity to the proposed Drury West train station which currently forms part of the New Zealand Upgrade Programme (NZUP) project.

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

- Widening of SH22 from its current general width of 20m to enable a 30m wide four-lane road with separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Demolition and reconstruction of the existing Ngakoroa Stream Bridge
- Proposed new and extended culverts
- Three proposed stormwater wetlands
- Batter slopes and retaining to enable widening of the corridor, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring

Figure 5-1 Overview of SH22 Upgrade

5.1.2 Project Features

The Project features that will impact on vegetation are:

- Vegetation removal within the proposed designation will be required where widening of the corridor extends over the tree growing location, including retaining and batter slopes to support the road widening and other features such as stormwater wetlands, culverts and outfalls.
- Construction work in the vicinity of trees may also require work within the rootzone and pruning of trees that are retained adjacent to the road widening work.

One group of trees that are protected by District Plan rules has been identified on Open Space zoned land at the Drury Sports Complex. A portion of the southern end of the Drury Sports Complex is included in the designation to allow for a works laydown area off SH22.

5.1.3 Existing and Likely Future Environment

The existing environment in this section contains 26 identified trees or groups of trees, comprised of 17 tree groups (totalling approximately 257 trees), eight shelter belts with undefined numbers of trees (totalling approximately 890 metres in length) and one identified single tree.

Trees that are protected by District Plan provisions in this section are limited to a group of 7 trees within the Open Space zoned land at the southern end of the Drury Sports Complex. Potential effects on these trees are discussed below.

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that have environmental benefits to the location. It is anticipated that these values will generally increase or remain constant over the timeframes that apply to the NoR.

There are no trees identified within the current road reserve on SH22.

The future environment for trees within and adjacent to SH22 is likely to be very different as the anticipated land use pattern change (urbanisation) is likely to result in removal of trees as the land is developed. Many trees on private land within the proposed designation will no longer be protected by the AUP rules when the adjacent zoning changes from rural/FUZ to urban.

5.2 Assessment of Arboricultural Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

5.2.1 Positive Effects

A large number of the trees in groups along SH22 are tree privet (*Ligustrum lucidum*), which is a plant pest species. The removal of these pest plants has a positive impact on natural forest regeneration, as the invasive weed species can suppress native plants.

Widening of the existing corridor with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

5.2.2 Assessment of Construction Effects

Trees could be harmed by movement of construction vehicles and machinery within the proposed designation extent that overlaps the open space land at the southern end of the Drury Sports Complex. Physical damage to the trees or alteration to their growing environment could cause adverse effects on the health and safety of the trees unless they are adequately protected during the work. It is likely that the group of trees in Drury Sports Complex can be avoided and retained through implementation of measures that avoid the trees during the design and construction process.

5.2.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

A Tree Management Plan should be developed prior to construction to identify existing trees protected under the District Plan, confirm the construction methods and impacts on each tree and detail methods for all work within the rootzone of trees that are to be retained. The Tree Management Plan should include:

- Confirmation that protected trees identified in Schedule A1 (refer 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;
- Detailing methods for all work within the rootzone of trees that are to be retained in line with appropriate arboricultural standards.

Replacement planting will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the proposed designation. The ULDMP 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.

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

5.2.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees are anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects. Street tree planting (to be decided through the ULDMP) will result in more trees in the public realm and an enhanced road environment in the long term.

5.2.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

5.3 Conclusion

The majority of NoR D1 contains no trees that are protected under the relevant District Plan provisions of the AUPOIP.

The group of protected (DP) trees at the southern end of the Drury Sports Complex can be retained and protected through implementation of standard tree protection measures, pursuant to a Tree Management Plan developed prior to construction and therefore the Project will have negligible effects on trees protected under the DP provisions.

6 NoR D2: Jesmond to Waihoehe West FTN Upgrade

Chapter Summary

The existing rural environment adjacent to Jesmond Road contains trees within the road and a group of trees within a historic site.

The urbanised environment between the new Bremner Road link and Waihoehoe Road has a number of groups of trees that are protected by the District Plan, where open space zoning, trees on roads and historic overlay provisions apply. Removal and works within the rootzone will apply to protected trees during the road upgrade works. Measures to mitigate the effects of tree removal will include replanting within available open space and the road-side berms in the new road layout. Measures to avoid and protect trees that are to be retained should be implemented as part of a Tree Management Plan developed during pre-construction planning.

The existing rural environment adjacent to Waihoehoe Road West (beyond the rail corridor) contains no trees that are protected by the District Plan.

Overall, the effects of the road upgrade from Jesmond Road to Waihoehoe Road West on trees protected by the District Plan will be minor.

6.1 Project Description

The Jesmond to Waihoehoe West FTN Project (NoR D2) includes, an approximately 4.1km long four-lane FTN arterial route along Jesmond Road, through a new greenfields link between Jesmond Road and the existing Bremner Road, Bremner Road, Norrie Road and Waihoehoe Road West. It primarily involves upgrading and widening existing transport corridors with the exception of the new link between Jesmond Road and the existing Bremner Road and the new bridge connection over Hingaia Stream. The functional intent of the Project is to provide an appropriate urban arterial connecting the growth areas of Drury West to the wider network and centres, including providing a frequent transport bus network. Generally, a 30m wide transport corridor will be provided with two general traffic lanes, two bus lanes and separated walking and cycling facilities on both sides of the road corridor. The urban arterials will have a likely speed limit of 50kph.

For assessment purposes, the Project has been separated into three sections, as shown in Figure 6-1, including:

- Jesmond Road FTN Upgrade
- Bremner Road FTN Upgrade
- Waihoehoe West FTN Upgrade

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade common to each Project section include the following:

- A typically 30m wide road with four lanes and separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings

- Batter slopes and retaining to enable widening of the corridor and/or wetland construction, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring.

Further details of each Project section are provided below.

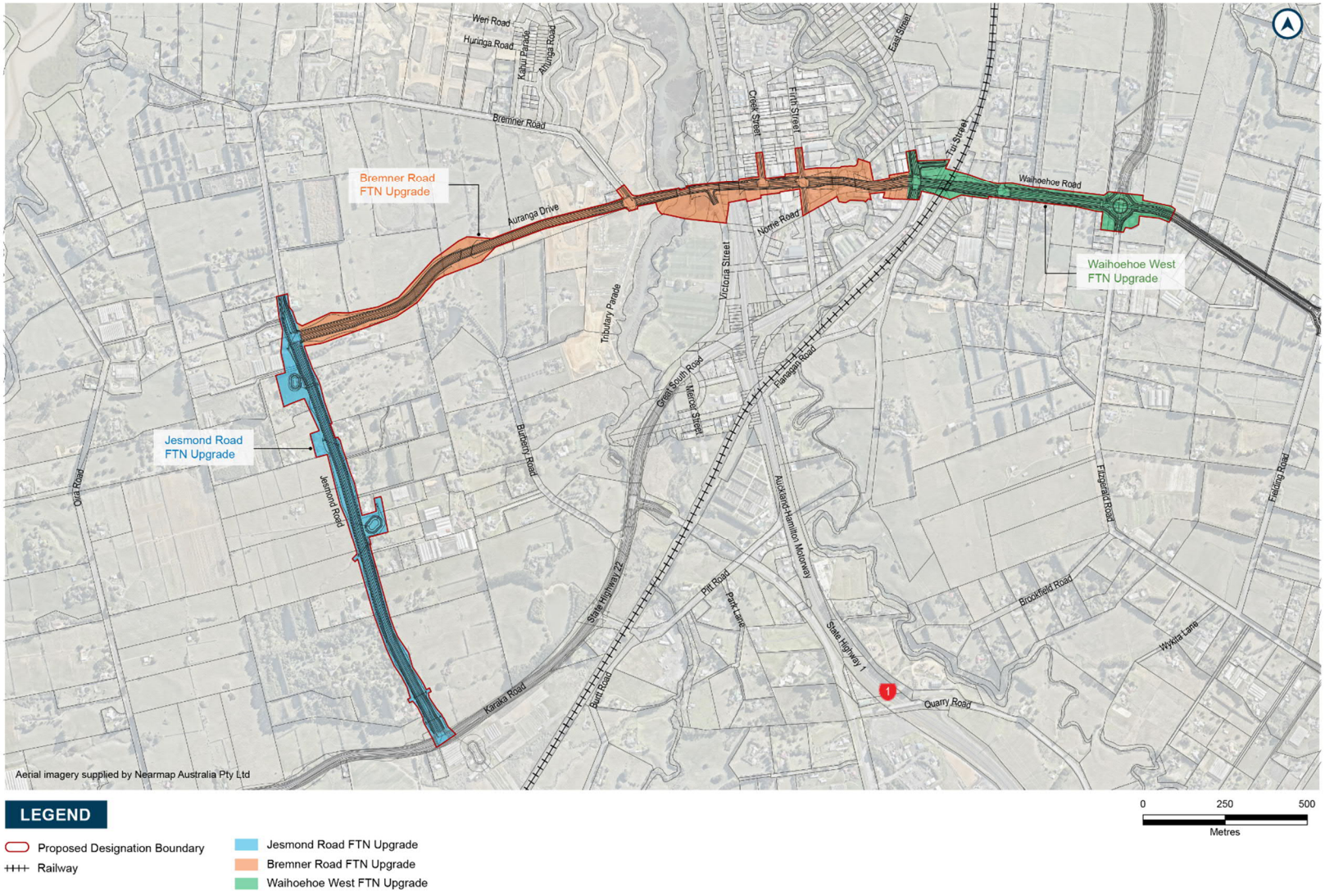


Figure 6-1 Overview of NoR D2

6.1.1 Jesmond Road FTN Upgrade Section

6.1.1.1 Section Overview

The Jesmond Road corridor provides greater accessibility via a north-south link that connects Bremner Road to the proposed Drury West Station and town centre, forming a key public transport and active mode spine through Drury West. An overview of the proposed design is provided in Figure 6-2.

In addition to those listed above, the key features of the Jesmond Road section include:

- Signalised intersections at SH22 and the new Jesmond to Bremner Link
- New and extended pipe culverts for cross drainage
- Two stormwater wetlands.

6.1.1.2 Specific Features of this section

The Jesmond Road FTN Upgrade section is adjoined by rural land and large residential lots/lifestyle blocks. Vegetation types associated with the current land use include hedgerows/shelterbelts, farm forestry lots and amenity plantings associated with homesteads. Several groups of trees planted in the manner of street trees are present.

The Project features that will impact on vegetation are:

- Vegetation removal within the proposed designation will be required where widening of the corridor extends over the tree growing location, including retaining and batter slopes to support the road widening and other features such as stormwater wetlands, culverts and outfalls.
- Construction work in the vicinity of trees may also require work within the rootzone and pruning of trees that are retained adjacent to the road widening work
- Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and/or pruning of trees.

Figure 6-2 Overview of Jesmond Road FTN Upgrade Section

6.1.2 Bremner Road FTN Upgrade Section

6.1.2.1 Section Overview

The Bremner Road FTN Upgrade section extends from Jesmond Road in the west, approximately 1.98km to the end of Norrie Road in the east. This section involves the construction of a new road from Jesmond Road to the existing Bremner Road referred to as the "Jesmond to Bremner Link" and widening, and direct connection via a new bridge over Hingaia Stream, of Bremner Road and Norrie Road to enable the four-lane FTN arterial. The functional intent of this section provides greater east-west accessibility that connects Jesmond Road to Great South Road and town centre, forming a key public transport and active mode spine. An overview of the concept design is provided in Figure 6-3 .

In addition to those listed above, the key features of the Bremner Road FTN Upgrade section include:

- Signalised intersections on Bremner Road with Auranga Road 1, Creek Street and Firth Street
- Between Jesmond and Bremner Roads (Jesmond to Bremner Link):
    - A new road from Jesmond Road to an unnamed stream at the Auranga Development.
    - Forming of two additional lanes for the FTN within the Auranga "Road 1" from the unnamed stream to Bremner Road)
- A new bridge over an unnamed stream within the Jesmond to Bremner Link
- Widening of the two existing bridges crossing Ngakoroa Stream and SH1. These two bridges are proposed to be reconstructed in the near future as part of the SH1 widening by the Papakura to Bombay Waka Kotahi Project which forms part of the New Zealand Upgrade Programme.
- A new bridge connection from Bremner Road to Norrie Road across Hingaia Stream
- Removal of Norrie Road Bridge and closure of Norrie Road west
- Removal of access to Bremner Road from Creek Street (south).

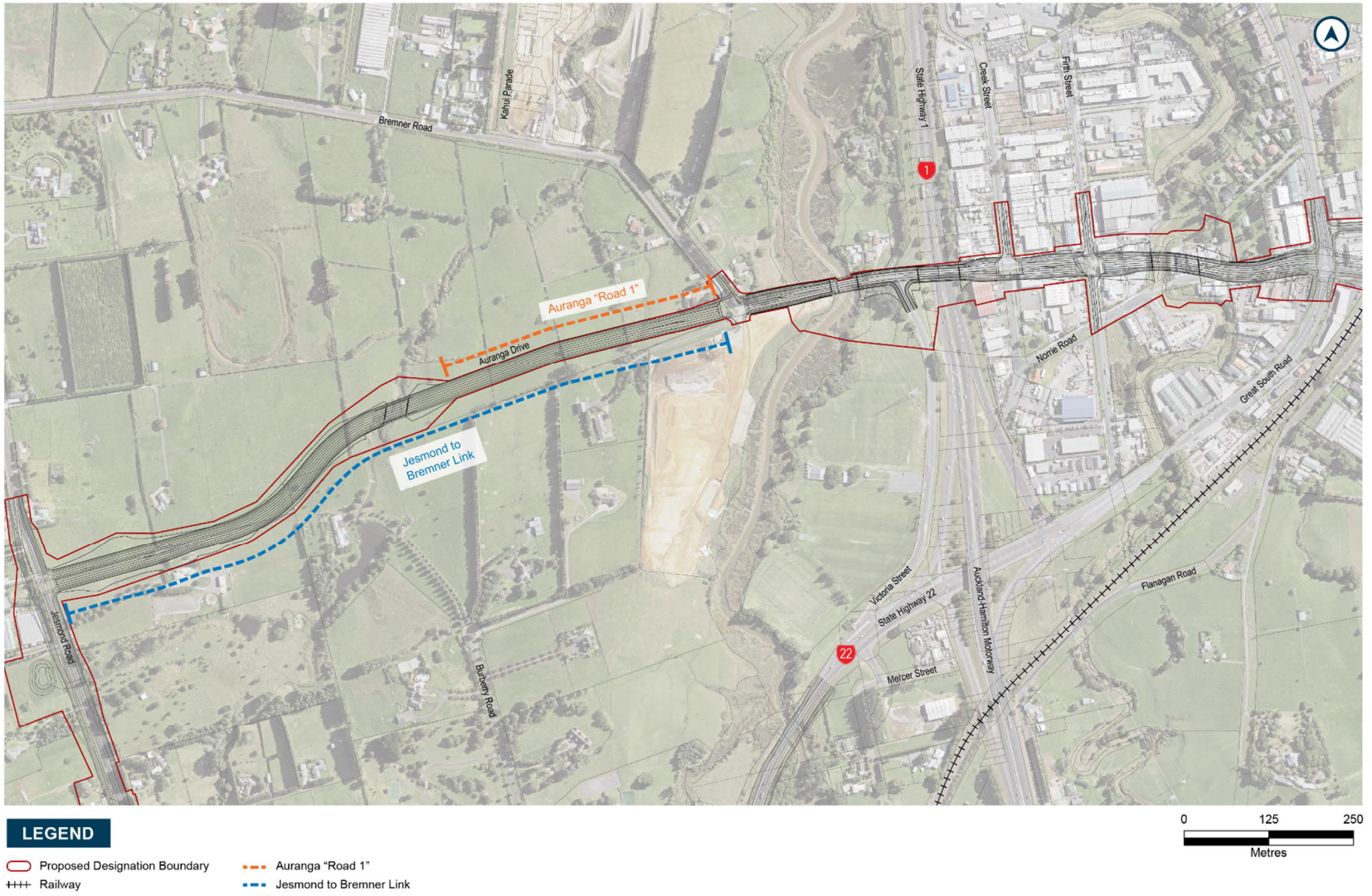


Figure 6-3 Overview of Bremner Road FTN Upgrade Section

6.1.2.2 Specific Features of this section

The Jesmond to Bremner Link crosses rural land and large residential lots/lifestyle blocks. Vegetation types associated with the rural portion of the route include amenity plantings associated with homesteads and vegetation around a stream crossing. Removal and work within the rootzone of trees is minimal for this portion of the project.

