



VEGETATION FRAMEWORK FOR PALMERSTON NORTH

JUNE 2016



CONTENTS

Executive Summary	1	Part 1	
Introduction	2	Key Directions/Public Spaces	15
Vision	3	How to use	16
Context	4	Public Spaces	19
Benefits	6	City Centre	20
Analysis	7	City Entrances	28
Street Tree Types	7	Streets	40
Vegetation Cover	8	Reserves	62
Street Tree Analysis	10	Green Corridors	68
So What?	12	Manawatū River	72
Key Directions	13	Part 2	
		Technical Procedures	79
		Street Tree Planting	81
		Understorey Planting	82
		Reserves and Open Space	83
		Community Vegetation / Berm Gardens	84
		Edible Trees	85
		Appendix 1 – Tree Palette	86
		Appendix 2 – Understorey Planting Palette	90
		Appendix 3 - Tree Selection Criteria	94



EXECUTIVE SUMMARY

The Palmerston North City-wide Vegetation Framework (Framework) provides a non-regulatory toolkit for delivering comprehensive planting guidance for the city. It is aimed at a range of users who will all play a part in initiating, installing and ensuring the ongoing enhancement of the 'lungs' of the City. This includes community groups, tangata whenua, Palmerston North City Council officers, the New Zealand Transport Agency, professionals involved in design and implementation and the public.

The Framework identifies three key directions for the City's vegetation on Council owned property, which include environmental, functional and aesthetic qualities that will allow the City to grow in a sustainable, robust and attractive manner. The key directions were identified through workshops with Palmerston North City Council staff, Rangitāne and Environment Network Manawatū. Partnerships, coordination and cooperation between the range of user groups is critical to the successful implementation of the Framework.



INTRODUCTION

2

[Introduction] VEGETATION FRAMEWORK FOR PALMERSTON NORTH

Aim of the Framework:

- To communicate the design vision for Palmerston North's vegetation
- To provide a City-wide vegetation framework that can be utilised by a range of user groups
- To set out the principles and techniques to be used to implement and manage vegetation, ensuring its viability in the long term

Vegetation contributes to the City in many ways: providing and sustaining a range of environmental benefits, reinforcing City-wide character and identity, and improving visual and landscape amenity. The city will benefit from a carefully planned and implemented Vegetation Framework.

This Framework is an initiative primarily derived from the Biodiversity Strategy, but both the City Centre Framework and the Street Design Manual also anticipate the development of a City-wide Vegetation Framework.

The scope of the Framework covers the City centre, streets, reserves, green corridors and Manawatū River network. It has a 30 year time horizon and provides a Framework to manage vegetation on Council owned property.

The City Council will work collaboratively with other agencies that manage public space to achieve the intentions of this framework (for example Horizons Regional Council and the New Zealand Transport Agency)

Structure of the Framework:

The Framework sets out the design philosophy and vision for Palmerston North's trees and supporting vegetation. The Framework is laid out in two parts.

Part One

Key Direction/Public Spaces - outlines the 'Key Directions' (overarching design principles that guide the selection of vegetation used within the Public Spaces), and 'Public Spaces', which break the city's vegetation into a number of related areas or types. This breakdown allows design criteria, rationale and specific vegetation types to be applied to each area or Key Element.

Part Two

Technical Procedures - outlines the practical measures which apply to the Public Spaces outlined in Part One. Part two provides detail to guide the implementation and ongoing management of vegetation within the public domain.

VISION

To create a City-wide Green Network that celebrates and enhances our local and introduced biodiversity and contributes to an environmentally healthy and attractive City, its surrounding villages, the Manawatū River and its Green Corridors.



CONTEXT

4

[Context] VEGETATION FRAMEWORK FOR PALMERSTON NORTH

Without guidance, the planting and management of vegetation on Council land can occur in an ad-hoc manner, resulting in vegetation that lacks visual strength and unity. The Framework sets out the Council's vision for its valuable public vegetation resource and provides guidance on how to manage and develop the resource to achieve this vision.

Trees and supporting vegetation are a collection of living entities that, like people, inhabit the City. They contribute to the City's identity, form and well-being. Streets, reserves, green corridors and the Manawatū River comprise the largest open space in the City-wide area. As people move about, this open space has a powerful impact on their daily lives and their perception of the City.

Vegetation also plays a critical role in the overall appeal and enjoyment of the city. A recent study¹ found that having 10 or more trees in a City block, on average, makes people feel seven years younger and as if they've moved to a wealthier neighbourhood. The study also identified that a larger number of street trees decreases cardio-metabolic conditions and has an even larger impact on perceived health benefits comparable to a significant increase in annual income.

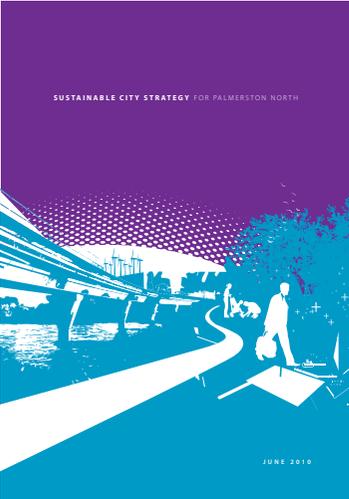
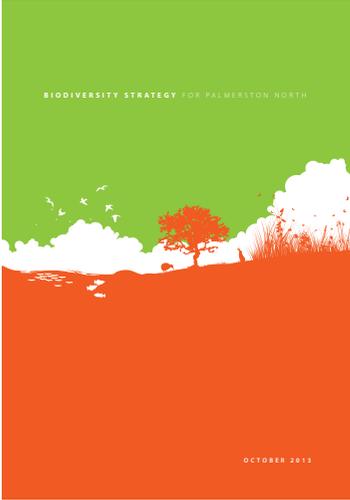
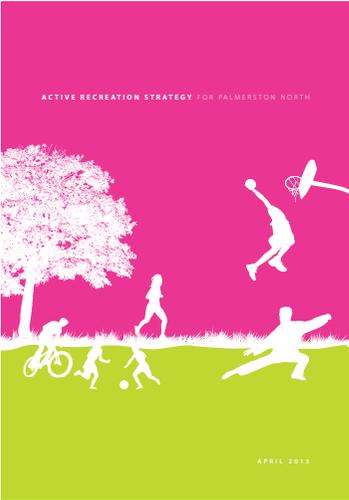
This study highlights how important vegetation can be and the potential benefits that plants can contribute to well-being. Given that vegetation deficits tend to be located in particular parts of the City, there is significant potential to increase well-being within these areas.

1_ Kardan, O. et al (2015). Neighbourhood greenspace and health in a large urban centre. *Scientific Reports*. 5, 11610; doi: 10.1038/srep11610 9 (2015).



Other Key Documents

The following strategic documents have influenced the development of the City-wide Vegetation Framework:



BENEFITS

6

Vegetation has a wide range of benefits. For the purposes of this Framework, the following environmental, economic and community and health benefits have been identified.



Environmental

- Improve climatic conditions by absorbing heat and dissipating cold, and capturing dust and allergens
- Provide an important habitat and a food source for urban fauna
- Improve environmental comfort by providing summer shade for the comfort of pedestrians and park users
- Improve environmental amenity by diminishing traffic noise, screening unappealing views and reducing glare
- Assist in the formation of ecological corridors, reinforcing the ecological structure of the City
- Soil and water conservation
- Atmospheric purification (J.E Cavanagh of Landcare Research notes 'Trees can intercept atmospheric particles and absorb various gaseous pollutants')
- Noise attenuation

Economic

- Enhance property values as trees establish and mature
- Food production
- Traffic control
- Enhance street appeal for visitors, making them more likely to return
- Attractive City for business

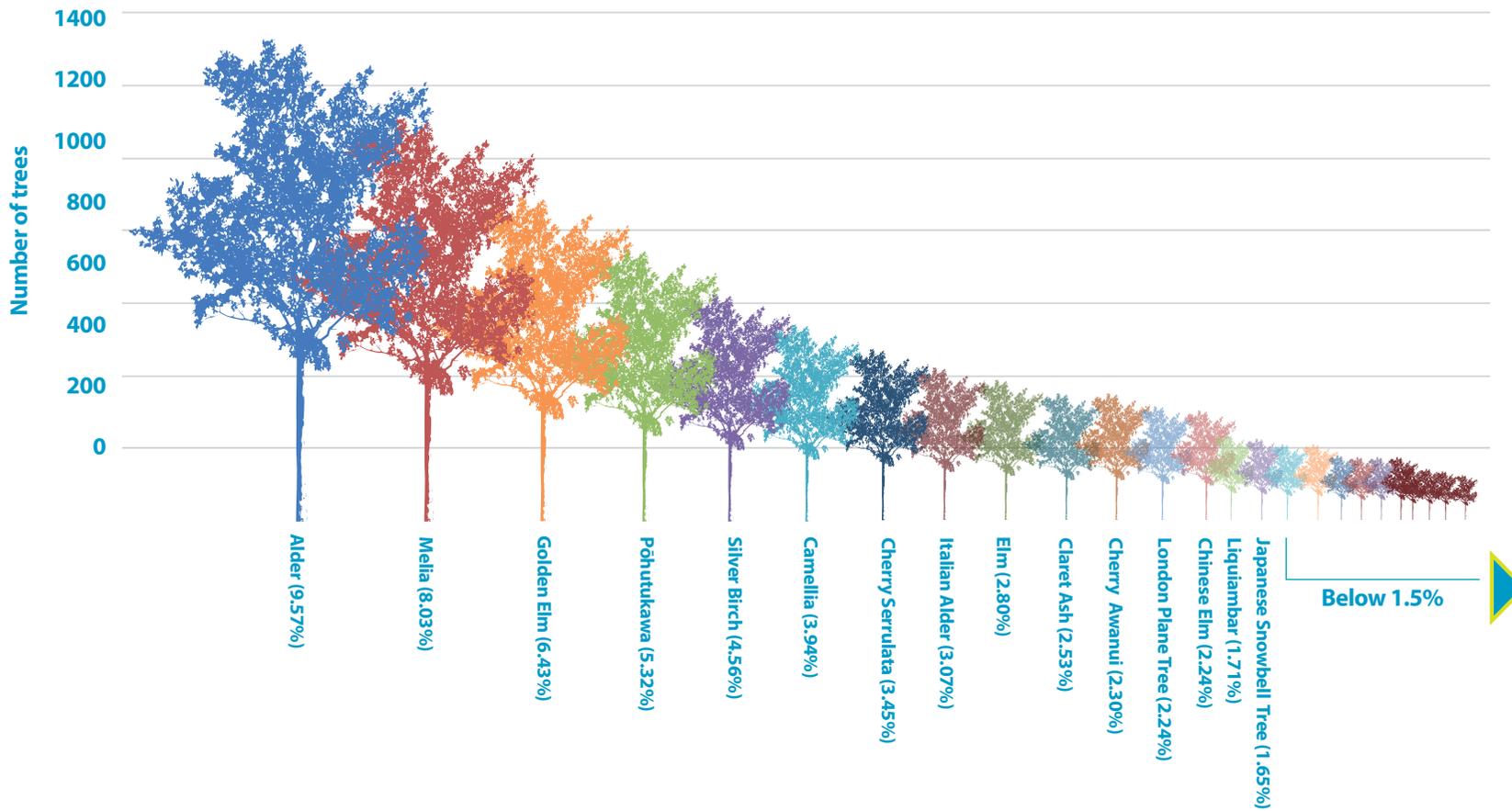
Community and Health

- Define a neighbourhood's character and strengthen local identity
- Assist way-finding within the City's street network
- Offer a human scale that mediates the sometimes dominating effect of buildings
- Provide seasonal interest and natural beauty through foliage, leaf patterns, flowers, bark, fruit and canopy
- Provide a link to nature and act as a source of appreciation and delight
- Strengthen community identity and relationship development
- Improve mental health (Dr Wayne Linklater of Victoria University of Wellington notes a strong relationship between living in a greener neighbourhood and people's mental health)

ANALYSIS

Street Tree Types

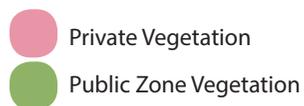
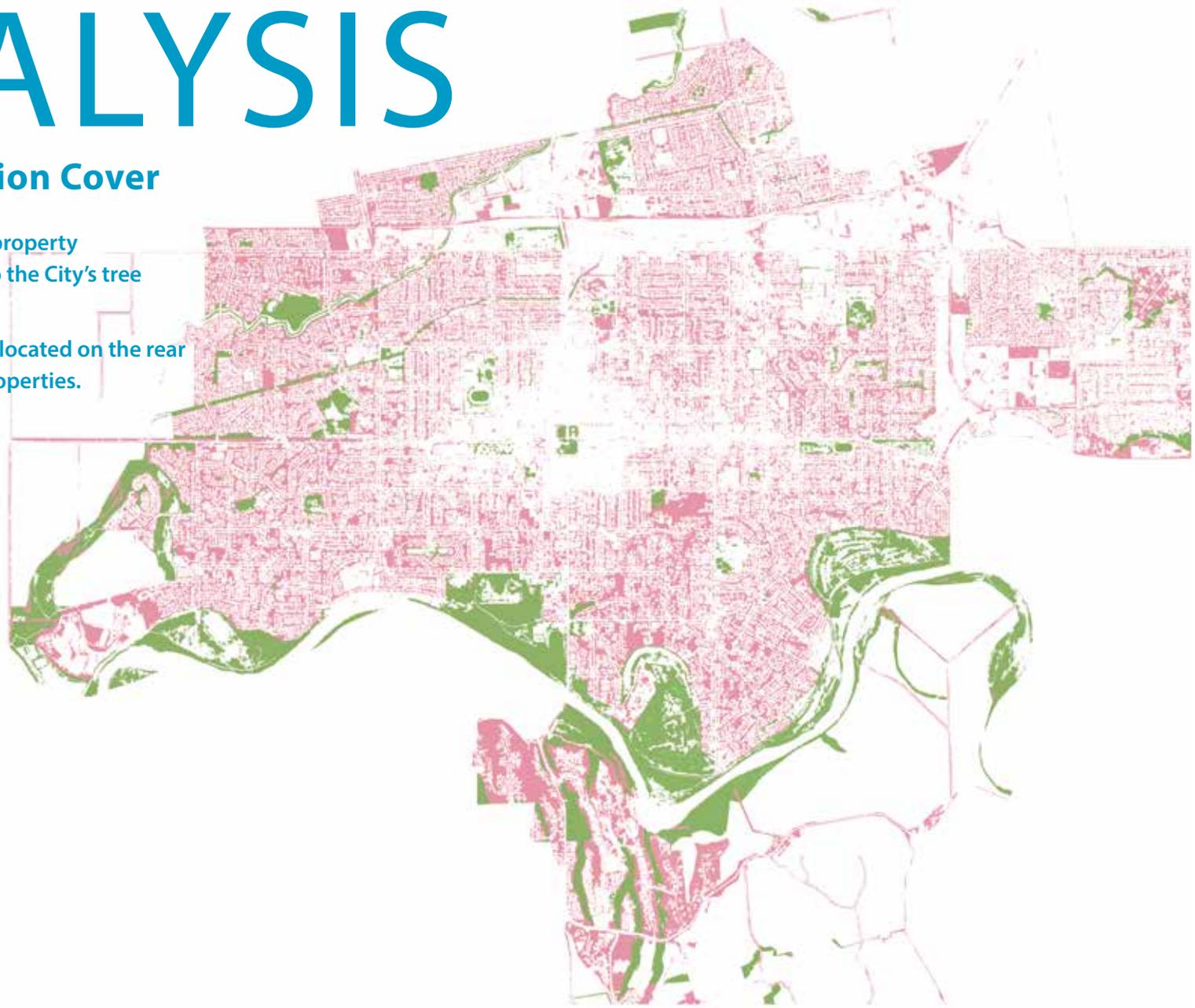
Palmerston North City has a diverse range of trees planted along its streets. The diagram below shows the distribution of different trees in the City.



ANALYSIS

Private Vegetation Cover

- Vegetation on private property contributes the most to the City's tree canopy.
- Vegetation is primarily located on the rear boundary of private properties.

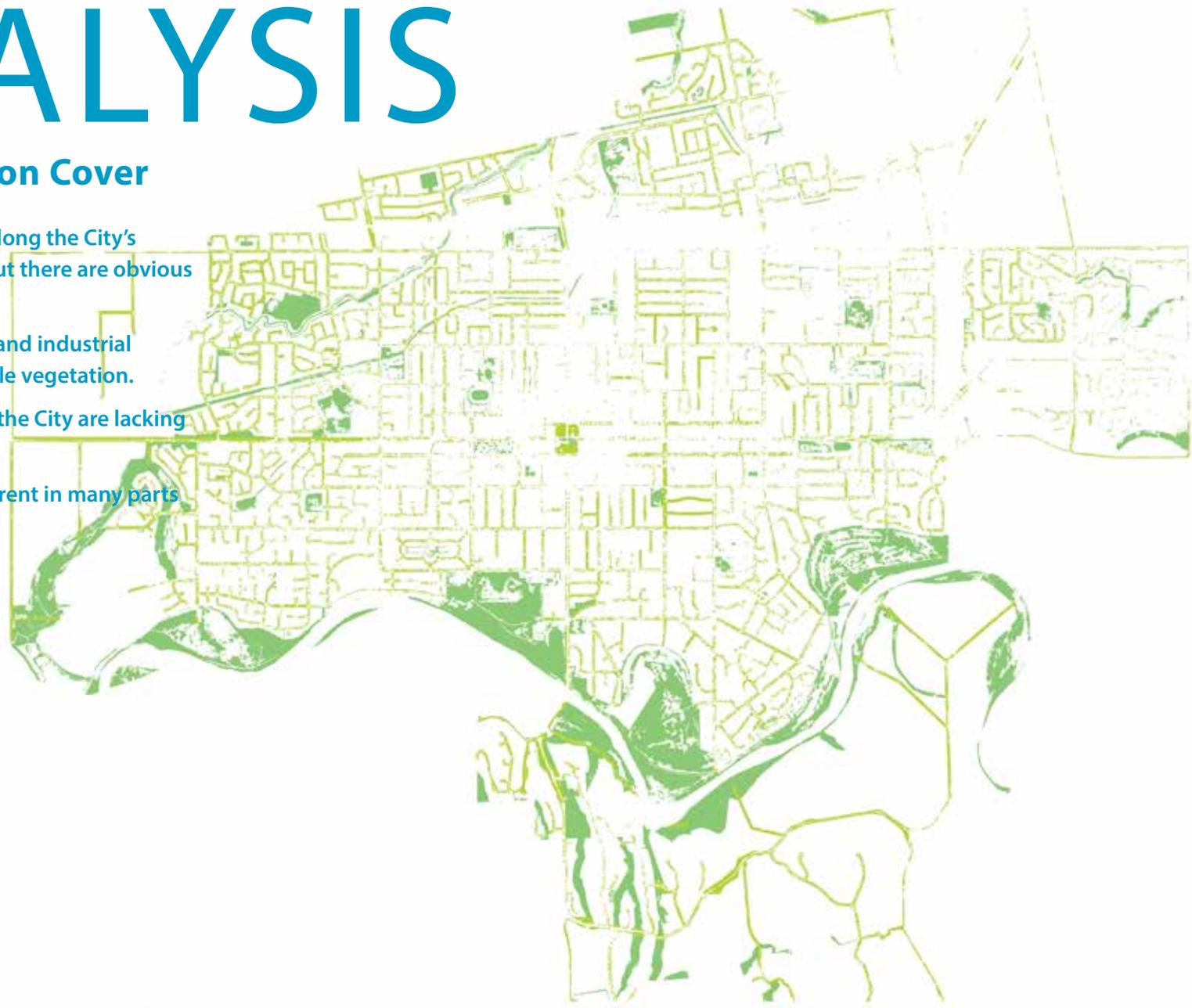


Data generated using the normalized difference vegetation index (NDVI)

ANALYSIS

Public Vegetation Cover

- Vegetation coverage along the City's streets is significant, but there are obvious gaps.
- The City's commercial and industrial locations have very little vegetation.
- Newer subdivisions in the City are lacking vegetation.
- Fragmentation is apparent in many parts of the City.



- Road Reserve Vegetation
- Public Zone Vegetation

Data generated using the normalized difference vegetation index (NDVI)

ANALYSIS

Street Tree Analysis

10

Problematic Trees

The following trees have been identified as problematic for health, functional, or environmental reasons.

Golden Elms (6.43%) – Shallow roots damage footpaths. The canopy of these trees are large, which can be a problem for maintenance. These trees also have high leaf fall, which Council contractors are required to clean up to avoid drain blockages and slippery footpaths. This is costly.

Claret Ash(2.53%) – Mature Claret Ash trees are prone to limb failure during storm conditions. This is problematic in a windy City, such as Palmerston North.

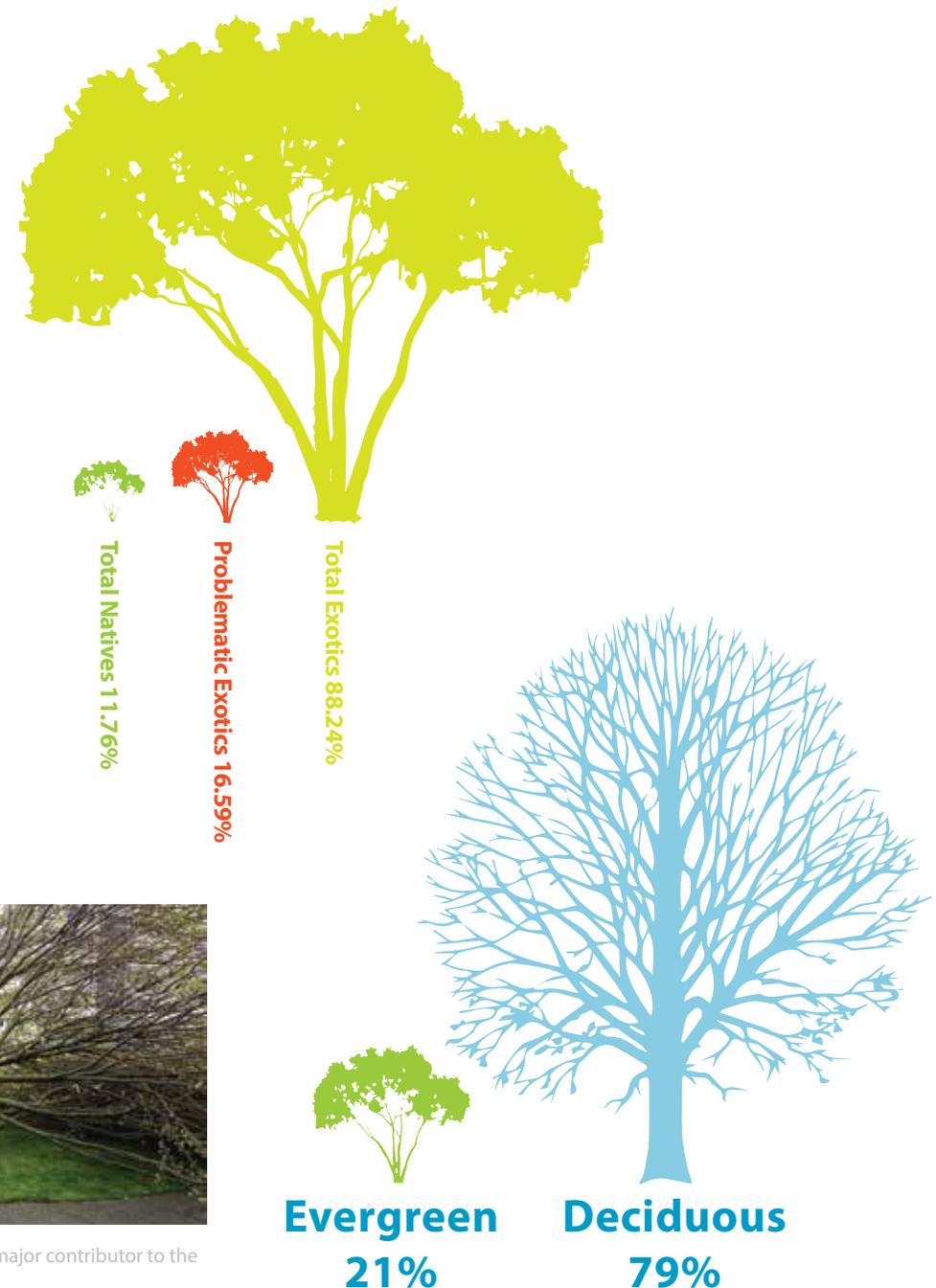
Italian Alder (3.07%) – These trees are very messy. Italian Alders drop small cones and catkins, which block channels and sumps, stain footpaths and cause issues for lawn mowers. Council also receives many enquiries from the public to maintain these trees.

Silver Birch (4.56%) – These trees have a known impact on asthma sufferers. Silver Birch pollen is a potent allergen. It has been identified as the main tree pollen causing allergic symptoms in New Zealand.

Where they are problematic, Council's intention is to progressively remove these trees from the City's streets and reserves, and replace them with more suitable alternatives. This replacement programme will take time and will potentially have a significant impact on the City's tree canopy. Despite the known issues with these particular trees, removing all of these trees would be a significant impact given these trees make up 16.59% of street trees.



Golden Elm that fell in October 2015. The major contributor to the failure was the shallow root structure.



Notable Trees

What are Notable Trees?

Notable Trees are significant trees or groups of trees. They are characterised by their uniqueness, size, form, indigenous status and visual contribution to the landscape. Because of their significance, notable trees are protected under the District Plan. There are currently 96 notable trees scheduled in the Palmerston North District Plan. 21 groups of notable trees are also protected. Notable trees are located on both public and private property.

Implications of notable status

- Resource consents are required to carry out any maintenance or trimming of a notable tree that is more than minor.
- Minor trimming or maintenance of a notable tree means work undertaken by hand-operated secateurs or pruning shears.
- This is to ensure that appropriate arboriculture practices are used and that the integrity of notable trees is maintained or enhanced.
- The removal of a notable tree also requires a resource consent from Council. Given the District Plan's focus on protecting and retaining notable trees, resource consent applications for the removal of notable trees are rarely approved.

Process for adding or removing notable tree to the District Plan schedule:

1. Trees are nominated by residents or Council identifies trees of interest
2. Arborist conducts assessment of trees using a STEM assessment (assessments conducted on a 5 yearly basis)
3. Recommendations made by arborist on the suitability of Notable status.
4. Council drafts a change to the District Plan to update the Notable Tree schedule.
5. Council consults on proposed plan change.
6. Residents given the opportunity to support or oppose the proposed changes.
7. Hearing on plan change held.
8. Decision made and released to the public.
9. Opportunity for appeals on the decision.
10. Notable Tree schedule updated.

