

PARKVILLE URBAN FOREST

PRECINCT PLAN

2015-2025



CITY OF MELBOURNE

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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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Disclaimer

This report is provided for information and it does not purport to be complete. While care has been taken to ensure the content in the report is accurate, we cannot guarantee it is without flaw of any kind. There may be errors and omissions or it may not be wholly appropriate for your particular purposes. In addition, the publication is a snapshot in time based on historic information which is liable to change. The City of Melbourne accepts no responsibility and disclaims all liability for any error, loss or other consequence which may arise from you relying on any information contained in this report.

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?

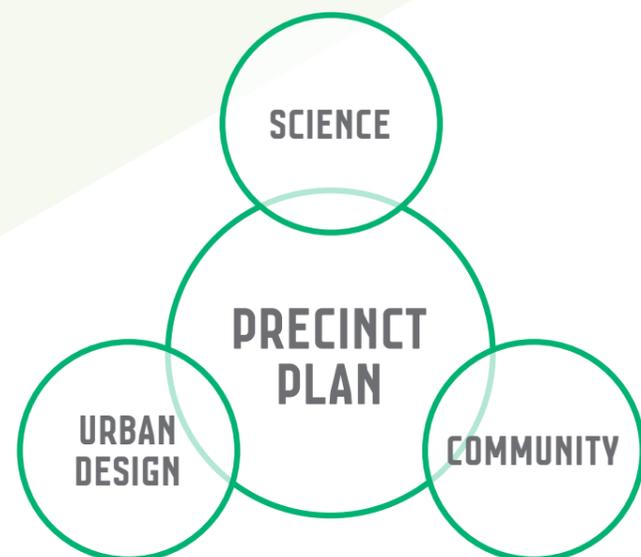
The urban forest comprises all of the trees and other vegetation – and the soil and water that supports it – within the municipality. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, green walls, balconies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



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.

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.



Useful Life Expectancy mapped for City of Melbourne Trees.

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 Melbourne 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 to 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.

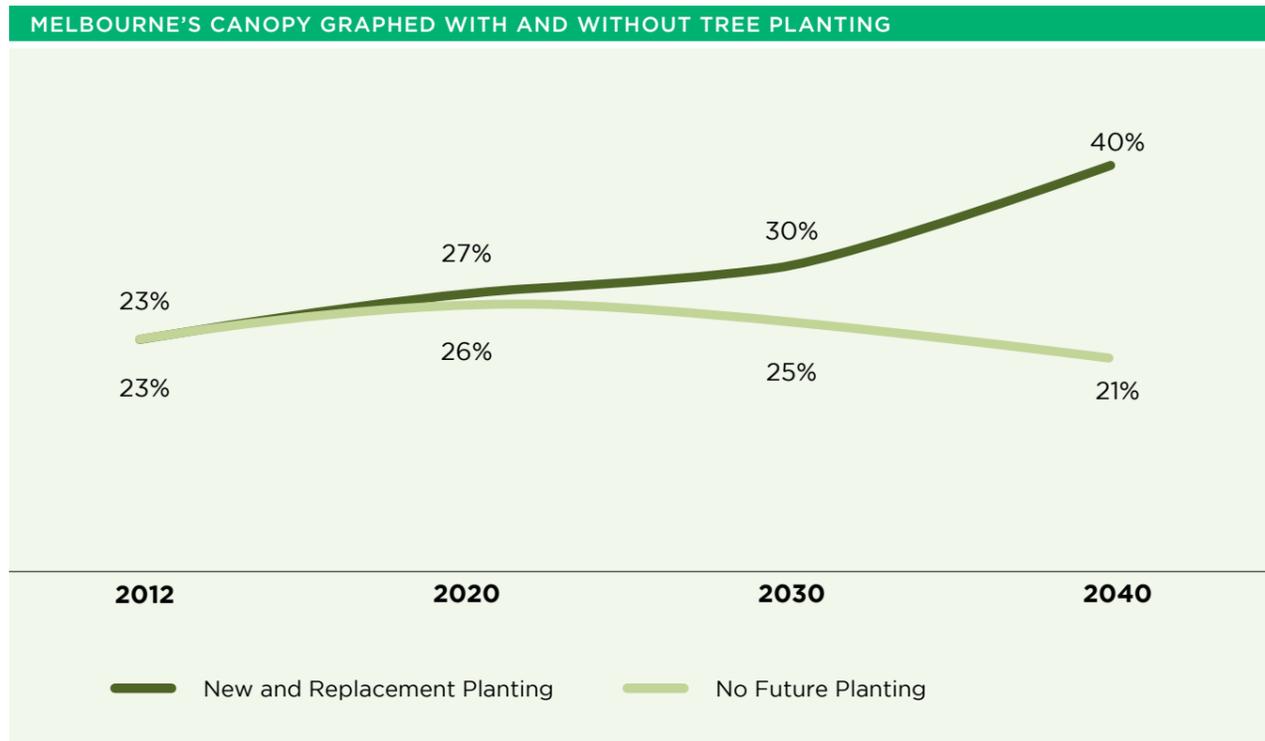
Access to ample soil moisture enables trees to actively transpire and cool the surrounding air. Adequate soil moisture is critical for healthy vegetation. A number of active and passive approaches are currently undertaken to replenish soil moisture and ensure it is maintained at levels to provide healthy growth. Our Total Watermark City as a Catchment is being 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.



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?