Land adjacent to the Ngakoroa Stream bridge and approaches includes Open Space zoned land and residential properties that contain amenity plantings. The construction area associated with the new Ngakoroa Stream bridge contains several groups of trees and requires the removal a stand of large pine trees. Several trees within a SEA (terrestrial) also require removal for the bridge construction. Amenity trees at the edge of the open space area at the northern end of the Drury Sports Complex may be affected by construction-related activities.

Existing street trees on Bremner Road and Creek Street may require removal or works within their rootzone during the road and widening and intersection improvements. A group of palm trees in the road reserve at the intersection of Norrie Road and Great South Road will require removal.

Several groups of trees growing on the banks of Hingaia Stream will require removal for the new bridge, stormwater outfalls and associated access.

The Project features that will impact on vegetation are:

- Vegetation removal within the proposed designation will be required where widening of the corridor extends over the tree growing location, including retaining and batter slopes to support the road widening and other features such as stormwater wetlands, culverts and outfalls.
- Construction work in the vicinity of trees may also require work within the rootzone and pruning of trees that are retained adjacent to the road widening work
- Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and/or pruning of trees.

6.1.3 Waihoehoe Road West FTN Upgrade Section

6.1.3.1 Section Overview

The Waihoehoe Road West FTN Upgrade section extends from Great South Road in the west, approximately 800m east to just past Fitzgerald Road in the east and involves widening the existing two-lane rural road to enable the four-lane FTN arterial. The functional intent for the section provides a strategic east-west link between strategic north-south and east-west corridors (Norrie Road, Great South Road and the Ōpāheke N-S FTN Arterial) that connects Waihoehoe Road to the Drury Central Station (and associated park and ride facilities) and town centre, forming a key public transport and active mode spine through Drury West. An overview of the concept design is provided in Figure 6-4.

In addition to those listed above, the key features of the Waihoehoe Road West FTN Upgrade section include:

- Realignment of Tui Street to Great South Road
- Upgraded and signalised intersection at Great South Road

- Reconstruction of the bridge crossing the NIMT rail line
- Relocation of the Waikato 1 watermain. The point of re-location to be agreed with Watercare at future detailed design.

Figure 6-4 Overview of Waihoehoe Road West FTN Upgrade Section

6.1.3.2 Specific Features of this section

The Waihoehoe Road West FTN Upgrade Section is adjoined by rural land and large residential lots/lifestyle blocks. Vegetation types associated with the current land use include hedgerows/shelterbelts and amenity plantings associated with homesteads.

The Project features that will impact on vegetation are:

- Vegetation removal within the proposed designation will be required where widening of the corridor extends over the tree growing location, including retaining and batter slopes to support the road widening and other features such as stormwater wetlands, culverts and outfalls.
- Construction work in the vicinity of trees may also require work within the rootzone and pruning of trees that are retained adjacent to the road widening work
- Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and/or pruning of trees.

6.2 Existing and Likely Future Environment

6.2.1 Jesmond Road FTN Upgrade section

The existing environment contains 37 identified trees and groups of trees, comprised of 24 groups of trees (totalling approximately 200 trees), three identified single trees and six identified hedge/shelterbelts (totalling approximately 694 metres in length).

The existing environment includes three single trees and five groups of trees (totalling 23 trees) that are growing within the public road reserve.

Trees protected under District Plan provisions in this section are limited to approximately 30 Japanese cedar (*Cryptomeria japonica*) trees in one row adjacent to Aroha Cottage, 201 Jesmond Road, because they are within the scheduled historic extent of place.

Trees within the road reserve include:

- A hedge of *Griselinia* in the road reserve outside 'the Red Shed' at 64 Jesmond Road.
- One Lombardy poplar (*Populus nigra* 'Italica') in the road reserve outside 16 Jesmond Road.
- Six silver birch (*Betula pendula*) and two flowering cherry (*Prunus sp.*) in the road reserve outside 'the Red Shed' at 64 Jesmond Road.
- Seven silver birch (*Betula pendula*) in the road reserve outside 64 and 84 Jesmond Road.
- Nine pin oak (*Quercus palustris*) in the road reserve outside 256-262 Jesmond Road.

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that have environmental benefits to the location. These values will generally increase over the short term (0-10 years), medium term (10-20 years) and long term (20+ years) timeframes that may apply to the NoR.

With the exception of trees within the Historic Heritage Extent of Place overlay relating to Aroha Cottage, the removal of the identified trees within the designation is a permitted activity according to the District Plan provisions. Tree owner approval will be required for the removal of trees and other works affecting trees growing within the road reserve. However, the removal of trees on roads adjacent to rural/FUZ land is a permitted activity under the district plan.

The future environment for trees within and adjacent to Jesmond Road is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment in the future.

6.2.2 Bremner Road FTN Upgrade section

The Bremner Road FTN Upgrade section contains 17 identified trees or groups of trees, comprised of 13 groups of trees (totalling approximately 67 trees), three identified single trees and one hedge/shelterbelt.

Trees in this section that are protected under relevant District Plan provisions are:

- One sitka spruce (*Picea sitchensis*) and one Japanese cedar (*Cryptomeria japonica* 'Elegans') within the 'extent of place' heritage overlay adjacent to St Johns Church, 9 Cameron Place, Drury.
- One eastern arborvitae (*Thuja occidentalis*), two white willow (*Salix* alba) and one Yunnan poplar (*Populus yunnanensis*) in the 'paper road' on Cameron Place, Drury.
- Two melia (*Melia azadarach*) in the road reserve outside 11 Creek Street, Drury.
- Two silver birch (*Betula pendula*) in the road reserve of Bremner Road, outside 69 Creek Street, Drury.
- English oak trees growing on the motorway embankments either side of the Bremner Road bridge over SH1.
- Eight radiata pine (*Pinus radiata*) in the Open Space zoned land at the northern end of Drury Sports Complex, 256-262 Jesmond Road.
- Three pin oak (*Quercus palustris*), three American sweet gum (*Liquidambar styraciflua*) and two Yunnan poplar (*Populus yunnanensis*) in the Open Space zoned land at the northern end of Drury Sports Complex, 256-262 Jesmond Road.
- One pin oak (*Quercus palustris*), one American sweet gum (*Liquidambar styraciflua*) and two manna ash (*Fraxinus ornus*) adjacent to Ngakoroa Stream, in the Open Space zoned land at the northern end of Drury Sports Complex, 256-262 Jesmond Road, also partially within the SEA.
- Nine London plane (*Platanus X acerifolia*) in the road reserve at the western approach to the Ngakoroa Stream bridge.
- Five Mexican fan palms (*Washingtonia robusta*) in the road reserve on the corner of Great South Road and Norrie Road.

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that contribute environmental benefits to the location. These values will generally remain constant over the timeframes that may apply to the NoR for transport corridor designation.

The future environment for trees within and adjacent to the Bremner Road Section is likely to change little in general, due to the open space and industrial zoning of the land and the protection that applies to trees within this environment. Natural attrition is likely to be high within this environment due to the built environment and associated activities affecting trees. It is noted that the Papakura to Bombay Waka Kotahi (NZUP) Project proposes to reconstruct the two existing bridges on Bremner Road crossing SH1 and the Ngakoroa Stream as part of the SH1 widening before the future Bremner Road FTN section works. Therefore, some of the trees within the Drury Sports Complex and adjacent to the two bridges could be removed as part of that project. However, as details of the project are not confirmed yet these trees have been included in this assessment.

6.2.3 Waihoehoe Road West FTN Upgrade section

The existing environment contains 30 identified trees or groups of trees, comprised of 16 tree groups (totalling approximately 129 trees), four identified single trees and ten identified hedge/shelterbelts (totalling approximately 517 metres in length).

Trees in this section that are protected under relevant District Plan provisions are three English oak (*Quercus robur*) in the road reserve of Waihoehoe Road, outside 236 Great South Road.

The trees affected by the designation currently provide a range of ecological services and environmental benefits to the location. These values will generally increase over the short term (0-10 years), medium term (10-20 years) and long term (20+ years) timeframes that may apply to the NoR proposed designation.

The future environment for trees adjacent to Waihoehoe Road is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment.

6.3 Assessment of Arboricultural Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

6.3.1 Jesmond Road FTN Upgrade section

6.3.1.1 Positive Effects

Construction of the new road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

6.3.1.2 Assessment of Construction Effects

Only the Japanese cedar trees outside Aroha Cottage , 201 Jesmond Road, are considered to be protected by District Plan provisions as they are within the scheduled heritage extent of place. The proposed designation boundary includes the driveway of Aroha Cottage so that it can be regraded if required. The trees are likely to have no historical value due the cottage being relocated to the site. If the trees remain in the future, it should be possible to retain them adjacent to the works area. Potential effects on these trees should be minimised and controlled according to specific tree protection methodologies provided in a Tree Management Plan.

The loss of the existing road reserve trees within Jesmond Road contributes adverse effects on the local environment. This includes:

- One mature Lombardy poplar (*Populus nigra* 'Italica') outside 16 Jesmond Road that is a good quality specimen tree
- Variable quality silver birch (*Betula pendula*) and flowering cherry (*Prunus serrulata*) growing in groups outside 64 Jesmond Road
- Five silver birch (*Betula pendula*) outside 84 Jesmond Road that are mature trees of fair/good quality
- Nine good quality, early mature pin oak (*Quercus palustris*) outside 256-262 Jesmond Road.

The listed trees provide amenity to the rural road and may contribute other functions, such as stormwater amelioration and soil erosion protection.

The effects of tree loss in this instance can be mitigated by comprehensive planting within berms in the new road layout.

6.3.1.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

A Tree Management Plan 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 rootzone of trees that are to be retained. The Tree Management Plan should include:

- Confirmation that protected trees identified in Schedule A2 (refer 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;
- Detailing methods for all work within the rootzone of trees that are to be retained in line with appropriate arboricultural standards.

Replacement planting will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the designation. The ULDMP 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.

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

Consideration of tree transplanting should be included in the Tree Management Plan, where good quality trees in the road reserve are identified for removal. An assessment of the quality of the trees and the feasibility of transplantation should form part of the Tree Management Plan.

6.3.1.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects. Street tree planting (to be decided through the ULDMP) will result in more trees in the public realm and an enhanced road environment in the long term.

6.3.1.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

6.3.1.6 Summary and Conclusions

Only the Japanese cedar trees outside Aroha Cottage are considered to be protected by District Plan provision. These are likely to be avoided from the works and therefore effects are negligible. The group of protected trees outside Aroha Cottage could be avoided and retained. Details of the

measures for protection of the trees should be developed as part of the applicable Tree Management Plan.

Replacement planting to mitigate the loss of trees will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the designation.

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

6.3.2 Bremner Road FTN Upgrade Section

6.3.2.1 Positive Effects

Construction of the road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

6.3.2.2 Assessment of Construction Effects

The following paragraphs set out the impacts on trees that are protected by District Plan provisions.

Newly planted trees within the road reserve of Bremner Road, at the approach to the Ngakoroa Stream Bridge will require removal for the upgrade of the road.

Widening of Bremner Road at the eastern approach to the Ngakoroa Stream Bridge requires the removal of protected pine trees in the open space zoned land of the Drury Sports Complex. These trees require removal for bridge construction site access and for formation of the batter slope to support the road.

Use of the northern end of the Drury Sports Complex for a site compound also potentially impacts on other groups of amenity trees growing within an unformed road off Victoria Street. The raising of ground levels to allow Victoria Street to tie in to the new Bremner Road level will likely require removal of these trees. Where possible, these trees should be retained and fenced off for protection to avoid harm occurring during the construction.

At the western side of the site compound at the northern end of the Drury Sports Complex a group of trees that is within the riparian margin requires removal due to the changes to ground levels. Where possible to retain trees outside of the construction area, these trees should be fenced off for protection to avoid harm occurring during the construction.

The proposed new bridge across the Southern Motorway will require removal of oak trees from motorway embankments on both sides of SH1 and the bridge.

Two protected Melia street trees on Creek Street are likely to be impacted by changes to the road layout where Creek Street ties in to Bremner Road. The new kerb aligns with the existing kerb, however the levels and kerb construction methodology need to be confirmed (via a Tree Management Plan) to confirm the effects on these trees.

Two protected birch trees on Bremner Road in the road reserve require removal. These are average quality specimens in terms of form and structure but appear to be in reasonable health. The trees provide some amenity to the industrial area. Tree planting within the new road layout will replace these trees.

Trees growing on open space land on the embankment of Hingaia Stream require removal for the construction of the new bridge. These poplar and willow have low arboricultural value, so effects of their removal are not significant from an arboricultural perspective. Replanting of the stream embankment will mitigate potential effects on ecology, stormwater and land stability.

Trees growing on the embankment of Hingaia Stream and within the Cameron Place paper road may require removal for the construction of the site access and new stormwater outfall. The willow trees on the stream embankment have low arboricultural value, so effects of their removal are not significant from an arboricultural perspective. The willow trees on Cameron Place have reasonable qualities from an arboricultural perspective, however they are a relatively short-lived species and are likely to deteriorate in quality over the Project timeframe. Replanting of the stream embankment and road reserve will mitigate potential effects on amenity, ecology, stormwater and land stability.

A group of palms in the road reserve on the corner of Norrie Road and Great South Road are protected trees according to the District Plan provisions of the AUPOIP. The four Mexican fan palms (*Washingtonia robusta*) are in good condition and add amenity to the location, as part of a larger group extending northwards on Great South Road. These palms are within the extent of the widened road at the approach to the intersection and will require removal.

Trees within the historic St Johns Church grounds are outside of the proposed designation for road widening, however the rootzone of these trees extend beyond the boundary and into the designation extent. Protection of these trees according to the recommendations of a Tree Management Plan will be required as a condition of the designation to avoid adverse effects on these protected trees during the construction.

Removal of protected trees on open space land and in the road reserve will reduce the tree cover and result in loss of the many functions and benefits that the trees provide, therefore resulting in adverse environmental effects.

6.3.2.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

A Tree Management Plan 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 rootzone of trees that are to be retained. The Tree Management Plan should include:

- Confirmation that protected trees identified in Schedule A2 (refer 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;
- Detailing methods for all work within the rootzone of trees that are to be retained in line with appropriate arboricultural standards.

Replacement planting will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the designation. The ULDMP 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.

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

Replacement planting procedures should be developed with ecological input for the replacement of trees (on open space and roads) in the riparian margin of the Hingaia Stream embankments.

6.3.2.4 Assessment of Operational Effects and Recommended Measures

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects.

