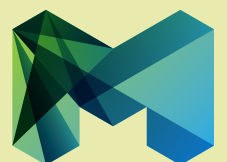


NORTH AND WEST MELBOURNE URBAN FOREST

PRECINCT PLAN

2014-2024



CITY OF MELBOURNE

CONTENTS

A MESSAGE FROM THE CITY OF MELBOURNE

The City of Melbourne's urban forest comprises around 70,000 trees in streets and parks as well as approximately 20,000 trees located in the private realm, in addition to a growing number of green roofs and walls across the municipality.

The trees managed by the City of Melbourne in the public realm contribute significantly to the character and identity of Melbourne. An increasing body of evidence and research informs us that urban forests and green space are vital to supporting a healthy community as well as providing a means to adapting to climate change.

The *Urban Forest Strategy* completed in 2012 identified the need to generate a new legacy for Melbourne and create a forest for future generations. This urban forest is to be diverse, robust and resilient in the face of current and future challenges. The urban forest precinct plan documents are a key implementation tool of the *Urban Forest Strategy*, providing a framework for tree planting in streets that will meet the *Urban Forest Strategy* targets.

We have worked closely with the community and key stakeholders to generate this plan and are confident that it provides the basis for a street tree planting program that is consistent with neighbourhood character, the community's vision for the future urban forest, and the principles of the *Urban Forest Strategy*.



Robert Doyle
Lord Mayor



Cr Arron Wood
Chair Environmental portfolio

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INTRODUCTION TO THE PRECINCT PLANS

Urban forest precinct plans guide tree planting and greening in City of Melbourne streets. Precinct plans are subsidiary documents to the City of Melbourne's 2012 *Urban Forest Strategy* and form a key component of the strategy's implementation. Melbourne is divided into 10 precincts.

Each precinct plan has been developed in collaboration with the community, and is grounded in the science underlying the *Urban Forest Strategy* and in sound urban design principles.

What is an urban forest?

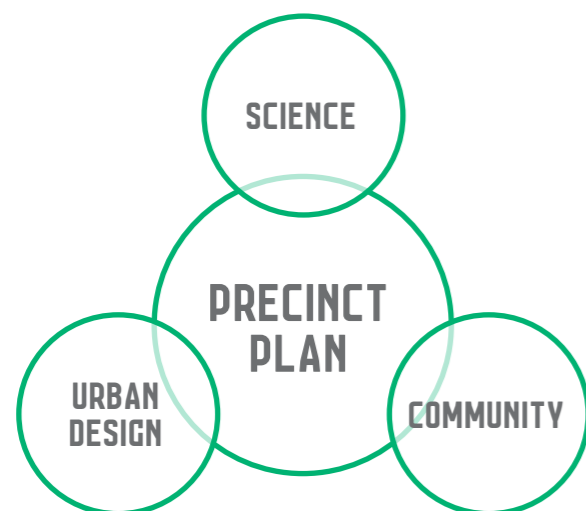
The urban forest comprises all of the trees and other vegetation – and the soil and water that supports it – within the municipality. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, green walls, balconies and roofs.

Why is the urban forest important?

The City of Melbourne is currently facing three significant challenges: climate change, urban heating and population growth. These will place significant pressure on the built fabric, services and people of the city.

A healthy urban forest will play a critical role in maintaining the health and liveability of Melbourne by:

- cooling the city
- improving and maintaining the health, well-being and happiness of urban dwellers
- improving social cohesion
- cleaning air and water
- sequestering and storing carbon
- attracting people to live, work and visit in Melbourne
- stimulating economic activity in retail and dining precincts
- providing habitat for native birds and pollinators



THE URBAN FOREST STRATEGY

PRINCIPLES:

- Mitigate and adapt to climate change
- Reduce the urban heat island effect
- Design for health and wellbeing
- Create healthier ecosystems
- Design for liveability and cultural integrity
- Become a water sensitive city
- Position Melbourne as a leader in urban forestry

THE TARGETS SET OUT IN THE URBAN FOREST STRATEGY ARE TO:

Increase canopy cover

The City of Melbourne's canopy cover will be 40% by 2040.

Increase urban forest diversity

The City of Melbourne's urban forest population will be composed of no more than 5% of one tree species, no more than 10% of one genus and no more than 20% of any one family.

Improve vegetation health

90% of the City of Melbourne's tree population will be healthy by 2040.

Improve soil moisture and water quality

Soil moisture levels will be maintained at levels to provide healthy growth of vegetation.

Improve urban ecology

Protect and enhance urban ecology and biodiversity to contribute to the delivery of healthy ecosystem services.

Inform and consult the community

The community will have a broader understanding of the importance of our urban forest, increase their connection to it and engage with its process of evolution.

INTRODUCTION TO THE PRECINCT PLANS **CONTINUED**

Why are we concerned about climate change, urban heat island and population growth?

Climate change impacts to human health and wellbeing are a significant concern for our municipality. Climate change science indicates that Melbourne is likely to experience an increase in the frequency and severity of extreme weather events such as heatwaves, drought and flooding. Heat waves kill more people in Australia each year than any other natural disasters. The average annual temperature is expected to increase by approximately

2.6 C° and the number of hot days each year is expected to increase from nine to 20 by 2070.

The urban heat island effect (whereby urban areas are several degrees hotter than surrounding rural areas) means that central Melbourne will reach threshold temperatures for heat related illness in vulnerable populations more often and for a longer duration

than surrounding suburban and rural areas. The urban heat island is primarily a result of impervious hard surfaces that absorb heat, human activity that generates heat and low vegetation cover that fails to provide adequate shade and natural cooling.

Anticipated population growth and increasing urban intensification means that more people will be at risk during extreme weather events



Thermal imaging of Melbourne, taken late at night, showing how paved, unshaded surfaces store heat from solar radiation and contribute to increased temperatures in urban areas.



Useful Life Expectancy mapped for City of Melbourne Trees.

and, as a result, there will be a greater demand on health services in the City of Melbourne. Urban intensification also places additional pressure on public realm open space as the private realm becomes increasingly built-up (for more information see Melbourne's *Open Space Strategy*). Access to open space is critical to people's physical and mental health and wellbeing.

What can the urban forest do?

Urban forests provide an array of environmental, economic and social benefits that contribute to creating resilient and sustainable cities that are enjoyable places for people to live and work. Some of the significant benefits that our tree canopy can provide to mitigate climate change impacts are shade, cooling and rainwater interception.

The urban forest and its associated benefits have been identified as one of the most cost-effective means of mitigating the potential impacts of climate change and heat on our city. The *Urban Forest Strategy* has established principles and targets for developing an urban forest that will meet Melbourne's needs and create a city within a forest.

HOW DOES MELBOURNE'S URBAN FOREST MEASURE UP?

In order to provide the benefits we need from our urban forest in a changing climate, our tree population needs to be healthy, diverse and resilient. To assess its current state we mapped the trees in our city to measure species/genus/family diversity, useful life expectancy and tree canopy.

Useful life expectancy

Useful life expectancy is an estimate of how long a tree is likely to remain in the landscape based on health, amenity, environmental services contribution and risk to the community. The recent period of drought and water restrictions triggered irreversible decline for many trees. This exaggerated the age-related decline of many significant elms and other trees. Modelling shows that within the next ten years, 23% of our current tree population will be at the end of their useful lives and within twenty years this figure will have reached 39%. Most dramatically, 55% of Melbourne's elms are in a state of severe decline and will likely need to be removed from the landscape within 10 years.

Tree diversity and vulnerability

At present, approximately 40% of our trees come from one family (Myrtaceae). Elm avenues line many of Melbourne's boulevards and plane trees dominate in many streets, particularly within the central city. Within streets 24% of trees are planes, 11% are elms and 8% are spotted gums. Reliance on a few species, and a lack of spatial diversity in species distribution, leaves the urban forest vulnerable to threats from pests, disease, and stress due to climate change.

Canopy cover

Increasing the provision of summer shade and biomass is important in combating the urban heat island effect, adapting to climate change and enhancing our streetscapes for the comfort of people. Canopy cover is a way of expressing, as a percentage, how much of any given area is shaded by trees. Currently, 77% of Melbourne's streets and parks are without natural shade, and the areas of the city with the highest population density have the lowest canopy cover. The City aims to double its canopy cover by 2040 and is currently planting 3,000 trees per year to achieve this target.

How can permeability, availability of water and soil volume be improved?

The urban environment is highly modified, with harsher conditions for plant growth than in natural landscapes. Tree health and the ability to maintain shade and cooling benefits are primarily influenced by the conditions in which trees are growing.

Access to ample soil moisture enables trees to actively transpire and cool the surrounding air. Adequate soil moisture is critical for healthy vegetation. A number of active and passive approaches are currently undertaken to replenish soil moisture and ensure it is maintained at levels to provide healthy growth. Our *Total Watermark Strategy* has been updated to strategically manage Melbourne's water catchment. In the meantime, we have implemented numerous water sensitive urban design projects to capture and store

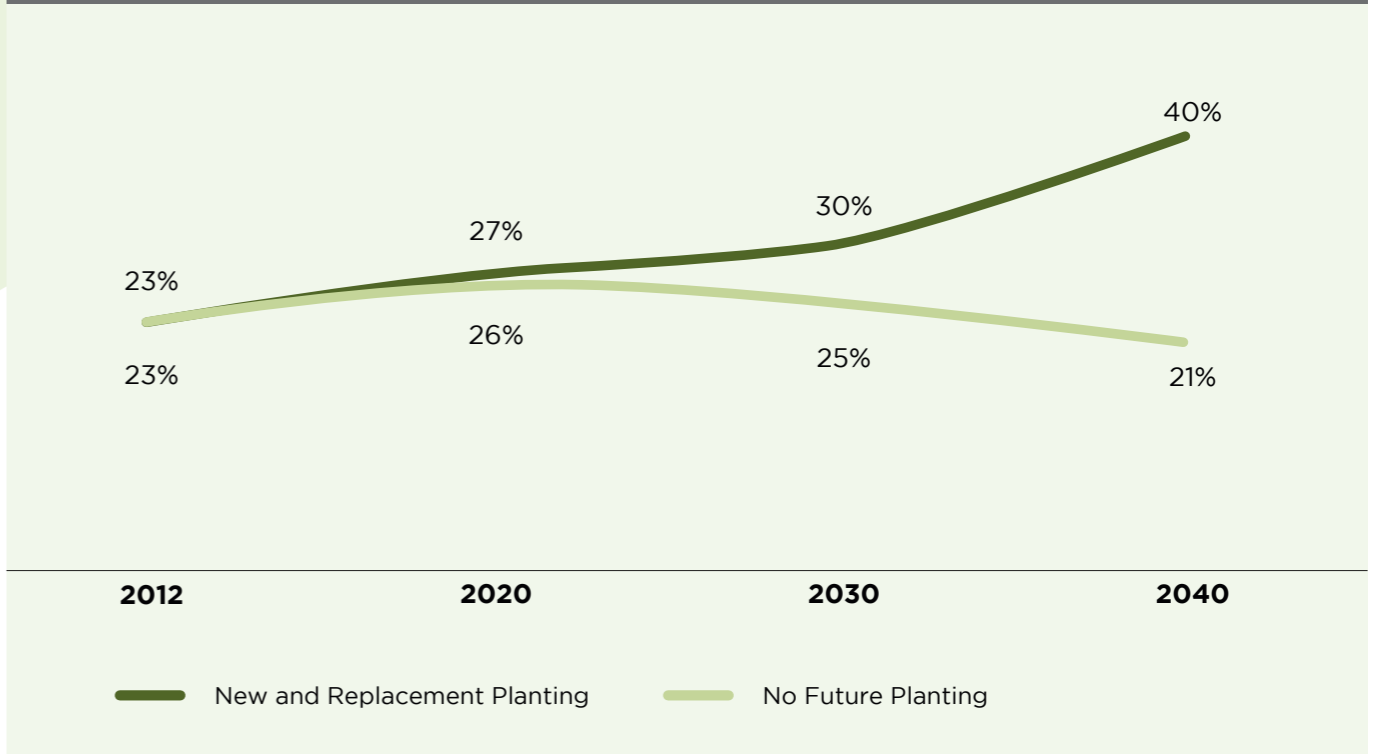
water that would otherwise go down the drain. This water is being used to water the vegetation in our urban landscapes.

Urban development has increased the connectedness of impervious surfaces resulting in:

- decreased vegetation cover and below ground growing space;
- decreased infiltration of water into the ground;
- increased pollutant runoff; and,
- increased hard surfaces which contribute to the urban heat island.

Fundamentally, the city has low levels of water permeability (50%) and water has little opportunity to infiltrate the soil. Ground surfaces need to allow rainfall to enter the soil, a huge reservoir that is ready-made to provide for a healthy forest. We are increasingly using methods to increase permeability through the use of permeable pavement, structural soil cells and peeling back asphalt where possible to provide better growing conditions for trees and vegetation, and a better cooling outcome.

MELBOURNE'S CANOPY GRAPHED WITH AND WITHOUT TREE PLANTING



The lower line represents what is projected to happen to our canopy cover if we stop planting trees. The line above shows what will happen if we replace trees as they are lost and plant new trees at a rate of approximately 3,000 trees per year to 2040.

WHAT WILL THE PRECINCT PLANS ACHIEVE?

The precinct plans will help to guide implementation of the urban forest strategy in Melbourne's streets. The information provided in the plans will direct the annual tree planting program to achieve urban forest strategy objectives, protect and enhance neighbourhood character, and to prioritise works and budgets within each precinct.

Within this document, specific direction is provided on the selection of appropriate trees for the precinct. The plans are performance based in that they

establish the desired outcomes for streets but do not prescribe specific species for each location. A set of *Urban Forest Diversity Guidelines* have been developed for Melbourne's urban landscapes and these will support the precinct plans with case studies and detailed guidance on how to achieve outcomes in streets that are consistent with the urban forest strategy. Park and significant boulevard trees will be planted using existing master plans and site specific plans.