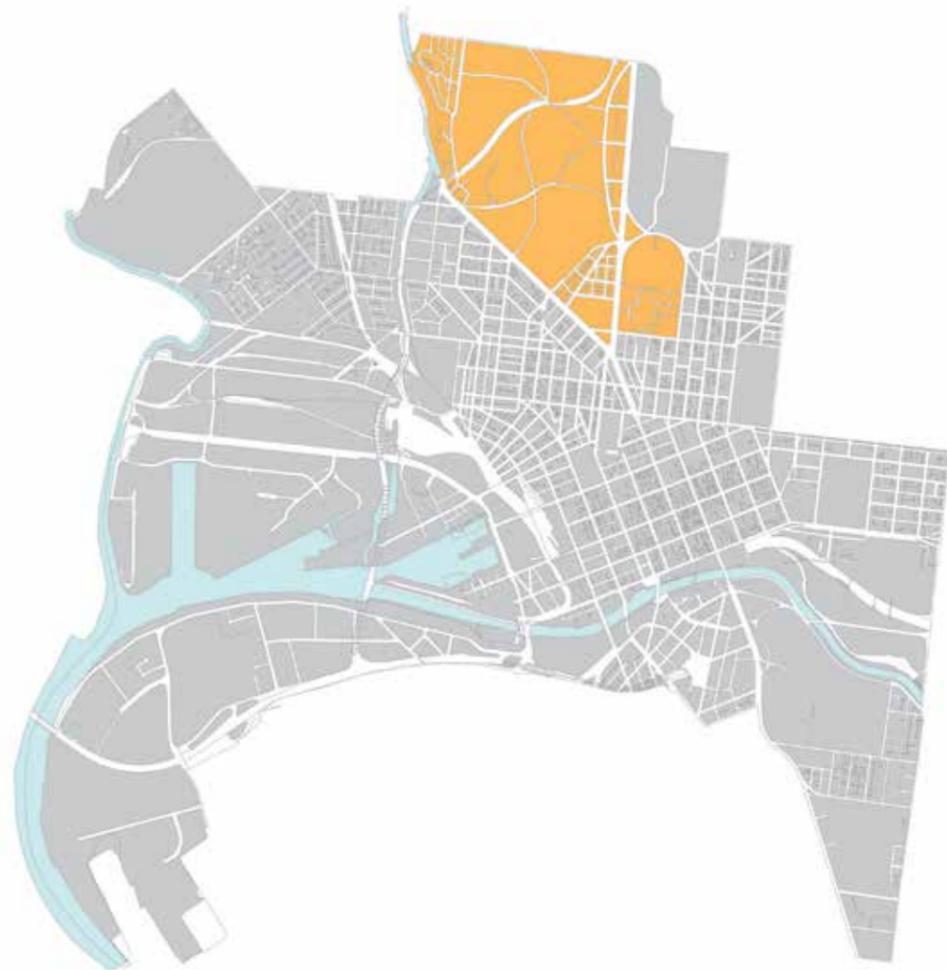
The precinct plans will help to guide implementation of the urban forest strategy in Melbourne's streets. The information provided in the plans will direct the annual tree planting program to achieve urban forest strategy objectives, protect and enhance neighbourhood character, and to prioritise works 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 high performance guidelines are being 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 documents are outlined in the *Urban Forest Strategy*. Within the Parkville precinct the *Royal Park Master Plan* and *Open Space Strategy* will influence the future character of the precinct.



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

THE VISION FOR PARKVILLE'S URBAN FOREST

WITH SHADY AND LAYERED VEGETATION, THE ICONIC PARKVILLE URBAN FOREST WILL BE SMART, PRODUCTIVE AND DIVERSE TO SUPPORT PEOPLE AND WILDLIFE WHILE RESPECTING THE EXISTING CHARACTER.



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 doubling of private realm canopy cover to 2% 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. We will also continue to educate residents on how they can contribute to the urban forest through our ongoing community engagement work.

The Royal Park Master Plan sets out the planting scheme for areas within Royal Park, including roadways. This is dominated by naturalised open woodland planting. The Master Plan also guides vegetation character in the streets bounding Royal Park, including The Avenue, Gatehouse Street, Manningham Street, Oak Street and Park Street.

In and adjacent to the Parkville precinct, the University of Melbourne, University High School, Melbourne Zoo, Royal Melbourne Hospital and Royal Children's Hospital manage 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

Parkville's physical area consists largely of parkland and institutional spaces; namely Royal Park, the University of Melbourne, the Melbourne Zoo, hospitals and research facilities. Prior to settlement the Royal Park area was occupied by open grassy woodland with the Moonee Ponds Creek running to its west through the current wetland and Ross Straw Field site. Remnants of this indigenous ecology persist in the grassland and woodland species of the park. Early in Melbourne's settlement history the southern portion of Parkville was favoured for livery stables and Royal Park provided nearby access to paddocks and grazing lands. The residential

areas to the south, east and west of the park were excised between 1859 and 1868 and were initially part of the separate settlement of North Melbourne. The more contemporary Parkville Gardens neighbourhood was built as the Athlete's Village for the 2006 Commonwealth Games.

Early tree planting was largely driven by the desire to create windbreaks and establish shade. The first significant street tree plantings in the Parkville precinct occurred in the 1850s when Royal Parade (then Sydney Road) was planted with plantations of fast growing blue gums and radiata pine. In records, there was mention of boulevard tree planting on Sydney Road in 1878 being halted for construction of a tramway. The road was divided for the Brunswick cable tram line that opened in 1887. Four rows of trees in Sydney Road are indicated on detailed plans of the area from 1899. In 1901 the road was renamed Royal Parade for the Duke and Duchess of York's visit to the university and landscape beautification occurred in advance of that visit. The elms that are present today are thought to have been planted in 1913. At one point palms were interplanted with the elms but these were removed in 1947. The other major boulevard on the west of the precinct, Flemington Road, was planted out between the late 1878 and 1930. The sugar gums and larger tree plantings that line Elliot Avenue and the park boundary in some locations are estimated to have been planted in the 1920s. Based on a review of aerial photos, it is thought that most remaining streets within Parkville were planted from 1970 onwards.