6.3.2.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

6.3.2.6 Summary and Conclusions

The widening of Bremner Road and construction of new bridges over the Ngakoroa Stream, southern motorway and Hingaia Stream will have adverse effects on trees that are protected according to District Plan provisions. Removal of large trees on open space land and protected trees in the road reserve will reduce the tree cover and remove the many functions and benefits that the trees provide.

Tree Management Plans that address construction methodologies and mitigation measures for works affecting all protected trees that exist at the time of construction are proposed to be developed to avoid and mitigate adverse arboricultural effects.

The loss of the existing road reserve trees within Bremner Road, Drury Sports Complex and the motorway corridor contributes adverse effects on the local environment. The effects of tree loss in this instance can be mitigated by comprehensive planting within open space land and berms in the new road layout.

The loss of the existing trees within open space and road reserve land (and riparian margins) adjacent to Hingaia Stream contributes adverse effects on the local environment. The effects of tree loss in this instance can be mitigated by comprehensive planting within the open space and stream embankments around the new bridge.

Overall, the arboricultural effects of the Bremner Road section of the proposed designation will be significant due to the removal of mature amenity trees at the Drury Sports Complex. These effects can be mitigated by replanting trees within the site, such that long-term effects are considered to be minor.

6.3.3 Waihoehoe Road West FTN Upgrade section

6.3.3.1 Positive Effects

Construction of the road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

6.3.3.2 Assessment of Construction Effects

The widening of Waihoehoe Road West on the northern side of the existing road appears to avoid the group of three protected English oak trees on the approach to the Waihoehoe Road rail bridge. These trees contribute significant amenity values to the town centre of Drury. However, the bridge over the rail crossing will need to be reconstructed so it is likely that the trees will be impacted. The effects on these trees from construction activities in close proximity may mean that the trees require removal. The removal of these trees would have adverse effects that would require mitigation through the Tree Management Plan. Management of these trees and the work around them, or the removal and replacement of these trees must be confirmed as part of a Tree Management Plan.

6.3.3.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

A Tree Management Plan 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 rootzone of trees that are to be retained. The Tree Management Plan should include:

- Confirmation that protected trees identified in Schedule A2 (refer 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;
- Detailing methods for all work within the rootzone of trees that are to be retained in line with appropriate arboricultural standards.

Replacement planting will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the designation. The ULDMP 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.

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

6.3.3.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects

6.3.3.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

6.3.3.6 Summary and Conclusions

The widening of Waihoehoe Road West will have negligible effects on protected trees, as the majority of the route contains no trees that are protected according to District Plan provisions.

One group of English oak trees may be significantly affected by works around the Great South Road and rail crossing of Waihoehoe Road. These should be retained and protected if possible.

Tree Management Plans that address construction methodologies and mitigation measures for works affecting all trees that exist at the time of construction are proposed to be developed to avoid and mitigate adverse arboricultural effects.

6.4 Conclusions

6.4.1 Jesmond Road FTN Upgrade section

The upgrade of Jesmond Road affects protected trees in one heritage site. Provided that these trees are either retained and protected or replaced upon completion of the road widening construction works, the effects on protected trees will be negligible.

6.4.2 Bremner Road FTN Upgrade section

The new link from Jesmond Road to Bremner Road does not affect trees protected under District Plan provisions.

The new Ngakoroa Stream Bridge and associated construction compound and earthworks affects trees in public open space land, requiring the removal of a stand of large pine trees and trees within other groups of amenity trees. Reinstatement of the reserve and planting of new trees, along with retention and protection of other trees in the reserve where possible, will mitigate the tree loss.

The new bridge crossing the Southern Motorway affects English oak trees on the motorway embankments, requiring the removal of several of the many trees in this environment. Retention and protection of the large number of other trees in the motorway corridor will mitigate the tree loss.

The new Hingaia Stream Bridge and associated construction compound and stormwater outfall affects trees in public open space land and road reserve. The removal of stands of poplar and willow can be mitigated by reinstatement of the reserve and ecological restoration of the remaining stream embankments.

6.4.3 Waihoehoe Road West FTN Upgrade section

The upgrade of Waihoehoe Road affects one group of protected trees in the road reserve. The works associated with the rail bridge approach are likely to have adverse effects on these trees, such that their removal may be necessary. Provided that these trees are retained and protected during the road widening construction works, or they are replaced with new trees as part of the UDLMP, the effects on protected trees will be minor.

7 NoR D3: Waihoehoe Road East Upgrade

Chapter Summary

The existing rural environment adjacent to Waihoehoe Road East contains no trees that are protected by the District Plan. Therefore, the overall effects of the upgrade of Waihoehoe Road East on trees protected by the District Plan will be nil.

Planting within new road-side berms in the proposed road layout will increase the number of trees in the public realm and offset the effects of removal of the existing trees identified in the road reserve.

7.1 Project Description

7.1.1 Project Overview

The Waihoehoe Road East Upgrade (NoR D3) consists of the widening of Waihoehoe Road to a two-lane arterial with walking and cycling facilities from the proposed intersection with Ōpāheke North-South Arterial in the east, to Drury Hills Road in the east. The functional intent of the Project is to provide strategic east-west connectivity between the strategic north-south corridors (Great South Road, the Ōpāheke N-S FTN Upgrade (NoR D4) and Mill Road), providing multi-modal access to the wider network for the planned growth area as well as providing access to the existing Drury township and proposed rail station (an NZUP project).

The eastern extent of the Project will tie into the future Mill Road corridor which forms a separate NZUP project. The intersection with Ōpāheke North-South is proposed to be signalised, but this work forms part of NoR D2 . Roundabouts are proposed at the intersections with Appleby Road and Cossey Road. The road will be an urban arterial with a likely reduced speed limit of 50kph. An overview of the proposed design is provided in Figure 7-1.

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

- Widening of Waihoehoe Road from its current general width of 20m to enable a 24m wide two-lane cross-section including separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for the two proposed roundabouts
- Batter slopes to enable widening of the corridor, and associated cut and fill activities.
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, the re-grade of driveways and construction traffic manoeuvring.

Figure 7-1 Overview of Waihoehoe Road East Upgrade

7.1.2 Project Features

The Waihoehoe Road East Section is adjoined by rural land and large residential lots/lifestyle blocks. Vegetation types associated with the current land use include hedgerows/shelterbelts and amenity plantings associated with homesteads. Vegetation removal within the proposed designation will be required where retaining and batter slopes to support the road widening extend over these areas. Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and pruning of trees.

7.2 Existing and Likely Future Environment

The existing environment contains 42 identified trees and groups of trees, comprised of 20 tree groups (totalling approximately 168 trees), seven identified single trees and fifteen identified hedge/shelterbelts (totalling approximately 1077 metres in length).

There are no trees that are protected by District Plan provisions identified in this section.

Trees identified within the road reserve for this section include:

- One water gum (*Tristaniopsis laurina*) in the road reserve outside 185 Waihoehoe Road;
- A group of two American sweet gum (*Liquidambar styraciflua*) and two Japanese cedar (*Cryptomeria japonica*) in the road reserve outside 272 Waihoehoe Road

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that contribute environmental benefits to the location. These values will

generally remain constant or increase over the long term (20+ years) timeframes that may apply to the NoR proposed designation.

The future environment for trees adjacent to Waihoehoe Road is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment in the future.

7.3 Assessment of Arboricultural Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

7.3.1 Positive Effects

Construction of the road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

7.3.2 Assessment of Construction Effects

As there are no trees that are protected by District Plan provisions, no measures are required to avoid, remedy or mitigate construction effects of this NoR. However, and as set out in section 10 below, if there are any trees protected by Regional Plan provisions that are to be retained, this will be addressed as part of the future resource consent process and a Tree Management Plan addressing potential effects on these trees should be developed as part of that process, as a condition of the designation.

7.3.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

Trees protected under Regional Plan provisions will be addressed as part of a future resource consent process. This should identify any protected trees, confirm the construction methods, impacts on each tree and detail methods for all work within the root zone of trees that are to be retained.

7.3.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects.

7.3.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

7.4 Conclusions

The upgrade of Waihoehoe Road East will have no effects on protected trees, as the route contains no trees that are protected according to District Plan provisions.

8 NoR D4: Ōpāheke N-S FTN Arterial

Chapter Summary

The existing rural environment within the alignment of the new Ōpāheke N-S FTN Arterial contains no trees that are protected by the District Plan. Therefore, the overall effects of the Ōpāheke N-S FTN Arterial on trees protected by the District Plan will be nil.

8.1 Project Description

8.1.1 Project Overview

The Ōpāheke North-South FTN Arterial is a new 30m four-lane FTN arterial with separated walking and cycling facilities between Hunua Road in the north and Waihoehoe Road in the south. The road will be an urban arterial with a likely speed limit of 50kph. The functional intent of the Project from a transport perspective is to increase connectivity and provide for good people-movement and public transport function through the FUZ. The Project will also support SH1, Great South Road and the proposed Mill Road corridor by providing a new corridor which will cater more to local north-south trips in Drury.

The road traverses greenfields zoned FUZ, crossing approximately seven streams (or tributaries of streams) and areas of flood plain, providing a new north-south connection between Drury and Papakura. The intersection with Hunua/Boundary Roads will be signalised, and roundabouts are proposed at Ōpāheke Road / Ponga Road, Walker Road and Waihoehoe Road. The intersection at Waihoehoe Road is not included in this project extent (it is included within NoR D2). An overview of the proposed design is provided in Figure 8-1.

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

- A new road to enable a 30m wide four-lane cross section including bus lanes and separate walking and cycling facilities
- Localised widening around intersections with existing roads to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Proposed new culverts
- Four proposed stormwater wetlands
- Two proposed bridges over Waipokapū Stream (approximately 120m) and Waihoehoe Stream and floodplain (approximately 265m)
- Batter slopes and retaining to enable construction of the corridor, and associated cut and fill activities
- Vegetation removal
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring.

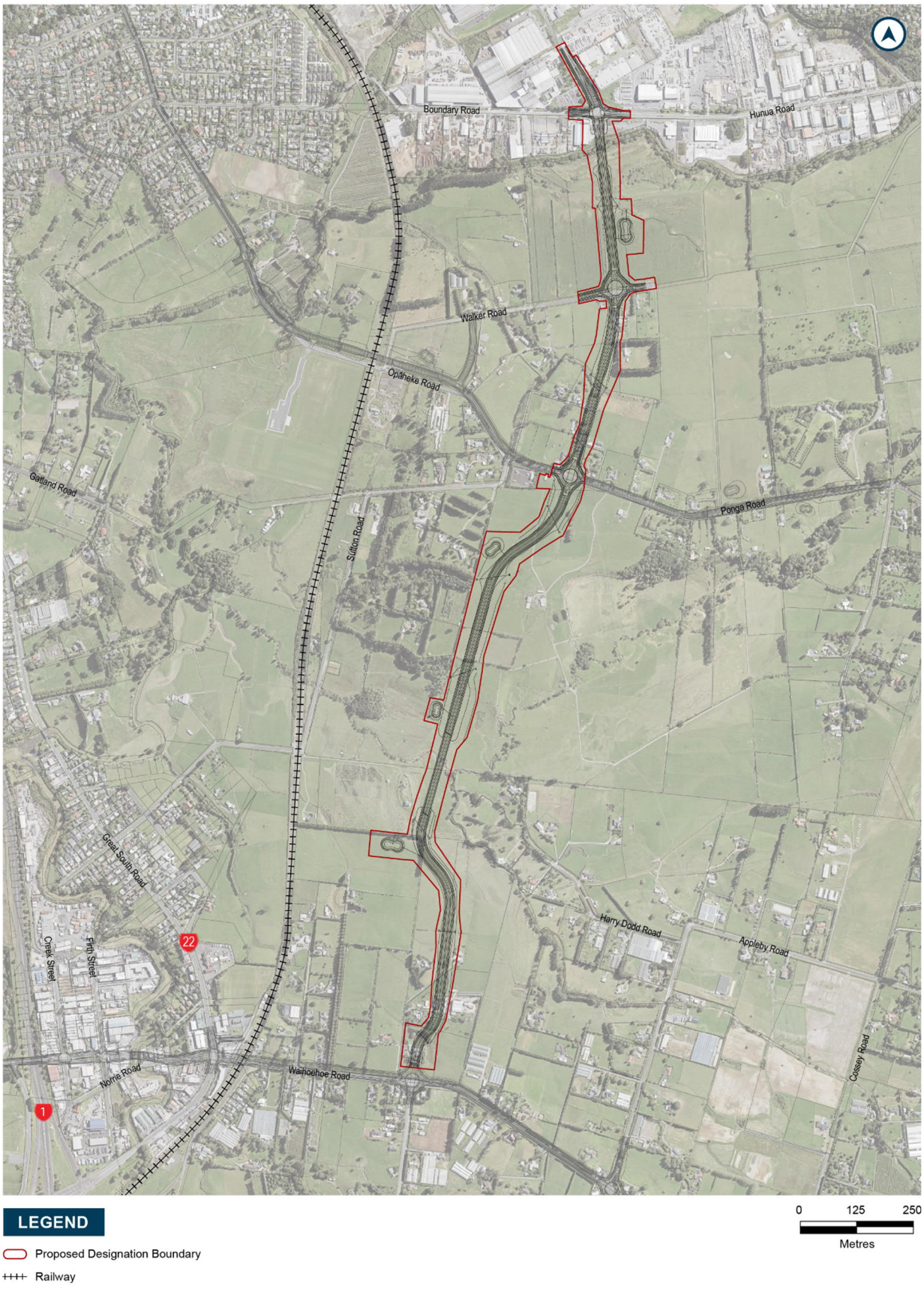


Figure 8-1 Overview of Ōpāheke N-S FTN Arterial

8.1.2 Project Features

The Ōpāheke N-S FTN Arterial crosses rural land. Vegetation types associated with this route include amenity plantings associated with homesteads and vegetation around a stream crossing. Vegetation removal and work within the rootzone of trees is required for this portion of the Project. There are no trees that are protected by District Plan provisions within this proposed designation.

8.2 Existing and Likely Future Environment

The existing environment contains 16 identified groups of trees, comprised of 12 tree groups (totalling approximately 289 trees) and four hedges/shelterbelts (totalling approximately 225 metres in length). The identified tree groups include amenity trees, farm forestry plantings and agricultural shelterbelts.

There are no trees that are protected by District Plan provisions identified in this section.

There is a group of notable trees at 205 Sutton Road that lies to the west of the NoR which is a remnant kahikatea forest. These trees have actively been avoided through the alternatives assessment process. Another remnant group of trees containing kahikatea is adjacent to a proposed stormwater wetland in the north-eastern part of this property.

The future environment for trees adjacent to NoR D4 is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment in the future.

8.3 Assessment of Arboricultural Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

8.3.1 Positive Effects

Construction of the new arterial road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few trees exist.

8.3.2 Assessment of Construction Effects

As there are no trees that are protected by District Plan provisions, no measures are required to avoid, remedy or mitigate construction effects of this NoR. However, and as set out in section 10 below, if there are any trees protected by Regional Plan provisions that are to be retained, this will be addressed as part of the future resource consent process and a Tree Management Plan addressing potential effects on these trees should be developed as part of that process.

8.3.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

Trees protected under Regional Plan provisions will be addressed as part of a future resource consent process. This should identify any protected trees, confirm the construction methods, and

impacts on each tree and detail methods for all work within the root zone of trees that are to be retained.

8.3.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects.

8.3.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

8.3.6 Summary and Conclusions

The construction of the Ōpāheke N-S FTN Arterial will have no effect on trees currently protected by District Plan provisions.