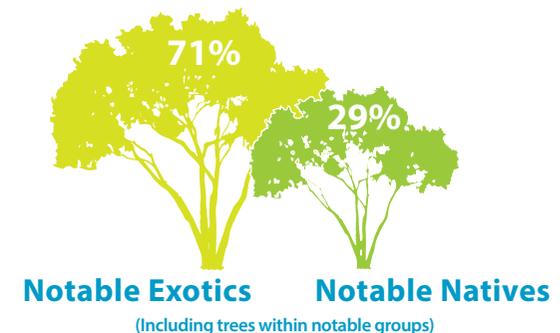
Challenges

There is a common misconception that native trees and large trees have some sort of protection and that the Council enforces this protection. In truth, trees are only protected if they are scheduled as Notable Trees in the District Plan.

In Palmerston North vegetation is primarily located on private property. Infill subdivision (where property is split up into smaller sections) is becoming more popular, accounting for about 50% of new dwelling units (up from about 30% in 2009). Infill subdivision often sees the complete clearance of vegetation, which over time has the potential to have a significant impact on the City's tree canopy. Only trees that have Notable status are protected in the subdivision process. This places a greater reliance on the provision of vegetation in public space.

Opportunities

The process for updating the Notable Tree schedule is time consuming. It can take years until the District Plan is updated. Another issue is that the identification of new Notable Trees is largely driven by nominations from the community. Because of this, many potential candidate trees could be overlooked in a review process. To help counter this, a comprehensive survey of the City's trees is required. More regular reviews of the notable tree section of the District Plan could also be undertaken. This would encourage a more responsive approach to the protection of the City's natural heritage. One approach could be to ensure that an update to the notable tree schedule of the District Plan is completed every five years.



Ecological Considerations

Birds

One of the objectives of the Council's Biodiversity Strategy is to increase planting around the City. It also recognises that Council can contribute to effective planting by ensuring that bird and pollinator friendly plants are used. The Biodiversity Strategy also promotes planting that encourages wildlife in the right places. This means avoiding planting in roundabouts, where birds are at risk of being hit by cars. It also means avoiding planting that attracts large concentrations of birds in places where there is significant pedestrian movement, seating and parking.

Healthy bird populations require all year round food sources. Exotic trees can play an important role when native plants are not providing food for birds. The majority of Council's street trees are exotic species but these are not necessarily species that are useful food sources for birds. Where suitable, Council will endeavour to establish a green network that provides all year round food sources for birds.

Invertebrates

Invertebrates such as insects and spiders largely rely on habitat rather than specific plant species. They like 'architecture' and 'structure' in terms of bark and leaf structure which most trees provide.

Shelter for insects is important. Long grasses, thick foliage and trees which drop leaves, bark and branches are excellent for providing habitat for insects. Most native insects have short tongues, so plants with small open blooms, especially native species, are best for attracting them.

SO WHAT?

It is clear that there are gaps in the City's green network.

There is increasing pressure on vegetation located on private property as infill subdivision becomes more popular. This places a greater reliance on the public space to sustain the City's tree canopy. If current trends continue, the perception of Palmerston North as a well treed City will come under threat.

To achieve the Framework's vision, several things will need to change:

- More planting will be required and any new vegetation will need to be functional, environmentally responsive and aesthetically appealing.
- A long-term view will be needed involving protecting the existing good vegetation and avoiding planting inappropriate species in the wrong places.

The Vegetation Framework provides a 30 year vision for how Council will achieve this.

Implications

There will be costs associated with increased planting. The extent of increased planting will need to be determined in Council's upcoming Asset Management Planning, which will help inform the 2018/19 Long Term Plan. Any increase in funding from the Long Term Plan will need to be approved by Council.

Any additional costs will be balanced by the improvements to community health, the natural environment and increased streetscape and reserve amenity values.



KEY DIRECTIONS

Key Directions set overarching design principles that guide the selection of species used within the Public Spaces. The Key Directions are important outcomes intended to be delivered through the Framework.

KD1 Environmentally Beneficial

KD2 Functionally Robust

KD3 Aesthetically Considered

The Key Directions are further explained in sub-directions, which define what is to be considered to help guide the type of vegetation that is planted. These are shown in the diagram to the right.

ENVIRONMENTALLY BENEFICIAL

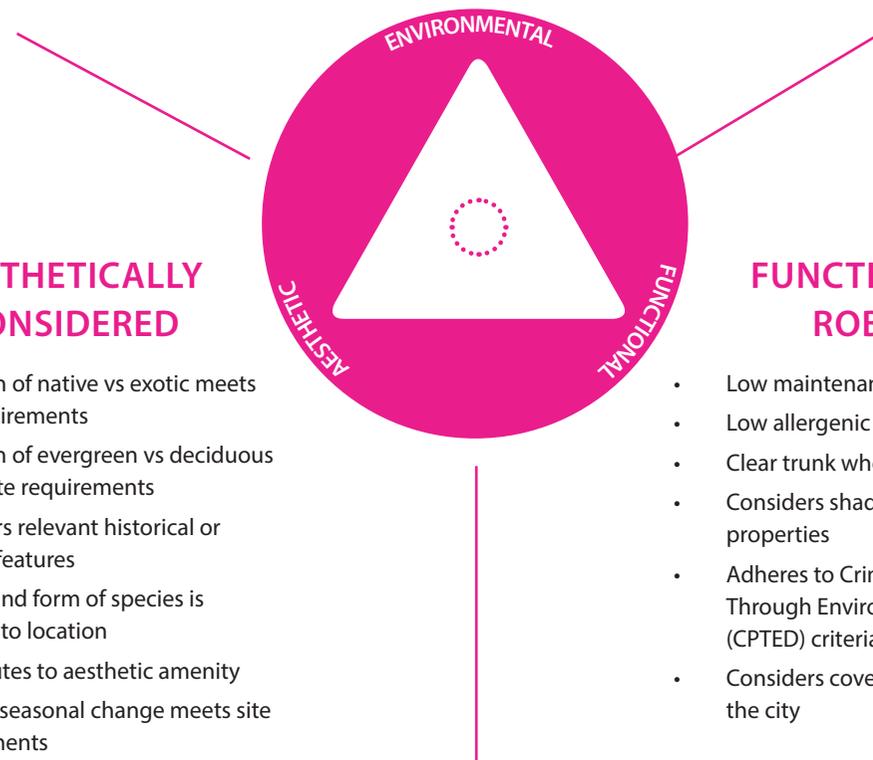
- Suited to climate
- Suited to local soils / geology
- Beneficial to fauna
- Enhances biodiversity
- Considers storm water management

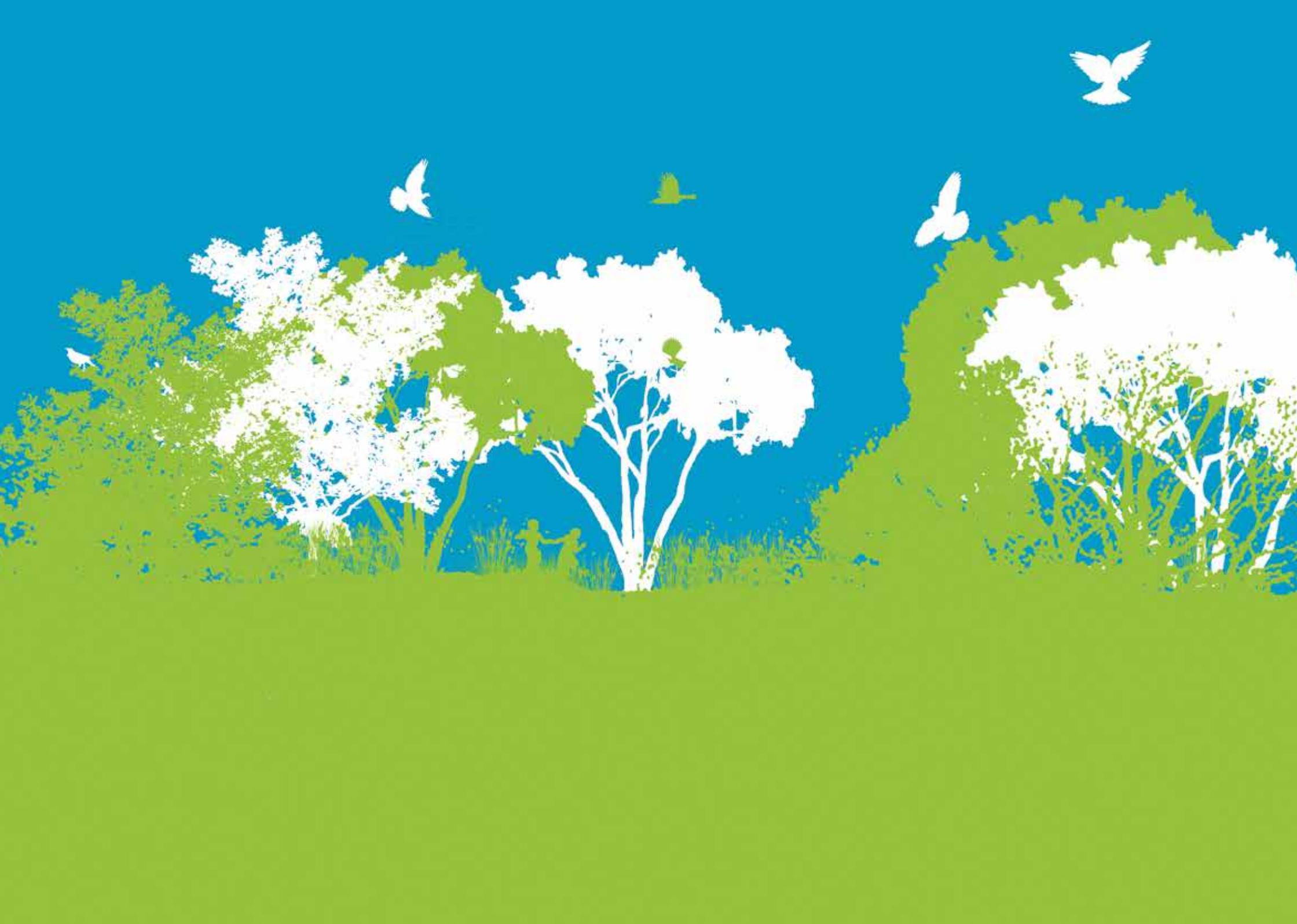
AESTHETICALLY CONSIDERED

- Selection of native vs exotic meets site requirements
- Selection of evergreen vs deciduous meets site requirements
- Considers relevant historical or cultural features
- Spread and form of species is relevant to location
- Contributes to aesthetic amenity
- Colour / seasonal change meets site requirements

FUNCTIONALLY ROBUST

- Low maintenance
- Low allergenic
- Clear trunk where appropriate
- Considers shading to adjacent properties
- Adheres to Crime Prevention Through Environmental Design (CPTED) criteria
- Considers coverage equity across the city





PART 1

KEY DIRECTIONS / PUBLIC SPACES

CITY CENTRE

CITY ENTRANCES

STREETS

RESERVES

GREEN CORRIDORS

MANAWATŪ RIVER AND TRIBUTARIES

How to use the Framework

16

[Key Directions] VEGETATION FRAMEWORK

Considering planting vegetation?



STEP 1:

Choose a species using the Framework

Refer to page.17 (opposite) for 'how to use' the Public Space planting guide.

Considering removing vegetation?



Refer to 'Removing Trees' (page. 81) before removing any trees in public space.

STEP 1:

Consult technical guidelines for planting

Refer to 'Part 2- Technical Guidelines' for planting street trees, understorey planting, planting in reserves, Community Vegetation / Berm Gardens and Edible Trees.

STEP 1:

Consult technical guidelines for ongoing maintenance guidelines

Refer to 'Part 2- Technical Guidelines' for maintenance requirements of selected trees.



Below is an example of two pages from a 'Public Space' section of this framework, with a basic explanation of how it is structured and how to interpret information.

Map key

Explains map content relevant to the Public Space type.

Location map

Indicates the location and extent of Public Space types. Refer to key on each map.

Typical visualisation

Small image indicating the composition and aesthetic of the Public Space.

Scale comparison

Quick reference diagram indicating the scale of tree species, divided up in to three size ranges (at maturity): [S] up to 6 metres, [M] 6-10 metres and [L] 10+ metres.

Bird friendly?

This symbol beside a tree species indicates if the tree attracts and provides food for birds. Further information on their seasonal variations can be found in Appendix 3.

Photo Examples

This is an example of what the tree or plant looks like.

Intent

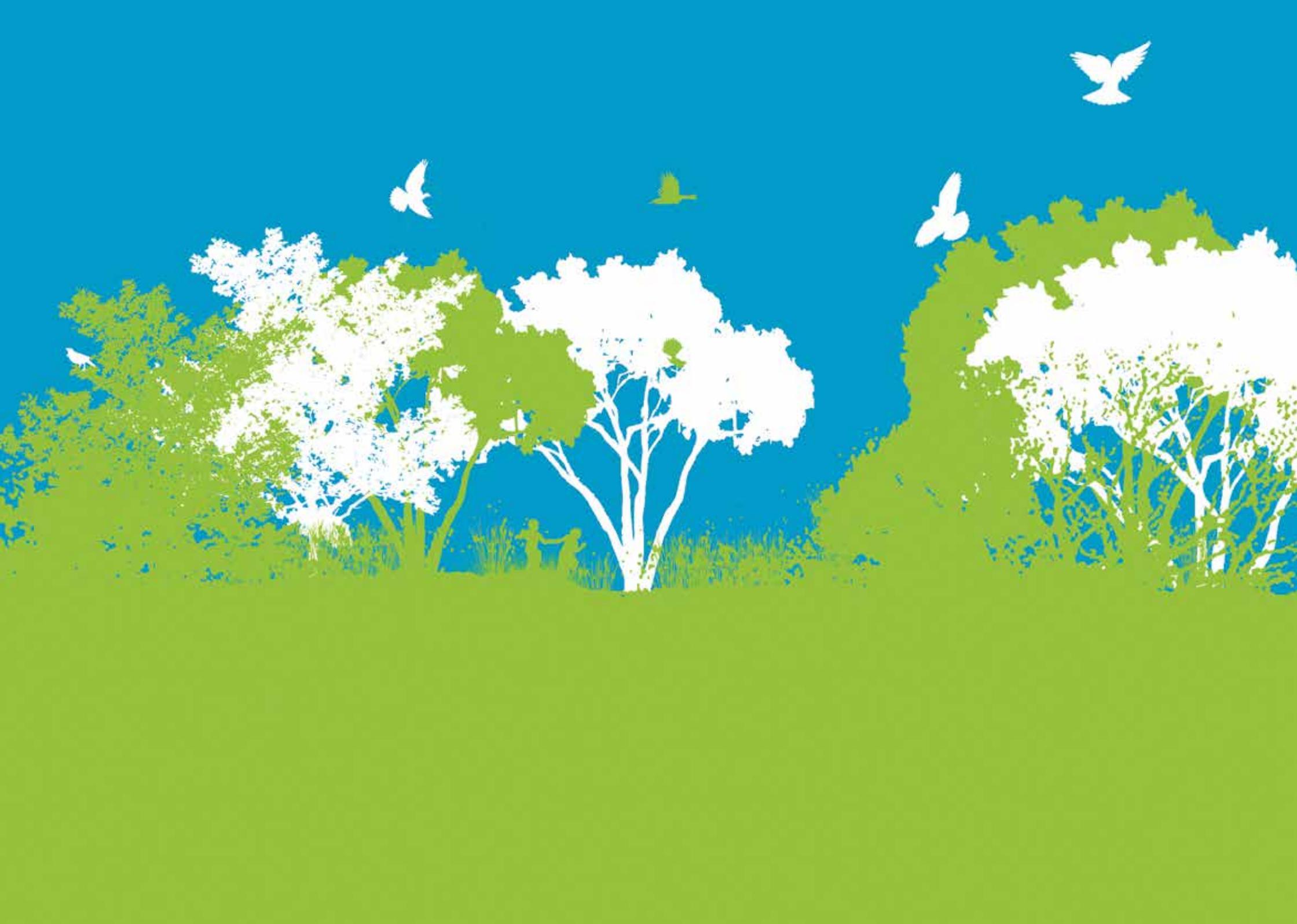
This is a paragraph explaining the overall goal for this type of Public Space.

Suggested tree and plant species

This is a list of key framework species which have been identified as good selections to achieve the design intent for that area.

Functionality

This diagram is a quick reference indicating the intent of planting in relation to the Key Directions (refer to page.13)



PUBLIC SPACES

Public Spaces describe the different areas of vegetation across the city. This allows design criteria, rationale and particular vegetation types or species to be used in each area or Key Element. Public Spaces allow specific parts of the city to be managed in a consistent and coherent framework, whilst being broad enough to allow some flexibility through specific design proposals.

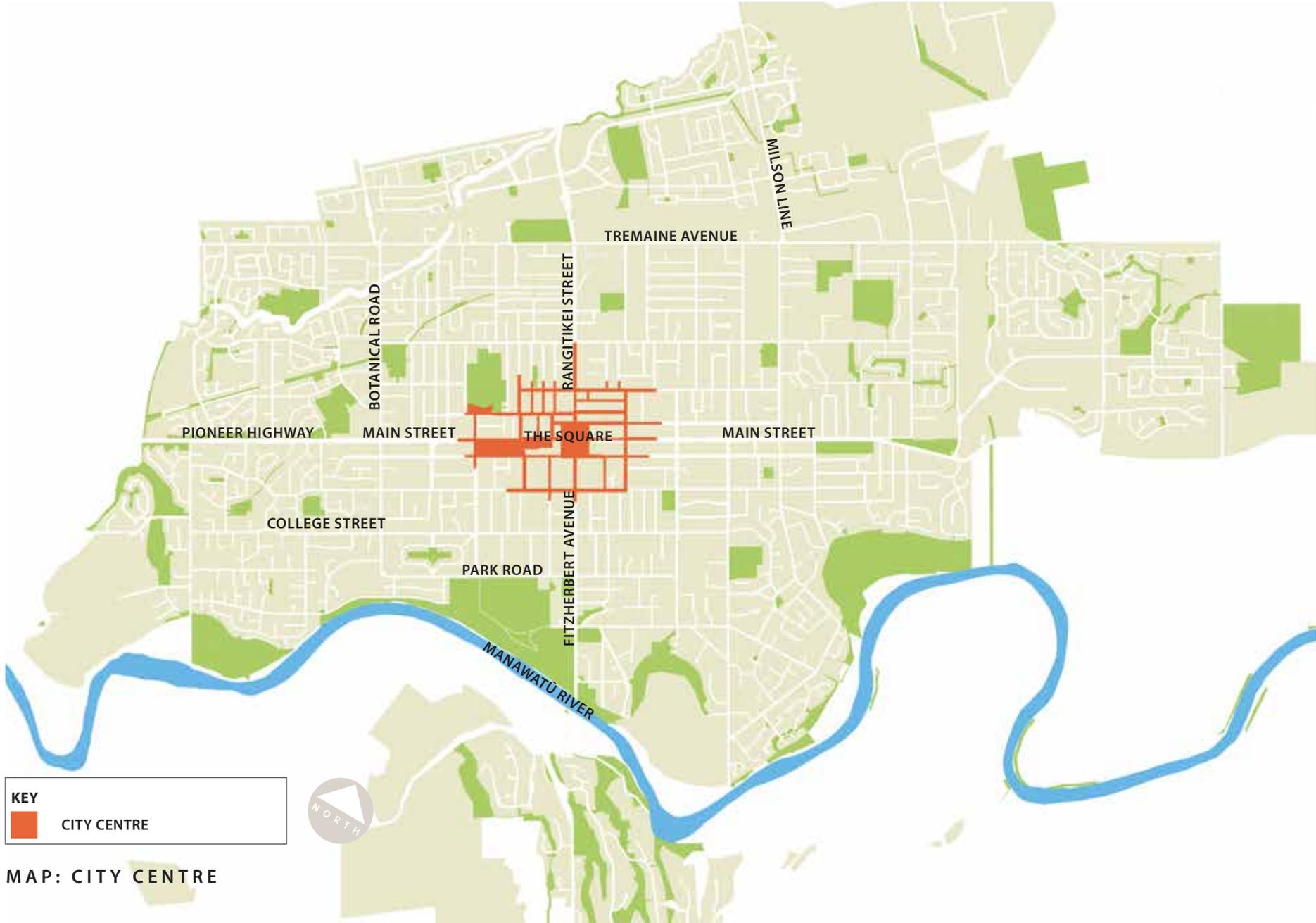
Public Spaces are broken into the following areas:

CITY CENTRE	Open Space, Place Streets, Movement / Place Streets, Movement Streets
CITY ENTRANCES	Rangitikei Street, Tennent Drive, Airport, Fitzherbert Avenue, Fitzherbert Bridge, Pioneer Highway, Napier Road / Main Street, Milson Line
STREETS	Arterial, Commercial, Residential, Industrial, Rural, Character
RESERVES	City-wide, Local, Natural Parks, Sports Fields
GREEN CORRIDORS	
MANAWATŪ RIVER	And Tributaries

This diagram to the right illustrates how the Key Directions (refer to page 13) inform the Public Spaces. Each key direction may be weighted differently to inform decisions on species selection and ongoing management. This weighting is indicated by the location of the dotted circle, and is informed by the needs of the specific Public Space.

The design intent and suggested vegetation relevant to each of these areas is outlined under each Public Space section of this framework.





KEY
[Red Box] CITY CENTRE

MAP: CITY CENTRE

CITY CENTRE

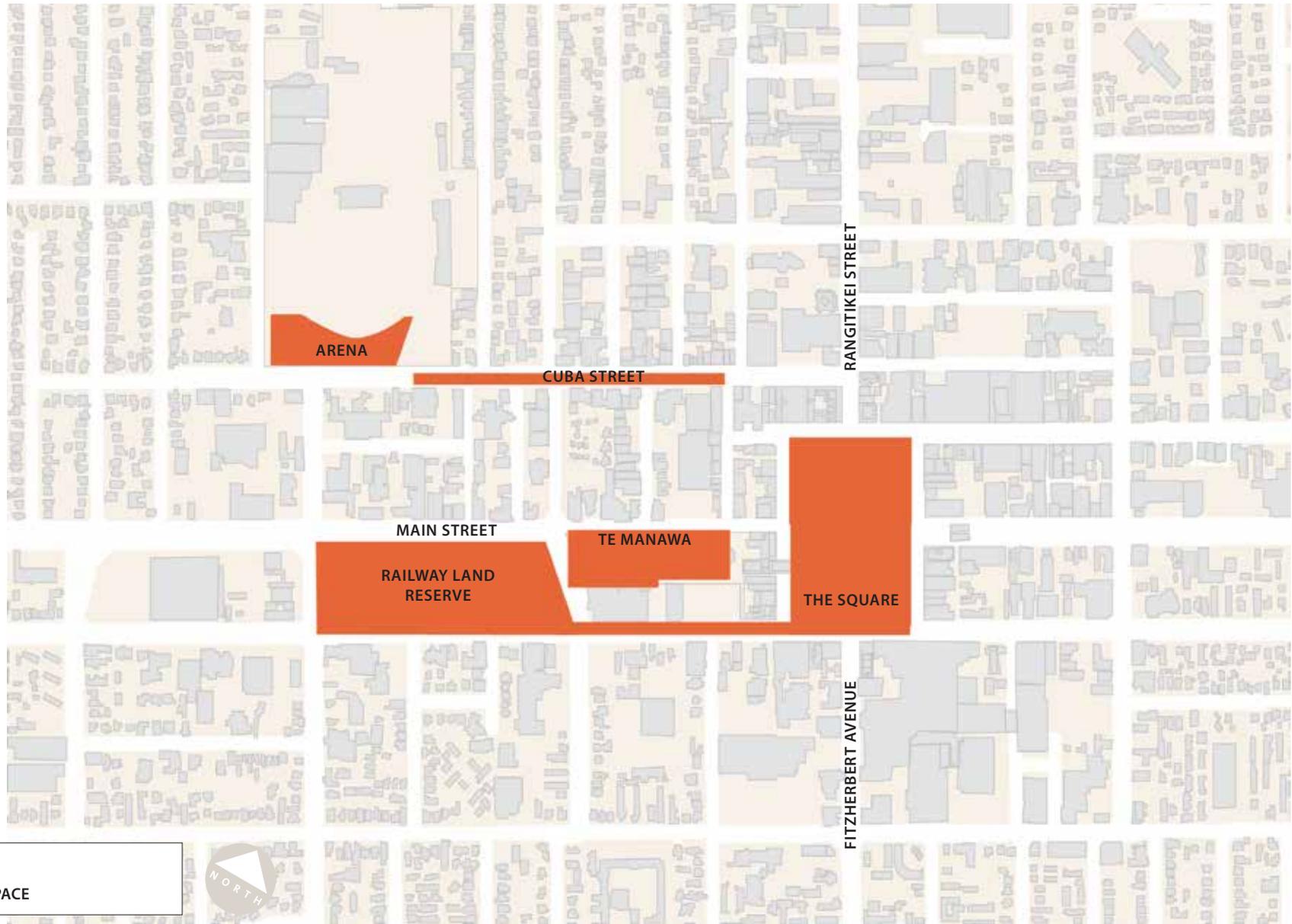
OPEN SPACE

PLACE STREETS, MOVEMENT / PLACE STREETS

MOVEMENT STREETS

21





MAP: OPEN SPACE

Map showing the location and extent of open space in the City Centre

Open space

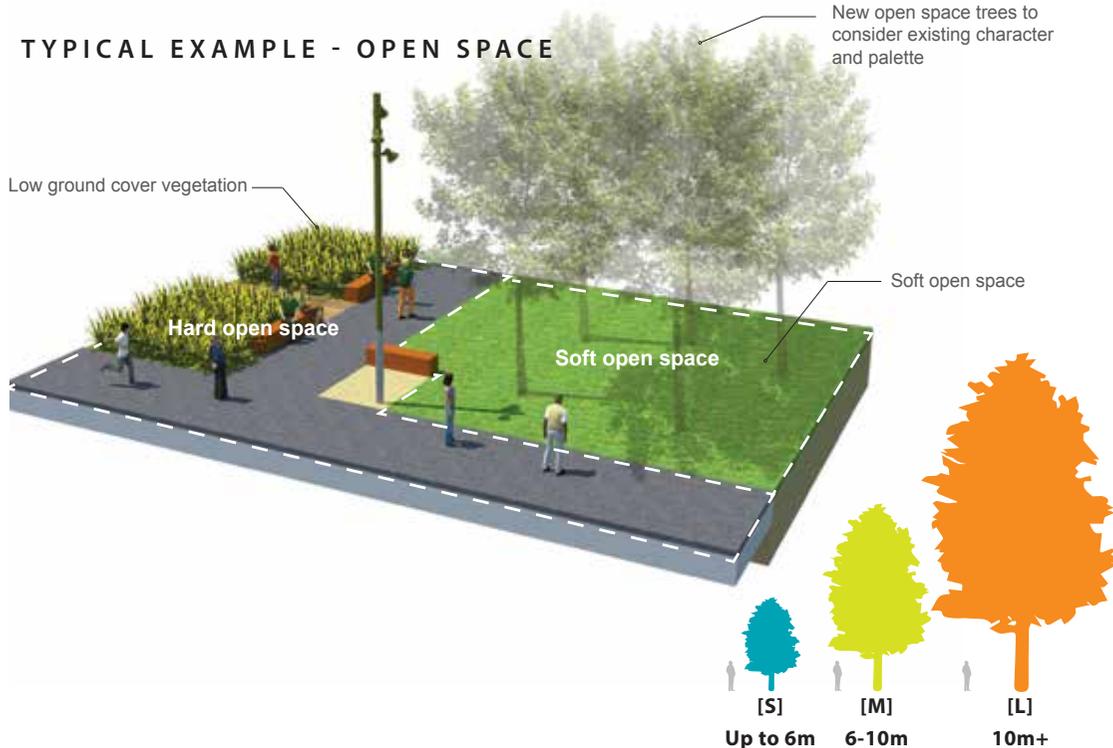
Intention

Vegetation within Hard Open Space (paved or sealed areas) is typically confined to a planter bed or planter pit. It needs to be hardy as some planter beds provide limited water and paving and walls can increase soil temperatures and dryness.