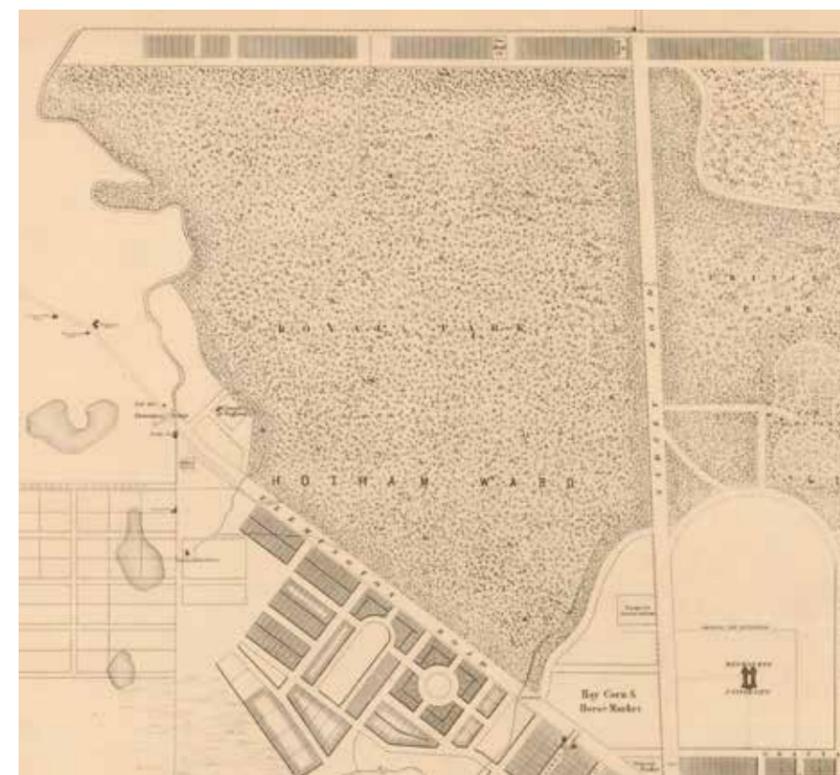
Parkville character

The Parkville precinct is unique within the city, with its main land use and dominant feature being Royal Park. Four physically separate residential areas cling to the edge of the park on the east, south and west.

The character of the urban forest in Parkville is heavily influenced by the Royal Park landscape, particularly in the neighbouring streets. Royal Park has a less formal style of planting than other parks in Melbourne, resembling open woodland rather than a formal garden. In particular, Royal Park is known for its native and indigenous species palette and diverse understorey planting. Accordingly, native trees have been widely planted in the streets leading into Royal Park, to signify entry points.

South Parkville is a compact triangle located in the valley running down from Royal Park's south-east corner, bounded by Gatehouse Street, Flemington Road and Royal Parade. North Parkville stretches longitudinally along the eastern edge of Royal Park, bounded by Royal Parade and The Avenue. Most streets in these areas are 30 metres wide with narrow footpaths and no nature strips. Central medians have been commonly used to break up the paved expanse and accommodate large canopy trees, while medium-sized trees are planted between parking bays on the road edge. The urban forest in these areas is predominantly large deciduous trees, with the exception of The Avenue, which is dominated by large evergreen eucalypts.

West Parkville is a small residential area between the Moonee Ponds Creek and the western edge of Royal Park. Parkville Gardens sits at the north-west corner of Royal Park, bounded by the Citylink freeway, Park Street and the City of Melbourne municipal boundary to the north. Streets are generally



'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)

narrower in these areas with evergreen native trees planted in the parking lanes

When asked, the community recognised that the character of the urban forest varies distinctly between areas in the precinct, but that each was equally valued and should be enhanced. The exotic plantings in North and South Parkville were seen to have great heritage value, with the elm avenue on Royal Parade of particular significance. The native character of the urban forest in West Parkville and Parkville Gardens was also highly valued for its beauty and ecological contribution.

COMMUNITY PRIORITIES

Parkville'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 Parkville's urban forest.

Consultation highlighted that Parkville residents and visitors see their urban forest as iconic and unique, placing great value on both the historically significant exotic plantings and the native landscapes. There was a strong sense that the urban forest in Parkville should be multi-functional; incorporating sustainable water use, understory planting for biodiversity, species diversity and shady canopy. The urban forest should be distributed equitably to enhance liveability for all residents and visitors to the precinct.

Our work with the Parkville community indicated a preference for trees that will sustain the community through the provision of shade and cooling, as well as colour and beauty.

The longevity of the urban forest in Parkville should be secured by the selection of trees that are resilient to drought and future climate conditions.



COLOUR

Desired future states defined by the community:

- Shady and cool
- Colourful and beautiful
- Water sensitive and drought resilient
- Sustainable
- Include understory planting
- Equitable and inclusive distribution
- Respectful of heritage and existing character
- Maintain the existing diversity of native and non-native landscapes

Urban forest benefits highlighted through community consultation:

- Shade and cooling
- Biodiversity
- Cultural and spiritual fulfilment through significant historical landscapes
- Aesthetically beautiful
- Supporting wellbeing, for example through tranquillity, connection to nature and providing pedestrian spaces and corridors
- Social cohesion and inclusiveness

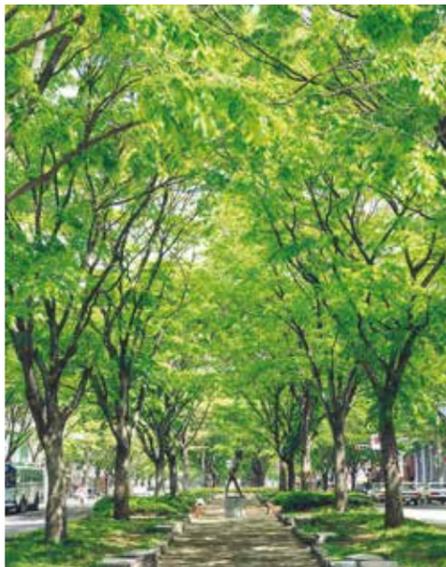
SHAPE, DIVERSITY AND LAYERS



Images selected as representing a preferred future for Parkville's urban forest that includes colour, canopy, shade, seasonal change and shape.