Policy context

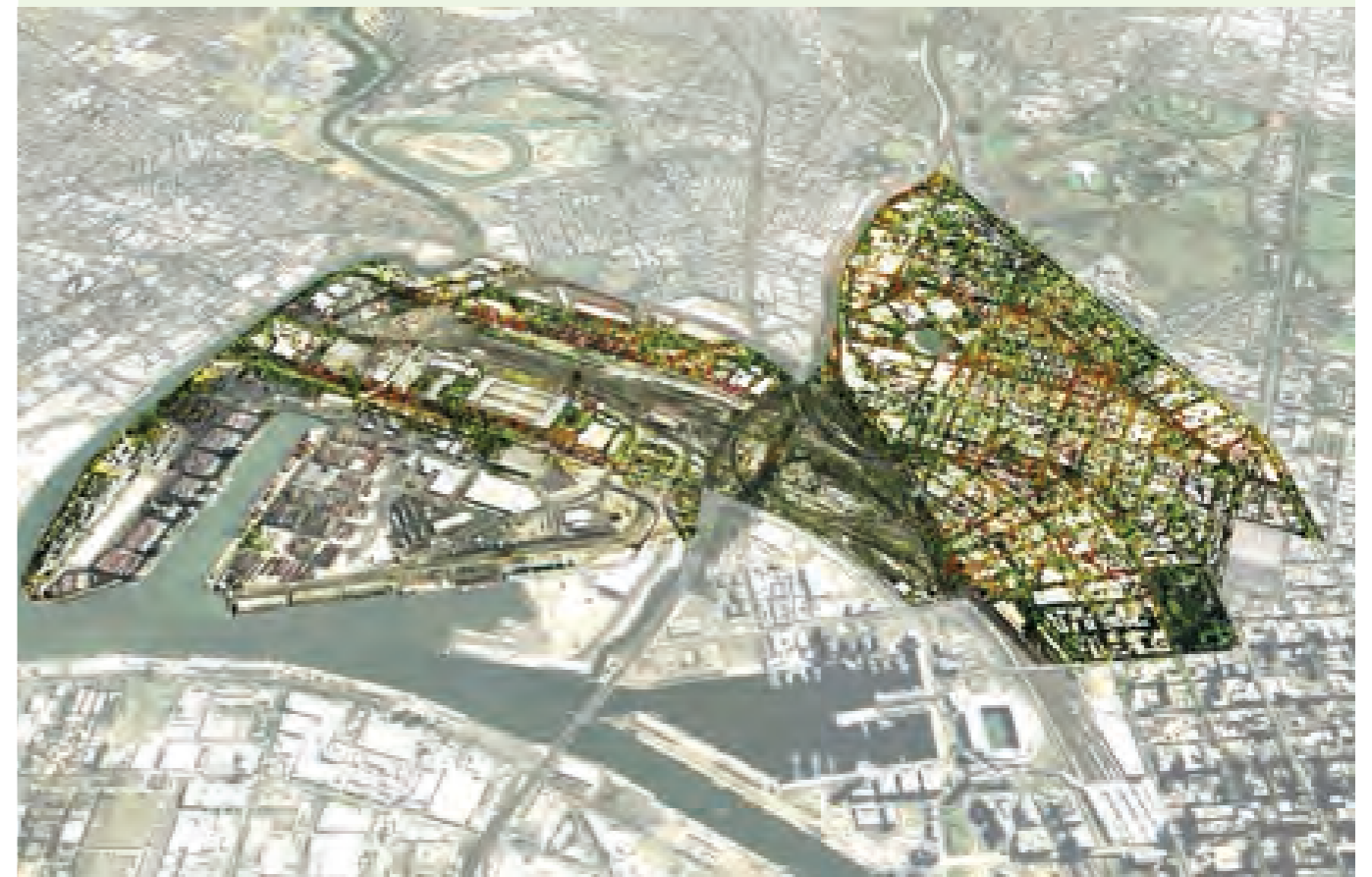
The relationships between the precinct plans and City of Melbourne policy documents are outlined in the Urban Forest Strategy. Within North & West Melbourne, the heritage overlays, City North and Arden Macaulay Structure Plans, Open Space Strategy and future development areas strongly influence the future character of the precinct. Structure planning may provide opportunities for new tree planting in appropriate locations as they are developed.



The City of Melbourne boundary is shown in grey and the North West Melbourne Precinct is highlighted in orange.

THE VISION FOR NORTH WEST MELBOURNE URBAN FOREST

North & West Melbourne's urban forest will be alive with colour, diversity and interest. Its shady, layered and connected canopy will provide a retreat for people and wildlife. The varied character of the precinct will be reflected in the character of plantings.



WHAT WILL THE PRECINCT PLANS ACHIEVE? CONTINUED

Complementary strategies

The precinct plans address tree planting in Melbourne's streets but there are many ways in which the private and public realm can contribute to meeting urban forest objectives and creating a city resilient to climate change. These include:

- Water sensitive urban design
- Tree planting in parks
- Private realm tree planting that contributes to urban forest canopy, diversity and connectivity
- Planting vegetation that enhances urban biodiversity
- Maximising permeable surfaces and growing space for trees
- Building green roofs and walls
- Greening balconies
- Implementing innovative green technologies

The City of Melbourne is working with stakeholders in both the public and private realm to support these outcomes.

Opportunities exist to enhance canopy cover in the private realm. The projected canopy cover for the entire precinct has included a potential tripling of private realm canopy cover to 7% by 2040. In order for this to occur, private and institutional land owners, and developers would need to actively create space for and plant trees.

The City of Melbourne will support private residents to plant trees by providing materials that advise on suitable trees to plant in small yards and by seeking creative ways to encourage private land planting. Council will also continue to

educate residents on how they can contribute to and be involved in the urban forest through our ongoing community engagement work.

In and adjacent to the North & West Melbourne precinct, the Port of Melbourne, State Government and schools manage large areas of land that could potentially support greater canopy cover. The City of Melbourne will work with institutional and large holding land managers across the city to support and encourage the adoption of urban forest strategy principles on those lands. Similarly, the City of Melbourne will work with neighbouring municipalities to support and encourage the adoption of urban forest strategy principles in other jurisdictions.

Historical and existing tree plantings

North Melbourne and the eastern section of West Melbourne were surveyed and subdivided in the 1850s. The western section of West Melbourne was a saltwater wetland that would have provided an important seasonal food source for Aboriginal people of the Wurundjeri tribe. In the early years of settlement the wetland was a beauty spot and hunting ground, but later became spoiled with waste. It was drained in the late 1800s and developed into the low lying railway and industrial areas of West Melbourne that exist today. North and West Melbourne were within the Town of Hotham until 1888, when Hotham amalgamated with City of Melbourne.

Early tree planting was largely driven by the desire to create windbreaks, manage dust and

establish shade. Flemington Road was a rough track in the earliest days. Improvement plans were developed in 1874 but the elms were not planted for some years due to cost. The Brush Boxes were planted in 1926.

A tender for 100 iron tree guards was advertised in 1876 and 50 of these were used in Queensberry Street to plant elms 4.5 m apart. Newspaper records indicate that Peel Street was planted around 1878 and Elizabeth Street was planted close to that time also. Curzon Street was planted in approximately 1884. Chapman Street and Canning Street were planted around 1886. Councillor preferences at this time suggest elms were commonly planted in streets while in reserves the preference was for deciduous trees alternated with evergreens (e.g., elms with pines). Most of these original plantings in streets appear to have been replaced.

Other significant periods of street tree planting occurred in the 1930s when many tree islands and medians were constructed, and another wave of planting occurred from the 1970s onward and this period saw a greater emphasis on the use of native trees.

North West Melbourne character

North and West Melbourne have a strong cultural identity attached to the arts community and their proximity to Queen Victoria Market, added to which a variety of commercial, industrial, residential and other land uses have been mixed. The precincts' street grid is largely based on the 200 m by 100 m module common to other local

neighbourhoods, varying between a radial geometry in the south-west sector, and a north-south orientation in the central sector, and east-west to the north.

While the major open spaces of Royal Park and Flagstaff Gardens are located on the neighbourhood fringe, there are few parks within the neighbourhood of any significant size. The points at which the different city grids converge result in distinctively shaped urban spaces. These offer unique opportunities and the potential for meaningful and enlarged green spaces such as the recently completed Errol Street Park.

Many of the streets in North and West Melbourne are 30 metres wide, with relatively narrow footpaths and no nature strips. A network of laneways and narrow streets also filters through the neighbourhood creating a dense, more intimate character. There are opportunities to expand planting opportunities in wider streets by either planting in roadsides and footpaths or by changing existing configurations to create new nature strips, road ends and kerb outstands. Understorey planting can also be supported in many locations.

The core genera (groupings of species) that characterise North and West Melbourne's urban forest are the many mature spotted gums and eucalypts that distinguish the area from other parts of Melbourne as well as elms and planes commonly found across the city.

Community consultation highlighted opportunities to create diverse and surprising landscapes in pocket parks and other strategic locations. More uniform landscapes were

favoured for wide streets and boulevards. Access to light, scale relative to homes and good design were also highlighted.

The character of the urban forest in North & West Melbourne is varied between areas with different historic land uses but a strong native tree planting theme permeates the neighbourhood and strengthens with proximity to Royal Park. In the more established residential zones of North Melbourne, mature spotted gums, elms and planes are planted uniformly in the wider avenues.

More recent plantings in narrow streets have introduced an eclectic range of species. The formerly industrial zones of North & West Melbourne (now becoming more residential) offer wide streets but plantings are relatively recent and consist of varied species. The industrial and future development areas of North & West Melbourne are largely un-planted and offer a substantial opportunity for tree planting as they develop.



'Melbourne and Its Suburbs' compiled by James Kearney, draughtsman; engraved by David Tulloch and James D. Brown. Victoria. Surveyor-General [Melbourne]: Andrew Clarke, Surveyor General 1855: (part, State Library of Victoria collection)

COMMUNITY PRIORITIES

North & West Melbourne's Urban Forest Precinct Plan has been developed in collaboration with the community, which is reflected in the character, vision, planting plan and priorities defined for North & West Melbourne's urban forest.

Consultation highlighted that North & West Melbourne's urban forest should contribute shade, colour, beauty and native habitat. The urban forest should provide a cool, healthy environment and be a place to meet people, relax and escape the hustle and bustle.

COLOUR



Desired future states defined by the community

- Shady, layered, connected, diverse, aesthetically pleasing
- Social, immersive and peaceful, providing relief from heat
- Native trees and native bird and insect attracting
- Healthy, appropriate tree selection and water sustainable
- Enhancement of local neighbourhood character and maintenance of heritage character and boulevards

Urban forest benefits highlighted through community consultation

- Shade
- Biodiversity
- Social cohesion
- Connection with nature
- Aesthetic beauty and screening
- Psychological benefits, such as a sense of calm and a soothing environment.

SHAPE, DIVERSITY AND LAYERS



Images selected by the community as representing a preferred future for North West Melbourne urban forest that includes colour, shape, layers, diversity and canopy.