Vegetation within Soft Open Space (grassed or garden areas) is typically not confined to a planter bed or planter pit, therefore it needs to be appropriate for an open setting in size, scale and species selection. This means selecting tree species which are large enough to anchor a space, and are visually effective and robust in stand alone situations.

Seasonal variation is also a defining character of these spaces. Consideration should be given to colour in autumn and the ability for deciduous trees to open up sunlight and viewshafts in winter. Vegetation in these areas should be non obstructive of key views to maintain the character of these open spaces.

Where possible, storm water management planting should be applied in open space areas in conjunction with other storm water management solutions. Refer to Appendix 2 for core riparian and wetland species.



Suggested trees:

Hard open space

- Kaikomako [M] *Pennantia corymbosa*
- Ornamental Cherry [M] *Prunus sp*
- Horoeka [L] *Pseudopanax crassifolius*
- Nikau [L] *Rhopalostylis sapida*
- Columnar Tulip Tree [L] *Liriodendron tulipifera 'Fastigatum'*
- Fastigate Oak [L] *Quercus robur*

Soft open space

- Ornamental Cherry [M] *Prunus sp*
- Norway Maple [L] *Acer platanoides*
- Catalpa [L] *Catalpa speciosa*
- White Maire [L] *Nestegis lanceolata*
- Red Oak [L] *Quercus rubra*
- European Beech [L] *Fagus sylvatica*
- Maidenhair Tree [L] *Ginkgo biloba (male)*
- Totara [L] *Podocarpus totara*
- Black Beech [L] *Nothofagus solandri*
- Pukatea [L] *Laurelia novaezealandiae*

Suggested understorey plants:

- Hen and Chicken Fern *Asplenium bulbiferum*
- Grey Sedge *Carex divulsa*
- Turutu *Dianella nigra*
- Geranium 'Pink Spice' *Geranium x antipodeum 'Pink Spice'*
- Chatham Island Geranium *Geranium traversii var elegans*
- Lily Turf *Liriope muscari*
- Japanese Spurge *Pachysandra terminalis*
- Prostrate Rosemary *Rosemarinus prostratus*
- Salvia *Salvia 'Amistad'*
- Blue Salvia *Salvia 'Sally Fun Blue'*
- Carpet Rose *Rosa carpet*



NORWAY MAPLE



KAIKOMAKO



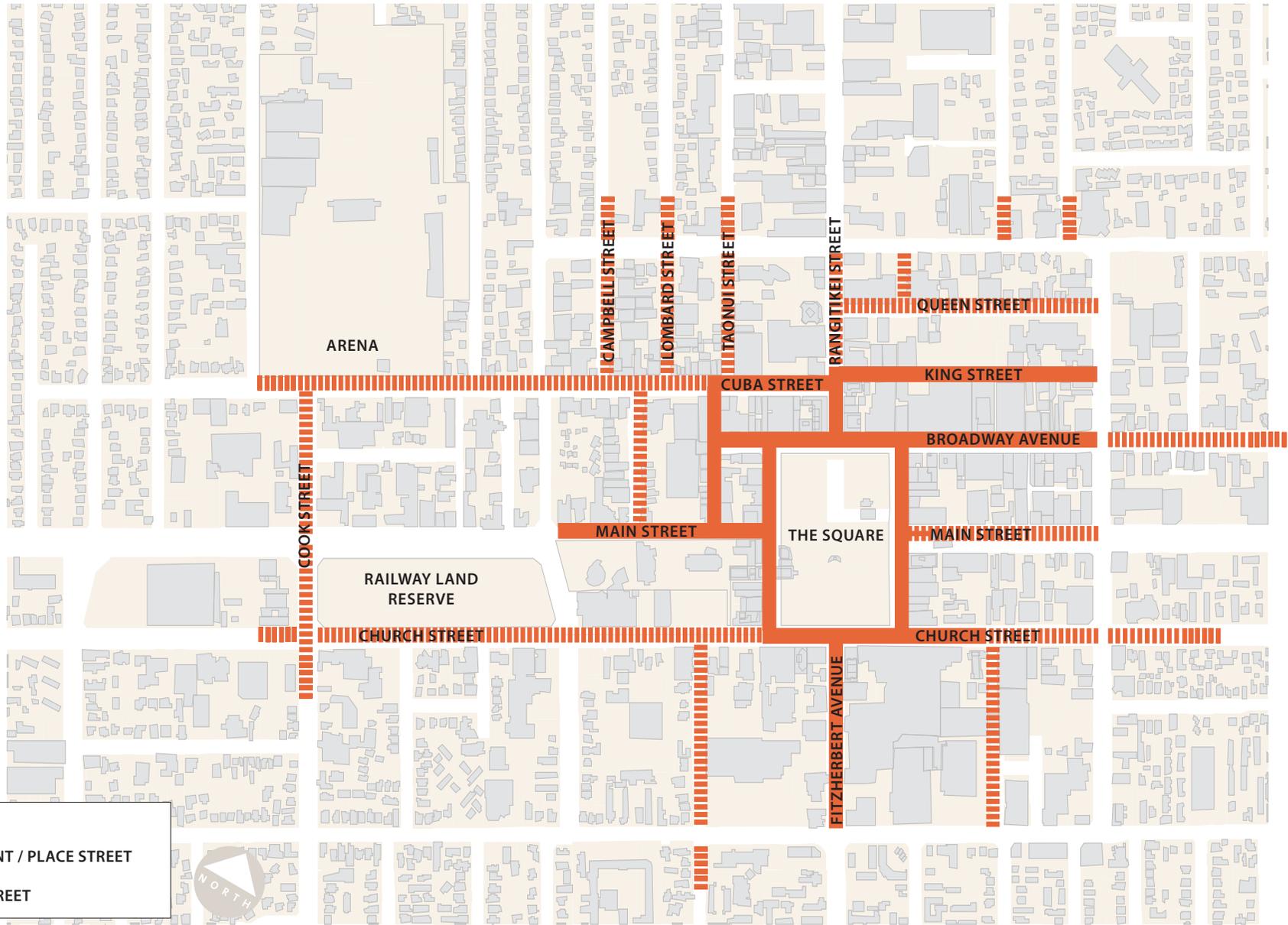
RED OAK



CATALPA



SALVIA



KEY

- MOVEMENT / PLACE STREET
- PLACE STREET

MAP: PLACE STREETS AND MOVEMENT / PLACE STREETS

Map showing the location and extent of movement / place streets and place streets.

Place streets, movement / place streets

Intention

Typically Place Streets and Movement / Place streets consist of soft landscape treatment that receives higher investment than other streets. These areas have a high level of pedestrian priority whilst facilitating efficient destination orientated vehicular movement. Vegetation size and scale needs to accommodate the high pedestrian use these streets typically receive. Vegetation should be an appropriate scale and quality to facilitate events, street trading and temporary activities. The Cuba Link provides a specific opportunity to create a formal City boulevard of mature trees visually linking the Arena Manawatu to CBD.

TYPICAL EXAMPLE - PLACE STREET



TYPICAL EXAMPLE - MOVEMENT / PLACE STREET



Suggested trees:

Hard open space

- Norway Maple [L]  *Acer platanoides*
- Ornamental Cherry [M] *Prunus sp*
- North Island Kowhai [M] 
- Sophora tetraptera*
- Southern Magnolia [L] 
- Magnolia grandiflora*
- Nikau [L]  *Rhopalostylis sapida*
- Japanese Elm [L] *Zelkova serrata*

Suggested understory plants:

- Bidibidi *Acena inermis 'purpurea'*
- Forest Floor Lily *Arthropodium candidum*
- Hen and Chicken Fern *Asplenium bulbiferum*
- Kakaha *Astelia fragrans*
- Kiokio *Blechnum novae zealandiae*
- Pukupuku *Blechnum medium*
- Geranium 'Pink Spice' *Geranium x antipodeum 'Pink Spice'*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Panakenake *Lobelia angulata*
- Japanese Spurge *Pachysandra terminalis*
- Ground Cover Thyme *Thymus praecox 'Coccineus'*
- Kohuhu cultivar 'Golf Ball' *Pittosporum tenuifolium 'Golf Ball'*
- Carpet Rose *Rosa carpet*



FLOWERING CHERRY



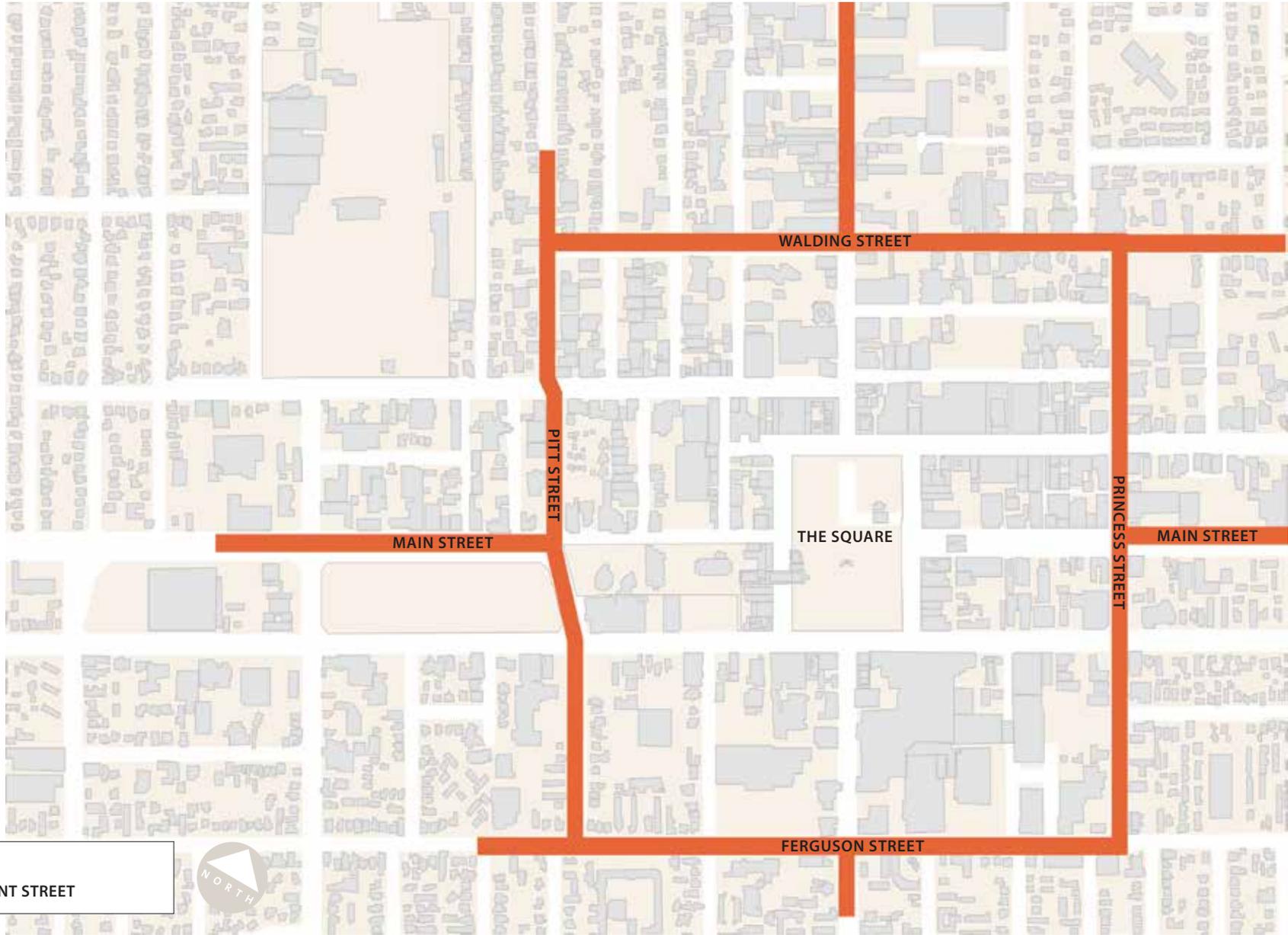
JAPANESE ELM



SOUTHERN MAGNOLIA



NIKAU



MAP: MOVEMENT STREETS

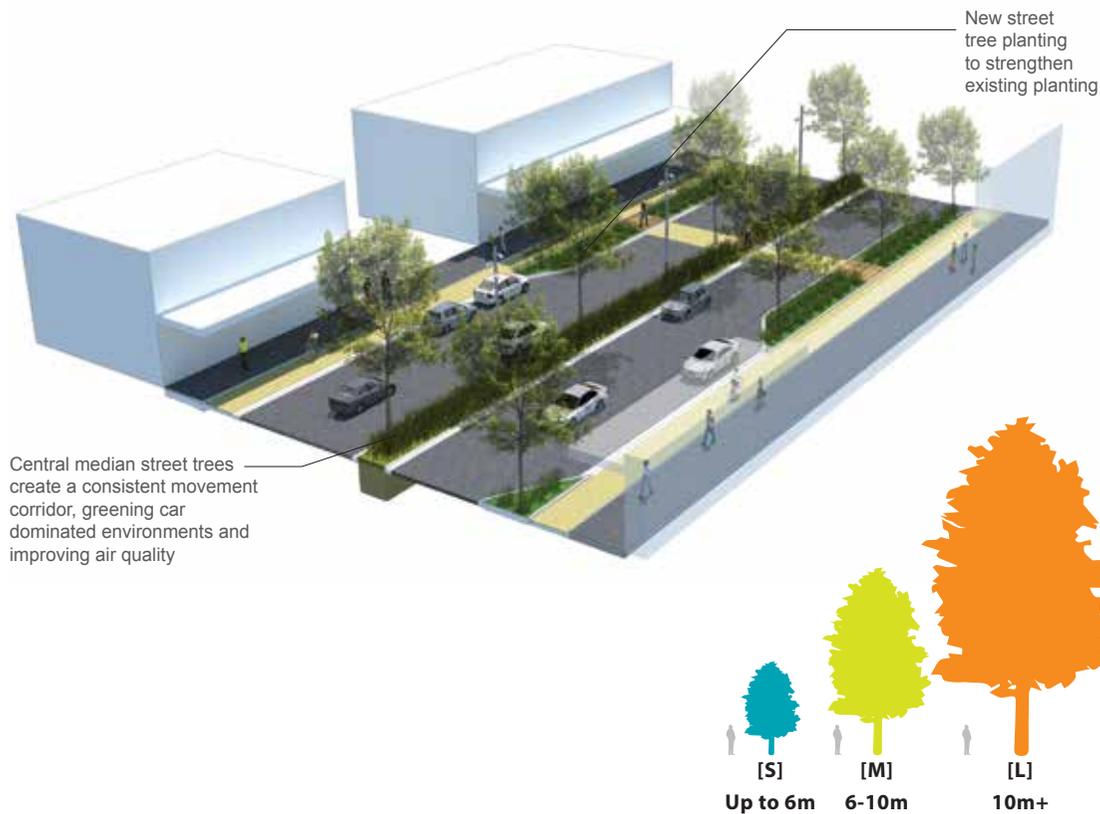
Map showing the location and extent of movement streets.

Movement Streets

Intention

Movement streets are typically key movement corridors around the City Centre (e.g. the Ring Road) with a planted central median. The larger scale streets mean larger scale trees can be used. Vegetation should enhance pedestrian movement routes and the human scale while allowing a safe high level of vehicular use. Large tree pits are used to establish good tree root growth. Vegetation should be consistent in size, species and position (spacing).

TYPICAL EXAMPLE - MOVEMENT STREET



Suggested trees:

Hard open space

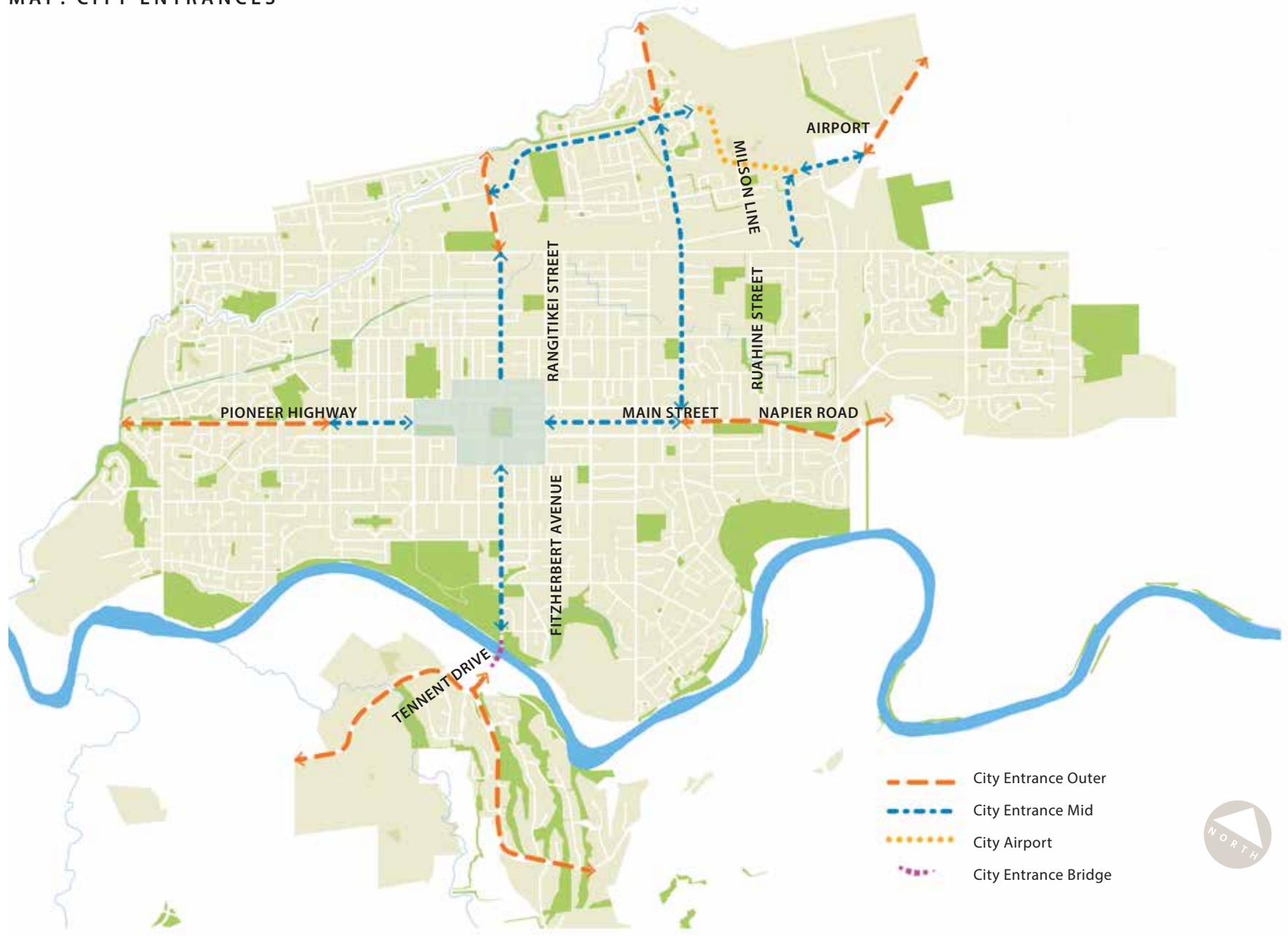
- Columnar Tulip Tree [L] *Liriodendron tulipifera* 'Fastigatum'
- English Oak [L] *Quercus robur* 'Fastigata'
- Oriental Plane [L] *Platanus orientalis*
- Sweet Gum [L] *Liquidambar styraciflua*

Suggested understorey plants:

- Silver Tussock *Poa cita*
- Hebe 'Inspiration' *Hebe* 'Inspiration'
- Ground Cover Thyme *Thymus praecox* 'Coccineus'



MAP: CITY ENTRANCES



CITY ENTRANCES

RANGITIKEI STREET

AIRPORT

FITZHERBERT AVENUE AND TENNET DRIVE

FITZHERBERT BRIDGE

PIONEER HIGHWAY

NAPIER ROAD / MAIN STREET

MILSON LINE / RUAHINE STREET

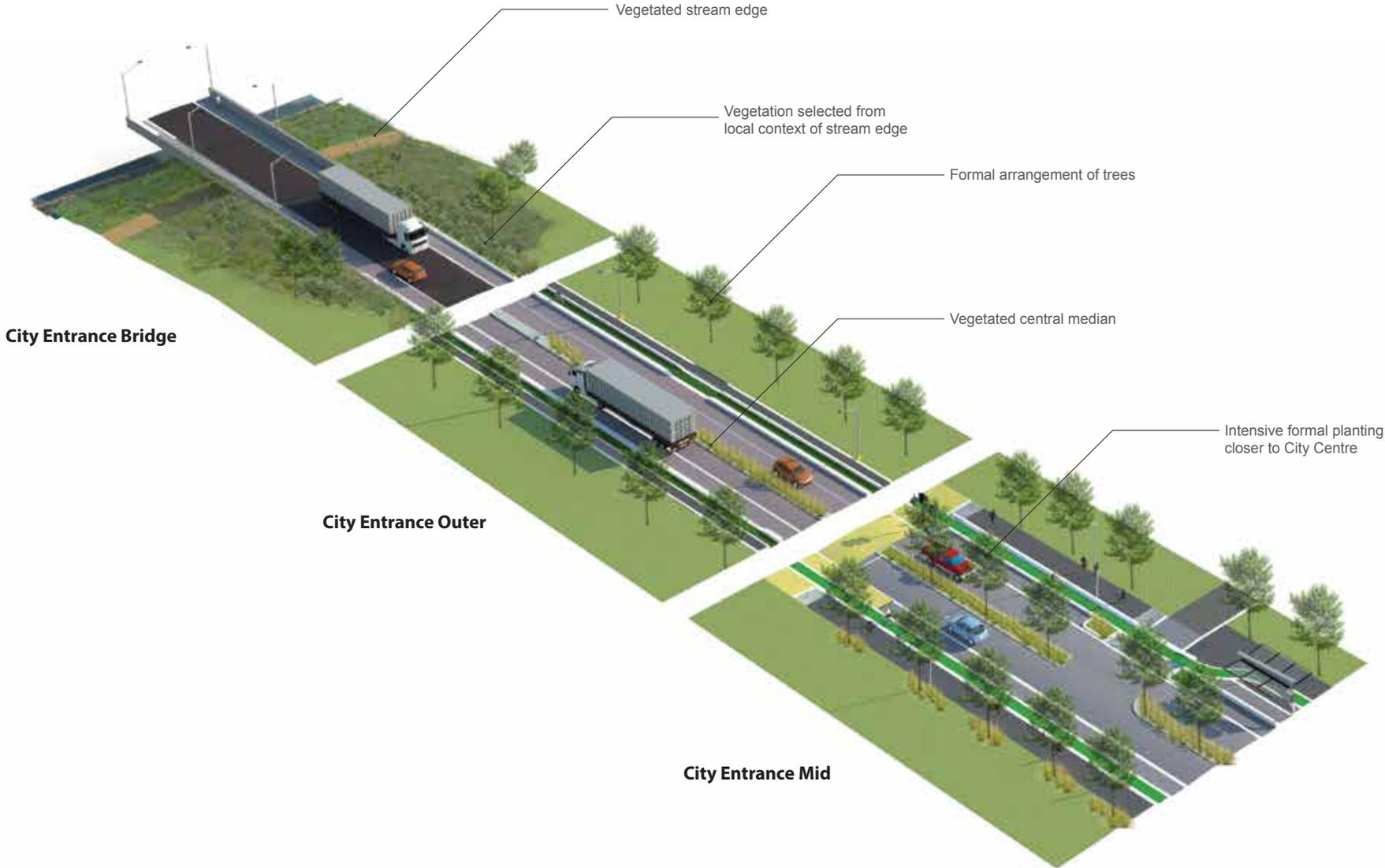


Intention

The City Entrances identified in the Framework connect the City to the north, south, east and west. Vegetation can play an important role in the way people experience entering and leaving Palmerston North along these movement corridors.

Species used in city entrance planting should respond to the specific context but maintain a level of aesthetic consistency in terms of scale, spacing, and the use of underplanting.

TYPICAL EXAMPLE - SEQUENCE OF ARRIVAL



Rangitikei Streets

Intention

In 1995 Liquidambar and Alder trees were planted at the City Entrance to commemorate the 50th Anniversary of the end of World War II. This was followed up by planting along Rangitikei street (up to the Coronation Park at the Rangitikei Street / Tremain Avenue intersection).

Current plantings between the entrance to the urban area and Tremain Avenue are patchy and do not create a welcoming experience for people entering or leaving the City. Future planting should strengthen the commemorative trees to create an avenue effect. The 'City Entrance Mid' section of Rangitikei Street should also encourage an avenue effect; however, larger specimens should be aligned with other tree specimens along Rangitikei Street nearer the City Centre and with other successful City Entrances, such as Fitzherbert Avenue.