COMMUNITY PRIORITIES CONTINUED

STREETScape



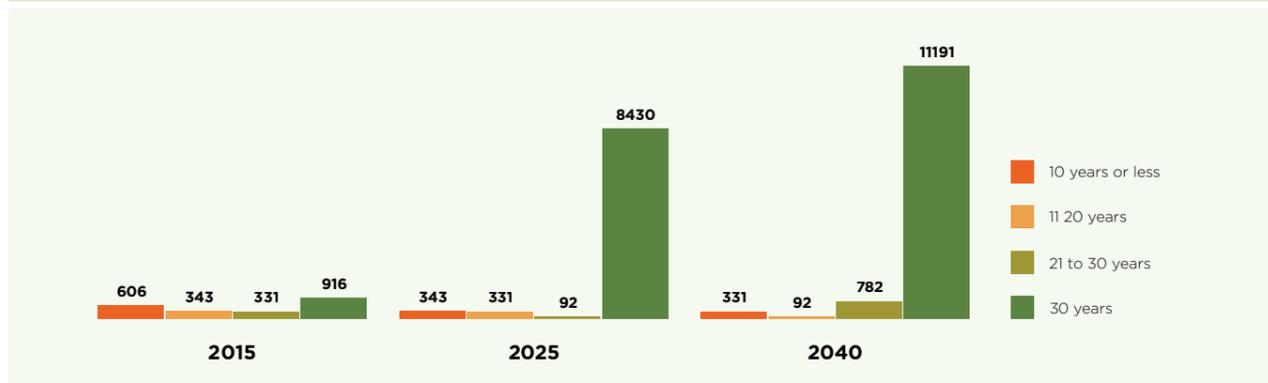
COMMUNITY



Parkville community members developing priorities for planting in the precinct. (opposite)

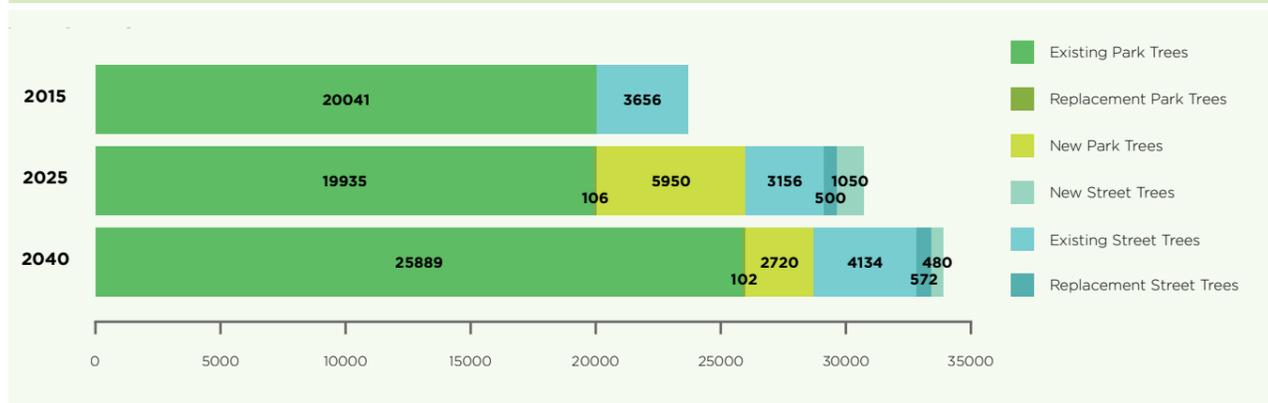
PARKVILLE'S URBAN FOREST IN 2015 AND ITS PROJECTED FUTURE

TREE HEALTH (ULE) - PUBLIC REALM



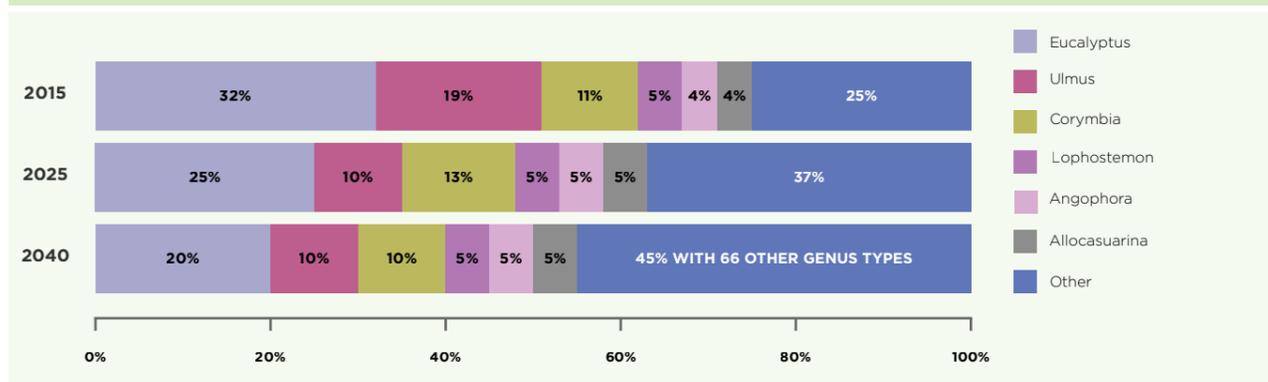
Tree counts for Parkville categorised by useful life time expectancy (ule) in years