8.4 Conclusions

The new Ōpāheke North South FTN Arterial does not affect any trees that are protected by District Plan provisions.

9 NoR D5: Ponga and Ōpāheke Road Arterial Upgrade

Chapter Summary

The existing rural environment adjacent to the Ponga Road Upgrade and the majority of the Ōpāheke Road Rural Upgrade contains no trees that are protected by the District Plan. Trees outside the Open Space zoned land at Ōpāheke Sports Park are protected by the District Plan. The proposed designations for the Ōpāheke Road Urban Upgrade contain no protected trees.

Overall, the effects of the upgrade of Ponga Road and Ōpāheke Road on trees protected by the District Plan will be minor, as protected trees are to be replaced as part of a comprehensive planting plan or accommodated and protected in the final design as part of a tree management plan recommended as a condition of the designation.

Planting within new road-side berms in the proposed road layout will increase the number of trees in the public realm and offset the effects of removal of existing trees in the road reserve of Ponga Road and Ōpāheke Road, where necessary.

9.1 Project Description

As the Drury-Ōpāheke area is urbanised it is proposed to upgrade a 4.15km section of Ponga Road and Ōpāheke Road, from Great South Road in the north, to Jack Paterson Road and the future Mill Road corridor (which forms a separate NZUP project) in the southeast, to a two-lane arterial with separated walking and cycling facilities. The functional intent of the Project is a multimodal corridor that provides access to the proposed Mill Road corridor, FUZ in Papakura and employment areas to the north. The Project has been separated into three sections as shown in Figure 9-1:

- Ponga Road Upgrade: from Ōpāheke Road to Jack Paterson Road
- Ōpāheke Road Rural Upgrade: from the northern extent of the FUZ to Ponga Road
- Ōpāheke Road Urban Upgrade: north of the FUZ

While the overall plan for the urban area of Ōpāheke Road is to upgrade the walking and cycling facilities from Ōpāheke Road Rural Upgrade in the south to Great South Road, Papakura in the north, generally, the upgrade can fit within the existing road reserve, therefore only the areas affecting land outside the existing road reserve are proposed to be designated.

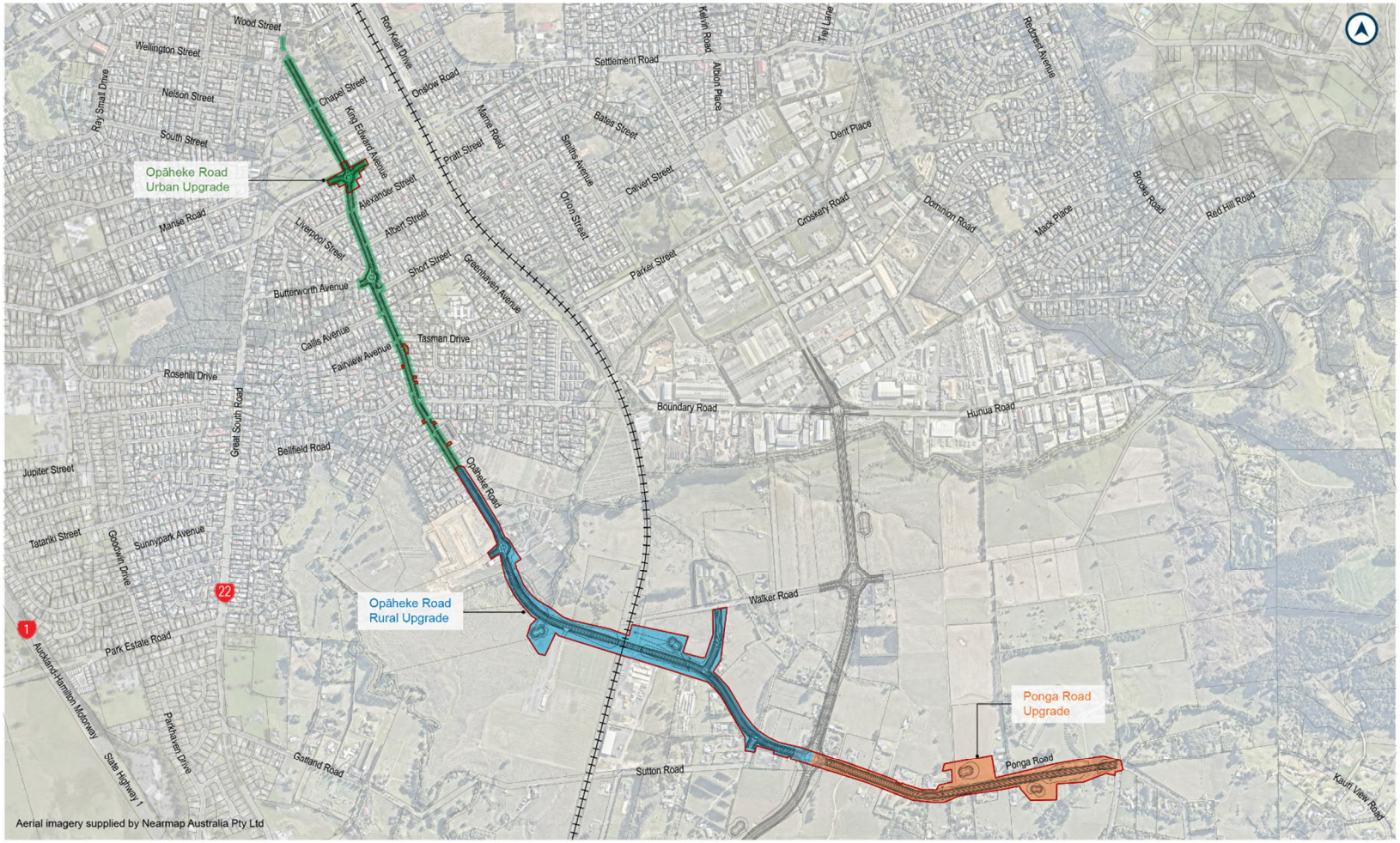
For the Ponga Road and the Ōpāheke Road Rural upgrade sections it is proposed to widen the existing roads to 24m two-lane urban arterials with separated walking and cycling facilities. As the Ōpāheke Road urban section is an existing and constrained urban environment, it is proposed to upgrade the existing road to a 20m two-lane urban arterial with separated walking and cycling facilities.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade common to each Project section include the following:

- A typically 24m or 20m wide road with two lanes and separated walking and cycling facilities
- Likely posted speed of 50kph

- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Batter slopes and retaining to enable widening of the corridor and/or wetland construction, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring

Further details of each Project section are provided below.



Works shown for the Ōpāheke Road Urban Upgrade outside of the proposed designation boundary are indicative and will be subject to a separate statutory approvals process (if required) in the future. Only those works within the designation boundary are assessed.

Figure 9-1 Overview of NoR D5

9.1.1 Ponga Road Upgrade Section

9.1.1.1 Section Overview

The Ponga Road Upgrade section is a 1km long upgrade extending from the proposed intersection with Ōpāheke North-South FTN Arterial in the west, to Jack Paterson Road in the east. In the future Ponga Road will tie into the proposed Mill Road corridor which forms a separate NZUP project. An overview of the concept design is provided in Figure 9-2.

Figure 9-2 Overview of Ponga Road Upgrade Section

In addition to those listed above, the key features of the Ponga Road Upgrade section include:

- Roundabout tying into the proposed Ōpāheke N-S FTN Arterial (NoR D4) and Ōpāheke Road Rural Upgrade section
- A bridge over Mangapū Stream
- Extension of existing pipe culverts
- Two stormwater wetlands.

9.1.1.2 Specific Features of this section

The Ponga Road Upgrade Section is adjoined by rural land and large residential lots/lifestyle blocks. Vegetation types associated with the current land use include hedgerows/shelterbelts and amenity plantings associated with homesteads. Groups of significant trees including English oak and mixed native tree plantings are present, particularly on the northern side of Ponga Road.

Proposed stormwater wetlands and outfalls potentially affect trees in two locations, where stormwater ponds and associated outfalls are within the areas occupied by trees. This may require removal or works within the root zone of trees, depending on the final design and construction methodology of the stormwater features.

Tree removal within the proposed designation will be required where road widening and associated batter slopes/retaining structures extend over these areas. Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and pruning of trees.

9.1.2 Ōpāheke Road Rural Upgrade section

9.1.2.1 Section Overview

It is proposed to widen, and realign a portion of, the existing road within the Ōpāheke Road Rural Upgrade section to a 24m urban arterial. The Ōpāheke Road Rural Upgrade section extends 1.6km from the extent of the FUZ in the north to Ponga Road in the south. An overview of the concept design is provided in Figure 9-3.

Figure 9-3 Overview of Ōpāheke Road Rural Upgrade Section

In addition to those listed above, the key features of the Ōpāheke Road Rural Upgrade section include:

- Roundabouts at Bellfield Estate and Ōpāheke N-S FTN Arterial / Ponga Road
- Realignment of a section of Ōpāheke Road and grade separation of the NIMT to avoid the Waikato 1 watermain and Ōpāheke Sports Fields and to allow the bridge to be constructed offline

- New road connection to Walker Road (and closure of a section of the existing Ōpāheke Road – replaced by the new NIMT bridge)
- Two walking and cycling bridges adjoining each side of the existing Ōtūwairoa Stream road bridge
- Two stormwater wetlands. One is an extension of an existing wetland located within Ōpāheke Reserve.

9.1.2.2 Specific Features of this section

The Ōpāheke Road Rural Section is adjoined by rural land and large residential lots/lifestyle blocks. Vegetation types associated with the current land use include hedgerows/shelterbelts and amenity plantings associated with homesteads.

The proposed stormwater wetland and outfall at the existing wetland at the Ōpāheke Sports Reserve affects trees in the road reserve of Ōpāheke Road. This may require removal or works within the root zone of trees, depending on the final design and construction methodology of the stormwater features and the road.

The proposed widening of Ōpāheke Road affects trees in the road reserve outside 2 Lorelei Place and 97 Ōpāheke Road. Construction of the new footpath and cycleway requires the removal of the existing grass berm where these trees are presently growing.

The proposed roundabout at the entrance to Bellfield Estate will require removal of two street trees on Ōpāheke Road.

Tree removal within the proposed designation will be required where road widening and associated batter slopes/retaining structures extend over these areas. Work in the vicinity of trees, including network utility installation or diversion, may also require work within the rootzone and pruning of trees.

9.1.3 Ōpāheke Road Urban Upgrade section

9.1.3.1 Section Overview

While the overall plan for the urban area of Ōpāheke Road is to upgrade the walking and cycling facilities from Ōpāheke Road Rural Upgrade in the south to Great South Road, Papakura in the north, only the areas affecting land outside the existing road reserve are proposed to be designated and assessed as part of this assessment. The Ōpāheke Road Urban Upgrade section of NoR D5 includes the regrading of nine driveways along Ōpāheke Road and the upgrade of the Ōpāheke Road / Settlement Road intersection to a roundabout. An overview of the proposed designation areas is provided in Figure 9-4.

The key features of the Ōpāheke Road Urban Upgrade section include:

- Upgrade of the Ōpāheke Road / Settlement Road intersection to a roundabout to provide for separated walking and cycling facilities, including crossing facilities
- Re-grade of nine driveways.

9.1.3.2 Specific Features of this section

There are no trees identified within the proposed designations for the Ōpāheke Road Urban Upgrade that are protected by District Plan provisions. The road reserve adjacent to the driveways that are to be regraded and the Settlement Road intersection contain no street trees.

Figure 9-4 Overview of Ōpāheke Road Urban Upgrade Section

9.2 Existing and Likely Future Environment

9.2.1.1 Ponga Road Upgrade section

The existing environment contains 32 identified trees or groups of trees, comprised of 23 tree groups (totalling approximately 192 trees), six identified single trees and three identified hedge/shelterbelts (totalling approximately 168 metres in length).

There are no trees that are protected by District Plan provisions identified in this section.

Trees within the road reserve include:

- Two English oak (*Quercus robur*) outside 154 Ponga Road.
- A mixed hedgerow of tree privet (*Ligustrum lucidum*), karo (*Pittosporum crassifolium*) and hawthorn (*Crataegus monogyna*) outside 126 Ponga Road.
- One English oak (*Quercus robur*) outside 31 Ponga Road.

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that contribute environmental benefits to the location. These values will

generally increase over the medium term (10-20 years) and long term (20+ years) timeframes that may apply to the NoR for road corridor designation.

The future environment for trees adjacent to Ponga Road is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment in the future.

9.2.1.2 Ōpāheke Road Rural Upgrade section

The existing environment contains 23 identified trees or groups of trees, comprised of 19 tree groups (totalling approximately 200 trees) and four identified single trees.

Trees that are protected by District Plan provisions in this section are limited to:

- Six swamp cypress (*Taxodium distichum*) and one Japanese cedar (*Cryptomeria japonica*) growing within the road reserve outside the Public Open Space zoned land at 165 Ōpāheke Road (Ōpāheke Sports Park).
- Four black poplar (*Populus nigra*) in the road reserve outside Open Space zoned land on the bank of Slippery Creek and adjacent to the Hays Stream Bridge.
- Four trees in a group outside 2 Lorelei Place and one ash (*Fraxinus excelsior* 'Raywoodii') street tree outside 97 Ōpāheke Road.
- Two titoki (*Alectryon excelsus*) street trees outside 122 Ōpāheke Road.

The trees within the proposed designation currently provide a range of cultural, amenity, landscape and ecological values that contribute environmental benefits to the location. These values will generally increase over the short term (0-10 years), medium term (10-20 years) and long term (20+ years) timeframes that may apply to the NoR for road corridor designation.

The future environment for trees within and adjacent to Ōpāheke Road is likely to be very different as the land use pattern change (urbanisation) is likely to result in removal of trees that are not protected by the current legislative framework when zoning changes from rural/FUZ to urban zones occur. Removal of trees can therefore be expected to occur as the land use changes from a rural environment to an urban environment in the future.

9.2.1.3 Ōpāheke Road Urban Upgrade section

Trees that are within or adjacent to the proposed designation areas around the driveways on Ōpāheke Road and roundabout at the intersection of Settlement Road are all growing on private property. There are no trees affected by the proposed works that are protected by the AUPOIP.

9.3 Assessment of Arboricultural Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

9.3.1 Ponga Road section

9.3.1.1 Positive Effects

Construction of the new road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few exist.

Widening to the south side of Ponga reduces impacts on the large existing tree resource on the northern side of Ponga Road. Where the trees on the north side or Ponga Road are able to be retained, this allows for retention of the significant benefits that the trees contribute to the environment.

9.3.1.2 Assessment of Construction Effects

As there are no trees that are protected by District Plan provisions, no measures are required to avoid, remedy or mitigate construction effects of this NoR. However, and as set out in section 10 below, if there are any trees protected by Regional Plan provisions that are to be retained, this will be addressed as part of a future resource consent process, and a Tree Management Plan addressing potential effects on these trees should be developed as part of that process.

9.3.1.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

Trees protected under Regional Plan provisions will be addressed as part of a future resource consent process. This should identify any protected trees, confirm the construction methods, and impacts on each tree and detail methods for all work within the root zone of trees that are to be retained.

9.3.1.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees is anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects. Street tree planting (to be decided through the ULDMP) will result in more trees in the public realm and an enhanced road environment in the long term.

9.3.1.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

9.3.1.6 Summary and Conclusions

The widening of Ponga Road will have no effect on trees currently protected by District Plan provisions.