MAP: RANGITIKEI STREET



Suggested trees:

- Rewarewa [S-M]  *Thymus praecox 'Coccineus'*
- Oriental Plane [L] *Platanus orientalis*
- Totara [L]  *Podocarpus totara*
- Sweet Gum [L]  *Liquidambar styraciflua*
- Alder [L] *Alnus acuminata*

Suggested understory plants:

- Pohuehue *Muehlenbeckia complexa*
- NZ Iris *Libertia grandiflora*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Carpet Rose *Rosa carpet*



ORIENTAL PLANE



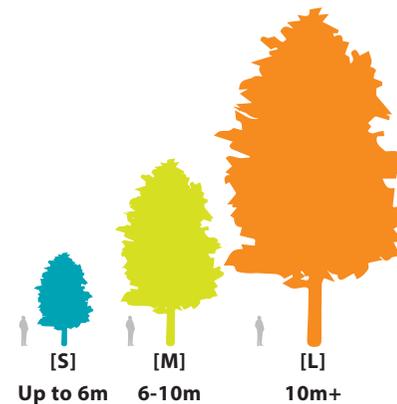
REWAREWA



TOTARA



NZ IRIS



Airport

Intention

The Airport is a gateway to and from the City. This City Entrance should be attractive and lead to a positive sense of arrival and departure.

The Airport presents constraints and opportunities for planting. The District Plan contains rules restricting height and vegetation types that would attract birdlife. The choice of vegetation used in the Airport Entrance will need to take this into account, especially in the immediate vicinity of the Airport.

Vegetation along the 'City Entrance Mid' sections should be of a scale and nature that creates a sense that you are approaching, or have left an important destination.

Vegetation along the 'City Entrance Outer' section should create a sense of feeling that you are transitioning from the outskirts of the City, into the urban area (and vice versa).

MAP: AIRPORT

KEY

-  CITY ENTRANCE OUTER
-  CITY ENTRANCE MID
-  CITY ENTRANCE AIRPORT



Suggested trees:

Hard open space

- Titoki [S]  *Alectryon excelsus*
- English Oak [S] *Quercus robur* 'Fastigata'
- Japanese Snowbell Tree [M] *Styrax japonica*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- NZ Iris *Libertia grandiflora*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Hebe 'Inspiration' *Hebe 'Inspiration'*
- Carpet Rose *Rosa carpet*



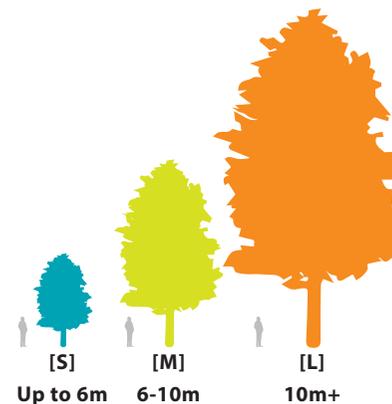
HEBE 'WIRI MIST'



POHUEHUE



NZ IRIS



Fitzherbert Avenue and Tennent Drive

Intention

Fitzherbert Avenue leads to and from the city in a southerly direction towards the Manawatū River and in a broader sense starts the journey out to the Tararua Ranges. Street trees and planting chosen for Fitzherbert Avenue, which runs between the Square and the Manawatū River, would ideally encourage birds and insects, strengthening this passage as a green corridor and providing a food source in addition to the nearby River and Victoria Esplanade.

Historically, Plane trees have been planted along Fitzherbert Avenue and these trees have performed well and provide shade for pedestrians. This species should be continued along the southern entrance taking advantage of their good performance record as well as strengthening the existing tree network.

The International Pacific United Tertiary Institute (IPU) is a high amenity campus in the Summerhill suburb. It has well established Ornamental Cherry Trees on its campus. A corridor of ornamental Cherry Trees along Summerhill Drive to the Fitzherbert Bridge should be planted to improve connectivity to the City.

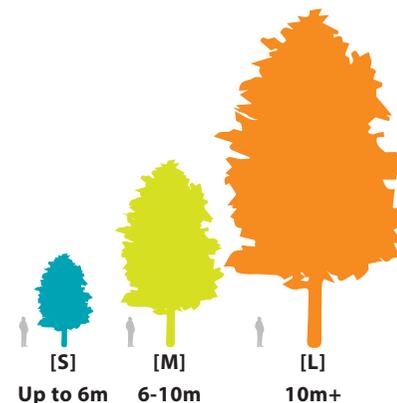


Suggested trees:

- Ti Kouka [M]  *Cordyline Australis*
- Ornamental Cherry [M] *Prunus sp*
- Pohutukawa Cultivar [M]  *Metrosideros excelsa* 'Maori Princess'
- Indian Lilac [M-L] *Azadirachta indica*
- Oriental Plane [L] *Platanus orientalis*
- Catalpa [L] *Catalpa speciosa*
- Japanese Elm [L] *Zelkova serrata*
- Hinau [L]  *Elaeocarpus dentatus*
- Puriri [L]  *Vitex lucens*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- NZ Iris *Libertia grandiflora*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Carpet Rose *Rosa carpet*



Fitzherbert Bridge

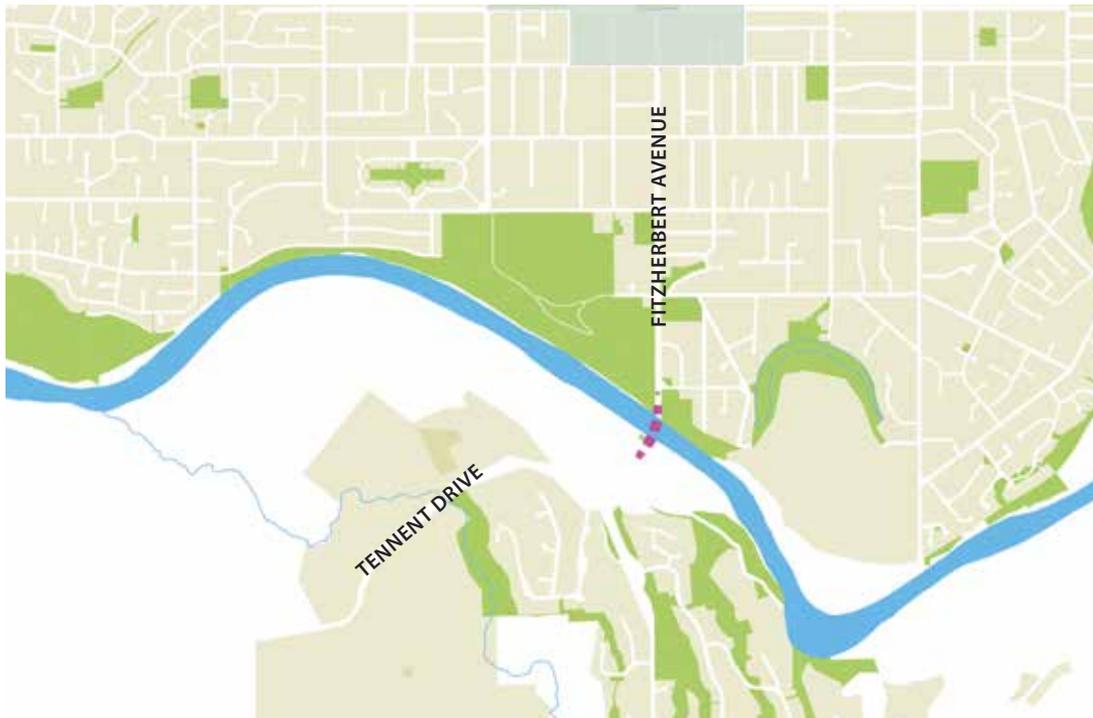
Intention

The Manawatū River is an important and unique feature in the City. Vegetation should complement the river and help identify the distinctiveness of this location as a threshold between the established urban area, Massey University and Summerhill communities.

MAP: FITZHERBERT BRIDGE

KEY

 CITY ENTRANCE BRIDGE



Suggested trees:

- Manuka [S] *Leptospermum scoparium*
- Oriental Plane [L] *Platanus orientalis*
- Ti Kouka [M] *Cordyline australis*
- Ornamental Crab Apple [M] *Malus tritobotaa*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- NZ Iris *Libertia grandiflora*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Carpet Rose *Rosa carpet*
- Harakeke *Phormium tenax*
- Longwood Tussock *Carex comans*
- Wind Grass/Gossamer Grass *Anemanthele lessoniana*
- Hen and Chicken Fern *Asplenium bulbiferum*
- Forest Sedge *Carex dissita*
- Red Tussock *Chionochloa rubra*
- Parataniwha *Elatostema rugosum*
- Kawakawa *Macropiper excelsum*



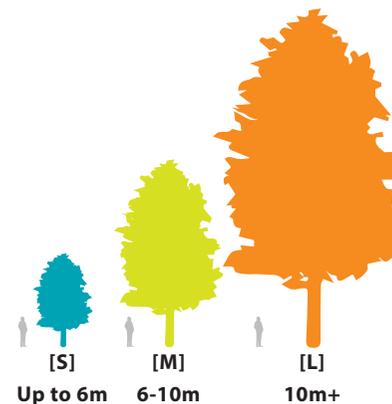
ORIENTAL PLANE



POHUEHUE



NZ IRIS



Pioneer Highway

Intention

Pioneer Highway leads to and from the city in a westerly direction towards Longburn and further afield to the coast. The Mangaone Bridge is a transition point between the rural and urban areas. This transition point is an ideal location to showcase vegetation that would have been prominent here before human settlement, particularly Harakeke, Raupo, Ti Kouka, Toetoe and Kahikatea.

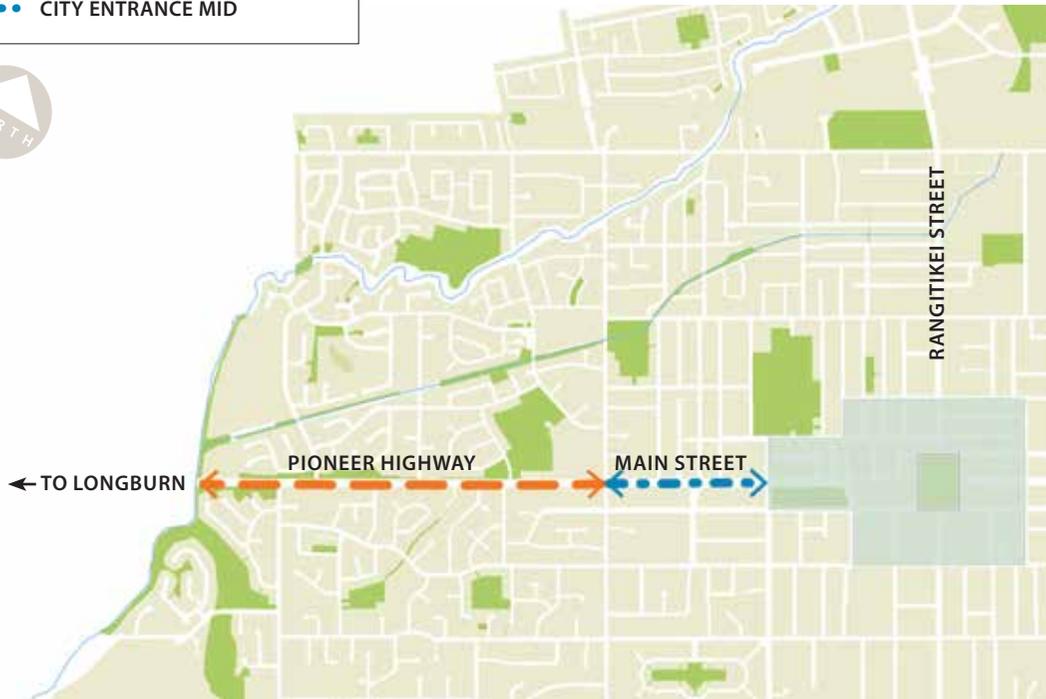
Along the 'City Entrance Outer' section any new plantings should complement the scale of existing vegetation on the Dalfield and Chippendale Reserves. Opportunities should also be taken to create an avenue effect by planting on the residential side of Pioneer Highway.

More intensive formal vegetation should be planted along the 'City Entrance Mid' section to establish a strong avenue character to reinforce arrival into the City Centre.

MAP: PIONEER HIGHWAY

KEY

- CITY ENTRANCE OUTER
- CITY ENTRANCE MID



Suggested trees:

- Ti Kouka [M] *Cordyline australis*
- North Island Kowhai [L] *Sophora tetraptera*
- Indian Lilac [M-L] *Melia azedarach*
- Catalpa [L] *Catalpa speciosa*
- Japanese Elm [L] *Zelkova serrata*
- Kahikatea [L] *Dacrydium dacrydioides*
- Totara [L] *Podocarpus totara*
- Sweet Gum [L] *Liquidambar styraciflua*
- Titoki [L] *Alectryon excelsus*
- Chinese Elm [L] *Ulmus parvifolia*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- Hebe 'Red Rum' *Hebe 'Red Rum'*
- Carpet Rose *Rosa carpet*
- Turutu *Dianella nigra*
- Harakeke *Phormium tenax*
- Raupo *Typha angustifolia*
- Toetoe *Austroderia sp*



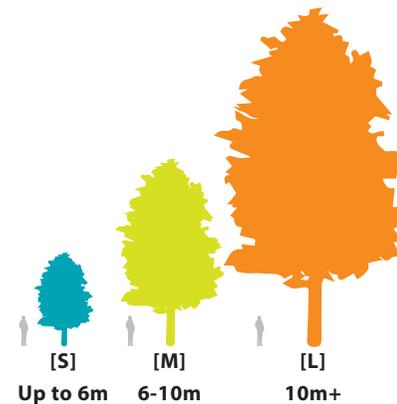
NORTH ISLAND KOWHAI



POHUEHUE



TURUTU



Napier Road/Main Street

Intention

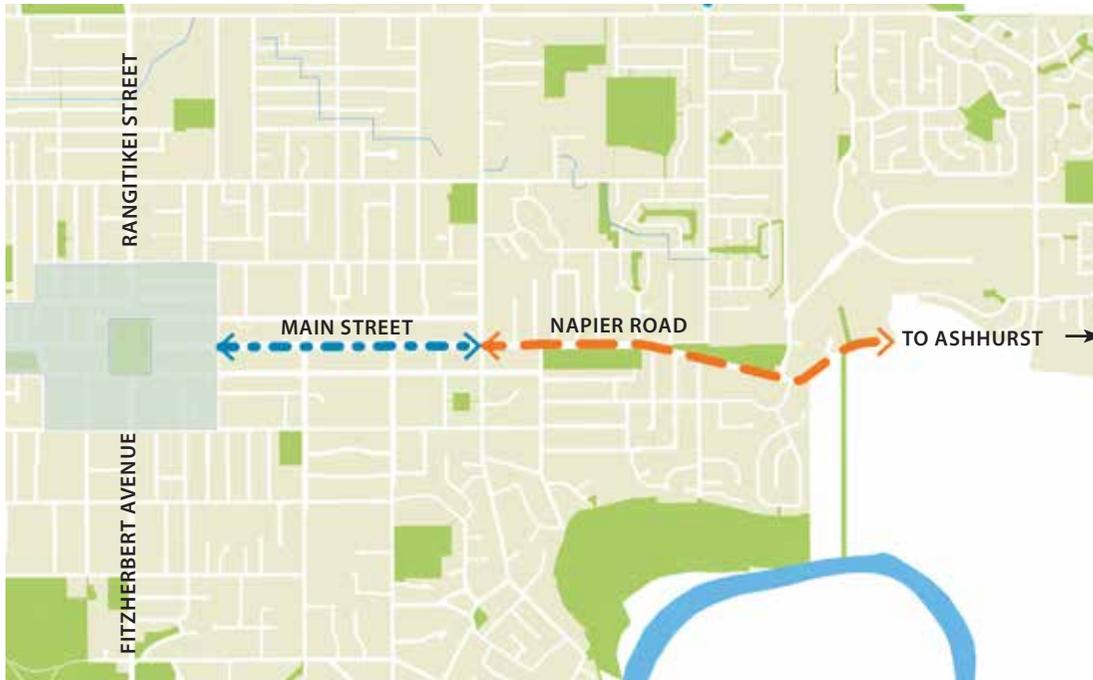
Napier Road leads to and from the city in an easterly direction towards Ashhurst and further afield to the Manawātū Gorge. Street trees chosen for Napier Road should be a variety which encourages bird life, strengthening this passage as a green corridor from Memorial Park to Ashhurst Domain.

More intensive formal vegetation should be planted along the 'City Entrance Mid' section to establish a strong avenue character to reinforce arrival into the City Centre.

MAP: NAPIER ROAD

KEY

- CITY ENTRANCE OUTER
- CITY ENTRANCE MID



Suggested trees:

- Pohutukawa [L] *Metrosideros excelsa*
- Hinau [L] *Elaeocarpus dentatus*
- Indian Lilac [M-L] *Melia azedarach*
- Catalpa [L] *Catalpa speciosa*
- Japanese Elm [L] *Zelkova serrata*
- Totara [L] *Podocarpus totara*
- Titoki [L] *Alectryon excelsus*
- RewaRewa [L] *Knightia excels*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- Turutu *Dianella nigra*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Carpet Rose *Rosa carpet*



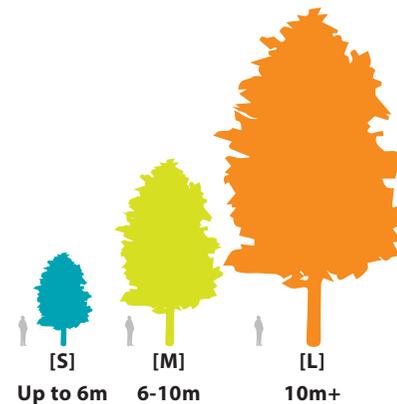
HEBE 'RED RUM'



HEBE 'WIRI MIST'



POHUEHUE



Milson Line / Ruahine Street

Intention

Milson Line is a major City Entrance. It is utilised by Feilding commuters in particular, as well as people wanting easy access to the Airport and hospital. The soil in this location is “high clay”, so vegetation choices need to be responsive to high water tables in winter and dry conditions in summer.

There is a strong threshold between the rural landscape and residential streets as the road crosses into the urban zone. Where Milson Line crosses Leander Place is the strongest moment of transition into the urban zone. From here heading south, strengthening the existing vegetation network is the goal, and also further reinforcing the green connection between the main east-west running corridors.

The northern end of the urban zone is exposed to the prevailing northerly wind, and dramatically affects vegetation. This needs to be considered in relation to soil type and species selection.

The District Plan contains rules restricting height and vegetation types that would attract birdlife near the Airport. The choice of vegetation used in the Milson Line Entrance will need to take this into account, especially in the immediate vicinity of the Airport.

MAP: MILSON LINE



Suggested trees:

- Rewarewa [S] *Knightia excelsa*
- North Island Kowhai [L] *Sophora tetraptera*
- Oriental Plane [L] *Platanus orientalis*
- Totara [L] *Podocarpus totara*

Suggested understorey plants:

- Pohuehue *Muehlenbeckia complexa*
- NZ Iris *Libertia grandiflora*
- Hebe 'Wiri Mist' *Hebe 'Wiri Mist'*
- Carpet Rose *Rosa carpet*
- Turutu *Dianella nigra*



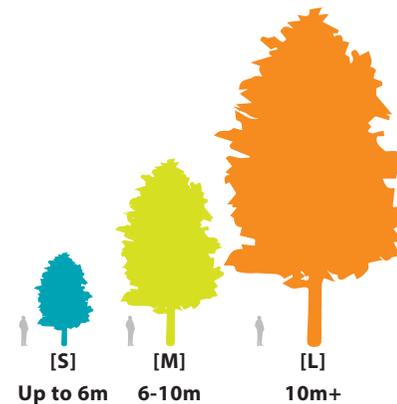
NORTH ISLAND KOWHAI



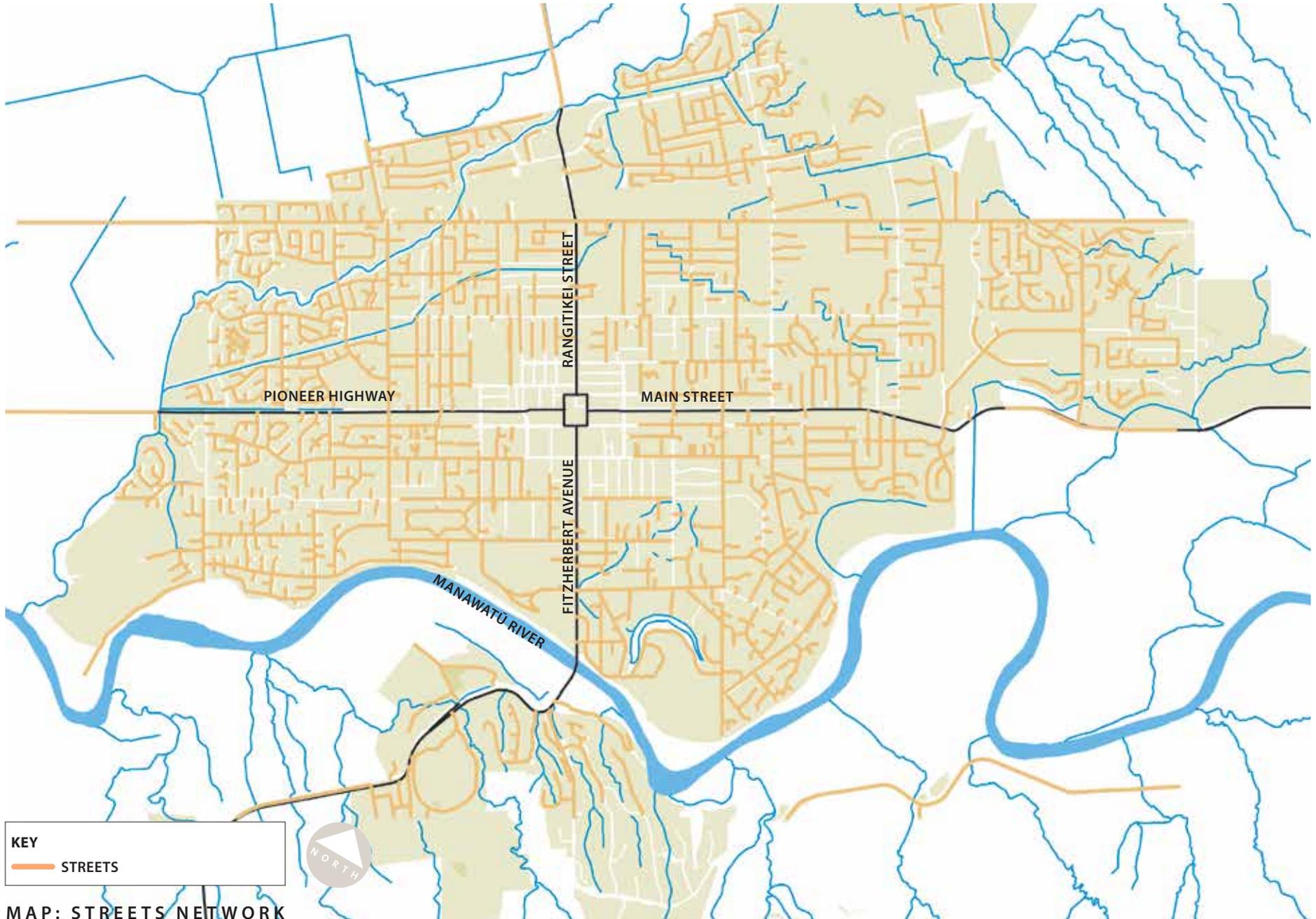
POHUEHUE



TURUTU







KEY

— STREETS

MAP: STREETS NETWORK

STREETS

ARTERIAL
COMMERCIAL
RESIDENTIAL
CHARACTER
INDUSTRIAL
RURAL ROADS



KEY
— ARTERIAL STREETS

MAP: ARTERIAL STREETS

Map showing the location and extent of arterial streets.

Arterial Streets

Intention

Vegetation is to provide an important green element to arterial routes which typically have a high proportion of vehicles, including heavy vehicles, and a low to moderate use by pedestrians. Street tree planting is to promote streetscape values, character, shade and shelter and could be used to reduce air pollutants from heavy vehicles. Vegetation could be used to create an even rhythm that can be appreciated by drivers.

Clear stem (3m) street trees planted in the central raised median provide relief on long stretches of road. Locations should not conflict with existing services and access safety guidelines. Trees should be planted at 8-20m centres, taking road speed in to consideration; faster roads suit larger tree spacing whereas slower streets suit closer spacing. Low ground cover and shrub species should be planted into tree pits and, where space allows, as bio-retention and infiltration areas. Trees to have adequate ventilation and watering systems.

TYPICAL EXAMPLE - ARTERIAL STREET



Suggested trees:

- Indian Lilac [M-L] *Melia azedarach*
- Catalpa [L] *Catalpa sp*
- Japanese Elm [L] *Zelkova serrata*

Suggested understory plants:

- Red Tussock *Chionochloa rubra*
- Hebe Diosmifolia *Hebe diosmifolia*
- Hebe 'Inspiration' *Hebe 'Inspiration'*
- NZ Iris *Libertia grandiflora*
- Silver Tussock *Poa cita*
- Sweet Box *Sarcococca confusa*
- Ground Cover Thyme *Thymus praecox 'Coccineus'*
- Carpet Rose *Rosa carpet*



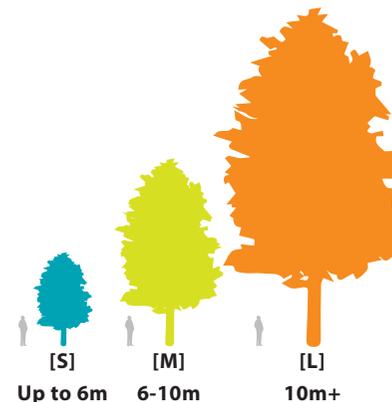
CATALPA



INDIAN LILAC



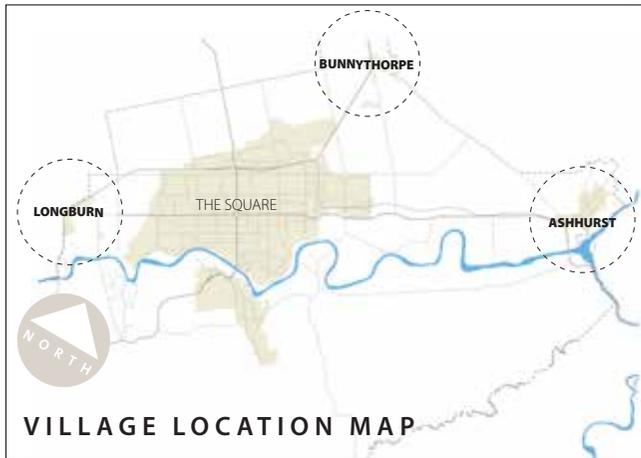
JAPANESE ELM



Arterial – Villages maps

44

[Streets] VEGETATION FRAMEWORK FOR PALMERSTON NORTH

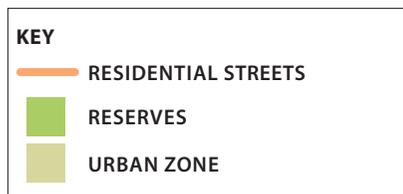
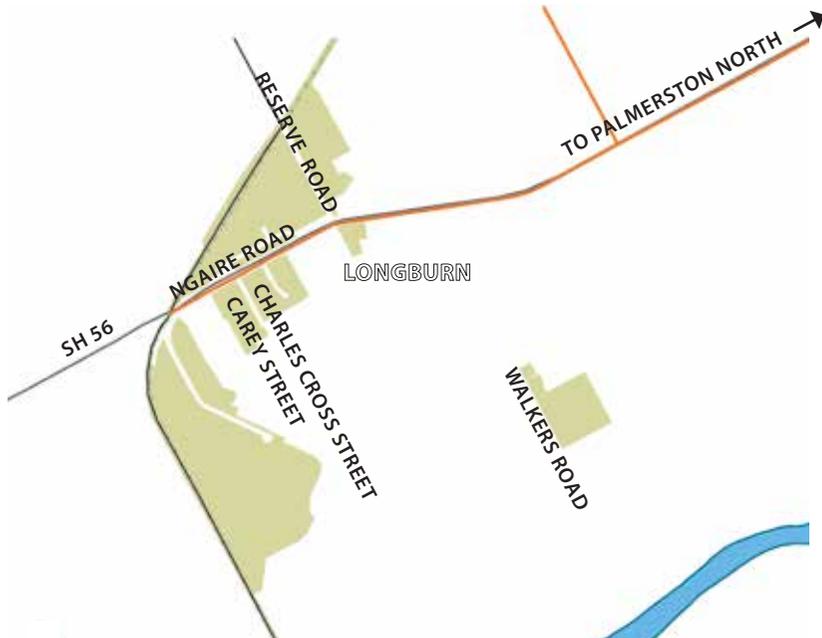


KEY

- ARTERIAL STREETS
- RESERVES
- URBAN ZONE

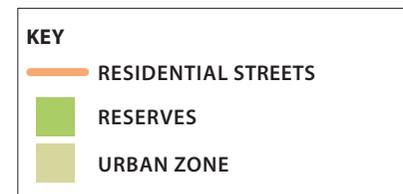
MAP: ARTERIAL STREETS IN ASHHURST VILLAGE

Map showing the location and extent of arterial streets.