TREES - PUBLIC REALM



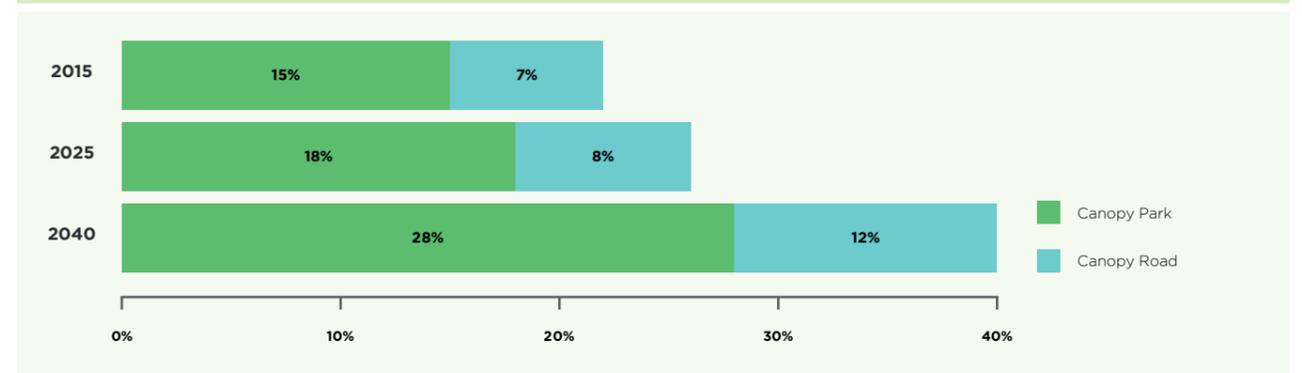
Tree counts and planting by City of Melbourne in Parkville

DIVERSITY (BY GENUS) - PUBLIC REALM



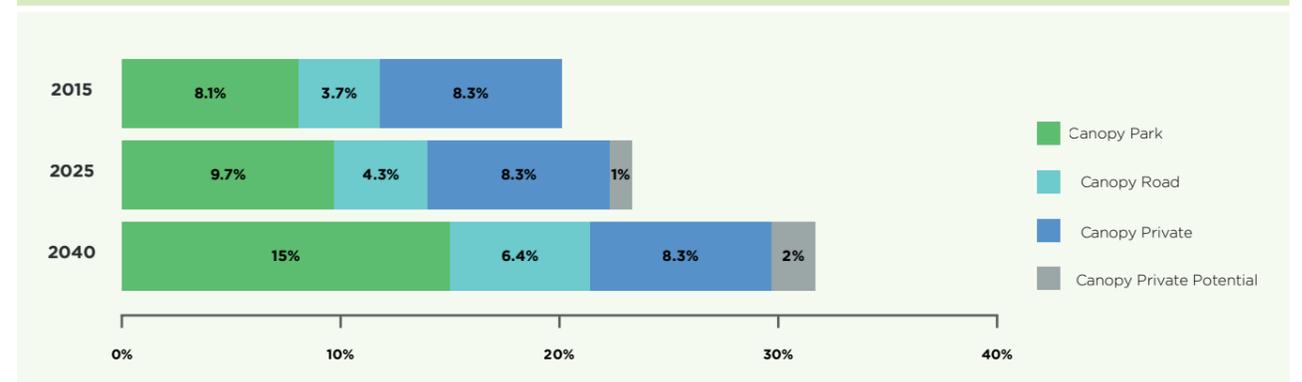
Main genus types for Parkville

CANOPY - PUBLIC REALM



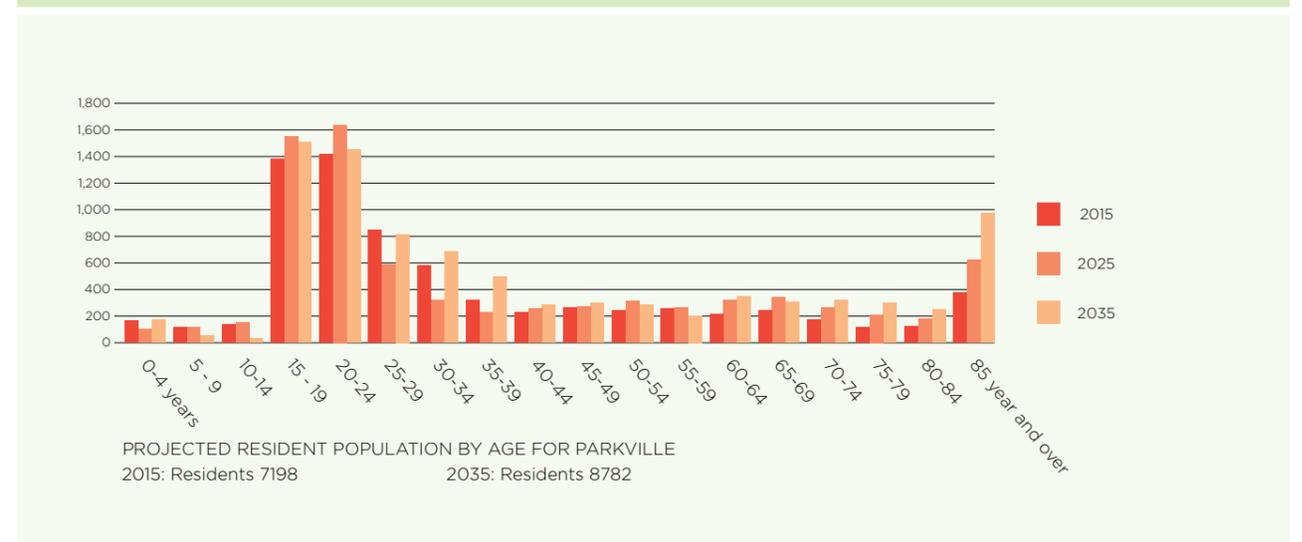
Tree canopy and locations for Parkville

CANOPY - ENTIRE PRECINCT



Tree canopy and locations for Parkville

PRECINCT POPULATION DISTRIBUTION - RESIDENTS



Projected resident population by age for Parkville

Data source: City of Melbourne 2013-2036 Population Forecast, Geografia (last updated March 2015)