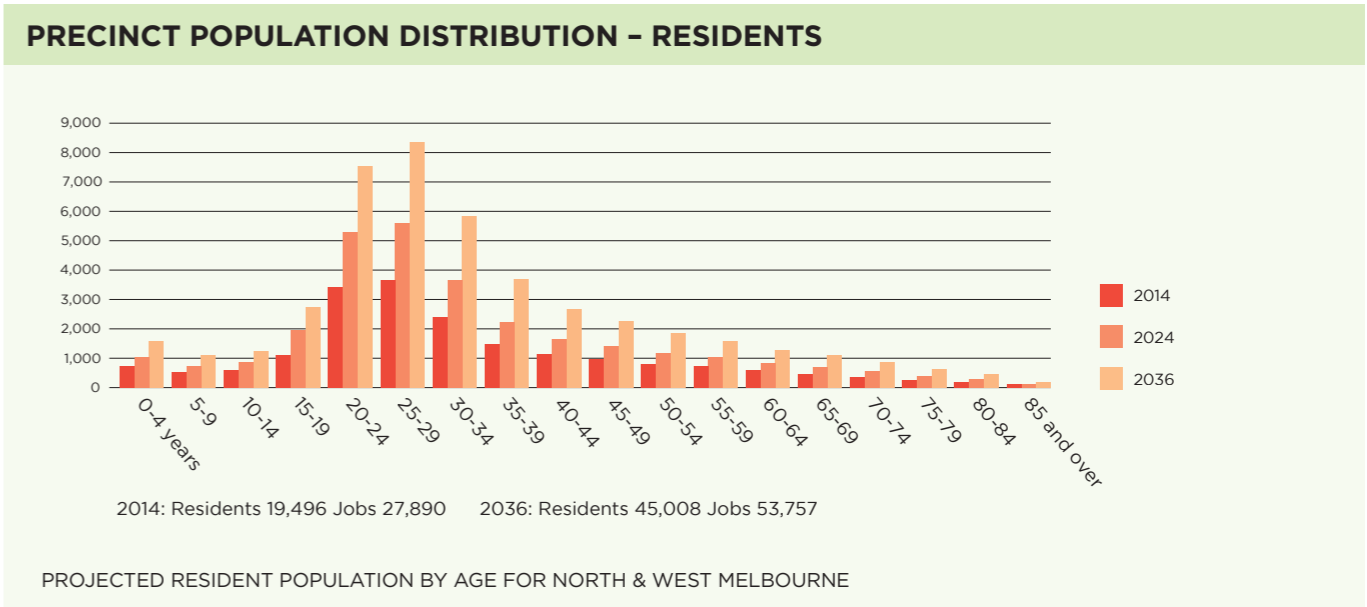
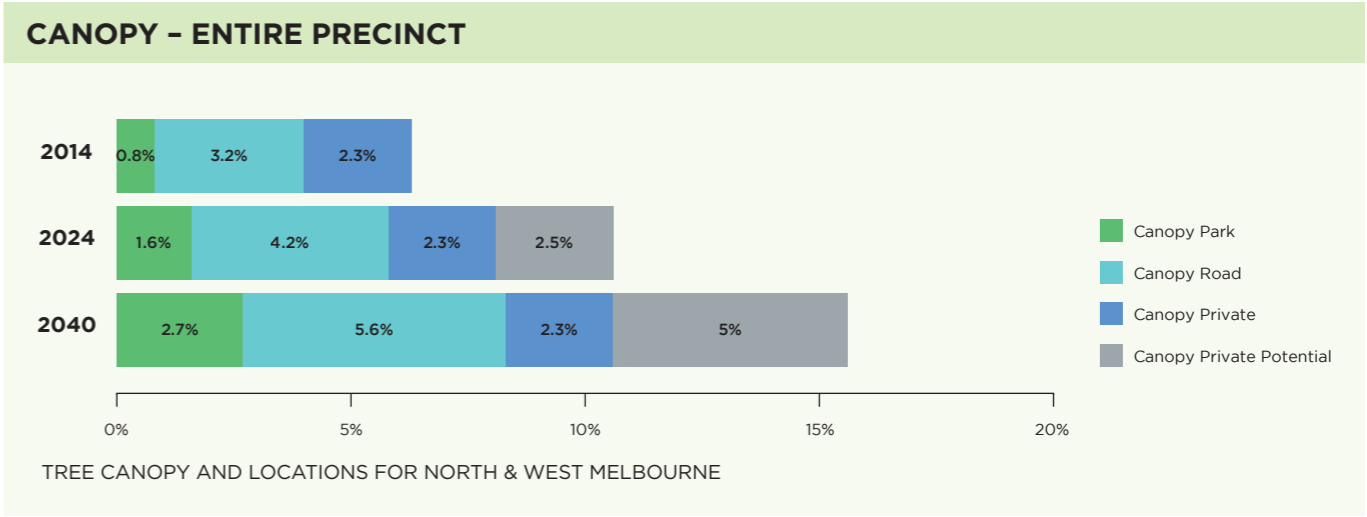
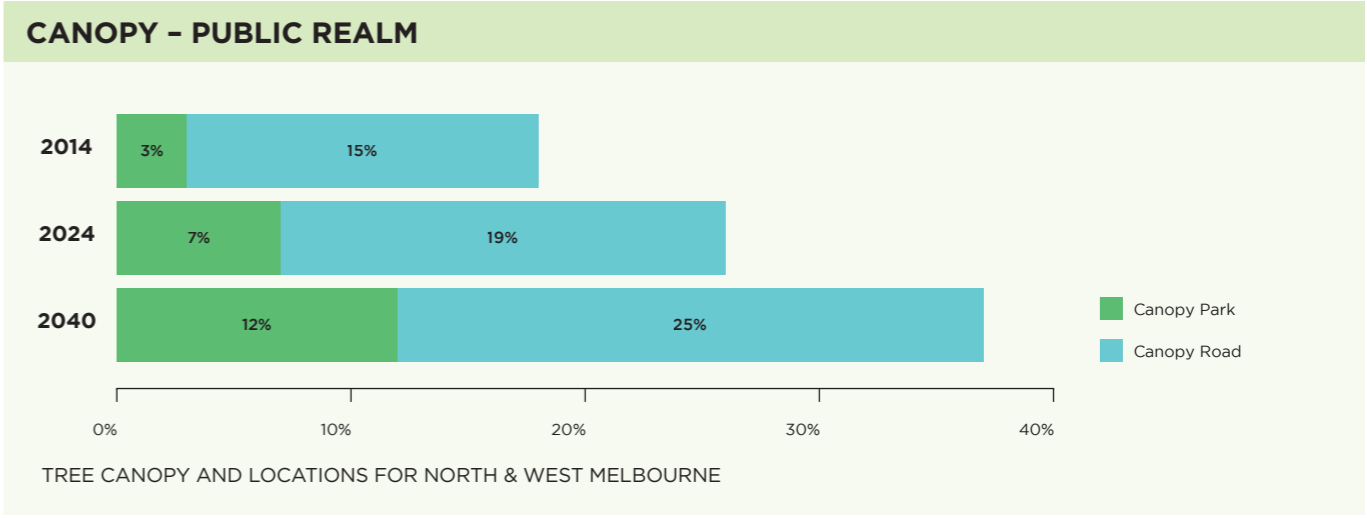
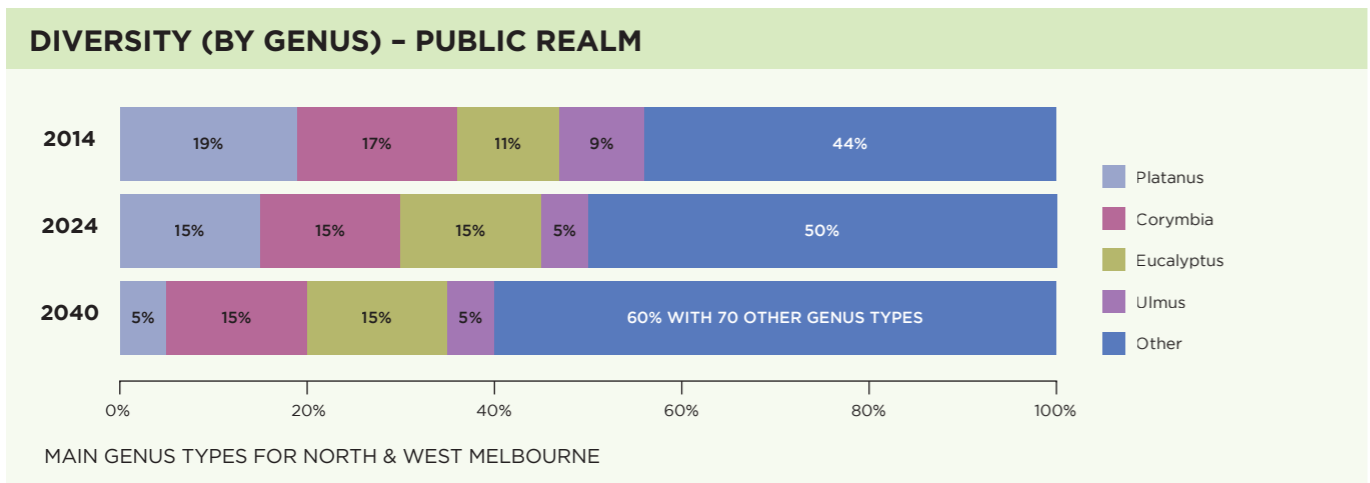
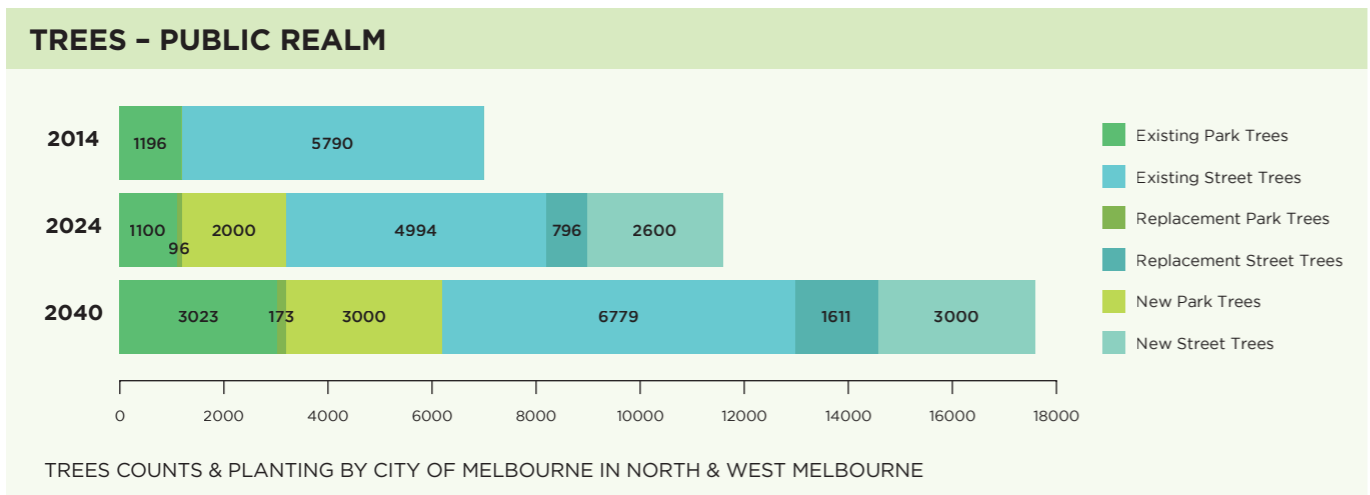
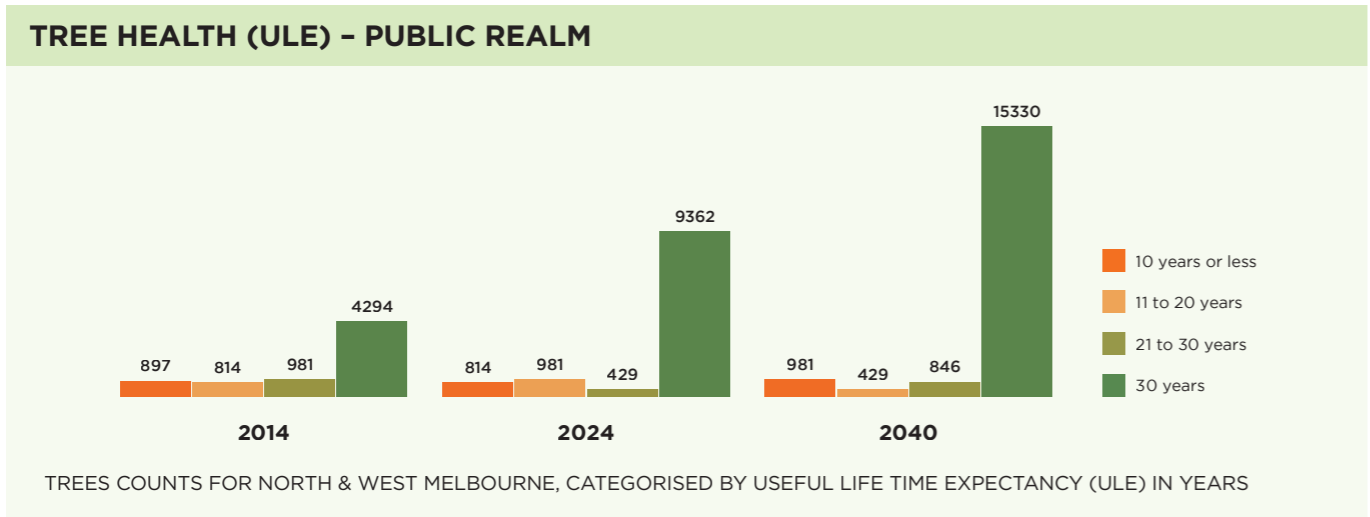
STREETScape



North West Melbourne community members developing priorities for planting in the precinct. (opposite)

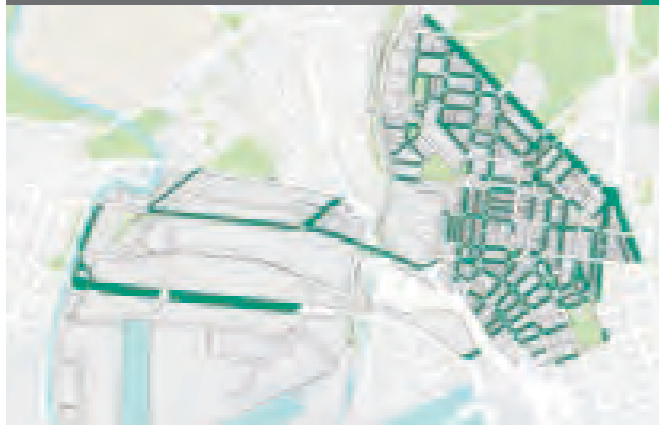


NORTH WEST MELBOURNE URBAN FOREST IN 2014 AND ITS PROJECTED FUTURE

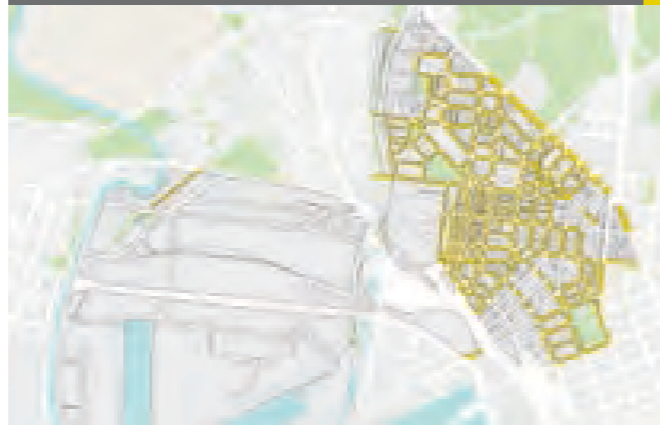


PRIORITISING TREE PLANTING IN STREETS

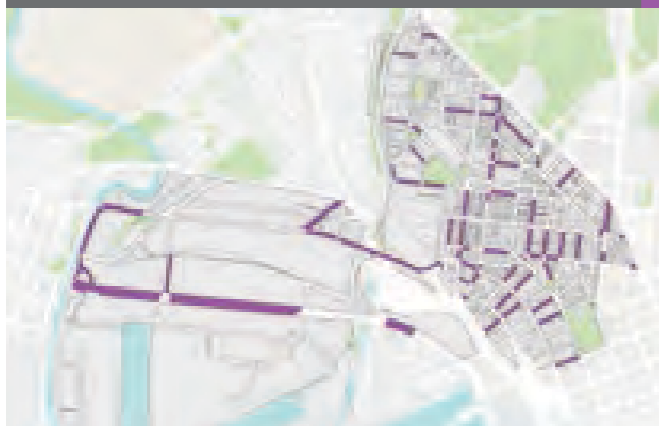
1. Streets with opportunities for planting or replacements



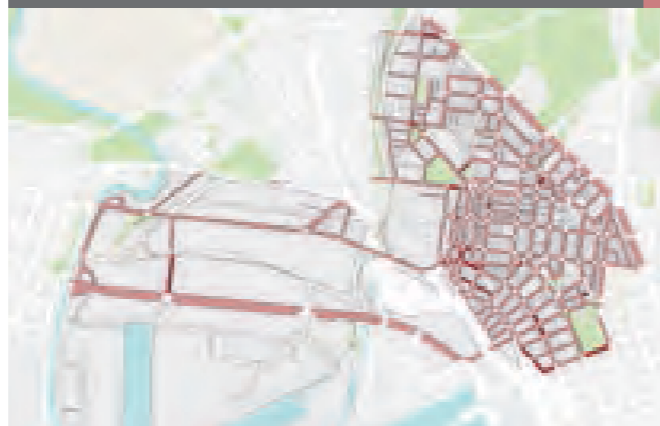
2. High density (>20) of vulnerable residents (<5 or >74 yo)



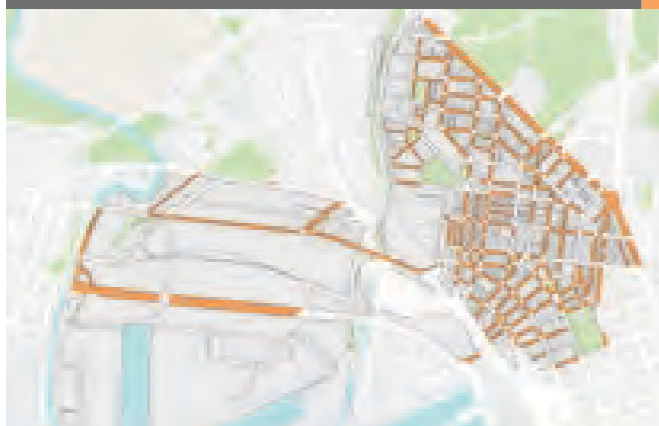
3. Community identified priority for greening



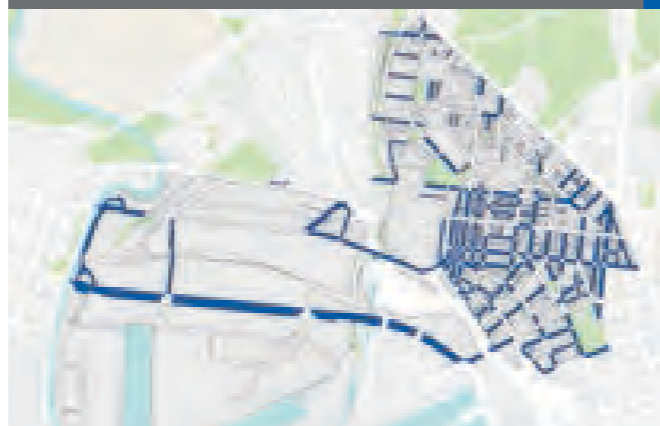
4. Hot and very hot streets



5. Tree replacements required in next 10 years



6. Canopy Cover <20%



Map 1: Planting priorities

The priority for work in different streets has been determined using varied criteria and the associated timing is provisional only. The schedule for some streets may be brought forward or delayed by capital works, renewal projects or developments that affect tree planting or survival. Unforeseen opportunities for streetscape improvement may also alter scheduled planting.