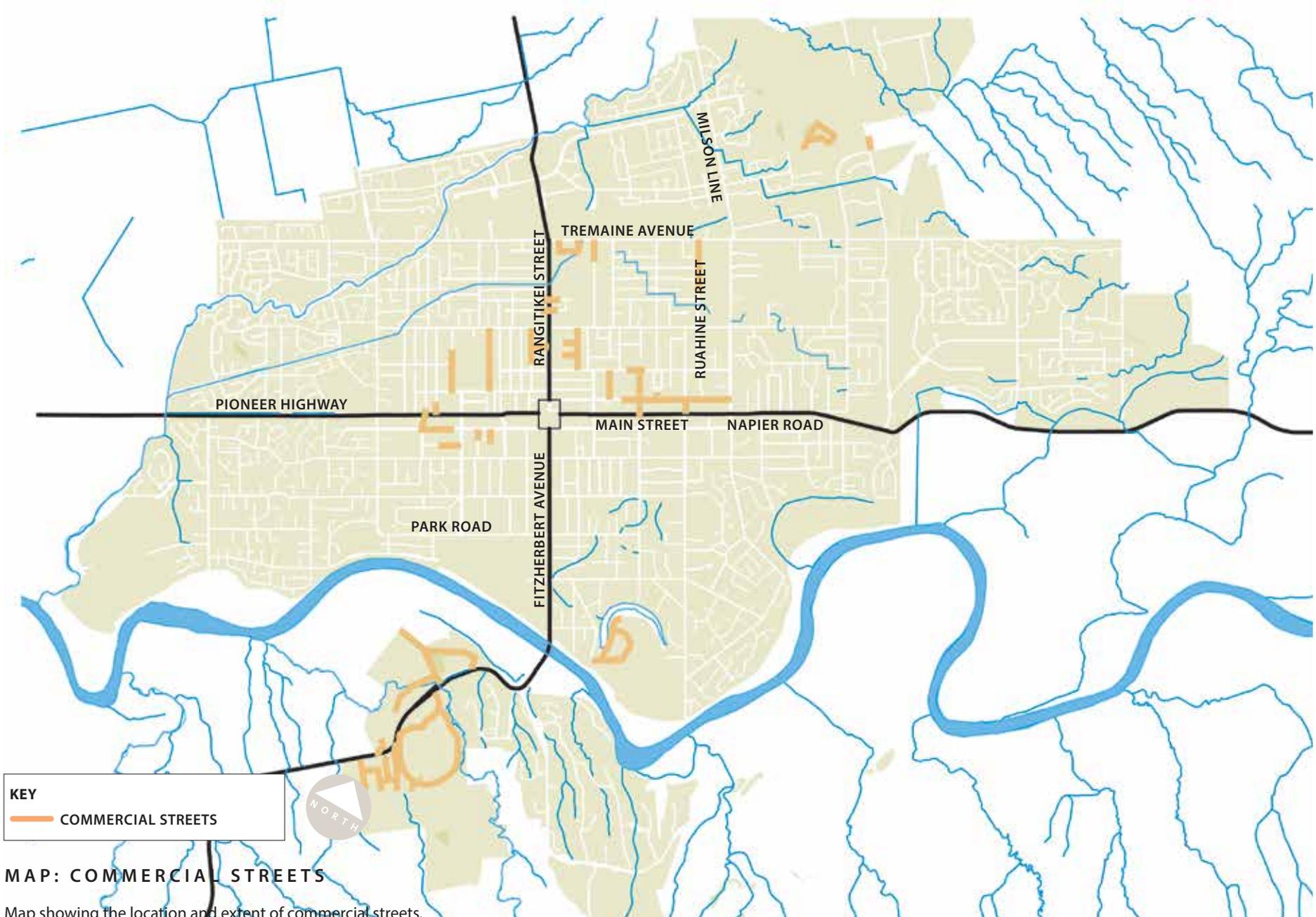
MAP: ARTERIAL STREETS IN LONGBURN VILLAGE

Map showing the location and extent of arterial streets.



MAP: ARTERIAL STREETS IN BUNNYTHORPE VILLAGE

Map showing the location and extent of arterial streets.



MAP: COMMERCIAL STREETS

Map showing the location and extent of commercial streets.

Commercial Streets

Intention

Vegetation in commercial streets should promote high streetscape values, character, amenity, shade and shelter. Commercial streets are typically heavily used by pedestrians and are both major transport routes connecting through to arterials as well as commercial roads at a local scale where pedestrians become more of a priority. A planting pattern that creates an even rhythm that can be appreciated by drivers should be used.

Clear stem (3m) street trees should be planted in the landscape strip, locations to fit with existing services, accesses, safety guidelines and pedestrian routes. Tree pits should be no less than 2m x 2m to include complementary low ground cover / shrub species to act as bio-retention and infiltration areas where space allows. Trees should be planted at 8-20m centres in larger commercial streets with a minimum of 8m³ of soil and include adequate ventilation and watering systems. Tree spacings should take road speed in to consideration; faster roads suit larger tree spacing whereas slower streets suit closer spacing.

TYPICAL EXAMPLE - COMMERCIAL STREET



Suggested trees:

- Japanese Snowbell Tree [M] *Styrax japonica*
- Indian Lilac [M-L] *Melia azedarach*
- Columnar Tulip Tree [L] *Liriodendron tulipifera* 'Fastigatum'
- Catalpa [L] *Catalpa speciosa*
- Tulip Tree [L] *Liriodendron tulipifera*
- Maidenhair Tree [L]  *Ginkgo biloba* (Male)
- Southern Magnolia [L] *Magnolia grandiflora*
- Sweet Michelia [L] *Michelia doltsopa*
- Japanese Elm [L] *Zelkova serrata*



MAIDENHAIR TREE



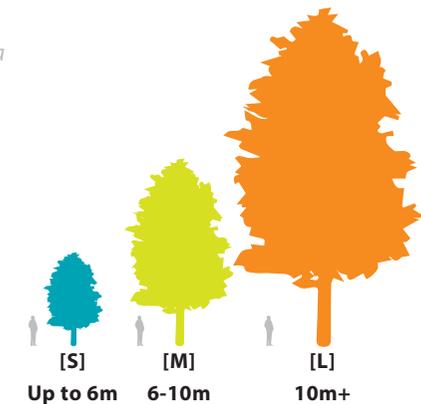
SOUTHERN MAGNOLIA



JAPANESE ELM

Suggested understorey plants:

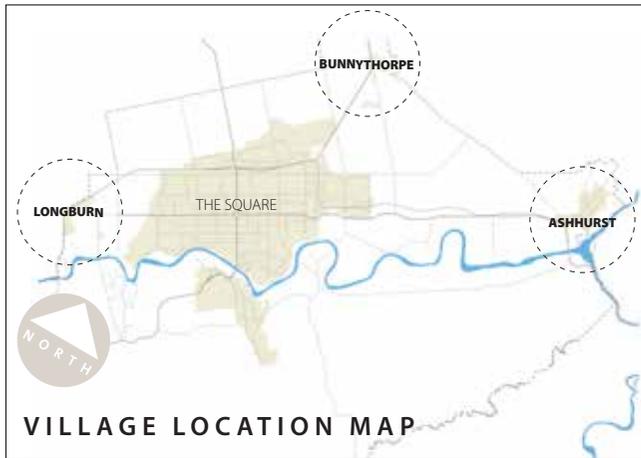
- Forest Floor Lily *Arthropodium candidum*
- Kakaha/Bush Lily *Astelia fragrans*
- Kiokio *Blechnum novae zealandiae*
- Common Box *Buxus sempervirens*
- Longwood Tussock *Carex comans*
- Red Tussock *Chionochloa rubra*
- Pukupuku *Blechnum medium*
- Hebe Diosmifolia
- Hebe 'Inspiration'
- NZ Iris *Libertia grandiflora*
- Kohuhu Cultivar *Pittosporum tenuifolium* 'Golf Ball'
- Sweet Box *Sarcococca confusa*
- Ground Cover Thyme *Thymus praecox* 'Coccineus'
- Carpet Rose *Rosa carpet*



Commercial – Villages maps

48

[Streets] VEGETATION FRAMEWORK FOR PALMERSTON NORTH



MAP: COMMERCIAL STREETS IN ASHHURST VILLAGE

Map showing the location and extent of commercial streets.



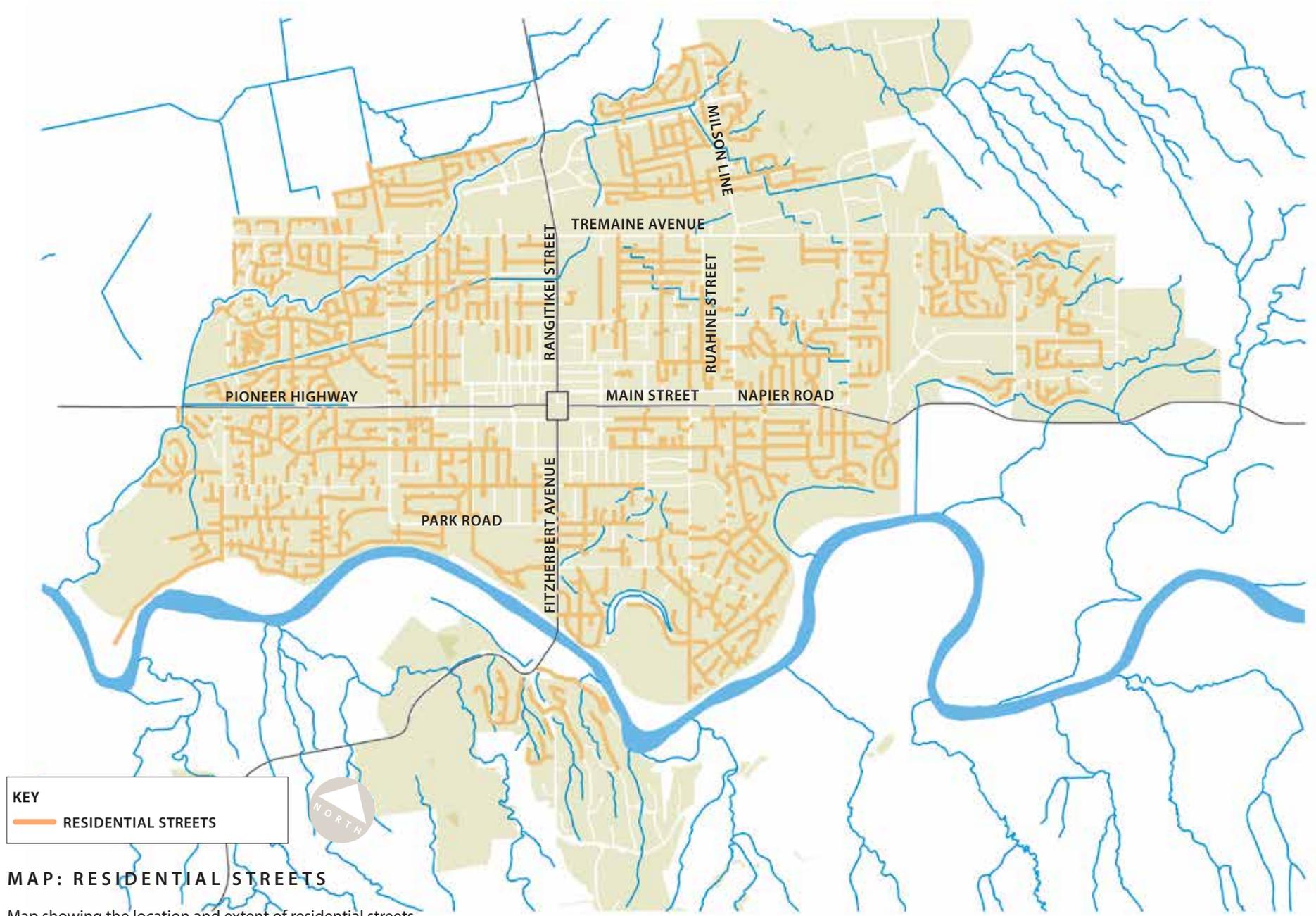
MAP: COMMERCIAL STREETS IN LONGBURN VILLAGE

Map showing the location and extent of commercial streets.



MAP: COMMERCIAL STREETS IN BUNNYTHORPE VILLAGE

Map showing the location and extent of commercial streets.



KEY
— RESIDENTIAL STREETS

MAP: RESIDENTIAL STREETS

Map showing the location and extent of residential streets.

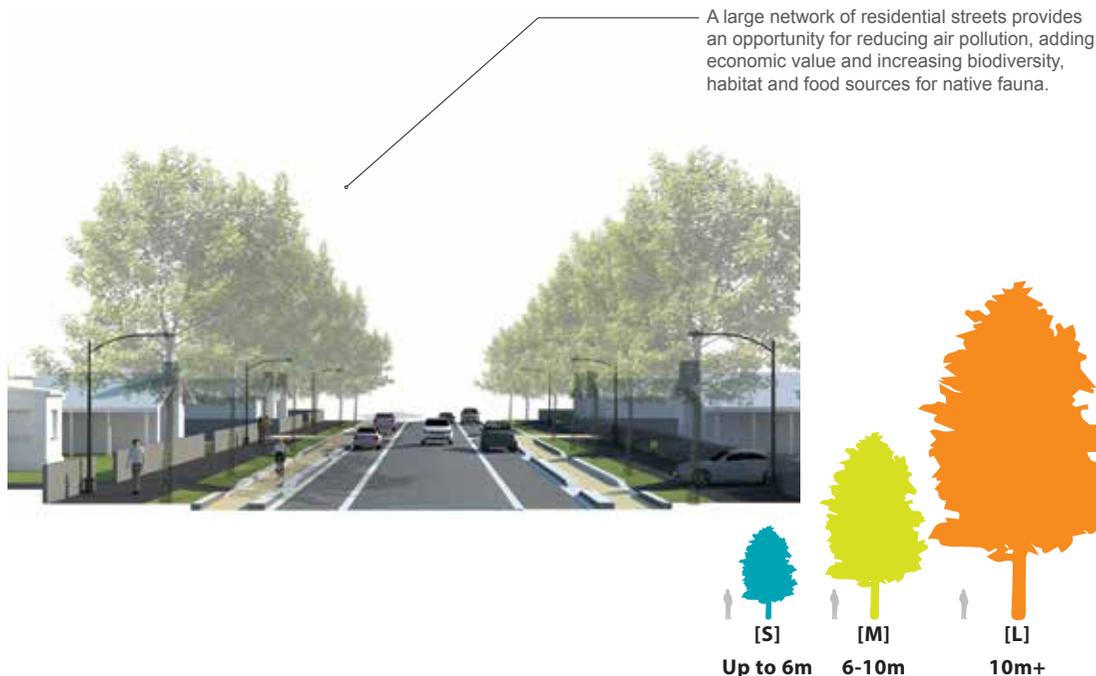
Residential Streets

Intention

Vegetation in residential streets is intended to promote high streetscape values and character, and to act as a buffer between pedestrians and users of the carriageway. Low planting should be able to accommodate storm water infiltration and bio-retention functions where appropriate. Residential streets are used heavily by pedestrians and vegetation should be conducive to facilitating human interaction. Species used can be specific to the individual street. To add interest and introduce a pedestrian scale to larger residential streets, species with interesting foliage, colour and flowers should be included. A species that flowers will be advantageous where streets have grass berms for flowers to drop onto.

Clear stem (3m) street trees should be planted in the landscape strip, locations to fit with existing services, access, safety guidelines and pedestrian routes. Tree pits should be no less than 2m x 2m and include adequate ventilation and watering systems. Trees should be planted at 8-20m centres in larger residential streets and at 12m spacing to delineate parking areas. Tree spacings should take road speed in to consideration; faster roads suit larger tree spacing whereas slower streets suit closer spacing.

TYPICAL EXAMPLE - RESIDENTIAL STREET



Suggested trees:

- Small Leaved Kowhai [S-M] *Sophora microphylla* 
- Japanese Snowbell Tree [M] *Styrax japonica*
- Flowering Cherry [M] *Prunus sp*
- North Island Kowhai [L] *Sophora tetraptera* 
- Indian Lilac [M-L] *Melia azedarach*
- Catalpa [L] *Catalpa speciosa*
- Tulip Tree [L] *Liriodendron tulipifera*
- Southern Magnolia [L] *Magnolia grandiflora* 
- Sweet Michelia [L] *Michelia doltsopa*
- Japanese Elm [L] *Zelkova serrata*

Suggested understorey plants:

- Forest Floor Lily *Arthropodium candidum*
- Kakaha/Bush Lily *Astelia fragrans*
- Kiokio *Blechnum novae zealandiae*
- Common Box *Buxus sempervirens*
- Geranium 'Pink Spice' *Geranium x antipodeum 'Pink Spice'*
- Chatham Island Geranium *Geranium traversii var elegans*
- Japanese Spurge *Pachysandra terminalis*
- Kohuhu Cultivar *Pittosporum tenuifolium 'Golf Ball'*
- Prostrate Rosemary *Rosemarinus prostratus*
- Salvia *Salvia 'Amistad'*
- Blue Salvia *Salvia 'Sally Fun Blue'*
- Ground Cover Thyme *Thymus praecox 'Coccineus'*
- Carpet Rose *Rosa carpet*
- Harakeke *Phormium tenax*



FLOWERING CHERRY



CATALPA

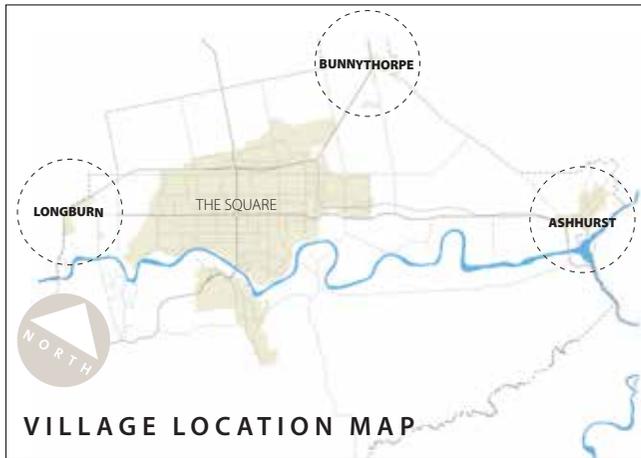


JAPANESE ELM



Residential – Villages maps

52

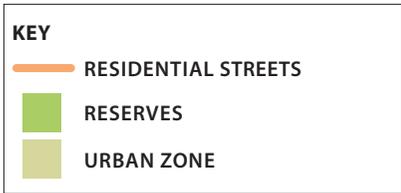


KEY

	RESIDENTIAL STREETS
	RESERVES
	URBAN ZONE

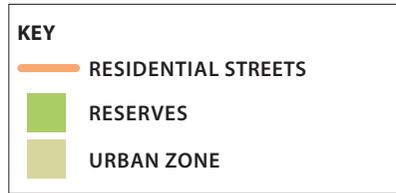
MAP: RESIDENTIAL STREETS IN ASHHURST VILLAGE

Map showing the location and extent of residential streets.



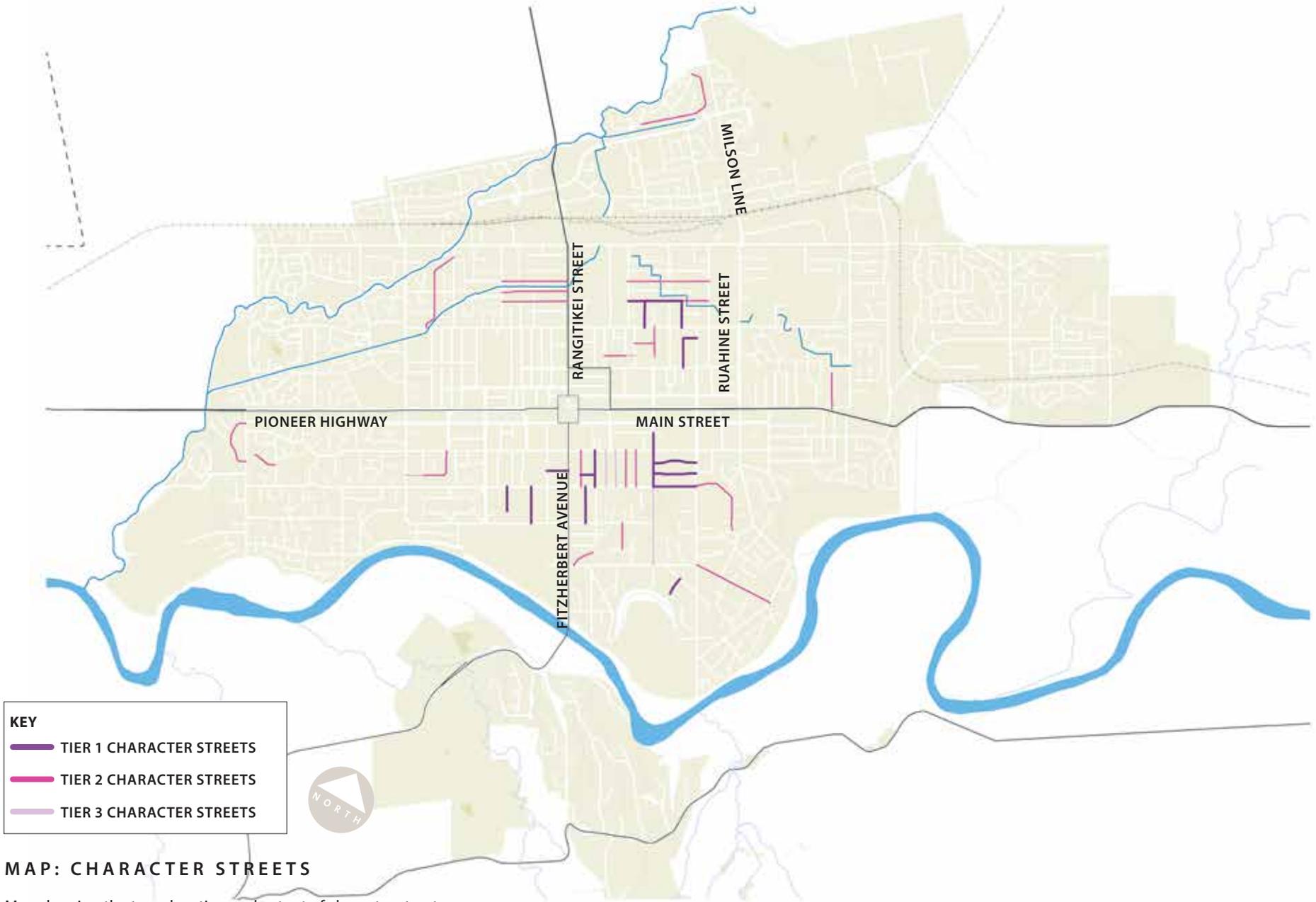
MAP: RESIDENTIAL STREETS IN LONGBURN VILLAGE

Map showing the location and extent of residential streets.



MAP: RESIDENTIAL STREETS IN BUNNYTHORPE VILLAGE

Map showing the location and extent of residential streets.



MAP: CHARACTER STREETS

Map showing the type, location and extent of character streets.