9.3.2 Ōpāheke Road Rural Upgrade section

9.3.2.1 Positive Effects

Construction of the road with road-side berms provides an opportunity for street trees to be established within the new environment. The establishment of street trees within the road corridor will provide opportunities for trees to exist over large portions of the road corridor where currently few trees exist.

9.3.2.2 Assessment of Construction Effects

Protected trees in the Ōpāheke Road road reserve adjacent to Ōpāheke Sports Park, 2 Lorelei Place and 97 Ōpāheke Road, and in the open space zone may be affected by construction works associated with the proposed stormwater infrastructure and road formation, including fill batters, berm, footpath and kerb construction.

Two groups of trees adjacent to the Ōpāheke Sports Park include one Japanese cedar (*Cryptomeria japonica*) and six swamp cypress (*Taxodium distichum*) that are well-established specimen with good form and health. The trees provide stormwater reduction, soil stability and amenity function outside the public reserve at 165 Ōpāheke Road.

A group of poplar trees growing on the bank of the Otuwairoa Stream / Slippery Creek includes one large tree that has been assessed to be in a hazardous condition. This is due to a large seam of decay on the trunk and the lean of the trees towards the bridge. This group of trees will require removal prior to any works relating to the bridge construction.

A mixed group of trees growing in the road reserve of Ōpāheke Road, outside 2 Lorelei Place will require removal for the road widening and path construction. The group of public trees provides some amenity to the location, however none of the trees are individually significant specimens.

A single ash tree outside 97 Ōpāheke Road will also require removal for the road widening and path construction. This tree is one of many of this species in the road reserve of Ōpāheke Road, which provide amenity to the street.

Construction effects can cause decline, death and/or instability in trees that are not adequately protected during works within their root zones. The effects of construction on these protected trees are adverse and will require a Tree Management Plan to detail the construction methodology and measures to avoid or mitigate effects on these trees if they are to be retained. Substantial replanting of new trees within the road or adjacent reserve land will be required to mitigate the effects of tree removal, where these trees are required to be removed for the road widening and/or works associated with the stormwater wetland.

9.3.2.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

A Tree Management Plan 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 rootzone of trees that are to be retained. The Tree Management Plan should include:

- Confirmation that protected trees identified in Schedule A3 (refer 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;
- Detailing methods for all work within the rootzone of trees that are to be retained in line with appropriate arboricultural standards.

Replacement planting will be decided through planting details for the Project under the Urban and Landscape and Design Management Plan (ULDMP) proposed as a condition on the designation. The ULDMP 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.

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

9.3.2.4 Assessment of Operational Effects

Once the road has been constructed, no further effects on trees are anticipated. Ongoing maintenance of street trees and trees retained adjacent to the road corridor is a standard operational requirement that does not generate adverse environmental effects. Street tree planting (to be decided through the ULDMP) will result in more trees in the public realm and an enhanced road environment in the long term.

9.3.2.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

Nil.

9.3.2.6 Summary and Conclusions

Widening of Ōpāheke Road impacts on protected trees adjacent to Slippery Creek, Ōpāheke Sports Park and Ōpāheke Road. The trees outside Ōpāheke Sports Park should be avoided where practicable in the development of final design and construction methodologies.

9.3.3 Ōpāheke Road Urban Upgrade section

The proposed designations around the Settlement Road intersection and distinct driveways on Ōpāheke Road affect no protected trees.

9.4 Conclusions

9.4.1 Ponga Road Upgrade section

The widening of Ponga Road affects trees growing in the road reserve and on private property that are trees of significant importance to the locality. Provided that trees are retained and protected during the road widening construction works, the effects on trees can be minimised.

A large group of trees protected by Regional Plan provisions has been avoided by the design. As part of a future resource consent process, detailed design and completion of a Tree Management Plan prior to construction should set out the methodologies for protection and retention of these trees.

Avoidance of the removal of good quality trees may provide significant environmental benefit and assist to mitigate effects of the road widening project.

9.4.2 Ōpāheke Road Rural Upgrade section

The upgrade of Ōpāheke Road Rural section affects protected trees in the road reserve of Ōpāheke Road. Opportunities for these trees to be retained and protected should be investigated at detailed design stage. If the trees are required to be removed, suitable replacement planting should be undertaken upon completion of the road widening construction works.

Avoidance of the removal of good quality trees that are not protected may provide significant environmental benefit and assist to mitigate effects of the road widening project.

9.4.3 Ōpāheke Road Urban Upgrade section

There are no trees within the urban environment that are currently protected by the AUPOIP.

10 Regional Consent Considerations

The vast majority (approximately 70%) of the trees and groups of trees identified within the proposed designations are protected by Regional Plan rules only. Of the remaining trees or groups of trees, only approximately 8% of the total are protected by District Plan rules.

The assessment of effects for the purposes of the NoRs has considered only the status of trees protected by the District Plan provisions of the AUPOIP, as the Regional Plan considerations will be addressed via a regional consent application prior to construction of works within each project area.

The protection status of trees within the project area is somewhat fluid, as the protection of trees in private property and road reserves depends on the zoning of the land.

Currently, Regional Plan rules (Ref: E26.3.3.1 Activity table and applicable Standard E26.3.5.2 (1) Vegetation alteration or removal) protect trees that are 6m or greater in height or 600mm and greater in girth. As the rural and future urban land is anticipated to be developed the underlying zoning of the land will change from rural to urban. The protection status of trees will be lifted once the zoning changes, as there are currently no rules that generally protect trees in the urban environment.

Conversely, as the underlying zoning of the land changes from rural to urban, the protection status of those trees on adjacent road reserve land will change to protected, as trees on roads (excluding those adjacent to rural and future urban zones) are protected by Table E26.4.3.1 Activity table - Network utilities and electricity generation – Trees in roads and open space zones and the Notable Trees Overlay.

Trees that have been identified in this report as protected under Regional Plan provisions have informed the design of the proposed road layout and the designation boundaries. An example of this is the significant tree resource on the northern side of Ponga Road, where impacts have been reduced by the proposed widening to the south of the existing road. Further design iterations and the final design will continue to consider trees that are currently protected by the District Plan and those trees protected by the Regional Plan via future resource consents at the appropriate time of the programme for road widening. It is anticipated that any potential impacts on trees protected by the Regional Plan can be appropriately managed via a future consent process.

The trees protected according to Regional Plan provisions are impacted to varying degrees by the upgrade and construction of the FTN Arterials. Schedule C s in Appendix 3 of this report lists protected (RP) trees identified within the proposed designations and provides comments relating to how the proposed designation and road upgrade works are likely to impact on the listed trees/tree groups, based on the design drawings available at this stage of the process. The potential effects of works on trees/tree groups protected according to Regional Plan provisions shall addressed by avoidance or mitigation as part of the regional consent process.

11 Conclusion

The existing environment within the project areas is primarily rural and future urban (FUZ), with some areas zoned recently for residential development in Drury west and Ōpāheke Road and industrial land within Drury central. The rural land includes arable land with few trees but also many small holdings/lifestyle blocks that contain trees planted for amenity and shelter.

Trees within the existing environment are not generally protected by District Plan provisions, except where they are within a heritage site, open space land, or on road reserve adjacent to open space or non-rural zoned land. Trees are protected under Regional Plan provisions when they are 6m or greater in height or 600mm or greater in girth, and where certain overlays exist, such as riparian margins.

The future environment for trees within and adjacent to the roads within the proposed designations is likely to be very different in the future. The land use pattern change (towards urbanisation) is likely to result in removal of trees that are not protected by the current district plan regulatory framework when zoning changes from rural to urban.

For District Plan protected trees the future environment is unlikely to change, generally. The transition to urban land and the network infrastructure to support this is likely to require alteration and removal of existing trees within the road reserve. Because this will require approval of Auckland Council as the asset owner, controls are in place to avoid and/or mitigate the effects on trees in the road reserve.

Appendix 1. Schedule A: Protected Trees - District Plan

Table 2: Schedule A1 – District Plan Protected Trees for NoR D1: Alteration to NZ Transport Agency designation 6707 - State Highway 22 Urban Arterial Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	Council owned	general comments
196	Tree group	7	Eucalyptus sp., Acacia mearnsii	Fair	Mature	Soil / erosion protection, Exotic species	Decline in 10-20 years	Decline in 20+ years	Medium (10-20 years)	Open space, Riparian	Yes	Retain and protect.

Table 3: Schedule A2 - District Plan Protected Trees for NoR D2: Jesmond to Waihoehoe West FTN Arterial Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	Council owned	general comments
27	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Mature	Exotic species, Heritage, Screening	Constant	Constant	Medium (10-20 years)	Heritage	No	Work within rootzone of northern row, Remove southern row for fill batter.
39	Tree group	9	Platanus x hispanica 'Acerifolia'	Fair	Juvenile	Community, Amenity, Specimen, Part of Group	Increase in 0-10 years	Increase in 20+ years	Long (> 20 years)	Road	Yes	Remove for bridge approach
40	Tree group	8	Pinus radiata	Fair	Mature	Amenity, Carbon sink, Exotic species, Soil / erosion protection, Stormwater reduction	Decline in 10-20 years	Decline in 20+ years	Medium (10-20 years)	Open space	Yes	Remove for fill batter and access/compound
41	Tree group	5	Quercus palustris, Liquidambar styraciflua, Ligustrum lucidum, Fraxinus ornus	Good	Mature	Exotic species, Soil / erosion protection, Specimen, Stormwater reduction	Increase in 10-20 years	Increase in 20+ years	Medium (10-20 years)	Open space, Riparian	Yes	Design fill batter to avoid. Retain and protect.
42	Tree group	8	Quercus palustris, Liquidambar styraciflua, Populus yunnanensis	Fair	Early-mature	Amenity, Exotic species, Part of Group	Increase in 10-20 years	Increase in 0-10 years	Long (> 20 years)	Open space	Yes	Retain and protect. Remove trees for fill batter. Design tie-in with Victoria Road to avoid.
43	Tree group	4	Quercus robur	Good	Early-mature	Amenity, Exotic species, Highly Visible, Part of Group, Specimen	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	Road	NZTA	Motorway embankments both sides. Remove where required for abutment walls
44	Tree group	3	Melia azedarach, Podocarpus totara	Good	Mature	Amenity, Community, Exotic species	Increase in 10-20 years	Increase in 0-10 years	Medium (10-20 years)	Road	Yes	Verify design/levels in relation to trees. Retain and protect if possible
45	Tree group	2	Betula pendula	Fair	Mature	Community, Exotic species, Specimen	Constant	Increase in 0-10 years	Medium (10-20 years)	Road	Yes	Remove for road widening

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	Council owned	general comments
46	Tree group	3	Salix fragilis, Populus alba	Good	Mature	Soil / erosion protection, Part of Group, Exotic species	Increase in 10-20 years	Increase in 20+ years	Medium (10-20 years)	Open Space, Riparian	Yes	Remove for bridge over Slippery Creek
48	Tree group	3	Salix alba, Populus yunnanensis	Good	Mature	Exotic species, Specimen	Increase in 20+ years	Decline in 20+ years	Medium (10-20 years)	Road	Yes	Remove for access, stormwater works
49	Single Tree	1	Thuja occidentalis	Fair	Mature	Amenity, Exotic species	Increase in 20+ years	Constant	Long (> 20 years)	Road	Yes	Retain and protect
50	Single Tree	1	Picea sitchensis	Fair	Early-mature	Amenity, Community, Exotic species, Specimen	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	Heritage	No	Retain and protect
51	Single Tree	1	Cryptomeria japonica	Good	Mature	Amenity, Community, Heritage, Highly Visible, Exotic species, Specimen	Increase in 20+ years	Constant	Long (> 20 years)	Heritage	No	Retain and protect
52	Tree group	3	Quercus robur	Fair	Mature	Amenity, Community, Exotic species, Screening, Stormwater reduction	Increase in 20+ years	Constant	Medium (10-20 years)	Road	Yes	Retain and protect
150	Tree group	5	Washingtonia robusta	Good	Early-mature	Amenity, Community, Exotic species	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	Road	Yes	Remove for road, intersection widening.

Table 4: Schedule A3 - District Plan Protected Trees for NoR D5: Ponga Road and Ōpāheke Road Arterial Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	Council owned	general comments
128	Tree group	4	Taxodium distichum	Fair	Early-mature	Amenity, Part of Group, Soil / erosion protection, Stormwater reduction	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	Road	Yes	Remove for stormwater wetland
129	Tree group	3	Taxodium distichum, Cryptomeria japonica	Good	Early-mature	Amenity, Exotic species, Part of Group, Soil / erosion protection, Specimen, Stormwater reduction	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	Road	Yes	Remove for fill batter and path
130	Tree group	4	Populus nigra	Good	Mature	Carbon sink, Highly Visible, Part of Group, Soil / erosion protection, Specimen, Stormwater reduction	Increase in 0-10 years	Decline in 0-10 years	Short (<10 years)	Open Space (also Riparian)	Yes	Hazardous. Remove before bridge construction
226	Tree group	4	Betula pendula, Knightia excelsa, Michelia figo, Schinus terebinthifolius	Fair	Mature	Amenity, Community, Screening	Constant	Increase in 20+ years	Medium (10-20 years)	Road	Yes	Remove for road widening, paths

227	Single Tree	1	Fraxinus angustifolia subsp. oxycarpa 'Raywood'	Fair	Mature	Amenity, Community, Specimen	Decline in 20+ years	Constant	Medium (10-20 years)	Road	Yes	Remove for road widening, paths

Appendix 2. Schedule B: Trees on Roads adjacent to FUZ - no resource consent required

Table 5 – Schedule B1 - Trees in Roads for NoR D2: Jesmond to Waihoehoe West Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	general comments
2	Single Tree	1	Populus nigra 'Italica'	No visible symptoms	Mature	Amenity, Exotic species, Highly Visible, Specimen	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	Remove for road widening
3	Tree group	7	Betula pendula, Prunus sp.	Fair, Minor decline in crown	Mature	Exotic species, Amenity, Part of Group	Constant	Constant	Medium (10-20 years)	Remove for road widening
5	Single Tree	1	Prunus sp.	Fair	Early-mature	Exotic species, Wildlife Habitat	Constant	Increase in 10-20 years	Medium (10-20 years)	Remove for road widening
13	Tree group	2	Betula pendula	Fair	Mature	Amenity, Community, Exotic species, Specimen	Constant	Increase in 10-20 years	Medium (10-20 years)	Remove for road widening
14	Tree group	5	Betula pendula	Fair, Good	Mature	Amenity, Community, Exotic species, Part of Group, Specimen, Soil / erosion protection, Stormwater reduction	Constant	Increase in 0-10 years	Medium (10-30 years)	Remove for road widening
18	Tree group	3	Quercus ilex, Acer saccharinum, Ligustrum lucidum	Good	Mature	Amenity, Part of Group	Increase in 0-10 years	Increase in 10-20 years	Medium (10-20 years)	Remove for road widening
24	Single Tree	1	Prunus serrulata	Good	Early-mature	Exotic species	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	Remove for road widening
33	Tree group	9	Quercus palustris	Fair	Early-mature	Community, Amenity, Part of Group, Exotic species, Specimen	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	Remove for road widening
70	Hedge / shelter belt	undefined	Pittosporum tenuifolium, Griselinia littoralis, Ligustrum lucidum	Fair	Mature	Screening	Constant	Constant	Medium (10-20 years)	Remove for road widening
71	Hedge / shelter belt	undefined	Chamaecyparis lawsoniana	Pest infestation	Early-mature	Screening	Decline in 10-20 years	Decline in 0-10 years	Medium (10-20 years)	Remove for road widening
81	Single Tree	1	Cryptomeria japonica	Fair	Early-mature	Community, Amenity, Specimen	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	Remove for roundabout