Streets prioritised for work in Years 1 - 4 (2014 - 2017) include those:

1. Already scheduled for work in the current planting season; or,
2. Having a high number of vulnerable people with two or more occurrences of: community priority, very low canopy cover, temperature hot spot or replacements required.

Streets prioritised for work in Years 5 - 7 (2018 - 2020) include those which have a:

1. Having a high number of vulnerable people with one occurrence of: community priority, very low canopy cover, temperature hot spot or replacements required.

Streets prioritised for work in Years 8 - 10 (2021 - 2024) include those with only:

1. High number of vulnerable people; or a combination of,
2. Community priority;
3. Very low canopy cover;
4. Temperature hot spot; or
5. Replacements required.

Prioritising tree planting in streets

When prioritising where to plant, it is important to focus resources in the locations that need it most. This includes consideration of where we have opportunities to plant new trees or replace trees, where the highest density of vulnerable people reside, which streets are the hottest in summer, and where very low canopy cover exists today.

Replacements are only identified for streets where the useful life expectancy of multiple trees is rated at less than 10 years. Census and mapping data were used to spatially define streets with these conditions and are defined on the maps overleaf.

HOW THE PRECINCT PLAN GUIDES ANNUAL PLANTING



Set annual planting program

Priorities (Map 1)
Streets undergoing unforeseen change (Eg. Infrastructure Project or Development)
Annual Budget



Define objectives for streetscape

Review guiding principles and considerations for tree planting (Map 2-7)



Define planting strategy

Maps 8-10



Select species

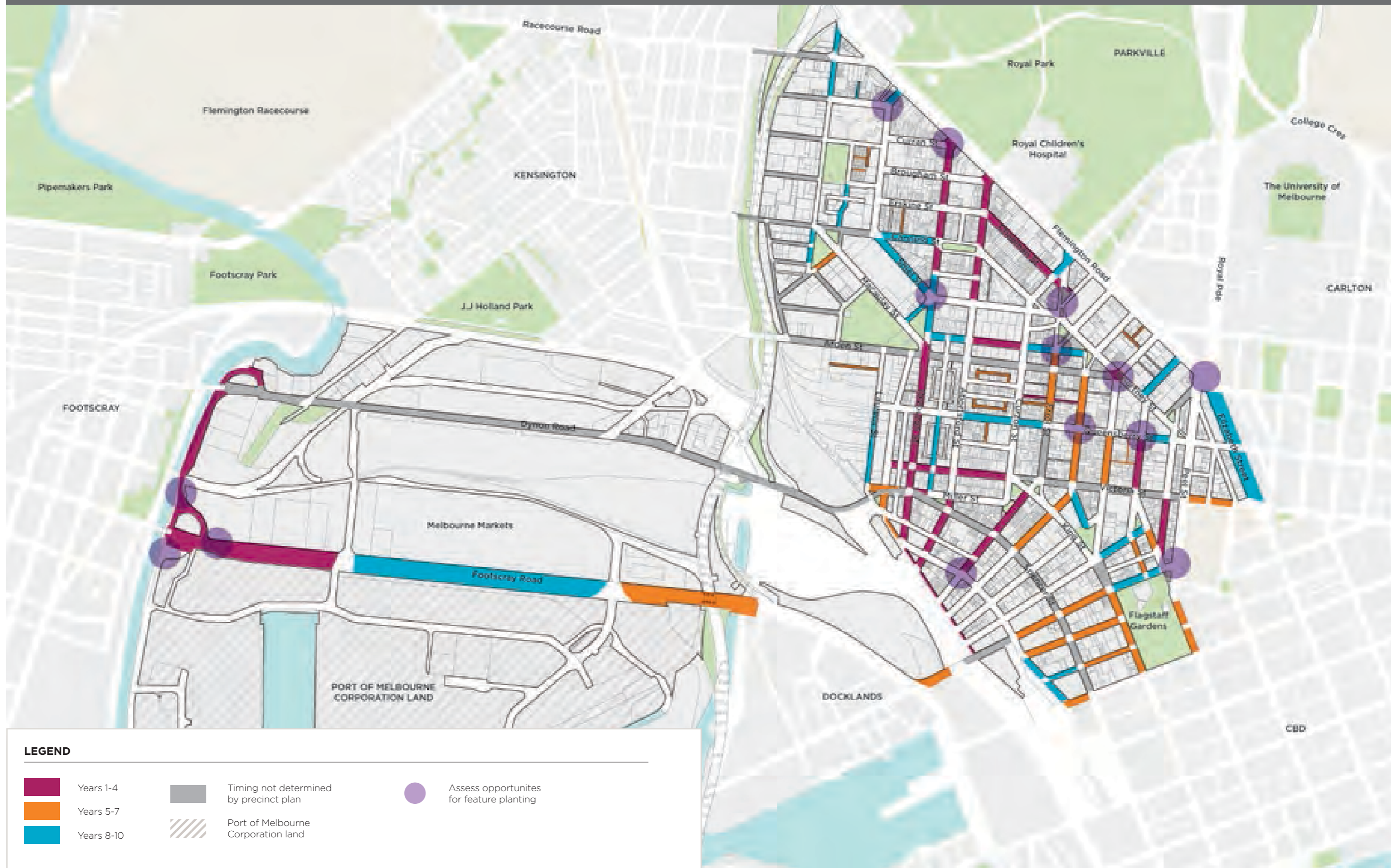
Review Streetscape objectives
Review What should change (Map 7)
Review Planting plans (Map 8, 9 & 10)
Review species palette









Implement planting

Produce streetscape design options
Consult with residents
Plant

MAP 1: PLANTING PRIORITIES



LEGEND

- | | | | | | |
|---|------------|---|--|---|---|
|  | Years 1-4 |  | Timing not determined by precinct plan |  | Assess opportunities for feature planting |
|  | Years 5-7 |  | Port of Melbourne Corporation land | | |
|  | Years 8-10 | | | | |

PRIORITISING TREE PLANTING IN STREETS **CONTINUED**

Planting in streets presents a variety of challenges, and there are important principles to use in responding to those challenges that will help to meet the Urban Forest Strategy targets. A complete and expanded set of these principles is included in the *Urban Forest Diversity Guidelines* and should be referred to when designing or planting any streetscape; however North & West Melbourne specific principles are outlined below.

Planting types and locations: Preference large canopy trees

A single large canopy tree provides greater benefits in terms of cooling, rainwater interception and other ecosystem services than multiple small trees totalling the same canopy extent. Wide streets in North & West Melbourne present opportunities for planting large trees in medians and, in some locations, there is potential to reduce road widths and construct either medians or nature strips for large trees.

Streets such as Spencer Street, Dryburgh Street and Victoria Street have existing medians with poor below ground conditions that will need to be remediated when trees are replaced.

Kerb outstands should be considered as opportunities to plant species drawn from a wider palette that are unique to that location or intersection and provide visual interest. Roundabouts and closed road ends should be considered as opportunities to

plant large canopy trees and create landmark feature landscapes with supporting understorey planting. Consider extending the character of Royal Park and the numerous small reserves into the surrounding streetscapes to create linkages between open spaces.

Low voltage overhead wires are present in many North & West Melbourne streets. High voltage wires are also present on Arden Street, Dynon Road, Railway Place and portions of Dryburgh Street, Queensberry Street, Courtney Street and Capel Street. These constraints

limit the potential for large, natural canopy growth. Where medians exist for large canopy tree planting, select small to medium trees on the side with overhead constraints. In streets where footpath trees provide the only canopy, select medium to large trees that can be effectively pruned around power lines. Always consider opportunities to bundle or underground power lines. Below ground services such as gas mains and water mains also restrict planting on streets such as Dryburgh Street, Melrose Street and Railway Place among others.

Alternative strategies for greening these streets, including the potential contribution of the private realm, will need to be considered.

Outcomes that improve the pedestrian environment should always be prioritised. Opportunities for understorey planting with a biodiversity and pedestrian environment objective should be considered where possible.



Streetscape with powerlines



Kerb outstands should be considered as opportunities to plant species drawn from a wider palette that are unique to that location or intersection and provide visual interest.

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING

Planting Patterns and Species Choice: Adopt planting patterns that increase diversity

The convention of planting avenues, or consistent lines of a single species, can limit species diversity. However, avenue plantings are important to local character in many streets and open spaces in Melbourne. To balance these two conflicting pressures, it is important to identify ways to minimise the extent of homogenous avenue planting while maintaining a strong design outcome. The following strategies can be used:

- Establish a hierarchy of streets and paths most important to plant with continuous avenues and limit use elsewhere;
- Identify breaks in avenues at logical points along the length of streets, where species may change;
- Use asymmetrical treatments along some streets. For example, local streets where there are power lines on one side only so large trees may fit on one side and small ones on the other);

- Use mixed avenues of two or more species of similar form and character where appropriate;
- Use informal mixes of species where acceptable. For example, perimeters of parks and gardens, streets where most trees are senescent but important established specimens remain, streets where vegetation from private gardens occasionally overhangs into street space.
- Use a balance of proven and trial species to increase diversity but limit the use of trial species in streets to less than 10% of the precinct tree population.

Select 'shorter-lived' (~50 years) species in approximately 10% of each sub-precinct to better balance future age distribution across North & West Melbourne. These selections should be focused in areas or planting positions where losses will have a lower impact on shade provision (e.g., where there are large, long-lived trees in medians or on one side of the street, or in landmark/biodiversity plantings).

Soil and moisture conditions: Improve soil moisture conditions and select species appropriate to the site conditions

Always consider opportunities to undertake soil volume improvement in planting areas and to increase permeability or water infiltration where needed. Assessment for these interventions is particularly necessary at sites where trees are being replaced because they failed to thrive. Interventions to consider include:

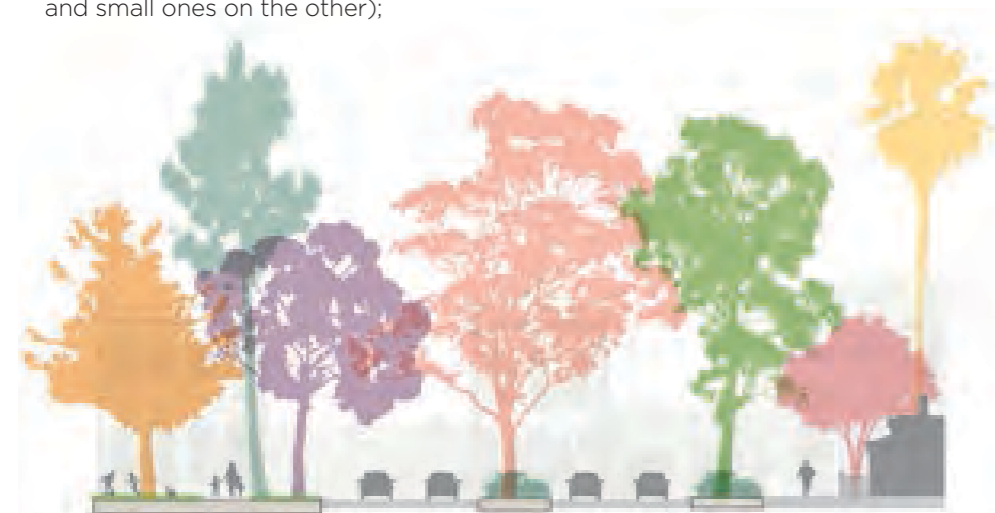
- Systematic trenching in landscaped areas, in medians, between tree plots and centre of road parking zones
- Structural soils or cells below permeable paving
- Increasing soil volume
- WSUD tree pits or infiltration pits
- Stormwater harvesting
- Improving existing soil quality and water holding capacity

The native soils in North & West Melbourne were formed from Silurian deposits. Heavy silty-clay soils with poor drainage occur in western part of the precinct for most of the length of Flemington Road and Elizabeth Street. The exception occurs between Gatehouse and Abbotsford Street where heavy textured clay soils derived from deeply weathered basalt occur. This same soil type is prevalent from Park Street south to Arden Street and in much of West Melbourne. Below the higher elevation areas in the vicinity of Erskine Street, and then Arden Street from Lauren Street to Curzon St and south through Flagstaff Gardens the underlying mudstone is capped with flat-lying tertiary sand which produces a loamy-sandy soil. Within this cap one would expect better drainage than the mudstone and sufficient nutrient status to support healthy trees. Adjacent to the Moonee Ponds Creek and over the full extent of the western end of the precinct (i.e., from the rail corridor west) medium to heavy textured clay with some sand derived from alluvial deposits is present, as is variable fill and Coode Island Silt.