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

City of Melbourne has prioritised the work in different streets by using varied criteria and the 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 (2015 - 2018) 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 (2019 - 2021) include those:

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 (2022 - 2025) 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 plan, 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 areas where there is a very low canopy cover. Replacements are only identified for streets where the useful life expectancy of multiple trees is rated at less than 10 years. We used census and mapping data to spatially define streets with these conditions. We defined these on the maps overleaf.

HOW THE PRECINCT PLAN GUIDES ANNUAL PLANTING



Set annual planting program

- Priorities (Map 1)
- Streets Undergoing Unforsee 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



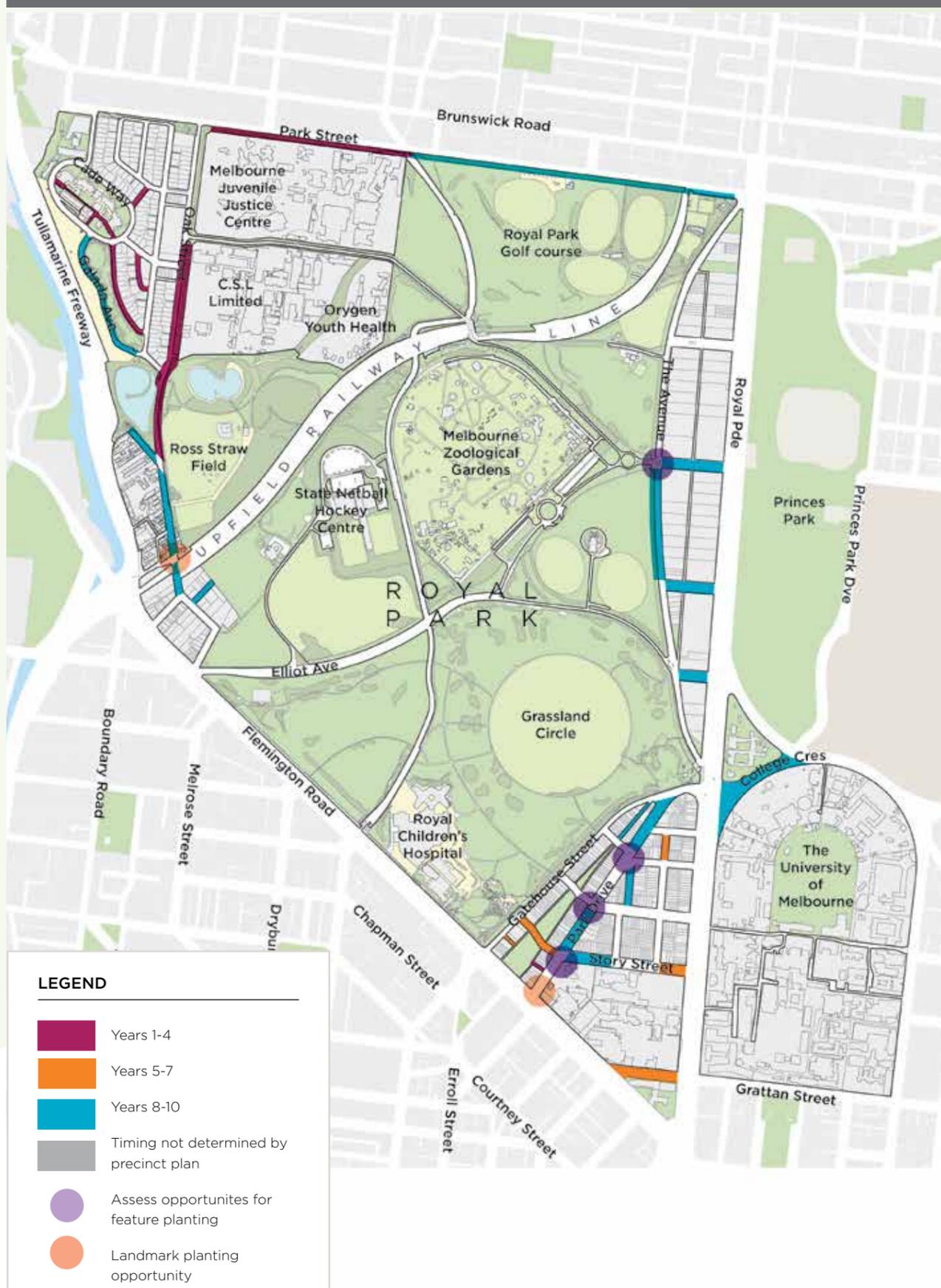
Select species

- 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



LEGEND

- Years 1-4
- Years 5-7
- Years 8-10
- Timing not determined by precinct plan
- Assess opportunities for feature planting
- Landmark planting opportunity

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING

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. These principles are expanded on in the Urban Forest Diversity Guidelines, which should be referred to when designing or planting any streetscape; although Parkville's 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. City of Melbourne prioritises large canopy trees, with larger trees planted preferentially in centre medians or tree islands, then in the roadway and then the footpath. Some wide medians, could support planting in two staggered rows to maximise canopy spread over hard surfaces.

Wide streets in South and North Parkville present opportunities for planting large trees in the medians and in some locations there is potential to reduce road widths

and construct either medians or nature strips for large trees, or provide additional planting in parking lanes. This could include infill planting within established streetscapes.