Table 6 – Schedule B2 - Trees in Roads for NoR D3: Waihoehoe East Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	general comments
154	Single Tree	1	Tristaniopsis laurina	Good	Mature	Amenity, Stormwater reduction	Constant	Increase in 10-20 years	Medium (10-20 years)	Remove for road widening
160	Tree group	6	Melia azedarach, Leptospermum scoparium, Kunzea ericoides, Pittosporum tenuifolium, Pittosporum crassifolium, Pittosporum eugenioides	Good	Early-mature	Amenity, Screening	Increase in 10-20 years	Constant	Long (> 20 years)	Remove for road widening
176	Tree group	6	Liquidambar styraciflua, Cryptomeria japonica	Good	Early-mature	Amenity, Exotic species, Stormwater reduction	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	Remove for roundabout
197	Single Tree	1	Pittosporum eugenoides	Good	Mature	Community, Native species	Increase in 10-20 years	Constant	Long (> 20 years)	Remove for road widening

Table 7 – Schedule B3 - Trees on Roads for NoR D5: Ponga Road and Ōpāheke Road Upgrade

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	general comments
84	Single Tree	1	Quercus robur	Good	Mature	Exotic species, Amenity, Community, Part of Group, Stormwater reduction	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	Remove for road widening, fill batter
94	Single Tree	1	Quercus robur	Good	Juvenile	Community	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	Remove for road widening, fill batter
95	Single Tree	1	Quercus robur	Excellent	Early-mature	Community	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	Remove for road widening, fill batter
101	Tree group	20	Ligustrum lucidum, Rhopalostylis sapida	Good	Mature	Native species, Exotic species	Constant	Constant	Short (<10 years)	Remove for road widening, fill batter
109	Hedge / shelter belt	undefined	Pittosporum eugenioides, Ligustrum lucidum, Crataegus monogyna	Fair	Mature	Screening, Soil / erosion protection	Constant	Constant	Short (<10 years)	Remove for road widening, fill batter
110	Single Tree	1	Quercus robur	Fair	Mature	Amenity, Community, Exotic species, Stormwater reduction	Increase in 20+ years	Constant	Long (> 20 years)	Remove for intersection works
118	Single Tree	1	Alectryon excelsus	Fair	Early-mature	Amenity, Community, Native species	Increase in 10-20 years	Increase in 0-10 years	Medium (10-20 years)	Remove for road widening
119	Single Tree	1	Alectryon excelsus	Fair	Early-mature	Community, Amenity, Native species	Increase in 10-20 years	Increase in 0-10 years	Medium (10-20 years)	Remove for road widening

Appendix 3. Schedule C: Protected Trees - Regional Plan

Table 8: Schedule C1 – Regional Plan Protected Trees for Alteration to NZ Transport Agency designation 6707 - State Highway 22 (SH22) Urban Arterial Upgrade (NoR D1)

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
133	Tree group	25	Quercus palustris, Liquidambar styraciflua, Chamaecyparis lawsoniana	varies	Mature	Amenity, Carbon sink, Part of Group, Screening, Soil / erosion protection	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600	Retain and protect oaks during culvert works.
134	Tree group	undefined	Pinus radiata	Good	Early-mature	Exotic species, Carbon sink	Decline in 0-10 years	Constant	No defined limit	Riparian,>6 m/600	Remove entire group
135	Tree group	16	Washingtonia robusta, Griselinia littoralis, Phoenix canariensis, Cryptomeria japonica, Gleditsia triacanthos, Pittosporum tenuifolium, Acer palmatum	Good	Early-mature	Amenity, Screening	Constant	Constant	Long (> 20 years)	>6m/600	Remove as required for road widening
137	Hedge / shelterbelt	undefined	Pittosporum crassifolium	Good	Mature	Shelter, Native Species	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove for road widening
138	Tree group	3	Cryptomeria japonica	Fair	Early-mature	Amenity, Shelter	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove as required for road widening
140	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Mature	Shelter	Constant	Constant	No defined limit	>6m/600	Remove as required for Oira Road intersection
141	Hedge / shelter belt	undefined	Cupressus macrocarpa	Fair	Mature	Shelter	Decline in 0-10 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove for road widening
142	Tree group	undefined	Cupressus macrocarpa	Pest infestation, Fair	Mature	Exotic species, Shelter	Decrease in 0-10 years	Decrease in 0-10 years	Short (<10 years)	>6m/600	Remove as required for Oira Road intersection
144	Single Tree	1	Quercus robur	Fair	Mature	Amenity, Highly Visible, Specimen	Constant	Constant	Medium (10-20 years)	>6m/600	Remove for road widening, fill batter
147	Tree group	undefined	Liriodendron tulipifera, Fraxinus angustifolia subsp. oxycarpa 'Raywood'	Fair	Mature	Amenity	Constant	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove as required for fill batter
148	Tree group	undefined	Liquidambar styraciflua, Quercus sp.	Good	Early-mature	Amenity, Exotic species, Soil / erosion protection, Wildlife Habitat	Increase in 10-20 years	Increase in 0-10 years	Long (> 20 years)	Riparian,>6 m/600	Fill batter affects trees

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
149	Hedge / shelterbelt	undefined	Cupressus macrocarpa	Fair	Mature	Amenity, Shelter	Decline in 10-20 years	Decline in 20+ years	Medium (10-20 years)	>6m/600	Remove for stormwater wetland
187	Tree group	11	Grevillea robusta, Banksia integrifolia, Liquidambar styraciflua, Quercus robur, Picea sitchensis	Fair	Mature	Amenity, Screening, Specimen	Increase in 20+ years	Constant	No defined limit	>6m/600	Remove as required for road widening, cut batter
188	Hedge / shelter belt	undefined	Cupressus X Cupressocyparis leylandii	Poor, Pest infestation	Over-mature	Screening, Shelter	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove for road widening
189	Hedge / shelter belt	undefined	Populus nigra	Good	Mature	Amenity, Exotic species, Highly Visible, Screening, Shelter, Soil / erosion protection, Stormwater reduction	Constant	Decline in 20+ years	Medium (10-20 years)	Riparian,>6 m/600	Remove for road widening, stormwater
190	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Early-mature	Exotic species, Screening, Shelter, Soil / erosion protection	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	Riparian,>6 m/600	Remove as required for road widening, stormwater
191	Tree group	1	Liquidambar styraciflua, Cedrus atlantica 'Glauca', Pinus sp., Ulmus glabra 'Lutescens', Salix alba, Betula pendula, Cupressus macrocarpa, Chamaecyparis lawsoniana	Good	Mature	Amenity, Screening, Shelter	Increase in 20+ years	Constant	Long (> 20 years)	>6m/600	Remove as required for fill batter, road widening
192	Tree group	3	Taxodium distichum, Salix alba, Cupressus lusitanica	Good	Mature	Amenity, Soil / erosion protection, Specimen, Stormwater reduction	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	Riparian	Avoid where possible during design of stormwater, tie-in
193	Tree group	15	Fagus sylvatica, Podocarpus totara, Betula pendula, Prunus sp., Cupressus sempervirens, Cedrus atlantica	Fair	Mature	Amenity, Screening, Specimen	Constant	Constant	No defined limit	>6m/600	Remove as required for road widening
194	Hedge / shelter belt	undefined	Cupressus macrocarpa	Fair	Mature	Shelter	Decline in 10-20 years	Decline in 20+ years	Medium (10-20 years)	>6m/600	Remove for stormwater works and fill batter
195	Tree group	4	Quercus palustris, Quercus robur	Good	Early-mature	Amenity, Specimen	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for road widening

Table 9: Schedule C2 - Regional Plan Protected Trees for Jesmond to Waihoehoe West FTN Arterial Upgrade (NoR D2)

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
1	Single Tree	1	Cunninghamia lanceolata	Dying	Over-mature	Exotic species	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Outside designation
7	Hedge / shelter belt	undefined	Euonymus japonicus, Ligustrum lucidum, Pittosporum crassifolium	Good	Mature	Exotic species, Screening	Constant	Constant	Short (<10 years)	>6m/600	Remove for road widening
8	Single Tree	1	Melia azedarach	Fair	Mature	Amenity, Exotic species	Increase in 20+ years	Increase in 20+ years	Medium (10-20 years)	>6m/600	Outside designation. Retain and protect.
9	Tree group	12	Quercus palustris, Quercus robur, Quercus sp.	Good	Mature	Amenity, Carbon sink, Exotic species, Part of Group, Screening, Stormwater reduction	Increase in 20+ years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Retain and protect where possible.
10	Tree group	10	Quercus robur, Ginkgo biloba	Good	Mature	Amenity, Carbon sink, Exotic species, Part of Group, Screening, Stormwater reduction	Increase in 20+ years	Increase in 0-10 years	Long (>20 years)	>6m/600	Retain and protect where possible.
11	Tree group	18	Sequoia sempervirens, Metasequoia glyptostroboides, Quercus palustris, Populus nigra	Good	Early-mature	Amenity, Carbon sink, Exotic species, Part of Group, Screening, Stormwater reduction	Increase in 20+ years	Increase in 0-10 years	Long (>20 years)	>6m/600	Retain and protect where possible. Redesign batter
12	Tree group	24	Salix alba, Populus nigra, Quercus coccinea, Fraxinus angustifolia subsp. oxycarpa 'Raywood', Acer platanoides, Alnus glutinosa	Good	Mature	Amenity, Carbon sink, Exotic species, Part of Group, Screening, Stormwater reduction	Increase in 20+ years	Increase in 0-10 years	Long (>20 years)	>6m/600	Retain and protect where possible. Redesign batter
15	Tree group	10	Quercus robur, Alnus cordata, Platanus x hispanica 'Acerifolia', Platanus orientalis	Good	Mature	Amenity, Exotic species, Part of Group, Specimen	Increase in 20+ years	Increase in 10-20 years	Long (>20 years)	>6m/600	Remove for path/berm and batter. Retain and protect where possible.
16	Single Tree	1	Pinus sp.	Excellent	Mature	Amenity, Food source, Specimen	Increase in 20+ years	Increase in 20+ years	Long (>20 years)	>6m/600	Remove for cut batter
17	Tree group	2	Quercus robur	Good	Mature	Amenity, Exotic species, Specimen	Increase in 20+ years	Increase in 10-20 years	Long (>20 years)	>6m/600	Works within rootzone for path/berm. Retain and protect

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
19	Tree group	20	Melia azedarach, Cupressus sempervirens, Cupressus lusitanica, Cupressus arizonica var. glabra, Chamaecyparis lawsoniana, Juniperus chinensis 'Kaizuka', Liriodendron tulipifera, Platanus x hispanica 'Acerifolia', Sequoia sempervirens, Griselinia littoralis, Acacia baileyana, Podocarpus totara, Alectryon excelsus, Corynocarpus laevigatus, Pittosporum tenuifolium, Agathis australis, Dacrycarpus dacrydioides	Good	Mature	Amenity, Carbon sink, Exotic species, Native species, Part of Group, Stormwater reduction, Wildlife Habitat	Constant	Increase in 10-20 years	Long (>20 years)	>6m/600	Works within rootzone for path/berm. Retain and protect where possible
20	Tree group	3	Corynocarpus laevigatus, Podocarpus totara	Poor	Mature	Native species	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove for fill batter
21	Tree group	3	Cedrus deodara, Cedrus atlantica, Ligustrum lucidum	Fair	Early-mature	Amenity, Exotic species	Increase in 30+ years	Constant	Long (>20 years)	>6m/600	Remove for stormwater wetland
23	Tree group	5	Pittosporum tenuifolium, Pittosporum eugenioides, Griselinia littoralis, Salix fragilis, Podocarpus totara	Fair	Early mature	Amenity, Exotic species, Native species	Constant	Constant	Medium (10-20 years)	>6m/600	Remove for fill batter
26	Tree group	7	Magnolia grandiflora, Magnolia campbellii, Quercus palustris, Gleditsia triacanthos, Griselinia littoralis, Prunus sp., Camellia japonica	Good	Mature	Amenity, Exotic species, Screening	Constant	Increase in 20+ years	No defined limit	>6m/600	Removal and works within rootzone for fill batter.
28	Tree group	18	Sequoia sempervirens	Good	Early-mature	Amenity, Carbon sink, Exotic species	Increase in 10-20 years	Increase in 20+ years	Long (>20 years)	>6m/600	Two groups. Retain and protect where possible
29	Tree group	2	Quercus coccinea	Good	Mature	Amenity, Exotic species, Specimen	Constant	Constant	Long (>20 years)	>6m/600	Retain and protect where possible
30	Tree group	20	Sequoia sempervirens, Griselinia littoralis, Betula pendula, Betula papyrifera, Salix fragilis, Quercus coccinea	Good	Mature	Amenity, Exotic species, Part of Group, Screening	Increase in 20+ years	Increase in 20+ years	No defined limit	Riparian,>6m/600	Two groups of Sequoia. Retain and protect where possible. Remove as required for stormwater works

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
31	Tree group	18	Alectryon excelsus, Fraxinus angustifolia subsp. oxycarpa 'Raywood', Liriodendron tulipifera, Liquidambar styraciflua, Platanus x hispanica 'Acerifolia', Quercus rubra	Good	Early-mature	Amenity, Exotic species, Part of Group, Screening, Specimen	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600	Remove for cut batter, paths
32	Tree group	30	Podocarpus totara, Cordyline australis, Quercus palustris, Knightia excelsa, Pseudopanax arboreus, Banksia integrifolia, Melicope ternata, Alectryon excelsus, Fraxinus angustifolia subsp. oxycarpa 'Raywood'	Good	Mature	Amenity, Native species, Part of Group, Screening	Increase in 20+ years	Increase in 20+ years	No defined limit	>6m/600	Remove for intersection approach.
34	Hedge / shelter belt	undefined	Pittosporum eugenioides	Good	Early mature	Screening, Native species	Constant	Constant	Medium (10-20 years)	>6m/600	Remove for road widening
35	Hedge / shelter belt	undefined	Populus nigra 'Italica'	Fair	Mature	Amenity, Exotic species, Part of Group	Constant	Decline in 20+ years	Long (>20 years)	>6m/600	Remove or design stormwater wetland to avoid
36	Tree group	4	Liquidambar styraciflua	Good	Early-mature	Amenity, Exotic species, Specimen	Increase in 10-20 years	Increase in 20+ years		>6m/600	Remove western trees
38	Tree group	5	Syzygium smithii, Podocarpus elatus, Schinus terebinthifolius, Liquidambar styraciflua, Syagrus romanzoffiana	Fair	Mature	Amenity, Part of Group, Exotic species	Increase in 20+ years	Increase in 20+ years	No defined limit	>6m/600mm	Remove as required
47	Tree group	3	Salix alba	Major decline in crown, Fair	Mature	Soil / erosion protection, Exotic species	Decline in 0-10 years	Decline in 10-20 years	Short (<10 years)	Riparian	Retain and protect or remove and replant with natives
55	Tree group	17	Fagus sylvatica var. purpurea, Betula pendula, Phoenix canariensis, Ligustrum lucidum, Magnolia campbellii, Myrsine australis, Callistemon viminalis, Camellia sasanqua, Euonymus japonicus, Coprosma repens	Fair	Mature	Exotic species, Screening, Part of Group, Amenity	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Remove for fill batter, road widening
56	Single Tree	1	Liquidambar styraciflua	Good	Mature	Amenity, Part of Group, Exotic species, Specimen	Increase in 20+ years	Decline in 20+ years	Short (<10 years)	>6m/600mm	Remove for fill batter, road widening
57	Single Tree	1	Quercus robur	Good, Minor decline in crown	Mature	Amenity, Exotic species, Part of Group, Screening, Specimen	Constant	Increase in 20+ years	Long (> 20 years)	>6m/600mm	Remove for fill batter, road widening