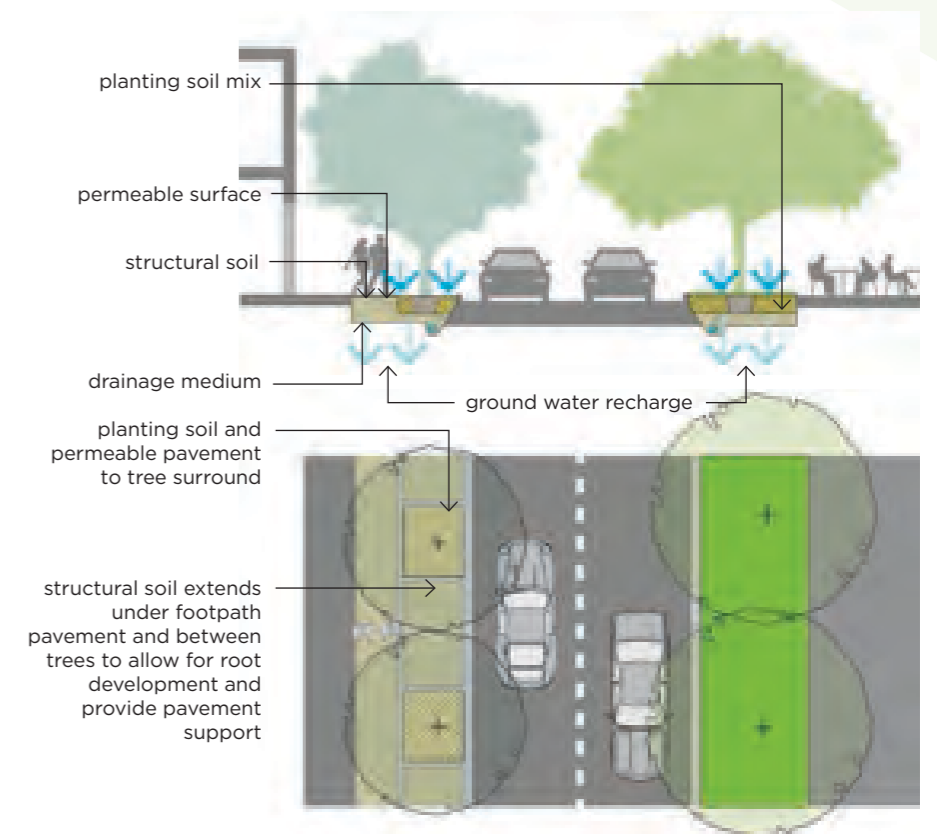
The Maribyrnong River and Moonee Ponds Creek are important waterways within the North & West Melbourne precinct and the surrounding streetscape and private realm vegetation can play a role in supporting the ecology of the river corridor. Species selection to provide habitat can be incorporated with initiatives for capturing water and runoff for filtration prior to entering the waterway.



Water infiltration, permeable paving and structural soil or cells provide opportunities to grow larger, healthier trees in paved areas.



Use informal mixes of species where acceptable (e.g., perimeters of parks and gardens, streets where most trees senescent but important established specimens remain, streets where vegetation from private gardens occasionally overhangs into street space, etc.).



Improving below ground growing conditions for trees in streets

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING **CONTINUED**

Map 2: Key planting constraints

This map indicates locations where overhead constraints have been identified and may impact tree selection and the maximum canopy cover that can be achieved. Low voltage overhead wires associated with electricity distribution and tram lines have minimum clearance distances from vegetation that must be maintained. When selecting which species to plant beneath overhead wires, ensure that the species chosen can be formatively pruned to create a pleasing canopy shape, or is at a mature height that it is a safe distance from overhead wires.



Small tree under powerlines



Tree trimmed under powerlines

Map 3 & 4: Planting Opportunities

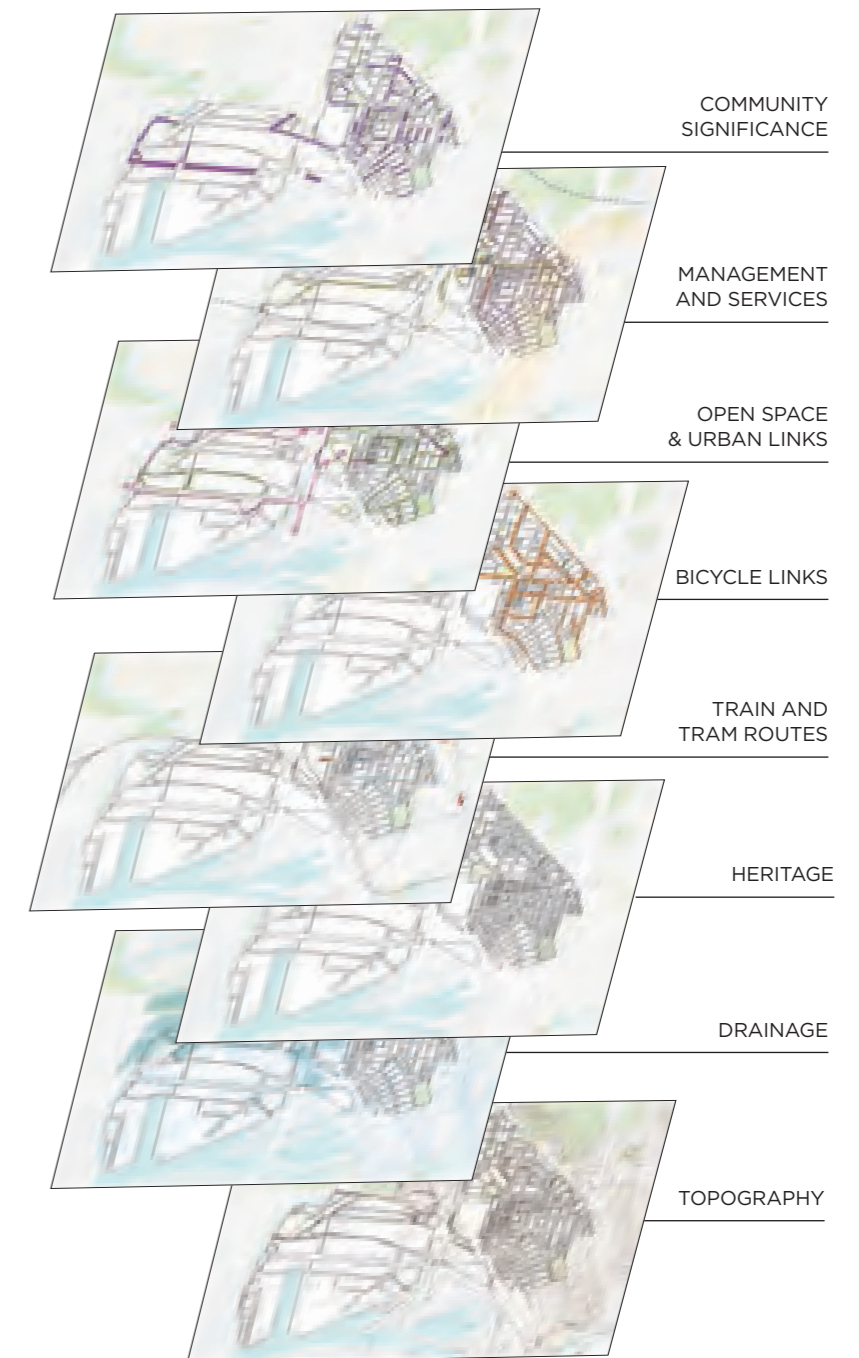
These maps show some of the many layers of information that influence the opportunities and objectives for tree planting in North and West Melbourne Streets.

Map 3 illustrates the Natural and Open Space Context which considers the geographic aspects of the precinct as well as open space opportunities.

Map 4 identifies the Strategic Context for North and West Melbourne. This plan combines planning and urban design factors, landuse and connectivity.

The combination of all of these factors will influence the design for streets, the varied role of planting in these streets and species selection.

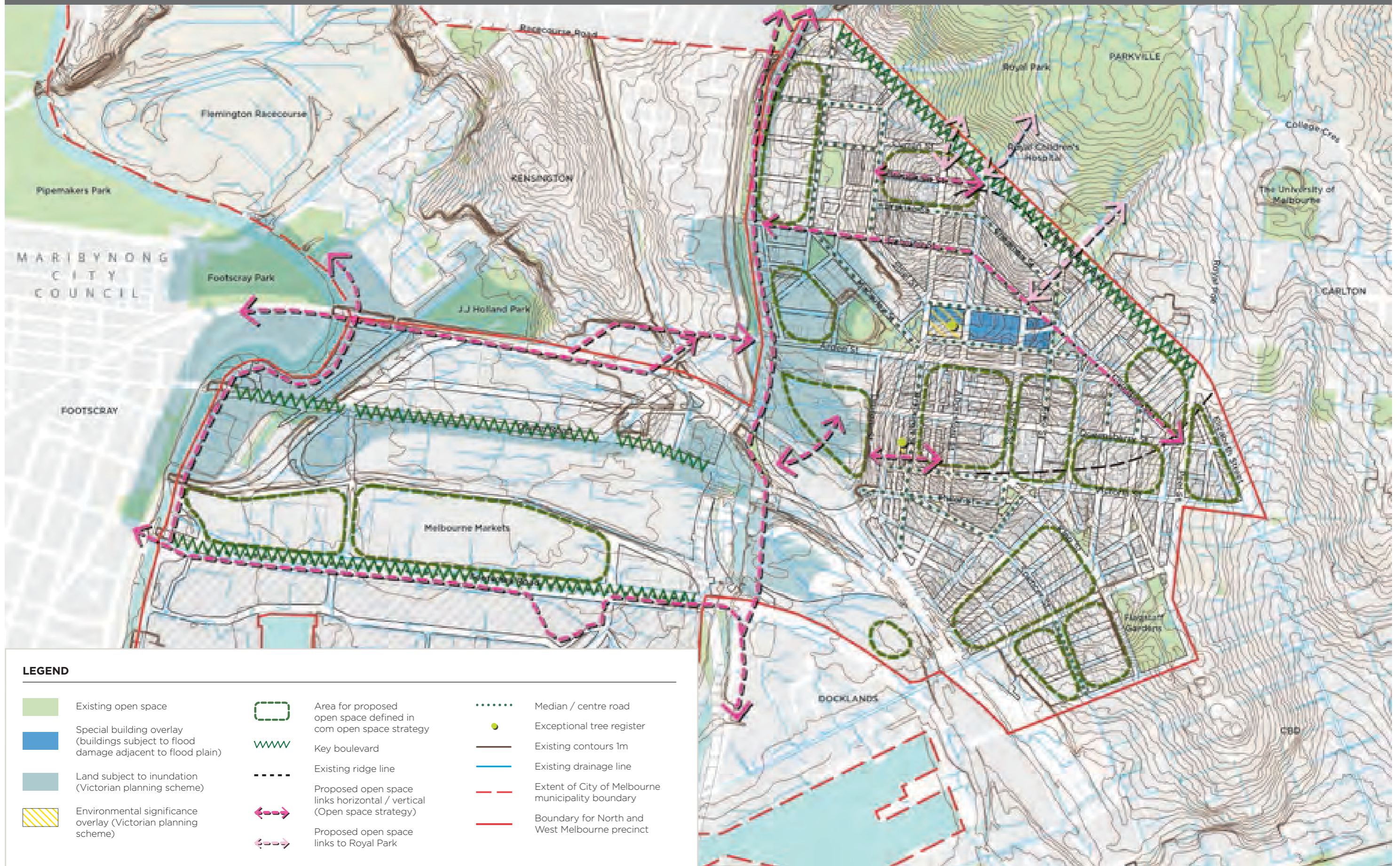
(refer Maps 3 & 4 on pages 32 & 34)



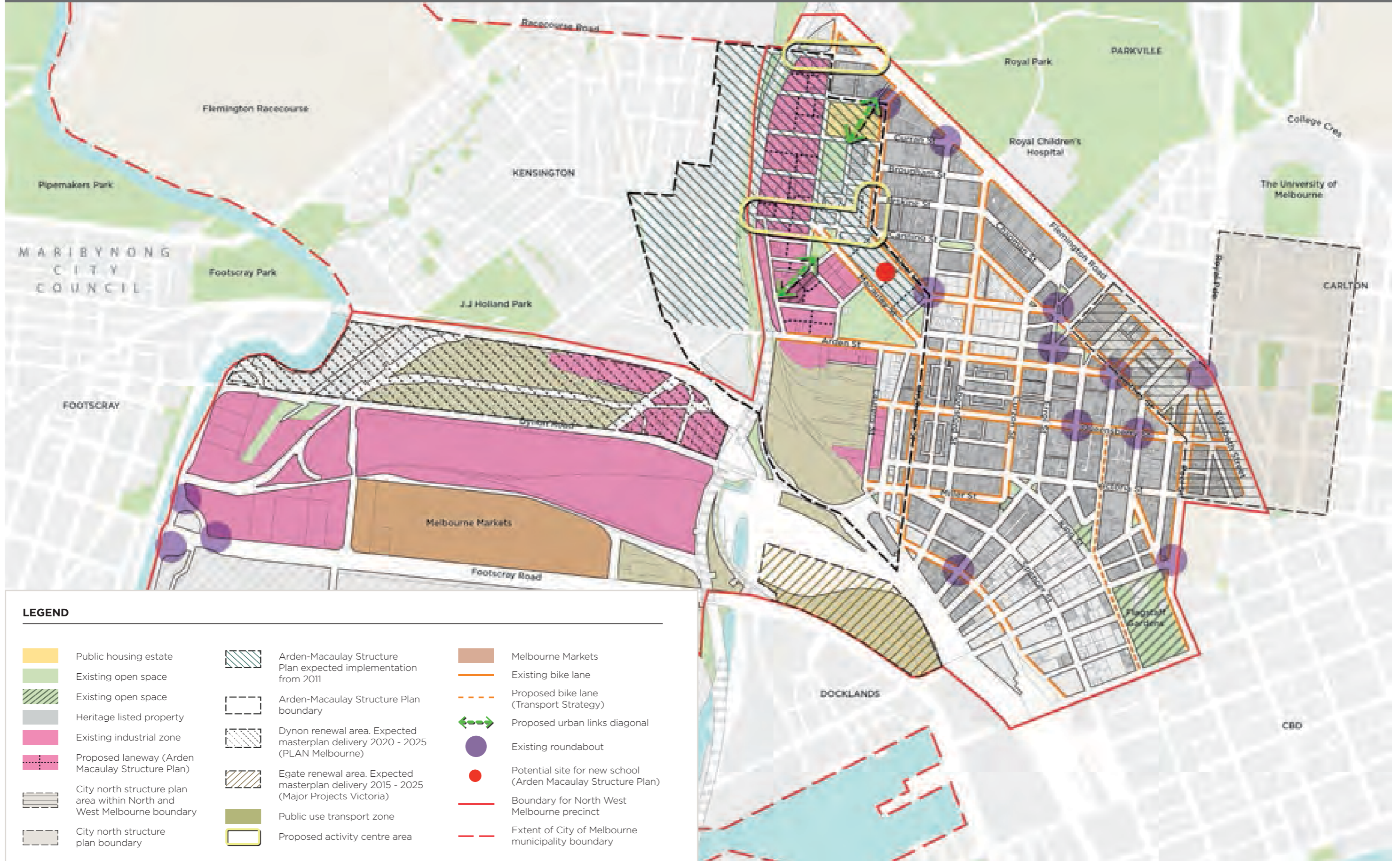
MAP 2: KEY PLANTING CONSTRAINTS



MAP 3: NATURAL AND OPEN SPACE CONTEXT



MAP 4: STRATEGIC CONTEXT



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING **CONTINUED**

Map 5: Planting Sub-precincts

The following sub precincts reflect the varied characteristics of North and West Melbourne. These include key differences in landuse, urban character, and landform to which planting will respond.