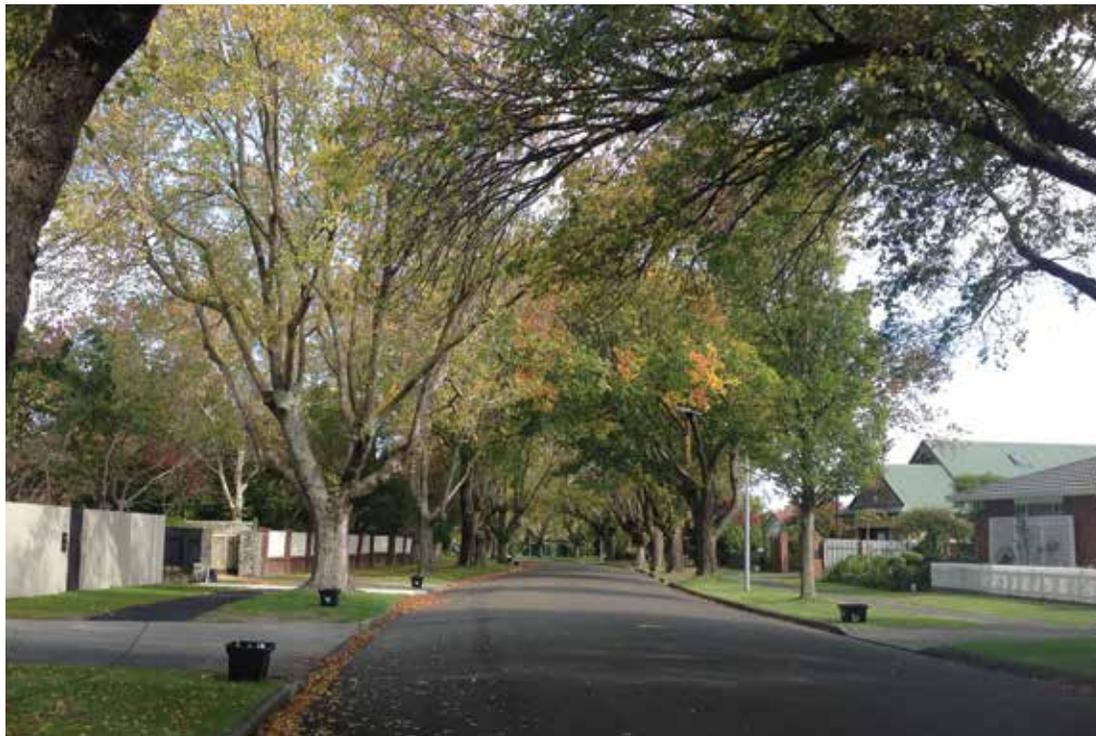
Character Streets – Tiers 1-3

Intention

Tier 1 – Outstanding Streets- The vegetation on outstanding streets are typically large scale, well established healthy trees with outstanding amenity value. This condition generally applies to the entire extent of these streets. The intention is to protect, maintain and retain trees in these locations.

Tier 2 – Significant Plantings - Medium scale, well established, one or two species, high amenity value, healthy trees, species that are intended to be continued to be planted; generally apply to the entire extent of streets. The intention is to maintain trees in these locations.

Tier 3 – Extension of Tier 1 or 2 - Tier 3 streets are opportunities to extend Tier 1 or 2 streets or where part of a Tier 1 or 2 Street has a missing segment of vegetation and there is opportunity to plant this section. The intention is to keep a consistent streetscape treatment along the full length of street and to create additional character streets where non-planted or non-character streets are in close proximity to a cluster of existing character streets.



A Tier 1 Street in Autumn - Well established, large scale trees with outstanding amenity value.

Suggested trees:

English Oak [L] *Quercus robur*
 Maintain existing species for consistency

Suggested understorey plants:

- Forest Floor Lily *Arthropodium candidum*
- Kakaha/Bush Lily *Astelia fragrans*
- Kiokio *Blechnum novae zealandiae*
- Common Box *Buxus sempervirens*
- Geranium 'Pink Spice' *Geranium x antipodeum 'Pink Spice'*
- Chatham Island Geranium *Geranium traversii var elegans*
- Japanese Spurge *Pachysandra terminalis*
- Kohuhu Cultivar *Pittosporum tenuifolium 'Golf Ball'*
- Prostrate Rosemary *Rosemarinus prostratus*
- Salvia *Salvia 'Armistad'*
- Blue Salvia *Salvia 'Sally Fun Blue'*
- Ground Cover Thyme *Thymus praecox 'Coccineus'*
- Kakaha *Astelia fragrans*



ENGLISH OAK



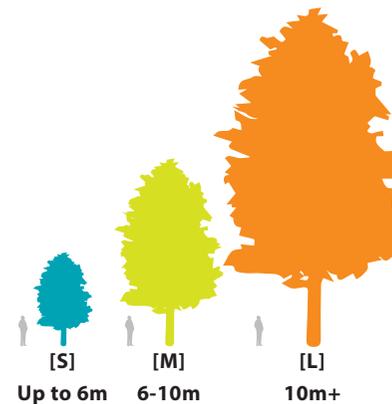
BUSH ASTELIA

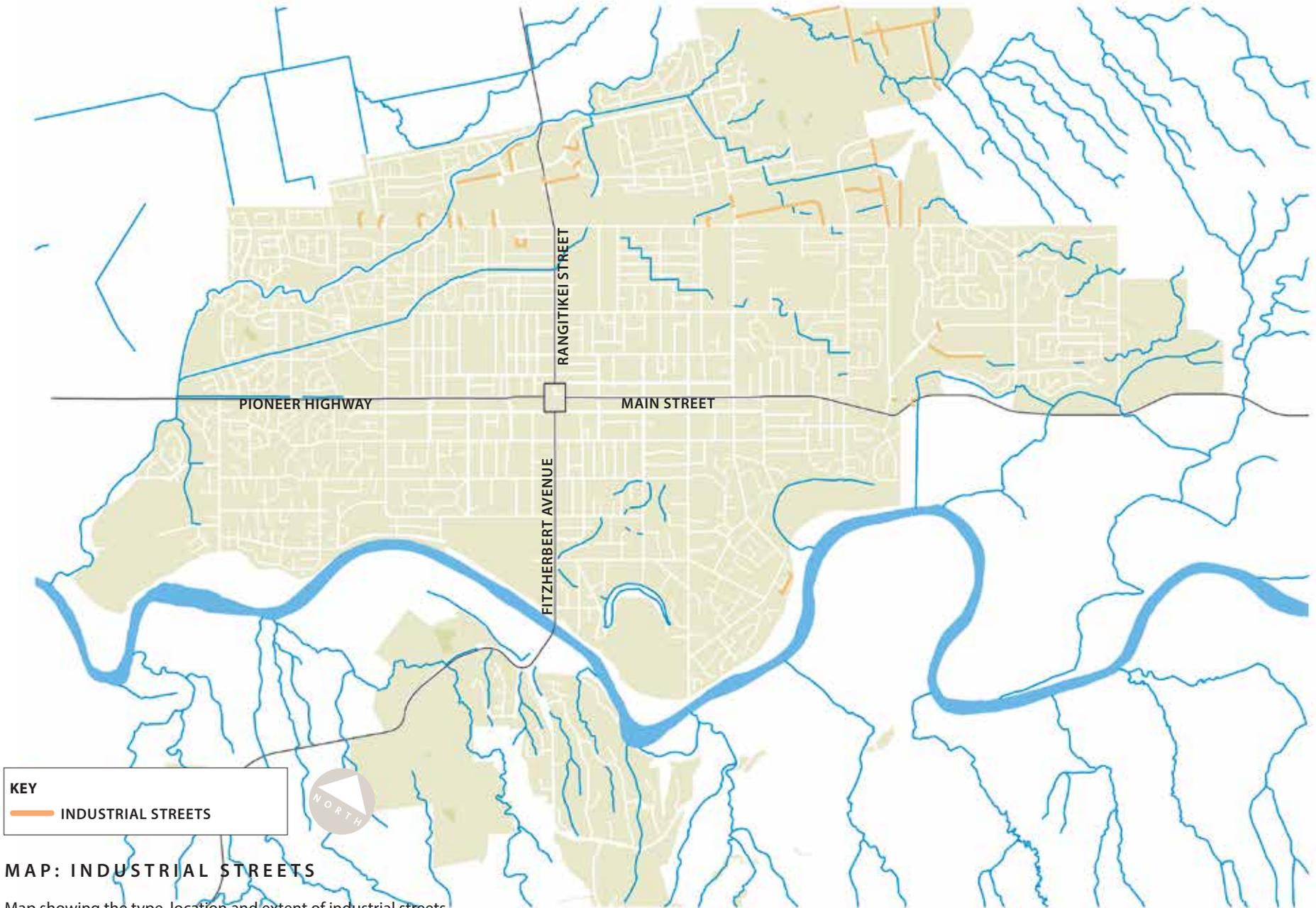


GERANIUM PINK SPICE



CHATHAM ISLAND GERANIUM





KEY
— INDUSTRIAL STREETS

MAP: INDUSTRIAL STREETS

Map showing the type, location and extent of industrial streets.

Industrial Streets

Intention

Industrial streets have high volumes of heavy traffic and vegetation should be used to provide a buffer between pedestrians and users of the carriageway. Street tree planting is to promote streetscape values and character, and could be used to reduce air pollutants from heavy vehicle use.

Clear stem (3m) street trees should be planted dependant on collector or local street type. Locations should align with existing services, access and safety guidelines. The spacing of any street tree should be 8-10m in collector industrial streets, and considered on a case by case basis, taking into account context and surrounding land-use for local industrial streets.

TYPICAL EXAMPLE - INDUSTRIAL STREET



Street tree planting is an opportunity to reduce air pollutants while providing a coherent visual link through an environment where there are varied building forms.

Suggested trees:

- Japanese Snowbell Tree [M] *Styrax japonica*
- Indian Lilac [L] *Melia azedarach*
- Columnar Tulip Tree [L] *Liriodendron tulipifera* 'Fastigatum'
- Catalpa [L] *Catalpa speciosa*
- Tulip Tree [L] *Liriodendron tulipifera*
- Maidenhair Tree [L] *Ginkgo biloba* (Male)
- Oriental Plane [L] *Platanus orientalis*
- Southern Magnolia [L] *Magnolia grandiflora*
- Japanese Elm [L] *Zelkova serrata*
- Sweet Michelia [L] *Michelia doltsopa*

Suggested understorey plants:

- Red Tussock *Astelia fragrans*
- Hebe Diosmifolia
- Hebe 'Inspiration'
- NZ Iris *Libertia grandiflora*
- Flax Cultivar *Phormium cookianum* 'Emerald gem'
- Silver Tussock *Poa cita*
- Sweet Box *Sarcococca confusa*
- Carpet Rose *Rosa Carpe*



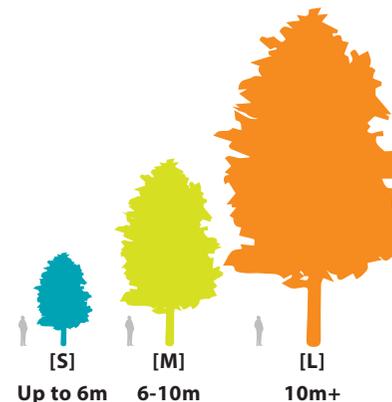
CATALPA



TULIP TREE



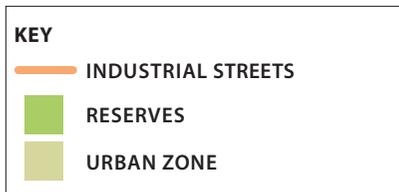
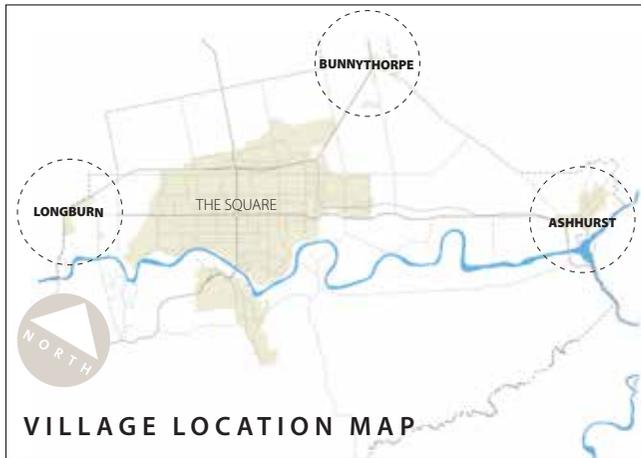
JAPANESE ELM



Industrial – Villages maps

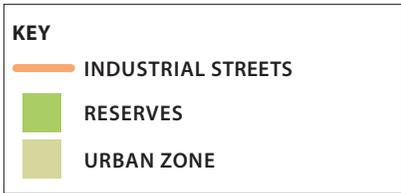
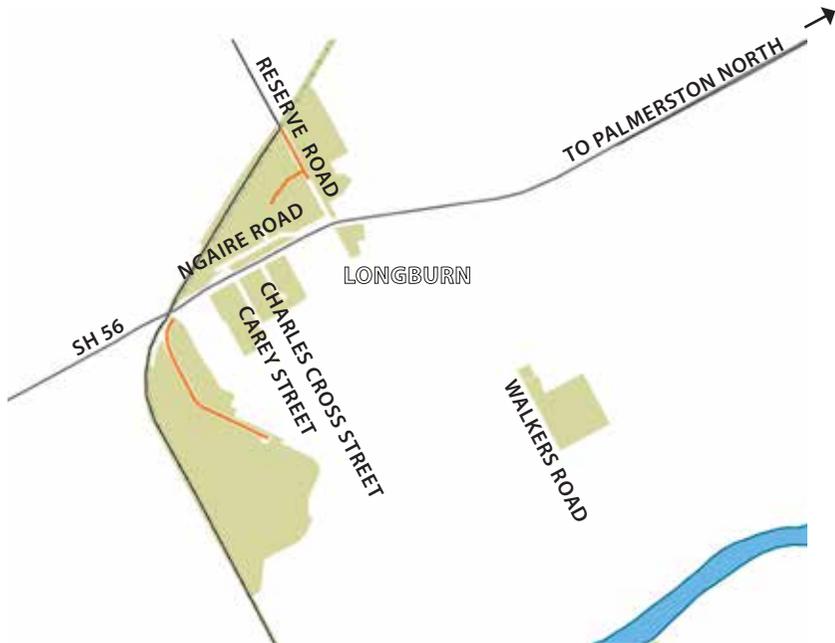
58

[Streets] VEGETATION FRAMEWORK FOR PALMERSTON NORTH



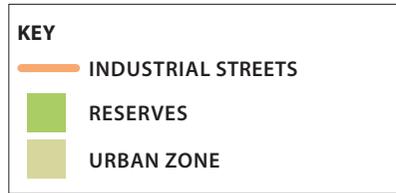
MAP: INDUSTRIAL STREETS IN ASHHURST VILLAGE

Map showing the location and extent of industrial streets.



MAP: INDUSTRIAL STREETS IN LONGBURN VILLAGE

Map showing the location and extent of industrial streets.



MAP: INDUSTRIAL STREETS IN BUNNYTHORPE VILLAGE

Map showing the location and extent of industrial streets.



MAP: RURAL STREETS

Map showing the location and extent of rural streets.

Rural Roads

Intention

Vegetation along rural routes makes a significant contribution to the character of the area. Rural roads provide opportunities to plant in areas where vegetation might be scarce in the surrounding rural environment. There is potential to use a layout that creates an even rhythm that can be appreciated by drivers whilst maintaining setbacks to avoid conflicts with road users and overhead utilities. In some cases, low planting could be used to provide storm water infiltration and bio-retention functions.

TYPICAL EXAMPLE - RURAL ROAD



Swales provide opportunities for native grasses and habitat creation.

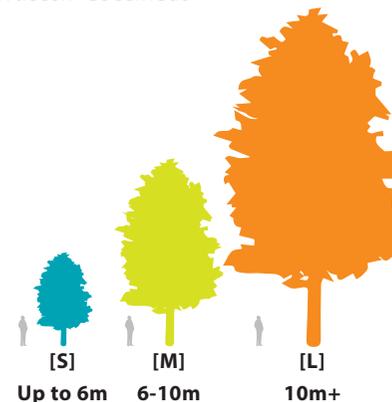
Extensive rural street network provides opportunities for clustering of tree planting in keeping with the rural typology and adding visual interest.

Suggested trees:

- Small Leaved Kowhai [M]  *Sophora microphylla*
- Kaikamako [M]  *Pennantia corymbosa*
- North Island Kowhai [M]  *Sophora tetraptera*
- Norway Maple [M]  *Acer platanoides*
- Hinau [L]  *Elaeocarpus dentatus*
- Tulip Tree [L] *Liriodendron tulipifera*
- Maidenhair Tree [L] *Ginkgo biloba (Male)*
- European Beech [L] *Fagus sylvatica*
- Pigeonwood [L]  *Hedycarya arborea*
- Black Beech [L]  *Nothofagus solandri*
- Pin Oak [L] *Quercus palustris*

Suggested understorey plants:

- Wind Grass/Gossamer Grass *Anemanthele lessoniana*
- Kakaha/Bush Lily *Astelia fragrans*
- Kiokio *Blechnum novae zealandiae*
- Swamp Sedge *Carex virgata*
- Hebe 'Inspiration'
- Kawakawa *Macropiper excelsum*
- Ground Cover Thyme *Thymus praecox 'Coccineus'*



NORWAY MAPLE



EUROPEAN BEECH



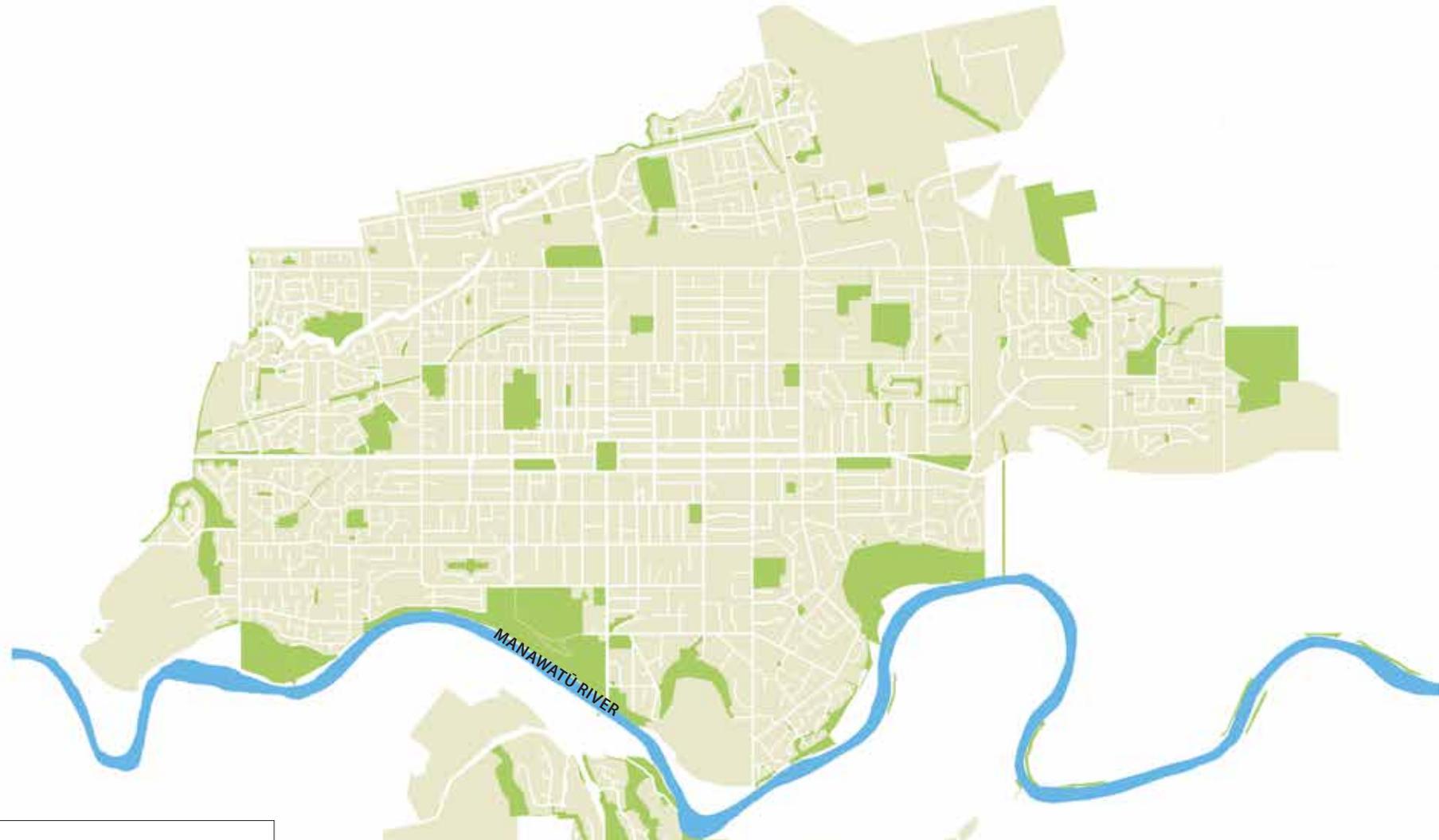
TULIP TREE



PIGEONWOOD



BLACK BEECH



KEY

 CITY-WIDE RESERVES / LOCAL RESERVES / NATURAL PARKS / SPORTS FIELDS



MAP: CITY-WIDE RESERVES / LOCAL RESERVES / NATURAL PARKS /SPORTS FIELDS

Map showing the type, location and extent of reserves / local reserves / natural parks /sports fields.

RESERVES

CITY-WIDE RESERVES / LOCAL RESERVES / NATURAL PARKS
SPORTS FIELDS

City-wide Reserves / Local Reserves / Natural Parks

City-wide Reserves including: Ashhurst Domain, Edwards Pit Park, Memorial Park, The Square, Victoria Esplanade and Linklater Reserve.

Intention

Any new vegetation within City-wide and Local Reserves should conform to the existing character and palette of vegetation that exists within each reserve. Any new vegetation must also be consistent with the uses within the reserve. Reserve Management Plans or other design documents that are developed in the future should be adhered to when preparing any future vegetation proposals.

Vegetation is often fundamental to achieving the reserve's required function. Opportunities exist to maintain and plant more larger trees and also native vegetation communities in reserves, where there is often less conflict with physical infrastructure.

Consideration of the Key Directions of the Framework (page 13) will help steer the selection and placement of vegetation within reserves ensuring vegetation is:

- Suited to climate
- Suited to local soils / geology
- Beneficial to fauna
- Enhances biodiversity
- Considers storm water management

- Selection of native vs exotic meets site requirements
- Selection of evergreen vs deciduous meets site requirements
- Considers relevant historical or cultural features
- Spread and form of species is relevant to location
- Contributes to aesthetic amenity
- Colour / seasonal change meets site requirements



- Low maintenance
- Low allergenic
- Clear trunk where appropriate
- Considers shading to adjacent properties
- Adheres to Crime Prevention Through Environmental Design (CPTED) criteria
- Considers coverage equity across the city





Sports Fields

Intention

Sports Fields are heavily used by those practicing sport and by spectators who come to support them. For these reasons, vegetation should be conducive to both functions, considering maintenance / management of leaf fall and turf growth whilst balancing shade and shelter for spectators. Where appropriate, deciduous trees that will not cause interference with grass growth and / or an increase in maintenance costs should be planted. This could include planting around building facilities to allow winter warming / summer cooling and within car parking areas. Evergreen trees are more appropriate solution to provide shade and shelter for spectators near grounds and could be selected from the range of proven native evergreen species.

Consideration of the Key Directions of the Framework (page 13) will help steer the selection and placement of vegetation within sports fields ensuring vegetation is:

- Suited to climate
- Suited to local soils / geology
- Beneficial to fauna
- Enhances biodiversity
- Considers storm water management



- Selection of native vs exotic meets site requirements
- Selection of evergreen vs deciduous meets site requirements
- Considers relevant historical or cultural features
- Spread and form of species is relevant to location
- Contributes to aesthetic amenity
- Colour / seasonal change meets site requirements

- Low maintenance
- Low allergenic
- Clear trunk where appropriate
- Considers shading to adjacent properties
- Adheres to Crime Prevention Through Environmental Design (CPTED) criteria
- Considers coverage equity across the city

Ecological Considerations

Reserves and Sports Fields provide opportunities for creating invertebrate and bird habitat that urban areas don't allow due to space restrictions.

Olearia species, Kohuhu, Karamu (*Coprosma lucida*), Tarata, Ribbonwood, Ti Kouka and Hebes are all particularly insect and bird friendly species.

Eco-sourcing

Where Council plants native trees in its Natural Reserves and City-Wide Reserves it will endeavour to plant eco-sourced vegetation. Eco-sourcing is based on the following principles:

- Using seed sourced from local naturally occurring populations.
- Preserving ecological history.
- Maintaining local biodiversity.
- Recognises ecological district species.

Entrances

Some sports grounds and reserves in Palmerston North currently rely heavily on signage for way finding and legibility. It is important to establish particular 'character' within the wider framework which increases recognition of these amenities to the public. This Framework does not replace signage, but will support signage to increase legibility on a more intuitive level.

City-wide Reserves / Local Reserves/ Natural Parks

Planting at the entrances to city reserves and natural parks should be in keeping with the character and ecology of the park. Planting of trees and plants should create a point of interest and interruption to the rest of the street through form and colour on either side of the entrance.

Where there is no clear entrance to a park or reserve such as a river park with an adjacent road, these principles can also be applied to reinforce parking areas and highlight amenities and other facilities.

Sports Fields

A common characteristic of sports fields is that they are often very open to the street. This open street interface is key for Crime Prevention Through Environmental Design (CPTED) considerations such as surveillance and safety and also for wayfinding.

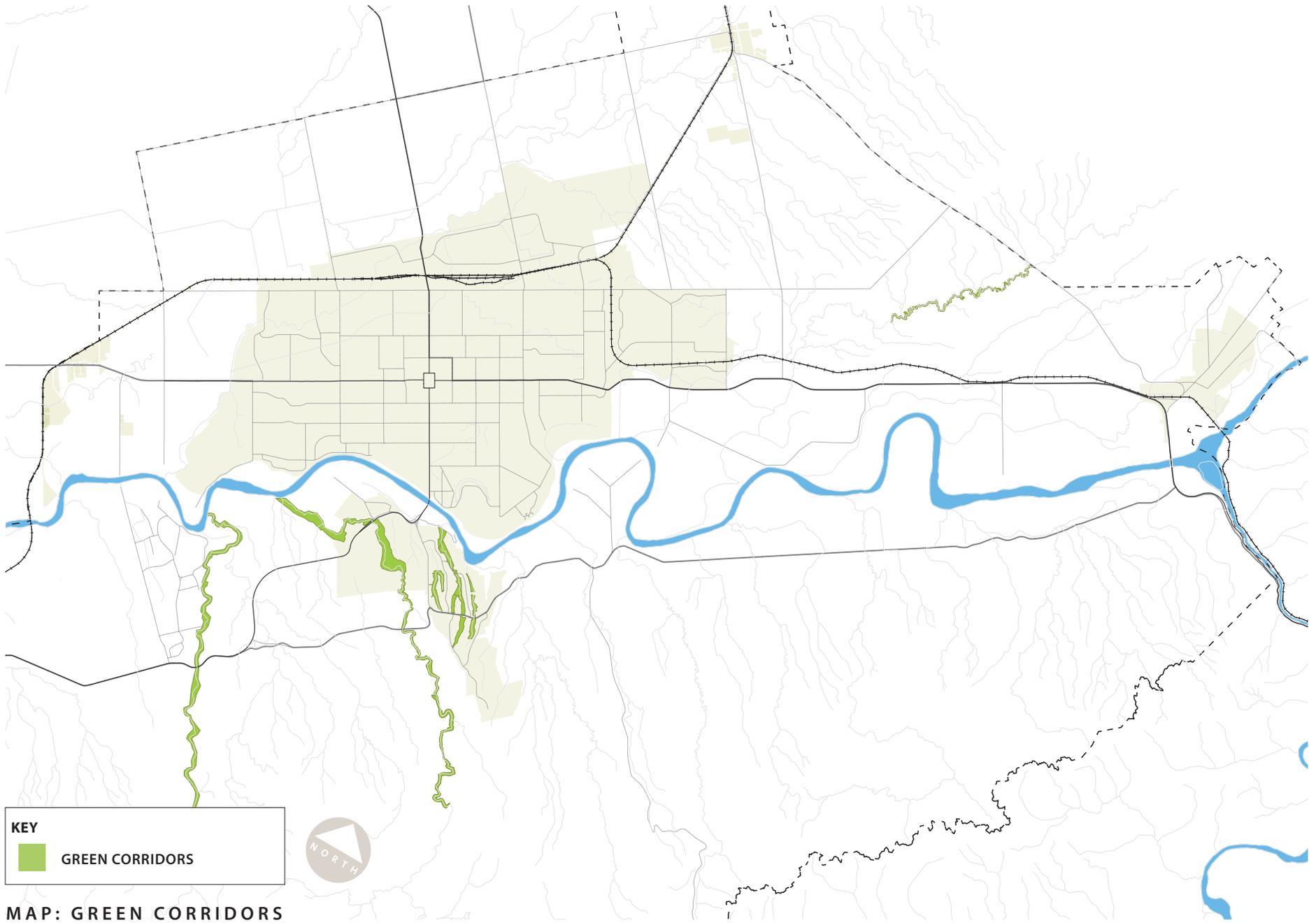
Vegetation at the entrance to sports grounds should aim to preserve sight lines and provide amenity, whilst giving the entrance a 'threshold'.