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
59	Tree group	3	Picea sitchensis, Cedrus deodara	Fair	Early-mature	Amenity, Specimen, Exotic species	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600mm	Remove for road widening
61	Tree group	2	Betula pendula	Fair	Mature	Exotic species, Amenity, Specimen	Constant	Constant	Medium (10-20 years)	>6m/600mm	Remove for road widening
62	Tree group	10	Magnolia grandiflora, Quercus palustris	Good	Mature	Amenity, Exotic species, Part of Group, Screening, Specimen	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600mm	Remove southernmost. Retain and protect remaining
63	Tree group	8	Podocarpus totara, Fraxinus angustifolia subsp. oxycarpa 'Raywood', Camellia sasanqua, Fagus sylvatica, Cedrus deodara, Laurus nobilis, Corynocarpus laevigatus	Fair	Mature	Screening, Amenity, Part of Group, Specimen	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Retain and protect
64	Single Tree	1	Magnolia grandiflora	Excellent	Mature	Specimen, Exotic species, Amenity	Constant	Increase in 20+ years	Long (> 20 years)	>6m/600mm	Outside designation
65	Hedge / shelter belt	undefined	Pittosporum eugenioides, Coprosma robusta, Myrsine australis, Ligustrum lucidum, Cedrus deodara, Camellia japonica, Podocarpus totara, Viburnum sp. Prunus sp.	Fair	Mature	Screening, Part of Group	Constant	Constant	No defined limit	>6m/600mm	Remove or retain
66	Tree group	9	Magnolia campbellii, Cupressus arizonica var. glabra, Ulmus glabra 'Lutescens', Gleditsia triacanthos, Ligustrum lucidum	Good	Mature	Screening, Exotic species, Amenity	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Works within rootzone for fill batter
67	Hedge / shelter belt	undefined	Casuarina cunninghamiana	Fair	Mature	Screening, Shelter	Constant	Constant	Medium (10-20 years)	>6m/600mm	Works within rootzone for road widening
68	Tree group	11	Yucca elephantipes, Washingtonia robusta, Syagrus romanzoffiana, Acacia baileyana, Trachycarpus fortunei	Good	Mature	Amenity	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Works within rootzone for road widening
69	Tree group	5	Araucaria heterophylla, Ligustrum lucidum, Magnolia campbellii, Camellia japonica	Fair	Mature	Amenity	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Works within rootzone for road widening
72	Tree group	6	Aesculus hippocastanum, Albizia julibrissin, Quercus rubra, Paulownia tomentosa, Ulmus glabra 'Lutescens', Acer palmatum	Fair	Mature	Exotic species, Amenity, Part of Group, Specimen	Increase in 20+ years	Constant	No defined limit	>6m/600mm	Works within rootzone for road widening

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
73	Tree group	7	Schinus terebinthifolius, Pittosporum tenuifolium, Cedrela sinensis, Agonis flexuosa	Fair	Mature	Screening	Constant	Constant	Medium (10-20 years)	>6m/600mm	Remove for intersection widening
76	Hedge / shelter belt	undefined	Feijoa sellowiana	Good	Mature	Screening, Food source	Constant	Constant	Long (> 20 years)	>6m/600mm	Remove for intersection widening
77	Tree group	5	Eucalyptus leucoxylon, Schinus molle, Pittosporum tenuifolium, Chamaecyparis lawsoniana	Fair	Mature	Amenity, Screening, Specimen	Increase in 20+ years	Increase in 20+ years	No defined limit	>6m/600mm	Remove for intersection widening
78	Tree group	4	Quercus palustris, Pittosporum tenuifolium, Schinus terebinthifolius, Prunus serrulata	Good	Early-mature	Specimen, Screening, Amenity	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600mm	Retain and protect
79	Hedge / shelter belt	undefined	Chamaecyparis lawsoniana	Dying, Pest infestation	Over-mature	Screening, Shelter	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600mm	Retain and protect
80	Hedge / shelter belt	undefined	Pittosporum eugenioides, Cryptomeria japonica	Fair	Mature	Screening	Increase in 20+ years	Constant	Medium (10-20 years)	>6m/600mm	Remove for road widening
146	Tree group	9	Syzygium smithii, Albizia julibrissin ,Gleditsia triacanthos, Populus nigra, Magnolia grandiflora, Chamaecyparis lawsoniana	Fair	Mature	Amenity	Constant	Constant	Medium (10-20 years)	>6m/600	Remove for bridge approach
215	Hedge / shelter belt	undefined	Populus nigra	Good	Early-mature	Amenity, Shelter	Increase in 10-20 years	Constant	Long (> 20 years)	>6m/600mm	Remove for new road

Table 10: Schedule C3 - Regional Plan Protected Trees for Waihoehoe Road East Arterial Upgrade (NoR D3)

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
151	Tree group	14	Liquidambar styraciflua, Pittosporum tenuifolium, Grevillea robusta, Pittosporum eugenioides, Pittosporum crassifolium, Betula pendula	Good	Mature	Amenity, Screening	Increase in 20+ years	Increase in 10-20 years	No defined limit	>6m/600	Remove for road widening, fill batter
153	Tree group	14	Podocarpus totara, Knightia excelsa, Magnolia grandiflora	Good	Early-mature	Amenity, Exotic species, Native species	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove for road widening
155	Tree group	12	Araucaria heterophylla, Quercus palustris, Corymbia ficifolia, Liquidambar styraciflua, Pittosporum crassifolium, Chamaecyparis lawsoniana, Photinia fraseri, Albizia julibrissin, Cinnamomum camphora	Fair	Mature	Amenity, Screening	Constant	Constant	No defined limit	>6m/600	Remove for road widening
156	Single Tree	1	Cupressus macrocarpa	Major decline in crown, Pest infestation	Over-mature	Exotic species	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove for road widening, fill batter
157	Tree group	9	Cupressus macrocarpa, Cupressus lusitanica	Poor	Mature	Carbon sink, Exotic species	Decline in 0-10 years	Decline in 0-10 years	Medium (10-20 years)	>6m/600	Remove for road widening, fill batter
159	Tree group	8	Agathis australis, Cupressus sempervirens, Melia azedarach, Pittosporum crassifolium, Camellia japonica	Fair	Early-mature	Amenity, Screening	Constant	Increase in 20+ years	No defined limit	>6m/600	Remove for road widening, fill batter
161	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Early-mature	Screening, Shelter	Constant	Constant	Long (> 20 years)	>6m/600	Remove for road widening, fill batter
162	Tree group	12	Fraxinus angustifolia subsp. oxycarpa 'Raywood'	Fair	Mature	Amenity	Increase in 10-20 years	Constant	Long (> 20 years)	>6m/600	Remove for road widening, cut batter
163	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Early-mature	Screening, Shelter	Constant	Constant	Long (> 20 years)	>6m/600	Remove for Appleby Road intersection
164	Hedge / shelter belt	undefined	Populus nigra	Good	Mature	Amenity, Shelter	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Outside designation

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
165	Tree group	18	Betula pendula, Acer negundo, Pittosporum tenuifolium, Prunus serrulata, Albizia julibrissin, Magnolia grandiflora	Fair	Early-mature	Amenity, Screening	Increase in 20+ years	Constant	No defined limit	>6m/600	Outside designation
166	Tree group	3	Albizia julibrissin, Prunus serrulata, Coprosma repens	Fair	Mature	Amenity	Increase in 20+ years	Constant	No defined limit	>6m/600	Remove for Appleby Road intersection
168	Hedge / shelter belt	undefined	Pittosporum eugenioides	Good	Early-mature	Amenity, Screening, Shelter, Native species	Constant	Constant	Medium (10-20 years)	>6m/600	Retain and protect
169	Single Tree	1	Acer negundo	Good	Early-mature	Amenity	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove for Appleby Road intersection
170	Tree group	18	Prunus sp., Quercus palustris, Liquidambar styraciflua, Quercus cerris	Good	Early mature	Amenity, Screening, Exotic species	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Retain and protect where possible
172	Tree group	7	Pittosporum eugenioides, Quercus palustris	Good	Early-mature	Amenity, Screening	Increase in 0-10 years	Increase in 10-20 years	No defined limit	>6m/600	Remove as required for road widening, fill batter
174	Tree group	18	Prunus sp.	Good	Early-mature	Amenity, Screening, Exotic species	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove as required for road widening, cut batter
175	Hedge / shelter belt	undefined	Cupressus X Cupressocyparis leylandii	Fair	Mature	Shelter	Decline in 10-20 years	Decline in 10-20 years	Short (<10 years)	>6m/600	Remove as required for road widening
177	Tree group	30	Liquidambar styraciflua, Sophora tetraptera, Prunus sp., Aesculus hippocastanum, Jacaranda mimosifolia, Cinnamomum camphora, Vitex lucens, Liriodendron tulipifera	Good	Early-mature	Amenity, Specimen	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600	Remove for Appleby Road intersection
178	Tree group	3	Podocarpus totara, Liquidambar styraciflua, Sophora tetraptera	Dying, Pest infestation	Over-mature	Amenity, Shelter	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove for Appleby Road intersection
180	Hedge / shelter belt	undefined	Sequoia sempervirens	Fair	Early-mature	Screening, Exotic species, Shelter	Constant	Constant	Long (> 20 years)	>6m/600	Remove for Appleby Road tie-in
181	Hedge / shelter belt	undefined	Pittosporum tenuifolium	Fair	Mature	Screening	Decline in 20+ years	Constant	Medium (10-20 years)	>6m/600	Outside designation

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
184	Single Tree	1	Podocarpus totara	Good	Early-mature	Native species, Amenity	Increase in 10-20 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Remove for Appleby Road widening
185	Tree group	4	Meryta sinclairii, Liquidambar styraciflua	Good, Fair	Early-mature	Amenity	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600	Remove for Appleby Road widening
186	Tree group	7	Betula pendula	Fair	Early-mature	Amenity	Increase in 10-20 years	Increase in 20+ years	Medium (10-20 years)	>6m/600	Remove as required for road widening, cut batter
198	Single Tree	1	Metrosideros excelsa	Excellent	Early-mature	Native species	Increase in 0-10 years	Increase in 10-20 years	Long (>20 years)	>6m/600	Remove for road widening, fill batter
199	Hedge / shelter belt	undefined	Salix alba	Good	Mature	Exotic species	Decline in 20+ years	Constant	Medium (10-20 years)	>6m/600	Remove for road widening
200	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Mature	Screening	Constant	Constant	Medium (10-20 years)	>6m/600	Remove for road widening
201	Tree group	18	Pinus radiata	Good	Early-mature	Carbon sink	Decline in 20+ years	Increase in 20+ years	Medium (10-20 years)	>6m/600	Remove as required for road widening
202	Single tree	1	Pinus pinea	Good	Early-mature	Amenity	Constant	Increase in 10-20 years	Long (>20 years)	>6m/600	Retain and protect
203	Hedge / shelter belt	undefined	Cupressus macrocarpa	Dying, Pest infestation	Over-mature	Shelter	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove for road widening
204	Tree group	6	Casuarina cunninghamiana, Corynocarpus laevigatus, Podocarpus totara, Pittosporum crassifolium, Salix alba, Cupressus macrocarpa	Fair	Mature	Amenity	Constant	Constant	No defined limit	>6m/600	Remove for road widening

Table 11: Schedule C4 - Regional Plan Protected Trees for Ōpāheke North South Arterial (NoR D4)

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
208	Tree group	7	Quercus robur, Cupressus macrocarpa	Fair	Mature	Exotic species	Decline in 10-20 years	Constant	Medium (10-20 years)	>6m/600mm	Remove where required for fill batter
209	Tree group	8	Liquidambar styraciflua, Quercus robur, Quercus palustris, Ulmus glabra 'Lutescens', Populus nigra, Lophostemon confertus, Prunus sp.	Fair	Early-mature	Exotic species	Constant	Increase in 10-20 years	Long (> 20 years)	>6m/600mm	Remove for new road
210	Hedge / shelter belt	undefined	Cryptomeria japonica	Fair	Early-mature	Shelter	Constant	Increase in 10-20 years	Medium (10-20 years)	>6m/600mm	Remove for cut batter, new road
211	Tree group	8	Pinus radiata, Quercus robur, Magnolia grandiflora, Agonis flexuosa, Casuarina cunninghamiana, Cedrus atlantica, Fraxinus angustifolia subsp. oxycarpa 'Raywood', Cupressus macrocarpa	Fair	Mature	Amenity	Constant	Constant	Medium (10-20 years)	>6m/600mm	Remove for new road
212	Hedge / shelter belt	undefined	Casuarina cunninghamiana, Cupressus Cupressocyparis leylandii, Pinus radiata	Good	Mature	Shelter	Constant	Constant	Medium (10-20 years)	>6m/600mm	Remove for fill batter
213	Tree group	23	Platanus x hispanica 'Acerifolia', Liquidambar styraciflua, Quercus palustris, Prunus serrulata, Magnolia grandiflora, Salix humboldtiana, Pittosporum eugenioides, Pittosporum crassifolium, Betula pendula, Pyrus communis	Good	Early-mature	Amenity	Increase in 0-10 years	Increase in 0-10 years	No defined limit	>6m/600mm	Remove for new roundabout
214	Hedge / shelter belt	undefined	Cupressus macrocarpa, Melaleuca lanceolata, Chamaecyparis lawsoniana, Eucalyptus sp.	Fair	Mature	Screening	Constant	Constant	Medium (10-20 years)	>6m/600mm	Remove for new roundabout
216	Tree group	10	Salix alba	Fair	Mature	Stormwater reduction, Soil / erosion protection, Exotic species	Decline in 10-20 years	Constant	Long (> 20 years)	Riparian	Remove for new road
218	Tree group	65	Pinus radiata, Populus nigra, Salix alba	Fair	Early-mature	Screening, Carbon sink, Shelter	Decline in 20+ years	Constant	No defined limit	>6m/600mm	Group avoided by change in designation alignment
219	Tree group	18	Salix alba, Alnus jorullensis, Fraxinus angustifolia subsp. oxycarpa 'Raywood', Grevillea robusta, Magnolia grandiflora, Agonis flexuosa, Platanus x hispanica 'Acerifolia', Salix humboldtiana, Eucalyptus nichollii	Good	Mature	Soil / erosion protection, Amenity	Constant	Increase in 10-20 years	Medium (10-20 years)	Riparian	Remove for new road

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
221	Tree group	6	Platanus x hispanica 'Acerifolia', Liquidambar styraciflua, Magnolia grandiflora, Gleditsia triacanthos, Salix alba	Good	Mature	Amenity	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	>6m/600mm	Group avoided by change in designation alignment
222	Hedge / shelter belt	undefined	Taxodium distichum	Fair	Mature	Shelter	Increase in 20+ years	Constant	Long (> 20 years)	>6m/600mm	Remove southern arm for new road. Retain and protect western arm where possible
223	Tree group	3	Dacrycarpus dacrydioides, Cordyline australis, Salix alba	Poor	Mature	Native species, Soil / erosion protection	Decline in 0-10 years	Constant	Medium (10-20 years)	Riparian	Remove for bridge
224	Tree group	10	Dacrycarpus dacrydioides	Good	Mature	Native species, Wildlife habitat, Stormwater reduction	Constant	Increase in 10-20 years	Long (> 20 years)	>6m/600mm	Retain and protect
225	Tree group	111	Crataegus monogyna, Pittosporum crassifolium	Fair	Mature	Shelter	Constant	Constant	No defined limit	Riparian	Remove as required
226	Tree group	25	Various – not surveyed	-	-	Amenity	Constant	Constant	No defind limit	>6m/600mm	Remove for new road