Arden-Macaulay growth area precincts

This precinct will undergo considerable change with conversion of the existing industrial areas to a higher density, mixed use neighbourhoods. There will also be considerable change to the existing housing estate and a need to plan for the new infrastructure (i.e. schools, public transport, activity/retail hubs) this growing community will require. The growth area is made up of 3 distinct sub precincts:

Arden precinct

Arden precinct adjacent to the Moonee Ponds creek is subject to flood inundation, and is currently characterised by industrial uses and the large recreation open spaces of North Melbourne. The urban forest in this precinct can extend the habitat values of the creek corridor and will need to respond to soil moisture conditions and be resilient to periodic flooding.



Moonee Ponds creek.

Macaulay/Flemington precinct is currently characterised by its industrial land uses and is defined by the creek, railway and Citylink road infrastructure, Boundary Road and Macaulay Road.

Macaulay Community precinct

Macaulay community precinct is currently a mixture of public housing, park and community infrastructure. The selection of trees and streetscape design in this area will need to be developed to provide increased amenity as part of the future neighbourhood activity centre.

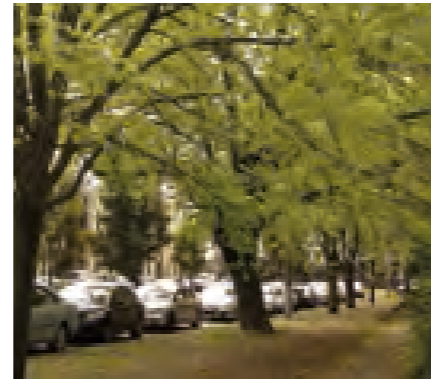
City north growth area precinct

This precinct will undergo a greater degree of change than most areas of North Melbourne. The growth area extends into, and will have strong links to, the north edge of the city and Carlton. Increased building height and density will create a varied microclimate at street level with the public realm design and planting needing to respond to issues of wind, building shade and providing pedestrian amenity and comfort. Enhancing the precinct's connections to Royal Park and linking the small reserves along Courtney Street will increase permeability and open space amenity.

Central park precinct

This precinct sits across a small valley in middle of North Melbourne that runs west to Moonee Ponds Creek. A series of triangular street intersections and open spaces are located where the two street layouts meet, and a number of wide medians connect these spaces. The Open Space Strategy proposes the expansion and connections between

these smaller open spaces. The selection of trees and streetscape design in this precinct will need to address the management of storm water along this valley.



Row of Elms in Chetwynd Street North Melbourne

North Melbourne retail precinct

This area sits to the north of Victoria Street and is characterised by its mix of heritage commercial and residential buildings. It is the hub of commercial and retail activity in North Melbourne with the 'high streets' of Victoria Street and Errol Street, and the Town Hall. The urban forest in this precinct needs to provide appropriate microclimate for outdoor dining, and enhance the character of this destination precinct.

Central residential heritage precinct

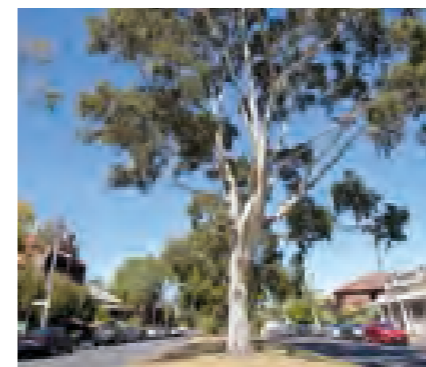
The central residential heritage precinct occupies the hilltop at the west end of Victoria Street and slopes to the north and west in a tight grid of heritage residential buildings interspersed with a mix of industrial and institutional uses. The series of service lanes also add to the fine grain of this precinct which contrasts with the broad width of the through streets.

North Melbourne station precinct

This area extends from North Melbourne Station up to Victoria Street at the intersection of Erroll Street. The station area is part of the Arden-Macaulay Structure Plan and will be an important junction between the E-gate precinct in future, along with the connection to the Errol Street shops. A series of small open spaces and wide street corners run through this precinct where the North and West Melbourne street patterns meet. These streetscape and open spaces will be enhanced to strengthen the connections between the key activity points, expanding open space areas and introducing greater biodiversity.

Royal Park precinct

On the north edge of North Melbourne, this area along Flemington Road is predominantly low rise heritage residential. The connection of this precinct to Royal Park will be enhanced through the character of its tree and streetscape planting. The Open Space Strategy identifies the need for some new smaller open spaces in this precinct.



Corymbia maculata in Chapman Street North Melbourne

Market / Flagstaff north precinct

This precinct is a pocket north of Flagstaff Gardens to Victoria Street where the city grid and north Melbourne street layouts meet, creating a series of angled junctions with wide streetscape spaces. The opportunities in this area include enhancing the park character of these spaces to create a strong connection to Flagstaff Gardens and the Market.

Flagstaff west precinct

Separated from the rest of the CBD by Flagstaff Gardens, this pocket of West Melbourne has a strong relationship with the character of the city, while Dudley Street separates it from the rest of West Melbourne. There is an opportunity to create a distinctive character in this precinct that strengthens its connections to Flagstaff Gardens.

West warehouse precinct

This precinct is defined by the tapering lot sizes that result in a transition from larger warehouses towards King and Spencer Street, towards the finer grain at Railway Place. The radiating streets have a common character and the arcing layout of the intersecting streets creates changing viewlines to the intersecting streets.

Dynon growth area

This area primarily accommodates freight and light industrial uses and is bounded by both the Maribyrnong River and Moonee Ponds Creek. The urban forest will support the ecological and recreation value of these corridors and a diverse gateway linkage to the city from the west. A consistent

native and indigenous planting palette used in this area will maintain the buffer between the ports and Melbourne's exotic urban forest plantings to mitigate the risk of exotic tree pests escaping from the ports.

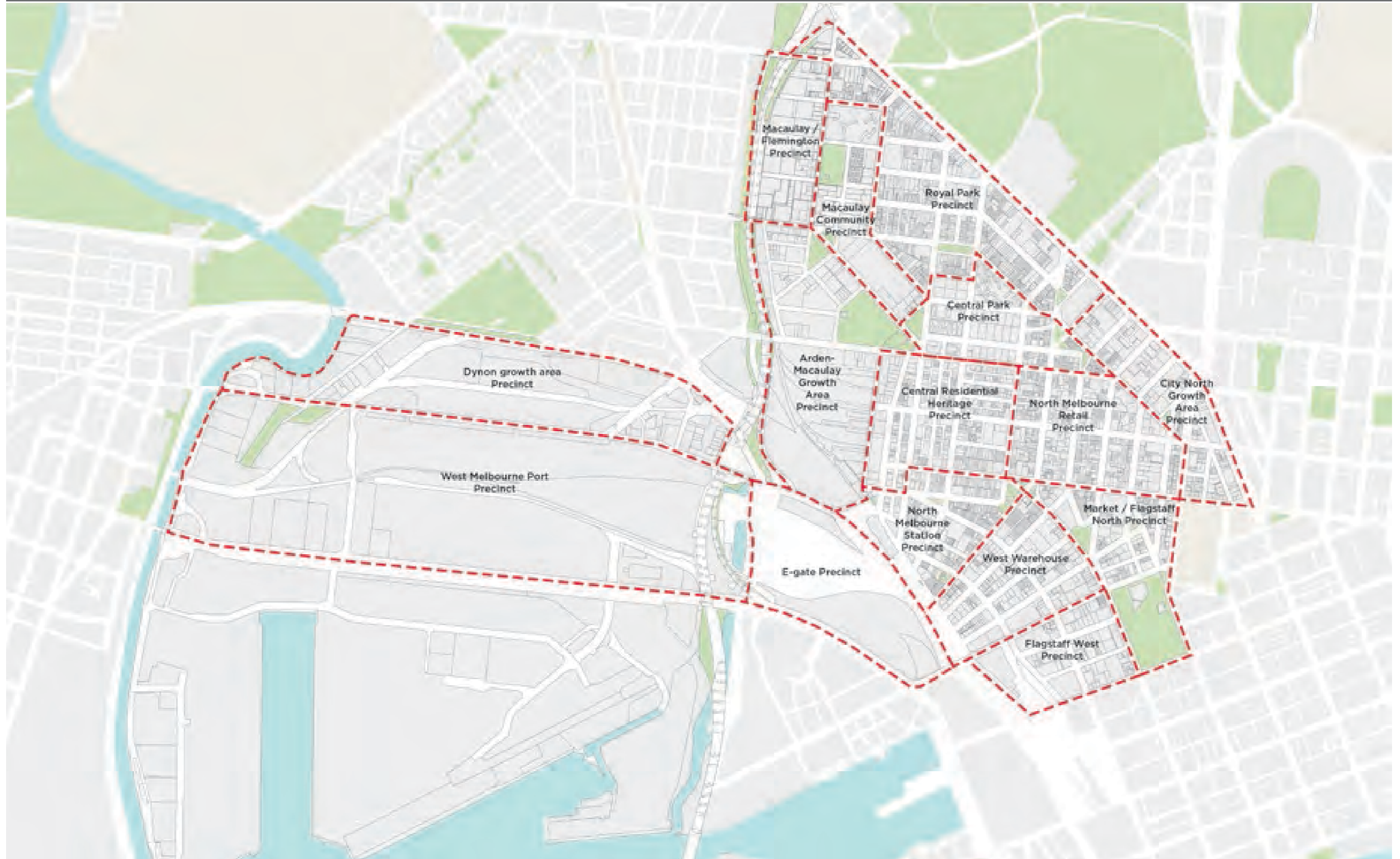
West Melbourne port precinct

This area will undergo significant change with the market relocations and proposed road and rail developments. As with the Dynon precinct, the urban forest will play an important role in linking the Maribyrnong River and Moonee Ponds Creek, and creating a significant gateway. Flood management will also need to be considered in the design of these linear corridors. It is also important to consider how the Port of Melbourne land supports the drainage and ecological functions of this area. A consistent native and indigenous planting palette used in this area will maintain the buffer between the ports and Melbourne's exotic urban forest plantings to mitigate the risk of exotic tree pests escaping from the ports.

E-gate precinct

Whilst the future development of this precinct is yet to be determined, its urban forest will need to consider its close linkages with North and West Melbourne, and Docklands. This area is currently occupied by rail infrastructure and its development will need to consider how it will best support tree growth. A consistent native and indigenous planting palette used in this area will maintain the buffer between the ports and Melbourne's exotic urban forest plantings to mitigate the risk of exotic tree pests escaping from the ports.

MAP 5: PLANTING SUB-PRECINCTS



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING **CONTINUED**

The following maps identify opportunities for creating diversity in the Urban Forest to increase canopy cover, enhance ecological diversity and manage risk factors.

Map 6: Canopy cover and biodiversity outcomes

Canopy cover

Anticipated canopy cover at maturity is represented as shading in streets on the map. In some streets the maximum canopy cover is limited due to constraints such as tram routes. Planting configuration should seek to maximise canopy cover in all cases.

Biodiversity


The Moonee Ponds Creek, and Maribyrnong River are important ecology corridors and the precinct plan will look to enhance habitat and bio diverse connections along these waterways and the drainage lines that feed into them. Creating links between the small open space pockets and the wider medians.

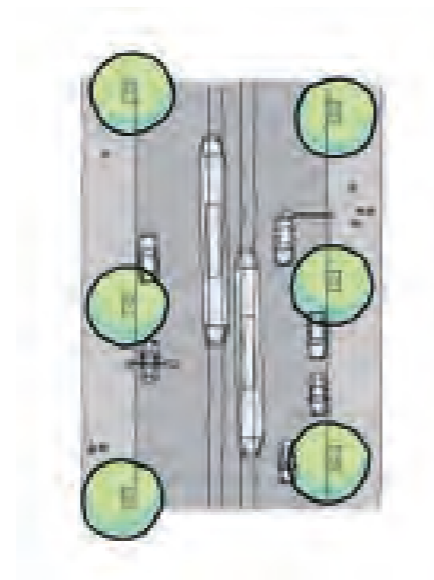
Opportunities to enhance biodiversity include selecting bird and pollinator attracting species and adding layers of vegetation to provide structural diversity. Avenue and linear open space corridors along Footscray and Dynon Roads play a key role in supporting biodiversity. Other streets may also provide opportunities for understorey planting.


Species choices for understorey planting should factor in light conditions, competition with existing plantings, and maintenance requirements related to irrigation and access. See adjacent images for examples of canopy cover and biodiversity outcomes.