Trees with clear stems (3m) should be used, and under planted with low groundcovers and grasses to provide visibility from key vantage points on the adjoining street.





Butterfly Park



GREEN CORRIDORS

Green Corridors

Intention

- To create green linkages to all major areas of bush and open space in the City;
- To create native bird feeding corridors from the ranges to the City's urban areas;
- To develop a broad green buffer zone around the outskirts of the City's urban development, including along tributaries to the Manawatū River (eg. Mangaone Stream and Stoney Creek)
- To add to the existing bridle path and the Manawatū River banks planted and accessible from the gorge to its mouth;
- To use native vegetation, with a strong preference for the use of eco-sourced plants;
- To plant in a manner that supports flood protection while still providing for ecological restoration, in particular along the Mangaone Stream.



Ecological Considerations – Invertebrates and Fish

Intention

The key focus for ecological stream planting is creating a wide variety of habitats within the stream corridor.

At a large scale, it is critical that the waterway is considered in its entirety from the headwaters downstream to avoid 'islands' of good habitat, separated by poor habitat, which sensitive species can't reach and become established.

At a smaller scale, natural vegetation cover is critical. The riparian vegetation needs to shade the stream to keep the water temperature low enough for some sensitive native species, and to prevent sunlight fuelling over-growth of aquatic plants and algae. Key riparian species also drop wood and leaves into the streams providing food and also giving more variability to the stream flow providing more habitat. (refer to Appendix 3: Tree Selection Checklist)

TYPICAL EXAMPLE - GREEN CORRIDOR



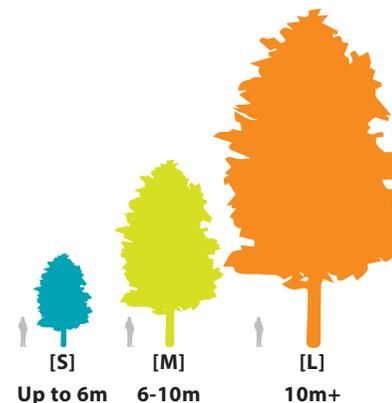
Suggested trees:

- Titoki [M]  *Alectryon excelsus*
- Ti Kouka [M]  *Cordyline australis*
- Hinau [L]  *Elaeocarpus dentatus*
- Black Maire [L]  *Nestegis cunninghamii*
- Tawa [L]  *Beilschmiedia tawa*
- Kahikatea [L]  *Dacrycarpus dacrydioides*
- Rimu [L]  *Dacrydium cupressinum*
- Totara [L]  *Podocarpus totara*
- Matai [L] *Prumnopitys taxifolia*
- Pigeonwood [L]  *Hedycarya arborea*

Suggested understorey plants:

- Kakaha *Astelia fragrans*
- Rangiora *Brachyglottis repanda*
- Swamp Sedge *Carex virgata*
- Tree Fuchsia *Fuchsia excorticata*
- Koromiko *Hebe stricta*
- Heketara *Oleria rani*
- Mikoikoi *Libertia ixioides*
- Harakeke *Phormium tenax*

For a full species list contact PNCC.



TITOKI



TAWA



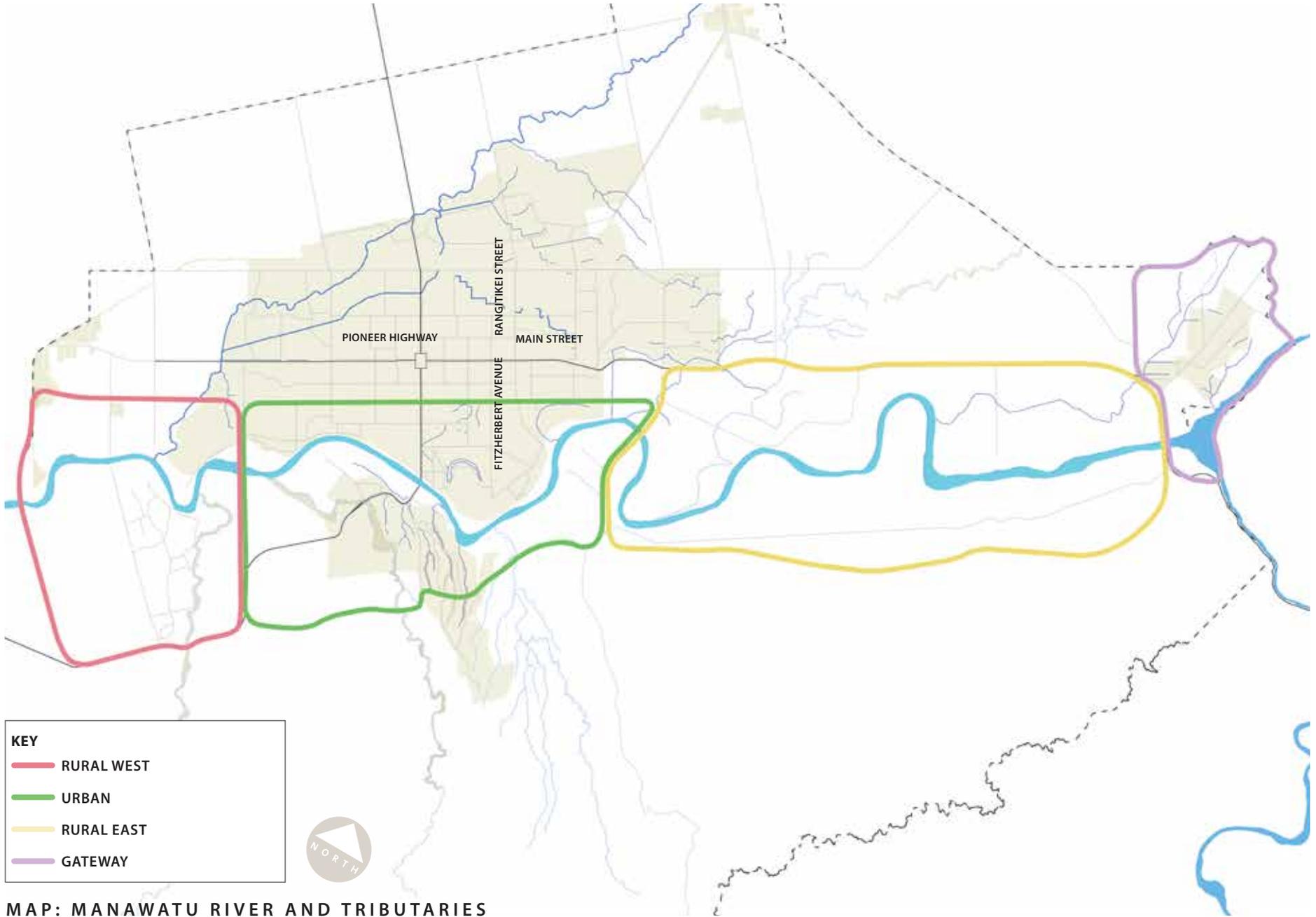
TI KOUKA



KAHIKATEA



BLACK MAIRE



MAP: MANAWATU RIVER AND TRIBUTARIES

MANAWATŪ RIVER

MANAWATŪ RIVER AND TRIBUTARIES

73

Precedent projects

Manawatū River and Tributaries

Intention

Enhance the Manawatū River to support the creation of Palmerston North’s Great Linear Park. Consider the Manawatū River Framework (MRF) and the Manawatū River Accord and consult with Rangitāne o Manawatū and Horizons Regional Council throughout any enhancement planting. Treat the four environments of the river (as identified in the MRF) separately to allow for the special character of each area to build on the local landscape, recreational and ecological needs. The four environments identified within the MRF are Gateway, Rural East, Urban, Rural West.

The MRF notes that the river park will be developed by several organisations and individuals over time. The Framework identifies vegetation that would enhance areas to be developed by these organisations and individuals. The list is not exhaustive but aims to include native species which fit with the river environment, and which support key directions in the MRF including:

UNIQUENESS	A variety of different spaces along the linear path (use planting to create this variety).
STORYTELLING	Maori, historical, environmental education (use native planting to showcase environmental education, consider planting used traditionally by Maori, use native vegetation that existed historically within the river corridor). Destination – Have a reason to visit the river including views to the ranges and special seasonal events (use vegetation to frame views to the ranges, consider the amenity and shading benefits vegetation can offer in strategic locations).
EXPRESS RANGITĀNE AND MAORI CULTURE	Through material and colour palette, storytelling (consult with Rangitāne on vegetation choices to maximise storytelling and colour palette opportunities that support local iwi culture and history).
ENVIRONMENT	Encourage projects that will improve water quality (consider vegetation that will support a healthy riverine environment in the long term).

The tributaries play a key role in supporting a healthy environment downstream. They also offer opportunities for recreation while supporting and linking green infrastructure across the city such as green corridors, street network vegetation and reserves.

Design along the tributaries should be consistent with the Manawatū River Framework and the Manawatū River Accord. Vegetation growing along tributaries should be improved to aid the river catchment in sustaining fish species, and to create a safe environment and a place for recreation. It should also support any flood protection function that a tributary may provide.

This planting list is a starting point which can be developed further by enabling individual tributaries to assume their own character where appropriate.

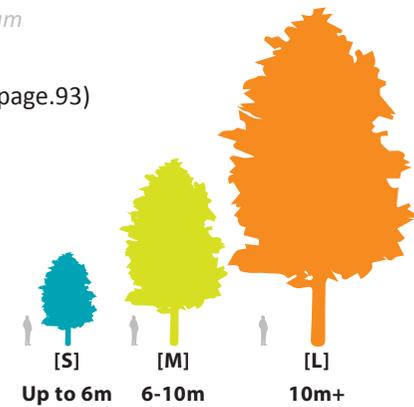
Suggested trees:

- Marble Leaf [S]  *Carpodetus serratus*
- Ti Kouka [M]  *Cordyline australis*
- North Island Kowhai [M]  *Sophora tetraptera*
- Mamaku [M-L] *Cyathea medullaris*
- Manatu [L] *Plagianthus regius*
- Hinau [L]  *Elaeocarpus dentatus*
- Pukatea [L] *Laurelia novaezealandiae*
- Kahikatea [L]  *Dacrycarpus dacrydioides*

Suggested understorey plants:

- Wind Grass/Gossamer Grass *Anemanthele lessoniana*
- Hen and Chicken Fern *Asplenium bulbiferum*
- Forest Sedge *Carex dissita*
- Red Tussock *Chionochloa rubra*
- Parataniwha *Elatostema rugosum*
- Kawakawa *Macropiper excelsum*

Refer to Riparian Plant List (page.93)



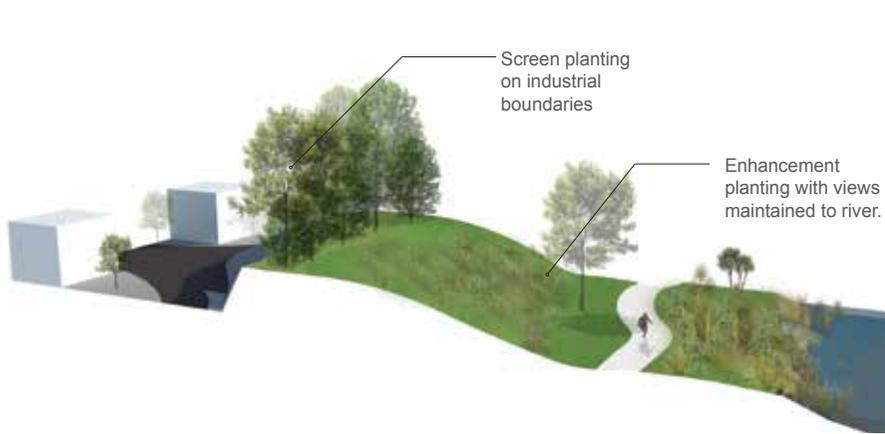
MAMAKU



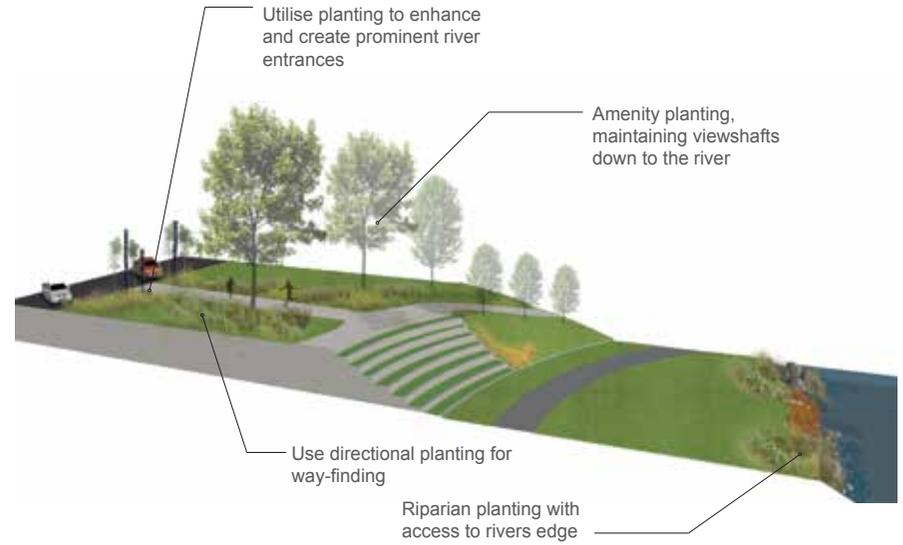
TI KOUKA



MARBLE LEAF



TYPICAL EXAMPLE - RURAL WEST



TYPICAL EXAMPLE - URBAN



TYPICAL EXAMPLE - RURAL EAST



TYPICAL EXAMPLE - GATEWAY

The Manawatū River Framework

The Manawatū River Framework is the key overarching document for the Manawatū River in Palmerston North. All planting and development in the river corridor and its tributaries needs to be carefully considered with regard to this Framework.

The Framework identifies four key river environment areas of the Manawatū River corridor; Rural West, Urban, Rural East and Gateway.

The following principles should be adhered to when implementing planting within these identified river environs.

Rural West

- Better connections to the communities of Linton and Longburn with the City.
- Mitigate adverse visual effects of industrial activities through screen planting.
- Support restoration planting along Turitea Stream and the creation of a walkway from the shared path to Massey University.
- The confluence of major tributaries should look to be rehabilitated as key ecological and recreational corridors using riparian and wetland plant species. Some key species have been identified in the Plant List (Appendix 2).

Urban

- Reinforce this area as the heart of the river park with furniture, large specimen tree planting and clear viewshafts connecting the river and urban areas.
- Create prominent river entrances at Albert Street, Fitzherbert Avenue, Ruahine Street, Riverside Drive and at the new walking and cycling bridge.
- The Esplanade requires new clear links from the sports grounds to the river walkway as stated in the Manawatū River Framework. Tree removal to create these links may be required in combination with low planting to define entrances.

Rural East

- This area is predominantly rural in nature. It contains low lying land meaning the area is particularly vulnerable to flooding.
- Maintain this as the buffer between the busy urban environment and Ashhurst Village. Retain the rural character and atmosphere.
- Creation of 'offline' rest spots along the shared path.
- Planting in this area should maintain viewshafts currently experienced in the area. Low planting using key species from the riparian plant list should be used where possible.

Gateway

- Embrace area as the hub of outdoor pursuits that makes the most of the natural landscape features contained within this environment.
- Create an entrance point at the Ashhurst Domain carpark with improved access down to the river to encourage the continuance of current activity.
- Distinct planting language in terms of colour, scale and form should be used in the gateway areas, especially at entrances to the river corridor.

Ecological Considerations – Invertebrates and Fish

The key focus for ecological stream planting is creating a wide variety of habitats within the stream.

At a large scale, it is critical that the waterway is considered in its entirety and from the headwaters downstream to avoid 'islands' of good habitat which sensitive species cannot reach to become established.

At a smaller scale natural vegetation cover is critical. The riparian vegetation needs to shade the stream to keep the water temperature low enough for some sensitive native species, and to prevent sunlight fuelling over-growth of aquatic plants and algae. Key riparian species also drop plant debris or plant litter into the streams providing food and giving more variability to the stream flow – and thus more habitats.



PART 2

TECHNICAL GUIDELINES

STREET TREE PLANTING
UNDERSTOREY PLANTING
VEGETATION IN RESERVES
COMMUNITY VEGETATION / BERM GARDENS
EDIBLE TREES

TECHNICAL PROCEDURES

The main objectives of these technical procedures are to enhance the image of City streets and improve the green infrastructure of the City while minimising effects on public utilities and activities. To optimise the contribution planting will make to the urban environment, careful planning and maintenance procedures are required. Planting within streets, parks and civic areas of Palmerston North are guided by this Framework and technical specifications contained in the PNCC Engineering Standards (Refer to PNCC website for current details).

These procedures are intended to act as a guide given the site specific considerations that apply to the selection and placement of trees in dense urban environments. For instance, as the central city has underground services which are located differently on every street, care must be taken to ensure that the position of services are accurately located prior to design and implementation.

STREET TREE PLANTING

1.0 ITEMS TO CONSIDER

- 1.1 Guidance for the selection of species for new street plantings is provided in relevant sections in Part 1.
- 1.2 Selection of trees is to be chosen from Appendix 1 of this Framework.
- 1.3 The City-wide area contains many culturally significant sites and areas of importance to local iwi. In known waahi tapu sites, prior to the installation of tree planting or vegetated areas, guidance will be sought from iwi as to the significance of the area and how this might be best reflected in vegetation selection.
- 1.4 New Zealand native species, particularly those planted in green corridors and the Manawatū River and tributaries, should be eco-sourced from the local ecological district.
- 1.5 The same species should be planted along the length of a block for consistency and coherency. At an intersection species may change, signalling a change in street type.
- 1.6 Place, Place / Movement Streets typically one tree per 10-15 metres. Movement, Commercial, Industrial, Residential, Arterial Streets typically one tree per 20 metres; all other areas are site specific.
- 1.7 Trees to be planted on the front berm between the footpath and the road, or within the service corridor where the berm is wider and allows two square metres minimum planting area.
- 1.8 Traffic visibility and personal safety. Pedestrians, road users and motorists exiting driveways should be able to see each other clearly.
- 1.9 CPTED. For further information refer to the Ministry of Justice – National Guidelines for Crime Prevention through Environmental Design in New Zealand. www.justice.govt.nz/policy/crime-prevention/environmental-design
- 1.10 Underground services.
- 1.11 Root barriers are installed where required to protect underground services.
- 1.12 Soil volume requirements.
- 1.13 Appropriate planter pit design.
- 1.14 Trees are to be consistent in size and quality and of good nursery stock, developed with a well-shaped trunk or stem and head.
- 1.15 For staking details refer to technical specifications contained in PNCC Engineering Standards (www.pncc.govt.nz/plans-policies-and-public-documents/application-forms-and-guidelines/engineering-standards-for-land-development/)
Generally tree planting should be undertaken between 1st April and 30th September each year.
- 1.16 Use appropriate fertilizer tabs.

2.0 MAINTAINING STREET TREES

- 2.1 Mulching will help to reduce moisture loss, conserve water, improve soil structure, reduce weed growth, reduce soil compaction and provide nutrients and thus should always be used. Mulch to be applied to the drip line in a 100mm thick layer. Mulch to be free from pests, diseases, weeds and matured for three months or longer.
- 2.2 Consider the biological needs of the tree species including soil, irrigation and drainage.
- 2.3 Consider weather damage and vandalism.
- 2.4 Consider leaf fall, limb drop and root encroachment.
- 2.5 Pruning is to be undertaken to promote the successful establishment and management of well-formed trees and to minimise risk to the public. All pruning is to be undertaken in accordance with arboricultural best practice.
- 2.6 No excavation should occur within the drip-line of existing trees. Should excavation happen within dripline, a tree site management plan should be undertaken. For example: protecting root systems, assessment of any root pruning or remedial works around tree.
- 2.7 Maintenance fertilizer for first three years after planting.

3.0 REMOVING TREES

- 3.1 Check if tree has been identified as notable
- 3.2 Transplanting of existing trees should be considered before destruction.
- 3.3 Trees that are dead, severely diseased or unstable, are a danger to public or property; they also have a detrimental effect to the roading or underground reticulation network, that impede a water course or drainage channel are conditions where removal can be considered.
- 3.4 Where trees with thorns could cause danger to the public, replacement should be programmed.
- 3.5 It is an insufficient cause for trees to be removed in circumstances where trees create leaf drop, shading or seed drop. In these instances periodic pruning is advocated.
- 3.6 Where pruning to reduce shade is required, reduction of tree height should not be permitted if it results in the loss of the natural habit and form of the tree.
- 3.7 The removal of trees on Council land is discouraged, where removal is simply to provide for new accesses for infill subdivision or house removal. All alternative options should be explored before removal is considered. Council's preference is to retain trees, especially healthy specimens. Removal will be at the discretion of Council.

4.0 PLANTING TREES ON PRIVATE LAND

- 4.1 Developers are encouraged to plant streets with suitable tree species identified in the Framework. This will contribute to the long term success of vegetation across the city. Refer to the PNCC Engineering Standards for guidelines www.pncc.govt.nz/plans-policies-and-public-documents/application-forms-and-guidelines/engineering-standards-for-land-development/

UNDERSTOREY PLANTING

1.0 ITEMS TO CONSIDER

- 1.1 New understorey vegetation is to be chosen from Appendix 2 of this Framework .
- 1.2 Understorey vegetation should have a design life of 7-15 years minimum.
- 1.3 Understorey planting selection shall consider CPTED principles and maintain clear sight lines between the understorey and street tree canopy.
- 1.4 New plant beds should be located away from parking bays, to ensure people do not step out into garden beds.
- 1.5 Vegetation should be chosen to take account of the size of plants at maturity to ensure that the roots do not become a trip hazard once they reach maturity.
- 1.6 Vegetation is to be hardened off to the conditions of Palmerston North and be free of pests and diseases.
- 1.7 New Zealand native species, particularly in green corridors and the Manawatū River/tributaries should be eco sourced from the local ecological district. This is particularly important around existing native bush and areas of significant indigenous vegetation.
- 1.8 Planting should be undertaken when the weather is suitable (i.e. mild, dull and moist) and when the ground is moist and workable. In general, planting should be undertaken during calendar months March-May and August-October.
- 1.9 Vegetation to be consistent in size and quality and of good nursery stock.
- 1.10 Mown grass as understorey cover ideally should be avoided as it requires high maintenance.

2.0 MAINTAINING UNDERSTOREY VEGETATION

- 2.1 Mulching will help to reduce moisture loss, conserve water, improve soil structure, reduce weed growth, reduce soil compaction and provide nutrients and thus should always be used. Mulch to be applied in a 100mm thick layer. Mulch to be free from pests, diseases, weeds and has been left to mature for three months or longer.

RESERVES AND OPEN SPACE PLANTING

1.0 ITEMS TO CONSIDER

- 1.1 Where Council is looking to develop key City or Regional reserves with their own distinct identity specific reserve management/landscape plans outlining planting requirements should be developed.
- 1.2 Plant away from boundaries of residential properties to reduce the impact of shading. Boundary planting should not exceed five metres height at maturity.
- 1.3 Specimen trees capable of exceeding 10 metres at maturity should be planted a minimum 10 metres from residential boundaries.
- 1.4 Vegetation should be established along western and northern boundaries to reduce shading of properties.
- 1.5 Shade trees should be established in the early stages of developing recreational reserves alongside children's play areas and areas for organised sporting activities.
- 1.6 Autumn colour, flowering seasonal change, ability to benefit fauna.
- 1.7 Vegetation on recreational reserves must consider the key criteria in the District Plan (visibility, accessibility, usability)
- 1.8 New Zealand native species should be eco-sourced from the local ecological district. This is particularly important around existing native bush, including areas of significant indigenous vegetation.

2.0 MAINTAINING VEGETATION IN RESERVES

- 2.1 Mulching will help to reduce moisture loss, conserve water, improve soil structure, reduce weed growth, reduce soil compaction and provide nutrients and thus should always be used. Mulch to be applied in a 100mm thick layer. Mulch to be free from pests, diseases, weeds and has been left to mature for three months or longer.

COMMUNITY VEGETATION / BERM GARDENS

COMMUNITY INITIATED VEGETATION

1.0 ITEMS TO CONSIDER

- 1.1 Residents are encouraged to undertake street tree planting as a community initiative. This will be considered by Council in circumstances where over 80% of households support planting of trees in their street. Such requests will only be able to be undertaken on a limited basis, subject to available funding.
- 1.2 If approved, it is expected that the community will assume responsibility for the maintenance of the vegetation for an agreed period of time to ensure ongoing success.
- 1.3 New street plantings are to be chosen from the list of species for residential areas identified in the Appendix 1 of this Framework.
- 1.4 Street tree planting within a street is to be maintained as a single species to avoid the ad hoc appearance of a mixed aesthetic.

COMMUNITY GARDENS

2.0 ITEMS TO CONSIDER

- 2.1 Council assistance is available to help locate community gardens, provide planting advice and with research. This does not extend to include construction or operation/maintenance of the gardens, plot allocation, monitoring garden users or cleaning up derelict plots.
- 2.2 Groups within Palmerston North that can be approached for further advice or support concerning the development of community gardens include: www.environmentnetwork.org.nz
- 2.3 Contact PNCC for further information.