Table 12: Schedule C5 - Regional Plan Protected Trees for Ponga Road and Ōpāheke Road Arterial Upgrade (NoR D5)

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
82	Tree group	8	Quercus robur	Good	Mature	Amenity, Carbon sink, Community, Exotic species, Shelter, Soil / erosion protection	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	Riparian,>6m/600	Retain and protect where possible. Remove as required for fill batter
85	Tree group	5	Quercus robur, Corynocarpus laevigatus	Good	Mature	Amenity, Community, Screening, Soil / erosion protection, Specimen	Constant	Increase in 10-20 years	Long (> 20 years)	>6m/600	Retain and protect. Design fill batter to avoid
86	Tree group	12	Salix alba, Populus nigra, Cyathea dealbata	Fair	Mature	Soil / erosion protection, Stormwater reduction	Constant	Constant	No defined limit	Riparian	Remove for bridge construction
87	Single Tree	1	Quercus robur	Excellent	Mature	Amenity, Community, Exotic species, Soil / erosion protection, Specimen, Wildlife Habitat	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	Riparian,>6m/600	Redesign fill batter to avoid tree
88	Hedge / shelter belt	undefined	Populus nigra, Quercus robur	Good	Mature	Exotic species, Part of Group, Screening, Soil / erosion protection, Stormwater reduction	Increase in 10-20 years	Increase in 0-10 years	Long (> 20 years)	Riparian,>6m/600	Outside designation
89	Tree group	11	Quercus robur	Fair	Mature	Amenity, Community, Exotic species, Part of Group, Wildlife Habitat	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for fill batter, stormwater culvert
90	Tree group	6	Acacia melanoxylon, Podocarpus totara, Ligustrum lucidum	Fair	Mature	Soil / erosion protection, Stormwater reduction	Increase in 10-20 years	Increase in 0-10 years	No defined limit	Riparian,>6m/600	Design fill batter and culvert to avoid good trees where possible.
91	Tree group	14	Quercus robur with understory of privet, nikau, karaka, karamu	Fair	Mature	Amenity, Carbon sink, Community, Exotic species, Screening, Shelter, Soil / erosion protection, Specimen, Stormwater reduction, Wildlife Habitat	Constant	Increase in 20+ years	Long (> 20 years)	>6m/600	Retain and protect. Design fill batter to avoid trees

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
92	Tree group	12	Corynocarpus laevigatus, Vitex lucens, Dacrydium cupressinum, Brachychiton acerifolius, Metrosideros excelsa, Ginkgo biloba, Acacia melanoxylon, Podocarpus totara	Good	Mature	Amenity, Carbon sink, Community, Native species, Part of Group, Screening, Soil / erosion protection, Specimen, Wildlife Habitat, Stormwater reduction	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Retain and protect. Design fill batter and culvert to avoid trees
93	Tree group	23	Quercus robur	Fair	Mature	Amenity, Carbon sink, Community, Exotic species, Part of Group, Soil / erosion protection, Specimen, Stormwater reduction, Wildlife Habitat	Constant	Constant	Long (> 20 years)	>6m/600	Redesign stormwater wetland 1 and access to avoid trees
96	Tree group	8	Olea europaea	Excellent	Early-mature	Amenity, Food source	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for road widening
97	Tree group	3	Camellia sasanqua, Fraxinus pennsylvanica, Acer palmatum	Fair	Mature	Amenity	Increase in 10-20 years	Constant	Medium (10-20 years)	>6m/600	Outside designation
99	Tree group	3	Cupressus macrocarpa, Vitex lucens, Cryptomeria japonica	Poor	Over-mature	Amenity	Decline in 0-10 years	Decline in 0-10 years	Short (<10 years)	>6m/600	Remove as required for road widening
100	Tree group	4	Quercus robur	Poor	Over-mature	Amenity, Community, Exotic species, Part of Group, Stormwater reduction, Wildlife Habitat,	Decline in 0-10 years	Constant	Medium (10-20 years)	Riparian,>6m/600	Remove for fill batter, culvert and stormwater works. Avoid trees if possible
102	Tree group	5	Quercus robur, Chamaecyparis lawsoniana	Good	Mature	Amenity, Carbon sink, Community, Exotic species, Part of Group, Specimen, Stormwater reduction, Wildlife Habitat	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Retain prominent oaks

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
103	Tree group	7	Griselinia littoralis, Quercus canariensis, Liriodendron tulipifera, Quercus robur, Fagus sylvatica	Good	Early-mature	Amenity, Part of Group, Screening	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Remove for cut batter
104	Tree group	4	Liquidambar styraciflua	Good	Early-mature	Amenity, Specimen	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Outside designation
105	Tree group	3	Quercus robur, Quercus canariensis	Excellent	Early-mature	Amenity, Exotic species, Screening	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Remove for road widening
106	Tree group	2	Platanus x hispanica 'Acerifolia'	Fair	Early-mature	Amenity	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Outside designation
107	Tree group	3	Pittosporum eugenoides, Metrosideros robusta	Fair	Mature	Native species	Increase in 10-20 years	Increase in 10-20 years	Medium (10-20 years)	>6m/600	Remove for road widening
111	Tree group	7	Liquidambar styraciflua, Camellia japonica, Camellia sasanqua, Prunus x yedoensis 'Awanui', Picea sitchensis, Pittosporum eugenioides	Fair	Mature	Amenity	Increase in 10-20 years	Increase in 20+ years	No defined limit	>6m/600	Remove as required for road widening. Retain large oak
112	Tree group	7	Quercus palustris, Liriodendron tulipifera, Agonis flexuosa, Syzygium smithii, Metrosideros excelsa	Good	Mature	Amenity, Screening	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for intersection

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
113	Tree group	5	Liquidambar styraciflua, Quercus palustris, Corymbia ficifolia	Good	Mature	Amenity, Specimen	Increase in 20+ years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for intersection
114	Tree group	5	Casuarina cunninghamiana, Cupressus arizonica var. glabra, Schinus molle, Metrosideros kermadecensis	Fair	Mature	Amenity, Screening	Increase in 20+ years	Constant	Long (> 20 years)	>6m/600	Remove for road widening
115	Tree group	4	Quercus robur	Good	Mature	Amenity, Carbon sink, Community, Exotic species, Stormwater reduction, Wildlife Habitat	Constant	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for road widening
116	Tree group	6	Chamaecyparis lawsoniana, Populus nigra	Fair	Mature	Amenity, Shelter	Increase in 10-20 years	Constant	Medium (10-20 years)	>6m/600	Remove southern end for road widening
120	Tree group	3	Podocarpus gracilior, Metrosideros excelsa, Quercus palustris	Good	Early mature	Amenity	Increase in 10-20 years	Increase in 20+ years	Long (> 20 years)	>6m/600	Remove for roundabout
122	Single Tree	1	Dacrydium cupressinum	Excellent	Early-mature	Amenity, Native species, Highly Visible	Increase in 10-20 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Retain and protect
123	Tree group	8	Liquidambar styraciflua, Podocarpus totara, Cinnamomum camphora, Ligustrum lucidum, Pittosporum eugenioides, Pittosporum crassifolium, Albizia julibrissin	Good	Early-mature	Amenity, Screening	Increase in 0-10 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Retain and protect

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
124	Tree group	8	Alectryon excelsus, Phyllocladus trichomanoides, Libocedrus plumosa, Photinia fraseri	Fair	Early-mature	Amenity, Native species, Part of Group, Screening	Increase in 10-20 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Remove as required for road widening
125	Tree group	5	Alectryon excelsus, Magnolia campbellii, Photinia fraseri, Cordyline australis	Good	Early-mature	Amenity, Screening	Constant	Constant	Long (> 20 years)	>6m/600	Remove as required for road widening
126	Tree group	5	Eriobotrya japonica, Ligustrum lucidum, Pittosporum tenuifolium, Ilex aquifolium, Camellia japonica			Amenity, Screening	Increase in 10-20 years	Increase in 10-20 years	No defined limit	>6m/600	Remove for road widening
127	Tree group	3	Cryptomeria japonica, Sequoia sempervirens	Fair	Juvenile	Amenity, Shelter	Increase in 20+ years	Increase in 20+ years	Long (> 20 years)	>6m/600	Outside designation
131	Tree group	undefined	Populus nigra, Pinus radiata, Salix alba, Alnus cordata	Fair, Pest infestation	Mature	Carbon sink, Exotic species, Soil / erosion protection, Stormwater reduction	Decline in 10-20 years	Increase in 0-10 years	No defined limit	Riparian	Retain and protect where possible
132	Tree group	16	Cinnamomum camphora	Fair	Mature	Amenity, Exotic species	Constant	Constant	Long (> 20 years)	>6m/600	Remove for road widening, fill batter
205	Single Tree	1	Metrosideros excelsa	Fair	Mature	Native species, Amenity	Decline in 10-20 years	Increase in 10-20 years	Long (> 20 years)	>6m/600	Remove for tie in to Ponga Road
206	Tree group	3	Quercus palustris	Excellent	Early-mature	Exotic species,Amenity	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Outside designation
207	Tree group	4	Platanus x hispanica 'Acerifolia'	Excellent	Early-mature	Exotic species,Amenity	Increase in 0-10 years	Increase in 0-10 years	Long (> 20 years)	>6m/600	Outside designation

Assessment of Arboricultural Effects

tree number	tree or group	number of trees	species list	vitality	age	values	growth vitality	values contribution	life expectancy	applicable rules	general comments
217	Tree group	33	Dacrycarpus dacrydioides, Kunzea ericoides, Eucalyptus sp. Liquidambar styraciflua, Salix alba, Acacia melanoxylon, Grevillea robusta, Salix babylonica, Quercus palustris	Good, Fair	Mature	Amenity, Exotic species, Native species, Soil / erosion protection, Stormwater reduction, Wildlife Habitat	Constant	Increase in 20+ years	Medium (10-20 years)	>6m/600	Outside designation

Appendix 4. Tree Location Plans – Tree Protection Status

Legend

tree protection status

- >6m/600mm (rp)
- not protected
- Riparian (rp)
- Road - no resource consent reqd

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D1 - West of Jesmond Road

Drawing No.: A3-D1-01
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

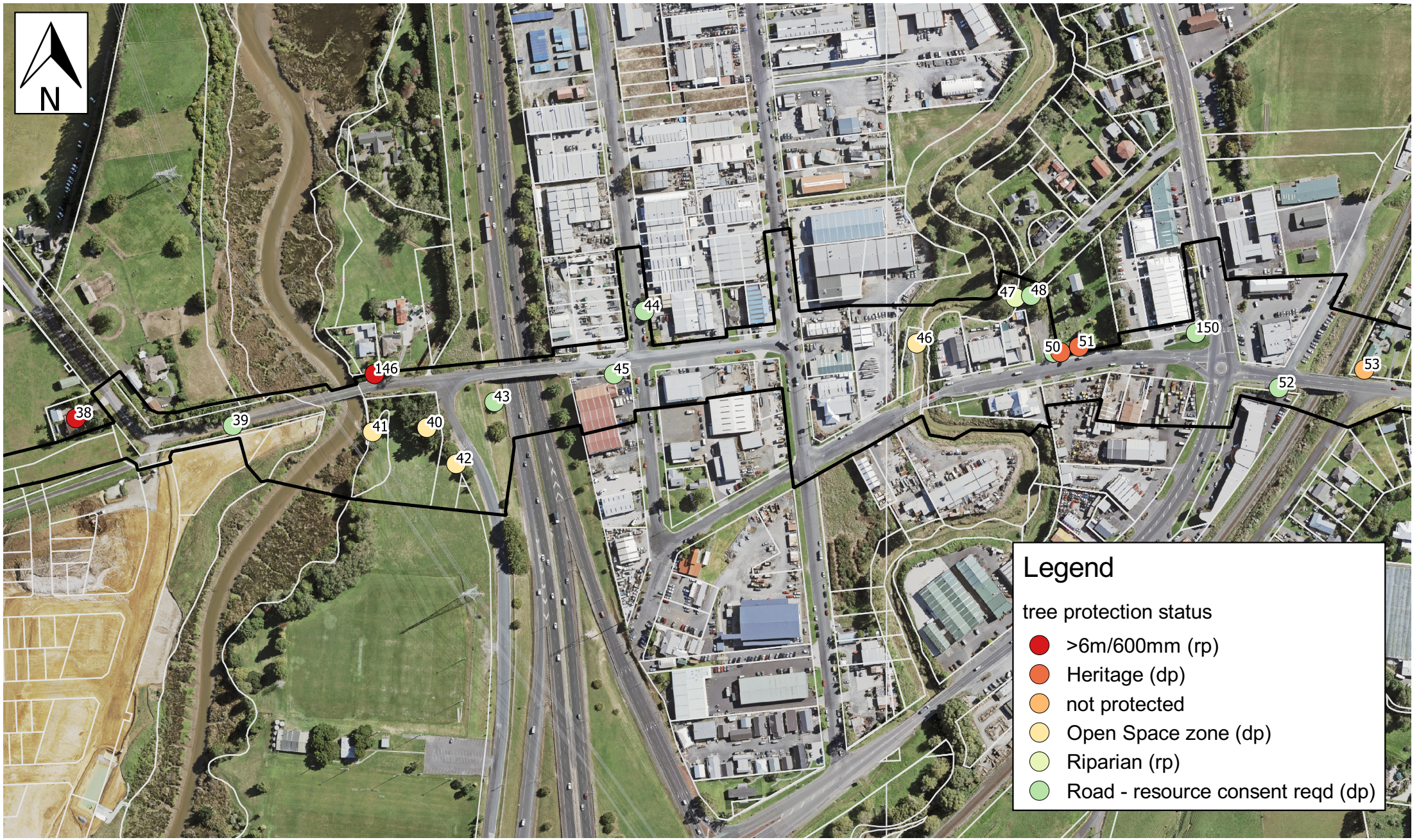
Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D1 - East of Jesmond Road

Drawing No.: A3-D1-02
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D2 - Jesmond Road

Drawing No.: A3-D2-01
Version: 04
Date: 30 December 2020



CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D2 - Bremner to Waihoehoe West

Drawing No.: A3-D2-02
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D2 - Waihoehoe West

Drawing No.: A3-D2-03
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs Title: Tree Location Plan for NoR D3 - Waihoehoe Road East

Drawing No.: A3-D3-01

Version: 04

Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D3 - Waihoehoe East

Drawing No.: A3-D3-02
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D4 - Opaheke N-S (Waihoehoe to Ponga)

Drawing No.: A3-D4-01
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D4 - Opaheke N-S (Ponga to Boundary)

Drawing No.: A3-D4-02
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D5 - Ponga Road

Drawing No.: A3-D5-01
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan for NoR D5 - Opaheke Road

Drawing No.: A3-D5-02
Version: 04
Date: 30 December 2020

Appendix 5. Tree Location Plans – Council-owned Trees

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan, Council Owned Trees for NoR D1 and D2

Drawing No.: A4-D1/2-01
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan, Council Owned Trees for NoR D2 & D3

Drawing No.: A4-D2/3-01
Version: 04
Date: 30 December 2020

CRAIG WEBB
Consultant Arborist

Project: Supporting Growth Alliance - Drury Package NoRs
Title: Tree Location Plan, Council Owned Trees for NoR D5

Drawing No.: A4-D5-01
Version: 05
Date: 13 January 2021