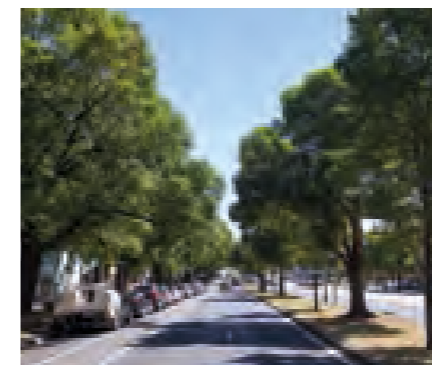
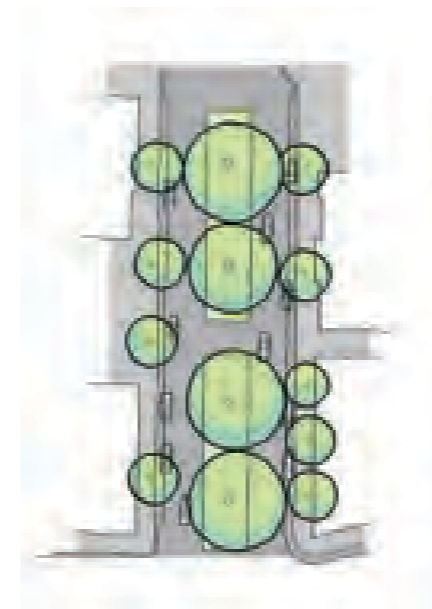
Map 7: What should stay and what should change?


Planes, elms, Corymbias (gums) and eucalypts are core genera within North & West Melbourne's urban forest today. That is not proposed to change; however their dominance will be reduced by using alternatives for new plantings and, in the locations defined on this map, by breaking up spatial continuity. Interrupting spatial continuity is necessary to reduce vulnerability within the urban forest tree population and aids diversity targets by providing an opportunity to change species. The use of elms will be limited to replacements in locations where they are already planted. Use of species within the Myrtaceae family should be targeted at streets where they can provide connecting corridors between open space for native birds, however it is preferable that different genera and species be planted in segments or as mixed plantings to increase diversity.

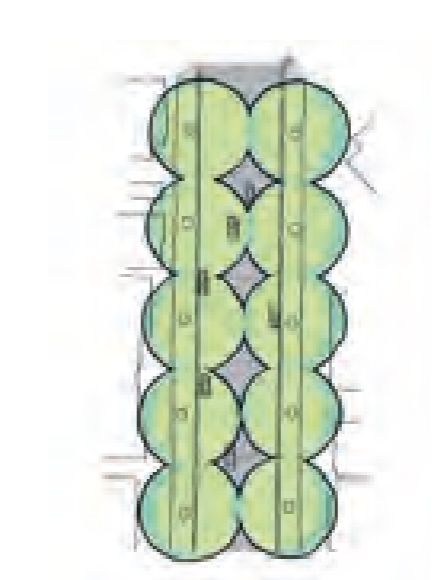
 Minimum canopy cover of 20%




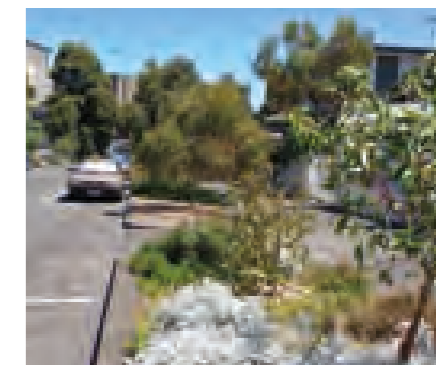
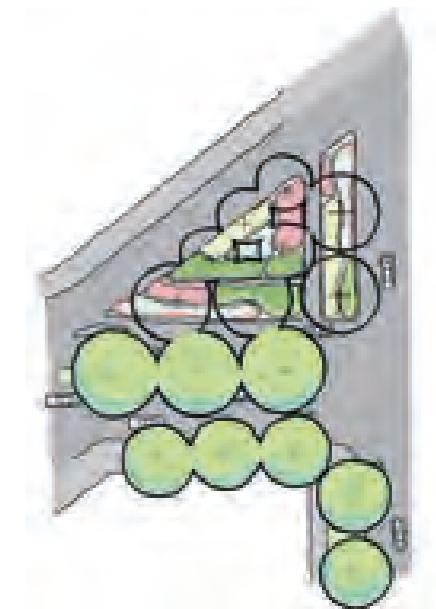
 Minimum canopy cover of 20 - 40%



 Minimum canopy cover of 40%



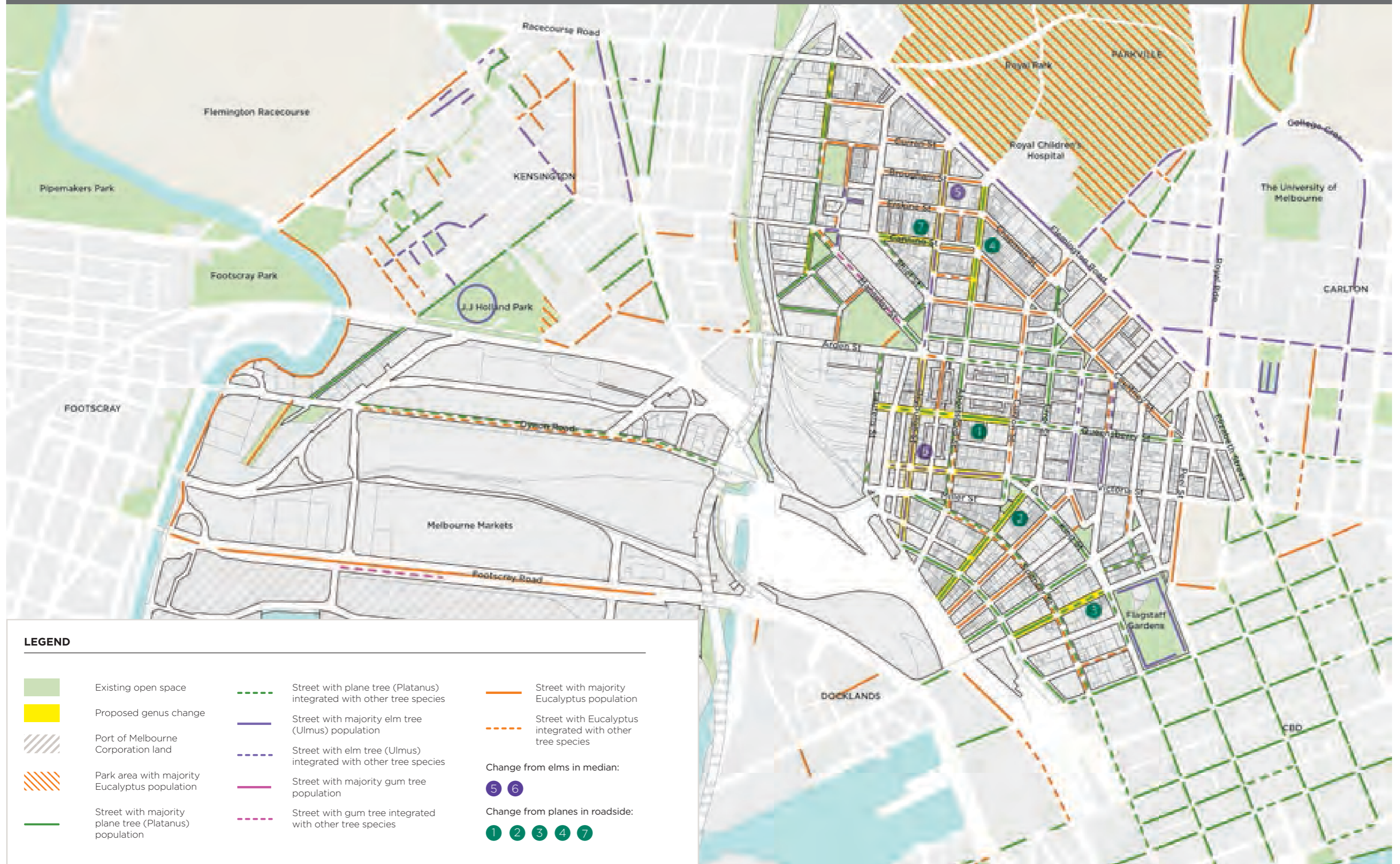
 Biodiversity objective maximise canopy



MAP 6: CANOPY COVER AND BIODIVERSITY OUTCOMES



MAP 7: WHAT SHOULD STAY AND WHAT SHOULD CHANGE?



PLANTING STRATEGIES

The following set of plans specifically identify outcomes for tree planting. They provide the framework for change within each street in the precinct with design outcomes informed by all of the other factors outlined in the previous maps.

Map 8: Long-term planting strategy

This strategy provides the long-term direction for planting in the precinct. The selection of tree species for each street should respond to criteria including optimal size and other characteristics that relate to the street typology and its relationship to the major planting sub-precincts. Values of existing vegetation are also a factor in species selection.

Overarching principles affecting the planting plan include:

- Enhance the character of park perimeter streets through plantings that respond to the character and scale of the park perimeter.
- Maximise the potential for tree canopy where planting opportunities are limited.
- Enhance the connections of the streetscape to the ecology of the Moonee Ponds and Maribyrnong river corridors.
- Create streets that provide connections between open spaces.
- Incorporate diversity, colour and seasonal change into species selections.

Map 9: 10-year planting plan

This plan provides direction on where new and replacement planting is to occur across North & West Melbourne. The size and evergreen/deciduous nature of the species to be used is also defined as a solid or dashed line (in the case of replacements this may be different to what is planted in that location currently). Species selection is left somewhat open; however, Map 7 and Map 8 provide guidance on where spatial diversity should be created and where core species should be retained. Streets with opportunities for re-design represent streets where permeability could be improved through interventions such as park expansions or new medians.

Map 10: Guide to Species Change

This map indicates locations along streets where a change in species is logical based on sub-precinct boundaries, topographic factors or objectives defined for streets within this plan. The colours do not indicate species distribution or specific species. Rather, they represent points of species change, with similar colours along a street indicating use of a range of species that will achieve a consistent character for that street.

Select or match species to form, colour and seasonal themes for streets to unify character even where species are varied. Introduce greater diversity in kerb outstands, roundabouts and road ends. In streets use a single species for multiple segments then change between sub-precinct boundaries, or consider the use of two alternating species of similar form, scale and colour. In narrow streets, and where there are power lines on one side only, use asymmetrical plantings of different species on each side of the street. When appropriate, use informal mixes of species along perimeters of parks and gardens or where vegetation from private gardens overhangs the streets.



Long term planting plan: This strategy provides the long-term direction for planting in the precinct

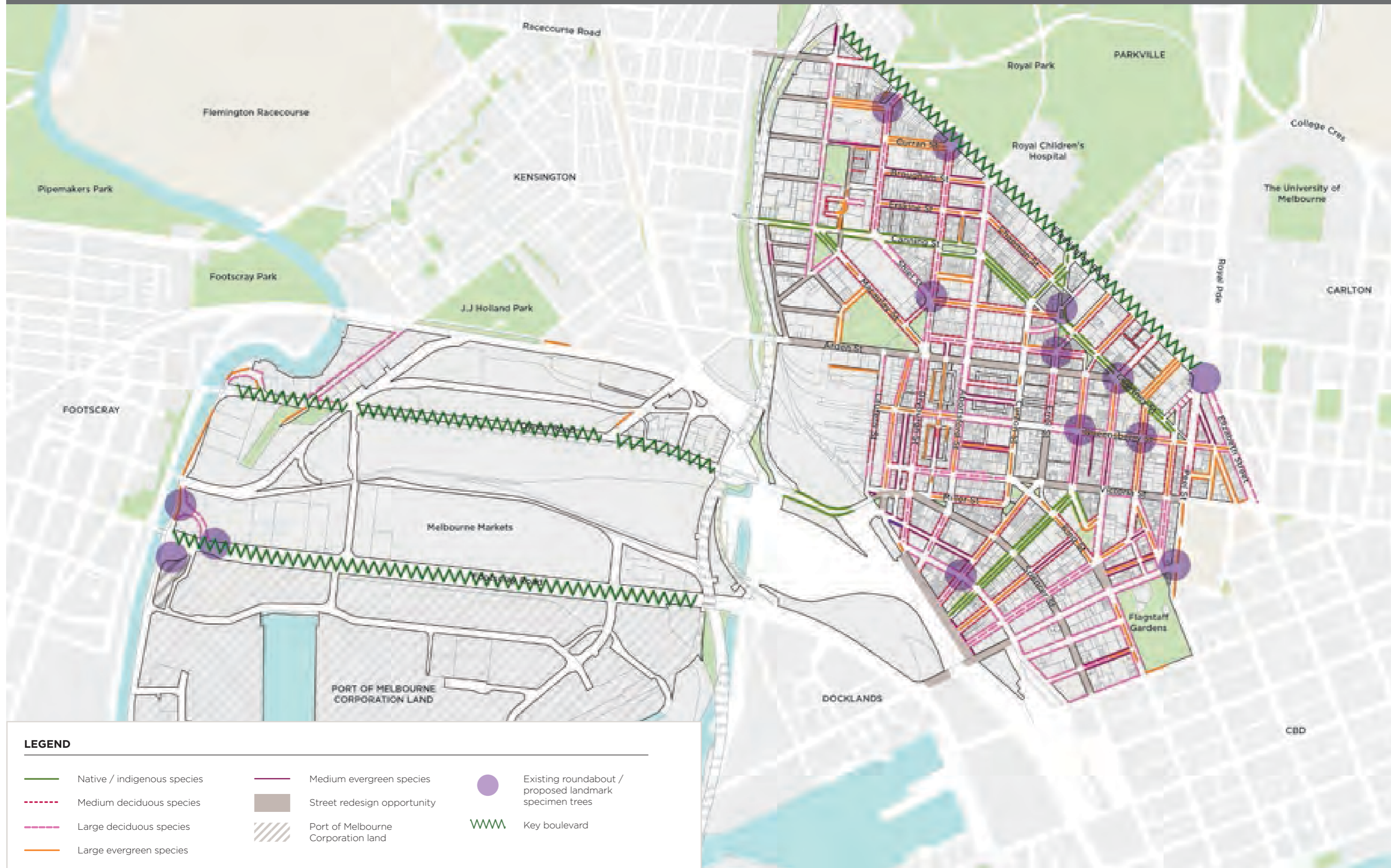


10-year planting plan: New and replacement planting is to occur across North & West Melbourne.



Guide to species change: This map indicates locations along streets where a change in species is logical based on sub-precinct boundaries, topographic factors or objectives defined for streets within this plan.