BERM GARDEN

3.0 ITEMS TO CONSIDER

- 3.1 As road berms are used to convey utilities and provide pedestrian access, berm gardens may be unsuitable and therefore the Council will assess requests on a case-by-case basis.
- 3.2 Berm gardens can become a health and safety / asset management risk if inappropriate vegetation is planted and/or it is not maintained over the long-term. For example, if deep rooted vegetation is planted close to utility services, or if short and bushy vegetation obstructs sight lines for vehicles accessing properties and other road / footpath users.
- 3.3 Where berm gardens are approved, an agreement to reinstate the site to its previous state where an occupier vacates the accompanying property will be required. Any costs associated with maintenance and/or removal of berm gardens will be borne by the applicant.

EDIBLE TREES

1.0 ITEMS TO CONSIDER

- 1.1 Edible fruit and nut trees could be established in local reserves and council housing sites. This allows fruit/nuts to develop and fall without conflict to roading infrastructure and street vehicles. Council will consider requests by the community regarding species and location on a case-by-case basis.
- 1.2 Trees should be consistent in size and quality, of good nursery stock and developed with a central leader.
- 1.3 All trees should be hardened off to the conditions of Palmerston North and be free of pests and diseases. Trees should be planted in an open, sunny position sheltered from strong winds with good drainage.
- 1.4 Selection of trees should be based on the soil type – pears and plums can tolerate heavier soils.
- 1.5 Generally fruit tree planting should occur in the winter months when trees are dormant.
- 1.6 To avoid fruit drop issues on ground, plantings should not occur within three metres of any hard stand area, footpath or roadway.

2.0 MAINTAINING VEGETATION IN RESERVES

- 2.1 Mulching will help to reduce moisture loss, conserve water, improve soil structure, reduce weed growth, reduce soil compaction and provide nutrients and thus should always be used. Mulch to be applied in a 100mm thick layer. Mulch to be free from pests, diseases, weeds and has ben left to mature for three months or longer.

APPENDIX 1

TREE PALETTE

SUGGESTED EXOTIC TREES

BOTANICAL NAME	COMMON NAME
<i>Acer campestre</i>	Field Maple
<i>Acer platanoides</i>	Norway Maple
<i>Acer negundo</i>	Box Elder
<i>Aesculus hippocastanum</i>	Horse Chestnut
<i>Alnus acuminata</i>	Alder, Evergreen Alder
<i>Alnus japonica</i>	Japanese Alder
<i>Banksia integrifolia</i>	Coastal Banksia
<i>Catalpa bignonioides</i>	Catalpa
<i>Catalpa speciosa</i>	Catalpa
<i>Corylus columna</i>	Turkish Hazel
<i>Crataegus laevigata</i> 'Pauls Scarlet'	Hawthorn
<i>Fagus sylvatica</i>	European Beech
<i>Fraxinus ornus</i>	Manna Ash
<i>Ginkgo biloba</i> (Male)	Maidenhair Tree
<i>Gleditsia triacanthos</i> var. <i>inermis</i>	Honey Locust
<i>Gleditsia triacanthos</i> 'Sunburst'	Golden Honey Locust
<i>Liquidambar styraciflua</i>	Sweet Gum
<i>Liriodendron tulipifera</i> 'Fastigatum'	Columnar Tulip Tree
<i>Liriodendron tulipifera</i>	Tulip Tree
<i>Magnolia grandiflora</i>	Southern Magnolia
<i>Magnolia kobus</i>	Kobushi Magnolia
<i>Malus trilobata</i>	Ornamental Crab Apple
<i>Malus tschonoski</i>	Crab Apple
<i>Michelia doltsopa</i>	Sweet Michelia
<i>Platanus orientalis</i>	Oriental Plane
<i>Prunus</i> 'Awanui'	Flowering Cherry
<i>Prunus</i> 'Kanzan'	Flowering Cherry
<i>Quercus robur</i> 'Fastigata'	English Oak
<i>Quercus coccinea</i>	Scarlet Oak

SUGGESTED EXOTIC TREES

BOTANICAL NAME	COMMON NAME
<i>Quercus palustris</i>	Pin Oak
<i>Quercus rubra</i>	Red Oak
<i>Styrax japonica</i>	Snowbell Tree
<i>Tilia cordata</i>	Small Leaved Lime /Linden
<i>Tilia platyphyllos</i>	Large Leaved Lime/Linden
<i>Ulmus glabra</i>	Wych Elm
<i>Ulmus minor</i> 'Louis Van Houtte'	Elm
<i>Ulmus parvifolia</i>	Chinese Elm
<i>Zelkova serrata</i>	Japanese Elm

SUGGESTED EDIBLES

<i>Acca sellowiana</i>	Feijoa
<i>Castanea sp</i>	Chestnut
<i>Citrus limon</i>	Lemon
<i>Citrus paradisi</i>	Grapefruit
<i>Citrus reticulata</i>	Mandarin
<i>Citrus × latifolia</i>	Tarhiti / Persian Lime
<i>Corylus avellana</i>	Hazelnut
<i>Eriobotrya japonica</i>	Loquat
<i>Ficus carica</i>	Fig
<i>Fortunella japonica</i>	Round Kumquat
<i>Juglans sp</i>	Walnut
<i>Malus sp</i>	Apple
<i>Olea sp</i>	Olive
<i>Prunus dulcis</i>	Almond
<i>Prunus persica</i>	Peach
<i>Prunus armeniaca</i>	Apricot
<i>Prunus × domestica</i>	Plum
<i>Punica granatum</i>	Pomegranate

SUGGESTED NATIVE TREES

BOTANICAL NAME	COMMON NAME
<i>Alectryon excelsus</i>	Titoki
<i>Carpodetus serratus</i>	Marble Leaf
<i>Cordyline australis</i>	Ti Kouka
<i>Cyathea dealbata</i>	Silver Fern
<i>Cyathea medullaris</i>	Mamaku
<i>Dacrycarpus dacrydioides</i>	Kahikatea
<i>Dacrydium cupressinum</i>	Rimu
<i>Elaeocarpus dentatus</i>	Hinau
<i>Hedycarya arborea</i>	Pigenwood/Porokaiwhiri
<i>Hoheria sexstylosa</i>	Houhere / Lacebark
<i>Nightia excelsa</i>	Rewarewa
<i>Kunzea ericoides</i>	Kanuka
<i>Laurelia novae-zealandiae</i>	Pukatea
<i>Leptospermum scoparium</i>	Manuka
<i>Metrosideros robusta</i>	Northern Rata
<i>Metrosideros excelsa</i>	Pohutukawa
<i>Metrosideros excelsa</i> 'Maori Princess'	Pohutukawa cultivar
<i>Myrsine australis</i>	Red Mapou
<i>Nestegis cunninghamii</i>	Black Maire
<i>Nestegis lanceolata</i>	White Maire
<i>Nothofagus solandri</i>	Black Beech
<i>Pennantia corymbosa</i>	Kaikomako
<i>Plagianthus regius</i>	Ribbonwood/Manatu
<i>Podocarpus totara</i>	Totara
<i>Prumnopitys taxifolia</i>	Matai
<i>Pseudopanax arboreus</i>	Five Finger
<i>Pseudopanax crassifolius</i>	Horoeka / Lancewood
<i>Rhopalostylis sapida</i>	Nikau
<i>Sophora microphylla</i>	Small Leaved Kowhai
<i>Sophora tetraptera</i>	North Island Kowhai

SUGGESTED NATIVE TREES

BOTANICAL NAME	COMMON NAME
<i>Vitex lucens</i>	Puriri
<i>Weinmannia racemosa</i>	Kamaha

SUGGESTED RIPARIAN TREES

<i>Cordyline australis</i>	Ti kouka
<i>Dacrycarpus dacrydioides</i>	Kahikatea
<i>Hoheria sexstylosa</i>	Long-leaved lacebark
<i>Kunzea ericoides</i>	Kanuka
<i>Meliccytus ramiflorus</i>	Red Matipo
<i>Pittosporum eugenoides</i>	Lemonwood, Tarata
<i>Pittosporum tenuifolium</i>	Kohuhu
<i>Plagianthus regius</i>	Ribbonwood, Manatu
<i>Pseudopanax arboreus</i>	Five-finger
<i>Sophora microphylla</i>	Kowhai

APPENDIX 2

UNDERSTOREY PLANTING PALETTE

SUGGESTED UNDERSTOREY PLANTING PALETTE – EXOTIC

BOTANICAL NAME	COMMON NAME
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<i>Ajuga reptans</i>	Blue Bugle
<i>Buxus sempervirens</i>	Common Box
<i>Salvia 'Sally Fun Blue'</i>	Blue Salvia
<i>Liriope muscari</i>	Lily Turf
<i>Pachysandra terminalis</i>	Japanese Spurge
<i>Rosa Carpet</i>	White Carpet Rose
<i>Rosemarinus prostratus</i>	Prostrate Rosemary
<i>Salvia 'Amistad'</i>	Salvia
<i>Sarcococca confusa</i>	Sweet Box
<i>Thymus praecox 'Coccineus'</i>	Ground Cover Thyme

SUGGESTED UNDERSTOREY PLANTING PALETTE – NATIVE

BOTANICAL NAME	COMMON NAME
<i>Acena inermis</i> 'purpurea'	Bidibidi
<i>Adiantum formosum</i>	Maidenhair Fern
<i>Anemanthele lessoniana</i>	Gossamer Grass / Wind Grass
<i>Arthropodium candidum</i>	Forest Floor Lily
<i>Asplenium bulbiferum</i>	Hen and Chicken Fern
<i>Asplenium oblongifolium</i>	Shining Spleenwort
<i>Astelia fragrans</i>	Kakaha / Bush Lily
<i>Austroderia</i> sp	Toetoe
<i>Blechnum medium</i>	Rasp FernRed / Pukupuku
<i>Blechnum novae zealandiae</i>	Kiokio
<i>Brachyglottis repanda</i>	Rangiora
<i>Carex comans</i>	Longwood Tussock
<i>Carex dissita</i>	Forest Sedge
<i>Carex divulsa</i>	Grey Sedge
<i>Carex testacea</i>	Sand Tussock
<i>Carex virgata</i>	Swamp Sedge
<i>Coprosma acerosa</i>	Sand Coprosma
<i>Coprosma acerosa</i> 'Hawera'	Sand Coprosma
<i>Cyperus ustulatus</i>	Giant Umbrella Sedge
<i>Dianella nigra</i>	Turutu
<i>Elatostema rugosum</i>	Parataniwha
<i>Fuchsia perscandens</i>	Scrambling Fuchsia
<i>Geranium</i> 'Pink Spice'	Geranium x antipodeum 'Pink Spice'
<i>Geranium traversii</i> var <i>elegans</i>	Chatham Island Geranium
<i>Hebe</i> 'Inspiration'	Hebe 'Inspiration'
<i>Hebe</i> 'Wiri Mist'	Hebe 'Wiri Mist'
<i>Hebe diosmifolia</i>	Hebe Diosmifolia
<i>Chionochloa rubra</i>	Red Tussock
<i>Hierochloa redolens</i>	Karetu / Scented Grass

SUGGESTED UNDERSTOREY PLANTING PALETTE – NATIVE

BOTANICAL NAME	COMMON NAME
<i>Juncus edgariae</i>	Wiwi
<i>Juncus pallidus</i>	Giant Rush
<i>Leptinella calcaea</i>	Leptinella
<i>Libertia grandiflora</i>	NZ Iris
<i>Libertia ixioides</i>	Mikoikoi
<i>Lobelia angulata</i>	Panakenake
<i>Macropiper excelsum</i>	Kawakawa
<i>Meuhlenbeckia complexa</i>	Pohuehue
<i>Oleria rani</i>	Heketara
<i>Phormium cookianum</i> 'Emerald gem'	Flax cultivar
<i>Phormium tenax</i>	Harakeke
<i>Pittosporum tenuifolium</i> 'Golf Ball'	Kohuhu cultivar
<i>Poa cita</i>	Silver Tussock
<i>Streblus heterophyllus</i>	Small leaved Milk Tree

SUGGESTED RIPARIAN PLANTING PALETTE – NATIVE

<i>Apodasmia similis</i>	Jointed Wire Rush / Oioi
<i>Carex secta</i>	Purei
<i>Carex virgata</i>	Swamp Sedge
<i>Coprosma propinqua</i>	Mingimingi
<i>Coprosma robusta</i>	Karamu
<i>Eleocharis acuta</i>	Spike Rush
<i>Hebe stricta</i>	Koromiko
<i>Olearia solandri</i>	Coastal shrub daisy
<i>Phormium tenax</i>	Harakeke

APPENDIX 3

TREE SELECTION CHECKLIST

TREE SELECTION CHECKLIST: EXOTIC

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Acer campestre</i>	Field Maple		E	Yes	No	Yes	Yes	Unknown	D	5-7m	8-10m	Dense round	Showy yellow
<i>Acer platanoides</i>	Norway Maple	Birds use seeds as food source Summer	E	Yes	No	Yes	Yes	Unknown	D	6-8m	10m	Dense rounded crown	Showy yellow
<i>Aesculus hippocastanum</i>	Horse Chestnut		E	Nuts messy		Yes	Yes	Yes	D	12-15m	15-25m	Oval	Not showy yellow
<i>Alnus acuminata</i>	Alder		E	Messy seeds	No	Yes	Yes	Yes	E	12-15m	25-30m	Vase shape	No change
<i>Alnus japonica</i>	Japanese Alder		E	Messy seeds	No	Yes	Yes	Yes	D	8-12m	15-22m	Oval	No change
<i>Catalpa speciosa</i>	Catalpa		E	Yes	Mild	Yes	Yes	Yes	D	12m	15-20m	Round	Showy yellow
<i>Corylus colurna</i>	Turkish Hazel		E	Yes	No	Yes	Yes	Unknown	D	7-10m	9-12m	Pyramidal	Not showy yellow
<i>Crataegus laevigata</i> 'Pauls Scarlet'	Hawthorn		E	Flower drop	Low	Yes	Yes	Unknown	D	4m	5-10m	Round	Not showy orange
<i>Fagus sylvatica</i>	European Beech	Fruit attracts birds Autumn	E	5 yearly crown lift/thin crown	No	Yes	Yes	Yes	D	12-18m	15-22m	Broad pyramidal	Showy orange
<i>Fraxinus ornus</i>	Manna Ash		E	Yes	No	Yes	Yes	Yes	D	8-12m	10-15m	Round	Showy orange
<i>Ginkgo biloba (Male)</i>	Maidenhair Tree		E	Deadwood, reduce length lower branches 5 yearly	Low	Yes	Yes	Yes	D	15-18m	15-22m	Pyramidal	Showy yellow
<i>Gleditsia triacanthos</i> 'Sunburst'	Golden Honey Locust		E	Messy pods	Yes	Yes	Yes	Yes	D	10-15m	15-22m	Oval, rounded	Showy yellow
<i>Gleditsia triacanthos inermis</i>	Honey Locust		E	Messy pods	Yes	Yes	Yes	Yes	D	10-15m	15-22m	Oval, rounded	Showy yellow

TREE SELECTION CHECKLIST: EXOTIC

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Liquidambar styraciflua</i>	Sweet Gum	Attracts birds Summer/ Autumn	E	Messy seeds/ otherwise low	Mild	Yes	Yes	Yes	D	12-15m	18-24m	Oval, pyramidal	Showy red
<i>Liriodendron tulipifera</i>	Tulip Tree		E	Deadwood, crown lift/thin, reduce crown width 5+ yearly	Mild	Yes	Yes	Yes	D	8-10m	20m+	Oval	Showy yellow
<i>Liriodendron tulipifera</i> 'Fastigatum'	Columnar Tulip Tree		E	Deadwood, crown lift/thin, reduce crown width 5+ yearly	Mild	Yes	Yes	Yes	D	6m	13-16m	Columnar	Showy yellow
<i>Quercus robur</i>	English oak		E						D	12m	10-20m	Spreading	No change
<i>Magnolia grandiflora</i>	Southern Magnolia	Attracts birds Summer	E	Moderate	Mild	Yes	Yes	Yes	E	9-12m	18-22m	Pyramidal, oval	No change
<i>Magnolia kobus</i>	Kobushi Magnolia	Fruit attracts birds Spring	E	Yes	Mild	Yes	Yes	Yes	D	7-12m	7-12m	Round, spreading	White flowers
<i>Malus trilobata</i>	Ornamental Crab Apple		E	Messy fruit	Mild	Yes	Yes	Yes	D	5-7m	15m	Columnar	Not showy orange
<i>Malus tschonoskii</i>	Crab Apple		E	Messy fruit	Mild	Yes	Yes	Yes	D	4-8m	8-12m	Columnar	Not showy red
<i>Michelia doltsopa</i>	Sweet Michelia		E	Flower drop	Yes	Yes	Yes	Yes	E	10-15m	20-25m	Oval, bushy	No change
<i>Platanus orientalis</i>	Oriental Plane		E	Yes	No	Yes	Yes	Yes	D	12-15m	18-21m	Round, pyramidal	Not showy orange
<i>Prunus</i> 'Awanui'	Flowering Cherry		E	Yes	Yes	Yes	Yes	Yes	D	4-8m	8-10m	Spreading	Showy orange
<i>Prunus</i> 'Kanzan'	Flowering Cherry		E	Yes	Yes	Yes	Yes	Yes	D	6-8m	5-10m	Vase shape	Showy orange

TREE SELECTION CHECKLIST: EXOTIC

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Quercus robur</i> 'Fastigata'	Fastigate Oak		E	Yes	No	Yes	Yes	Yes	D	3-5m	15-20m	Columnar	Not showy yellow
<i>Quercus coccinea</i>	Scarlet Oak		E	Yes, acorn drop	No	Yes	Yes	Yes	D	10-15m	20m+	Spreading	Showy red
<i>Quercus palustris</i>	Pin Oak		E	Deadwood, crown lift/thin, reduce crown width 5+ yearly, acorn drop	No	Yes	Yes	Yes	D	10-12m	15-20m	Pyramidal	Showy red/orange
<i>Quercus rubra</i>	Red Oak		E	Moderate, acorn drop	No	Yes	Yes	Yes	D	15-18m	18-21m	Round	Showy red/orange
<i>Styrax japonica</i>	Japanese Snowbell Tree		E	Yes	Yes	Yes	Yes	Yes	D	4-7m	6-9m	Rounded vase	No change
<i>Tilia cordata</i>	Lime		E	Aphids produce honey dew	No	Yes	Yes	Yes	D	10-15m	17-21m	Oval, pyramidal	Showy yellow
<i>Tilia platyphyllos</i>	Lime		E	Deadwood, crown lift/thin, reduce crown width 5+ yearly	No	Yes	Yes	Yes	D	11-16m	16-20m	Oval, pyramidal	Showy yellow
<i>Ulmus glabra</i>	Wych Elm		E	Yes	No	Yes	Yes	Yes	D	15-20m	30-40m	Spreading	Showy yellow
<i>Ulmus minor</i> 'Louis Van Houtte'	Elm		E	Yes	No	Yes	Yes	Yes	D	8-15m	15-20m	Oval	Not showy yellow
<i>Ulmus parvifolia</i>	Chinese Elm		E	Yes	No	Yes	Yes	Yes	D	15-20m	10-18m	Vase shape	Showy yellow
<i>Zelkova serrata</i>	Japanese Elm		E	Yes	Yes	Yes	Yes	Yes	D	15-22m	16-24m	Vase shape	Showy red/orange

TREE SELECTION CHECKLIST: NATIVE

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC / BIODIVERSITY	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Alectryon excelsus</i>	Titoki	Fruit and seeds for birds Late summer	N	Yes	No	Yes	Yes	Yes	E	4-6m	6-8m	Dense rounded head	No change
<i>Beilschmiedia tawa</i>	Tawa	Fruit and seeds for birds Autumn	N	Fruit	No	Yes	Yes	Yes	E	10-15m	20-30m	Dense rounded head	No change
<i>Carpodetus serratus</i>	Marble Leaf / Putaputawētā	Fruit and seeds for birds Autumn	N	Yes	No	No	Moderate	Yes	E	3-4m	8m	Irregular	No change
<i>Cordyline australis</i>	Ti Kouka	Fruit and seeds for birds Late summer-early autumn	N	Leaf drop	No	Yes	Moderate	Yes	E	3m	8m	Pyramidal	No change
<i>Cyathea dealbata</i>	Silver fern/ Kaponga		N	Fronndrop	Yes	Yes	Moderate	Yes	E	2-4m	10m	Spreading, drooping	No change
<i>Cyathea medullaris</i>	Mamuku/ Black Tree Fern		N	Fronndrop	Yes	Yes	Moderate	Yes	E	5m	5-15m	Spreading, drooping	No change
<i>Dacrycarpus dacrydioides</i>	Kahikatea	Fruit and seeds for birds	N	Yes	Yes	Yes	Yes	Yes	E	10-20m	50-65m	Oval	No change
<i>Dacrydium cupressinum</i>	Rimu	Fruit and seeds for birds Autumn	N	Yes	Yes	Yes	Yes	Yes	E	10-25m	40m	Weeping, pyramidal	No change
<i>Elaeocarpus dentatus</i>	Hinau	Fruit and seeds for birds	N	Yes	Yes	Yes	Yes	Yes	E	10-15m	15-20m	Vase shape	No change
<i>Hedycarya arborea</i>	Pigeonwood / Porokaiwhiri	Orange berries for birds	N	Yes	Yes	No	Moderate	Yes	E	6-8m	10-12m	Vase shape	No change

TREE SELECTION CHECKLIST: NATIVE

100

[Tree Selection Checklist] VEGETATION FRAMEWORK FOR PALMERSTON NORTH

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC / BIODIVERSITY	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Hoheria sexstylosa</i>	Houhere / Lacebark	Nectar Late summer	N	Yes	Yes	No	Short	Yes	E	3-5m	4-6m	Vase shape	No change
<i>Knightia excelsa</i>	Rewarewa	Nectar for birds Oct-Dec	N	Yes	No	Yes	Yes	Yes	E	3-5m	20m	Upright, columnar	No change
<i>Kunzea ericoides</i>	Kanuka		N	Flower drop, deadwood, crown lift/thin	No	Yes	Moderate	Yes	E	7-8m	10-12m	Vase shape	No change
<i>Laurelia novae-zealandiae</i>	Pukatea		N	Yes	No	Yes	Yes	Yes	E	15-20m	40m	Oval	No change
<i>Leptospermum scoparium</i>	Manuka/ Tea Tree		N	Flower drop	No	Yes	Moderate	Yes	E	3-4m	5m	Vase shape	No change
<i>Melicope simplex</i>	Poataniwha		N	Yes	No	No	Moderate	Yes	E	2m	2-3m	Pyramidal, bushy	No change
<i>Metrosideros excelsa</i>	Pohutukawa	Nectar, fruit, seeds for birds Oct-Dec	N	Flower drop	No	No	Yes	Yes	E	15-20m	10-20m	Spreading	No change
<i>Metrosideros excelsa</i> 'Maori Princess'	Pohutukawa cultivar	Nectar Summer	N	Flower drop	No	No	Yes	Yes	E	3-4m	5-10m	upright, erect	No change
<i>Metrosideros robusta</i>	Northern rata	Nectar for birds Nov-Dec	N	Deadwood, crown lift/thin - 5+ yearly	No	Yes	Yes	Yes	E	10-20m	25-40m	Oval	No change
<i>Myrsine australis</i>	Red Mapou		N	Yes	Yes	No	Moderate	Yes	E	2-3m	3-6m	Pyramidal, bushy	No change
<i>Nestegis cunninghamii</i>	Black Maire	Fruit for birds	N	Yes	No	Yes	Yes	Yes	E	10-15m	15-25m	Round, spreading	No change
<i>Nestegis lanceolata</i>	White Maire	Fruit for birds	N	Yes	Yes	Yes	Yes	Yes	E	10-15m	10-20m	Oval	No change
<i>Nothofagus solandri</i>	Black Beech	Flowers and fruit	N	Yes	No	Yes	Yes	Yes	E	10-15m	20-25m	Oval, spreading	No change

TREE SELECTION CHECKLIST: NATIVE

BOTANICAL NAME	COMMON NAME	ENVIRONMENTAL			FUNCTIONAL				AESTHETIC				
		BENEFITS FOR WILDLIFE/HABITAT	NATIVE / EXOTIC / BIODIVERSITY	LOW MAINTENANCE	LOW ALLERGENIC	CLEAR TRUNK	LONG LIVED	GOOD PERFORMANCE RECORD	EVERGREEN / DECIDUOUS	SPREAD	HEIGHT	FORM	AUTUMN COLOUR
<i>Pennantia corymbosa</i>	Kaikomako	Black fruit for birds	N	Yes	Yes	Yes	Yes	Yes	E	2-3m	8m	Oval	No change
<i>Plagianthus regius</i>	Manatu / Lowland Ribbonwood		N	Yes	No	Yes	Yes	Yes	D	5-7m	15m	Upright, spreading	No change
<i>Podocarpus totara</i>	Totara	Fruit Autumn	N	Bark drop, deadwood/ crown lift 5+ yearly	Yes	Yes	Yes	Yes	E	8m	25m	Dense compact growth	No change
<i>Prumnopitys taxifolia</i>	Matai		N	Yes	Yes	Yes	Yes	Yes	E	10-15m	25-30m	Pyramidal, drooping	No change
<i>Pseudopanax arboreus</i>	Five Finger/ whauwhaupaku	Nectar, fruit, seeds for birds	N	Fruit drop	No	No	Moderate	Yes	E	2-4m	5-8m	Open	No change
<i>Pseudopanax crassifolius</i>	Horoeka / Lancewood	Fruit Extended season	N	Yes	No	Yes	Yes	Yes	E	1-3m	5-15m	Round	No change
<i>Rhopalostylis sapida</i>	Nikau	Fruit	N	Yes	No	Yes	Yes	Yes	E	2-5m	10-15m	Vase shape	No change
<i>Sophora microphylla</i>	Small Leaved Kowhai	Nectar for birds	N	Flower drop	Yes	No	Moderate	Yes	E	3-5m	3-7m	Spreading, drooping	No change
<i>Sophora tetraptera</i>	North Island Kowhai	Nectar for birds Early spring	N	Flower drop, deadwood/ crown thin 5+ yearly	Yes	No	Moderate	Yes	Semi	6-8m	10m	Spreading, drooping	No change
<i>Vitex lucens</i>	Puriri	Nectar, fruit and seeds for birds Year round	N		Yes	Yes	Yes	Yes	E		20m	Spreading	No change
<i>Weinmannia racemosa</i>	Kamaha		N	Yes	No	No	Moderate	Yes	E	8-15m	10-25m	Vase shape	No change



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