Kerb outstands should be considered as opportunities to plant species drawn from a wider palette that are unique for 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 (e.g. roundabouts at Park Drive and Bayles Street). Consider extending the character of the parks and gardens into the surrounding streetscapes to create linkages between open spaces.



Wide streets in South and North Parkville present opportunities for planting large trees in the medians and in some locations there is potential to reduce road widths and construct either medians or nature strips for large trees, or provide additional planting in parking lanes.

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

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/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 (e.g., 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 (e.g., perimeters of smaller 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.).

Select 'shorter-lived' (~50 years) species in approximately 10% of each sub-precinct to better balance future age distribution across Parkville. These selections should

be focused in areas or planting positions where losses will have a lower impact on shade provision (e.g., where there large, long-lived trees in medians or on one side of the street, or in landmark/biodiversity plantings).

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. Use of unproven species should generally be restricted to short streets, streets where frontages are limited or where strong centre plantings provide continuity and canopy cover for the street.



Use informal mixes of species where acceptable

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 below permeable paving
- increasing soil volume
- WSUD tree pits or infiltration pits
- stormwater harvesting

The native soils in Parkville are formed predominantly from Silurian and Tertiary deposits. Smaller areas of alluvial deposits are present in the Parkville Gardens development and a finger of basalt old volcanic extends into the western boundary of Royal Park from Flemington Road.

Predominantly clay soils derived from Silurian mudstone are located along the southern boundary of Royal Park near Gatehouse Street and south across the residential area. Sandy loam soils are capped over mudstone across the remainder of Royal Park and The Avenue residential area. Within the Parkville Gardens development, silty soils are derived from the alluvial deposits. Between Elliot Avenue and the City Link entrance shallow, heavy-textured clay soils occur where a finger of deeply weathered basalt caps the Silurian mudstone. Substantial change in native soils has occurred over time as creeks and ravines were filled in and land surfaces smoothed, therefore soil texture is likely more variable than described above.

Historically, several creek drainages crossed the precinct from east to west and drained into the wetland complex and estuary that existed in what is now West Melbourne. Drainage patterns today are similar. The northern portion of Royal Parade drains down through levers Reserve and through Plane Tree Way and eventually out to what is now Moonee Ponds Creek. The central portion of the park drains to Elliot Avenue and

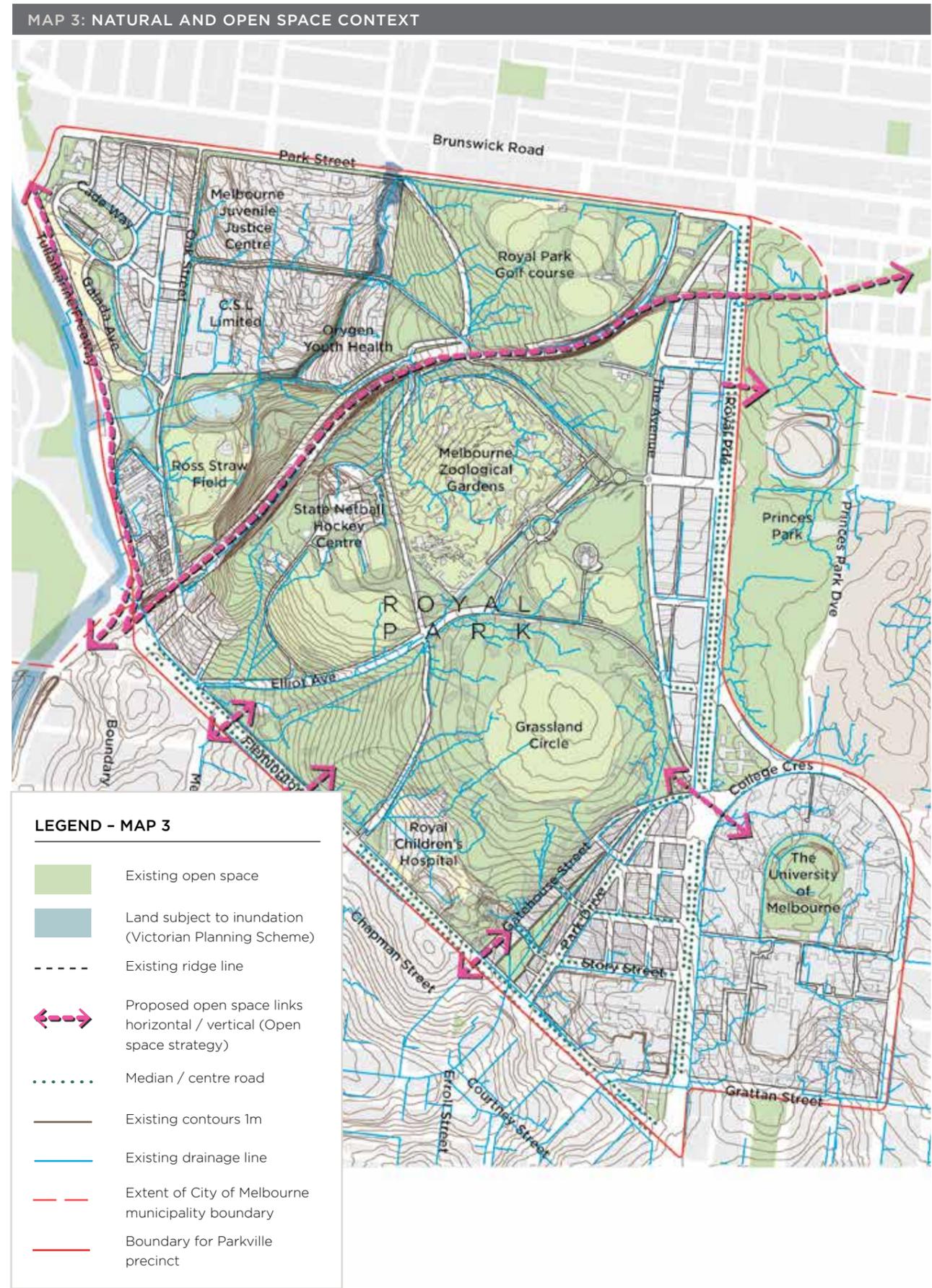
along Flemington Road to Moonee Ponds Creek. The northern part of the precinct drains to the Trin Warren Tam-boore Wetlands. The water table is approximately 2-3 m deep at its shallowest part (near the Moonee Ponds Creek area) and is deepest near Royal Parade. Waterlogging is not anticipated to be a frequent issue in most Parkville streets because they drain to lower lying greenspace areas.