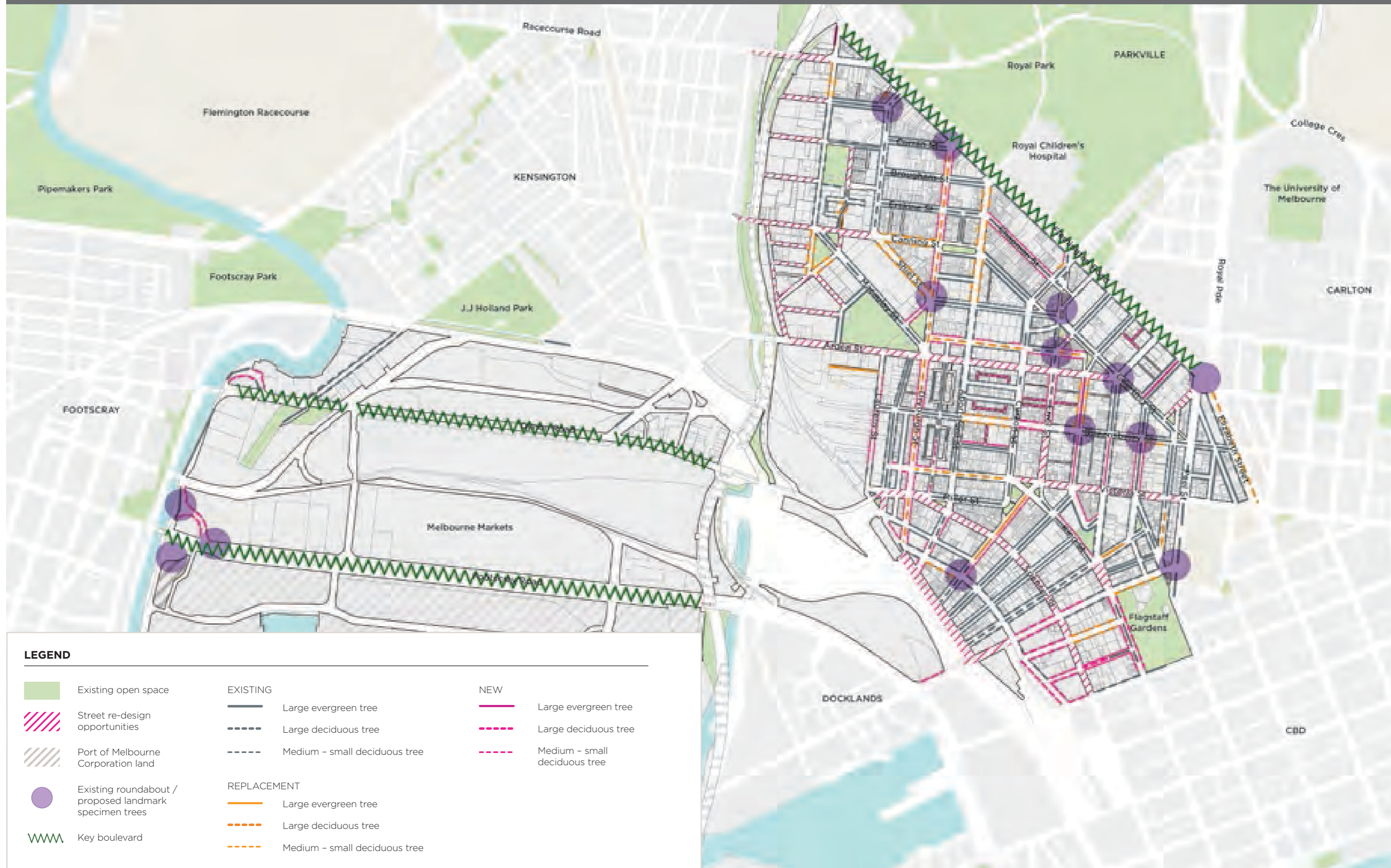
MAP 8: LONG TERM PLANTING PLAN



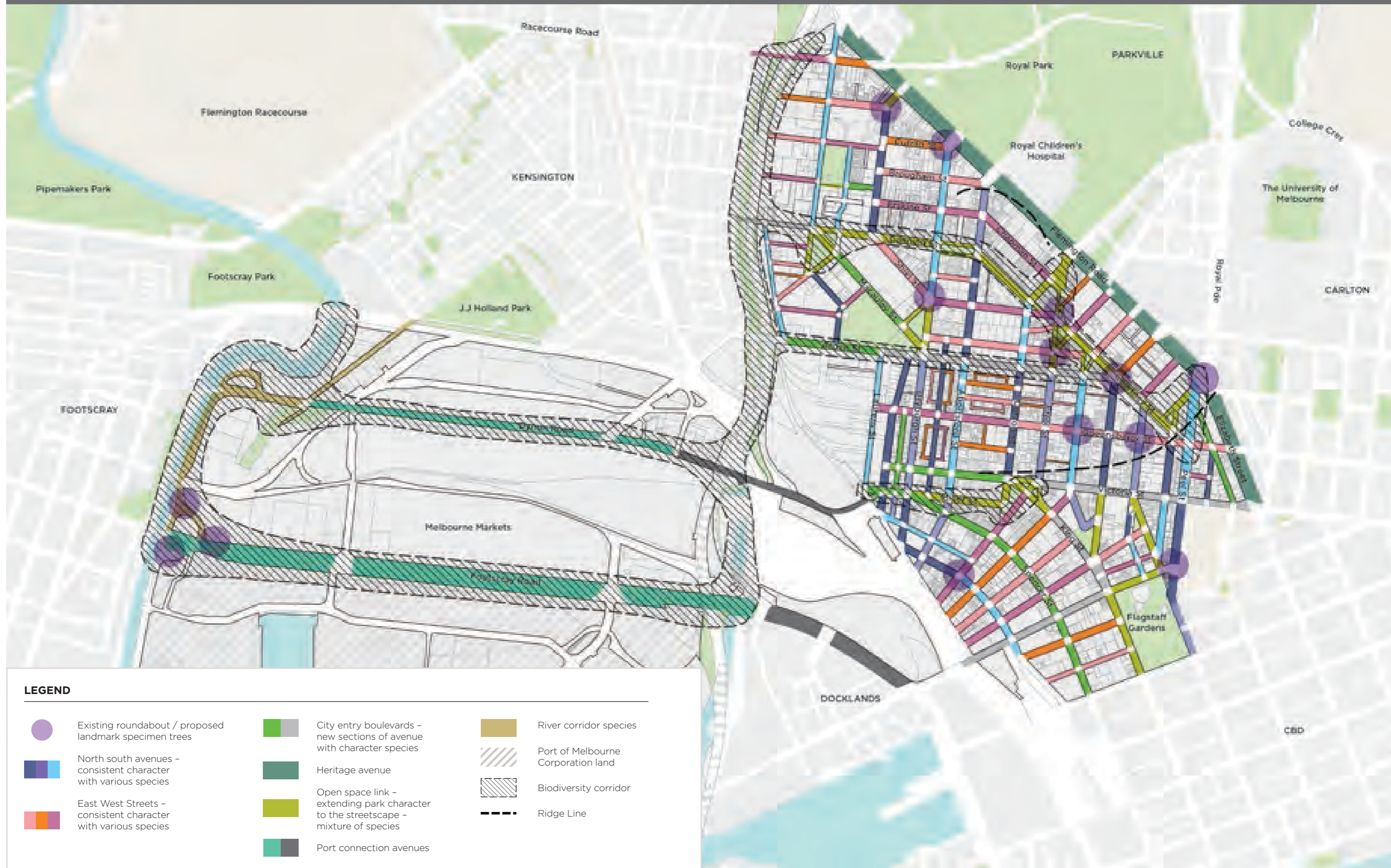
LEGEND

- | | | | | | |
|---|-----------------------------|---|------------------------------------|---|--|
|  | Native / indigenous species |  | Medium evergreen species |  | Existing roundabout / proposed landmark specimen trees |
|  | Medium deciduous species |  | Street redesign opportunity |  | Key boulevard |
|  | Large deciduous species |  | Port of Melbourne Corporation land | | |
|  | Large evergreen species | | | | |

MAP 9: 10-YEAR PLANTING PLAN



MAP 10: GUIDE TO SPECIES CHANGE



LEGEND

- Existing roundabout / proposed landmark specimen trees
- North south avenues – consistent character with various species
- East West Streets – consistent character with various species
- City entry boulevards – new sections of avenue with character species
- Heritage avenue
- Open space link – extending park character to the streetscape – mixture of species
- Port connection avenues
- River corridor species
- Port of Melbourne Corporation land
- Biodiversity corridor
- Ridge Line

SPECIES PALETTE

The following species are provided for guidance only and do not preclude the use of other trees that are consistent with the character of North & West Melbourne, Guiding Principles and Planting Plan. Elms and planes are key genera within North & West Melbourne, forming an important part of the character of its urban forest. While this

character will be maintained, species from many different genera will also be planted to increase diversity and reduce vulnerability within North & West Melbourne's urban forest population. Feature trees refer to trees that might be used in roundabouts, kerb outstands, road ends or that could add structure for biodiversity enhancement

in locations with adequate space. Productive trees or edible landscapes may be considered in locations such as medians or feature landscapes where they conform to City of Melbourne policy and the community actively provide support for the project.

Core North & West Melbourne Trees (Limited New Plantings)

Corymbia spp., Gums
Eucalyptus spp., Eucalypts
Platanus spp., Plane
Ulmus spp., Elm

Large Trees for Streets

Evergreen

Cinnamomum camphora, Camphor laurel
Eucalyptus sideroxylon, Red iron bark
Ficus rubiginosa, Rusty fig
Ficus platypoda, Rock fig
Flindersia australis (trial), Crow's ash

Deciduous

Celtis australis, European nettle tree
Fraxinus pennsylvanica, Green ash
Fraxinus oxycarpa 'Raywood', Claret ash
Metasequoia glyptostroboides (trial), Dawn redwood
Quercus spp., Oaks
Tipuana tipu (trial), Rosewood
Toona ciliata (trial), Australian red cedar

Medium to Small Trees for Streets

Evergreen

Afrocarpus falcatus (trial), Sickle-leaved yellowwood
Buckinghamia celsissima, Ivory curl tree
Callodendron capense, Cape chestnut
Eleocarpus reticulatus, Blueberry ash

Eucalyptus cinerea, Argyle apple
Eucalyptus leucoxylon spp. *megalocarpa*, Yellow gum
Brachychiton roseus, Flame tree
Stenocarpus sinuatus, Firewheel tree
Schinus terebinthifolius (trial), Broad-leaf pepper tree

Deciduous

Albizia julibrissin (trial), Persian silk-tree
Catalpa bignonioides, Catalpa
Cercis siliquastrum, Judas tree
Corylus columna, Turkish hazel
Gleditsia tricanthos, Honey locust
Koelrueteria bipinnata, Chinese flame-tree
Pistacia chinensis, Chinese pistachio
Phellodendron amurense (trial), Amur cork tree
Sapium sebiferum, Chinese tallow tree
Sophora japonica (trial), Pagoda tree

Large Feature Trees

Evergreen

Afrocarpus falcatus, Yellowwood
Angophora floribunda, Rough barked apple
Araucaria spp.
Eucalyptus camaldulensis, River red gum
Eucalyptus leucoxylon ssp. *connata*, Yellow gum
Eucalyptus melliodora, Yellow box

Ficus macrophylla, Moreton Bay fig
Ficus rubiginosa, Rusty fig
Lithocarpus densiflorus (trial), tanoak
Phellodendron amurense (trial), amur cork tree
Pinus spp.
Podocarpus elatus, Plum pine
Quercus agrifolia, Coast live oak
Quercus virginiana, Californian live oak
Schinus molle, Peppercorn

Medium to Small Feature Trees

Acacia implexa, Lightwood
Allocasuarina verticillata, drooping she-oak
Banksia marginata, silver banksia
Banksia serrata, saw banksia
Callitris glaucophylla, White cypress pine
Calistemon viminalis
Hakea francisiana
Hakea bucculenta
Melaleuca ericifolia Macadamia
integrifolia, Macadamia nut
Angophora hispida, Dwarf apple
Brachychiton acerifolia, Illawarra flame tree

FREQUENTLY ASKED QUESTIONS

Where can I find out more information about Melbourne's urban forest?

A wide range of information about Melbourne's urban forest can be explored at melbourne.vic.gov.au/urbanforest

What can I do to contribute to Melbourne's urban forest?

If you have a garden or room for a tree, you can contribute by planting in your own yard. If you own or manage a building, development, or institution you can contribute by planting in the grounds or by greening walls, roofs or balconies.

You can also contribute by staying informed about the urban forest and by talking to others about the benefits of having trees in our urban areas. The City of Melbourne will continue to provide opportunities for the community to volunteer their time and ideas to help achieve urban forest objectives. If you would like to be added to our mailing list, or have an urban forest idea you'd like to share, please email your details to urbanforest@melbourne.vic.gov.au

I have seen a sick or damaged tree, or an empty tree plot. How can I tell City of Melbourne about it?

Please email the location and a description of the issue to urbanforest@melbourne.vic.gov.au.

Can I plant a tree in a public space?

Trees can only be planted on public land with council authorisation or through a sanctioned public planting activity. However, if there is a location where you would like to see a tree planted then you can send a request for tree planting to urbanforest@melbourne.vic.gov.au.

Can I make a garden in a public space?

Please refer to the City of Melbourne's Street Garden Guidelines, which you can find at melbourne.vic.gov.au

How to contact us

Online: melbourne.vic.gov.au

In person:

Melbourne Town Hall - Administration Building
120 Swanston Street, Melbourne
7.30am to 5pm, Monday to Friday
(Public holidays excluded)

Telephone: 03 9658 9658

7.30am to 6pm, Monday to Friday
(Public holidays excluded)

In writing:

City of Melbourne
GPO Box 1603
Melbourne VIC 3001
Australia

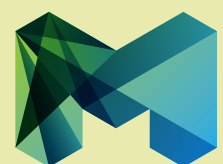
Fax: 03 9654 4854

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03 9280 0723	Español
03 9280 0724	Türkçe
03 9280 0725	Việt Ngữ
03 9280 0726	All other languages

National Relay Service: If you are deaf, hearing impaired or speech-impaired, call us via the National Relay Service: Teletypewriter (TTY) users phone 1300 555 727 then ask for 03 9658 9658
9am to 5pm, Monday to Friday
(Public holidays excluded)

melbourne.vic.gov.au



CITY OF MELBOURNE