WSUD at park interface

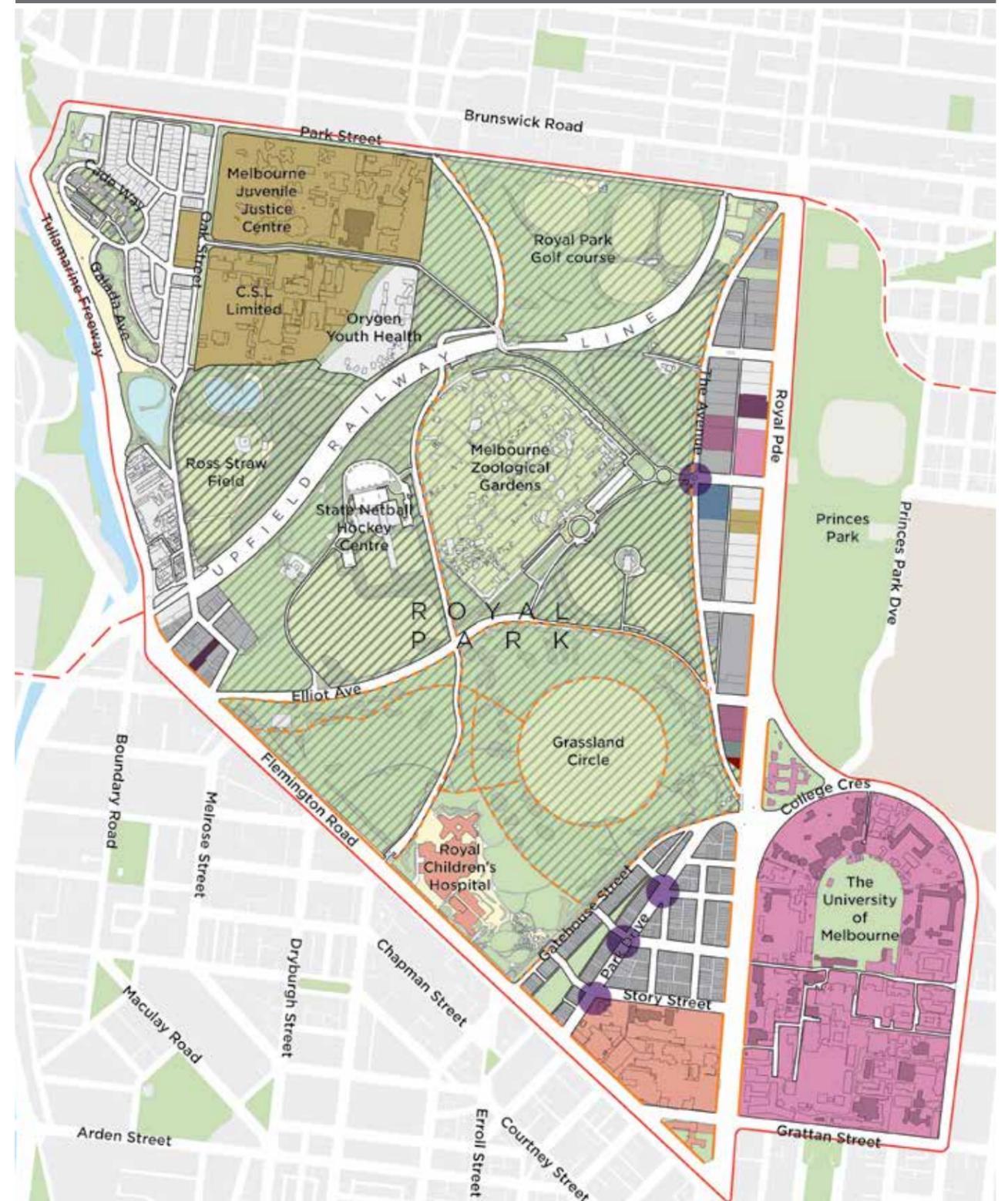
GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

The following maps show some of the many layers of information that influence the opportunities and objectives for tree planting in Parkville streets.



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

MAP 4: STRATEGIC CONTEXT



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

Planting sub-precincts

The following sub-precincts reflect the varied characteristics of Parkville. These include key differences in land use, urban character and landform to which planting will respond.

North Parkville Precinct

North Parkville sits on the plateau between Royal Park and Princes Park with a diverse built form mix of institutions and residences. This precinct is defined on the west by The Avenue which is characterised by its interface with Royal Park, and on the eastern edge by the heritage elm avenues of Royal Parade. The wide east-west streets have both footpath planting and generous medians with tree plantings. There are opportunities for increased ground level planting to connect the parklands.

South Parkville Precinct

This precinct is predominantly heritage residential sits southeast of Gatehouse Street in a small valley running southwest towards Flemington Road. The former creek line is defined by levers Reserve. This area is characterised by its wide streets with footpath and median plantings. The southern part of this precinct is dominated by the hospital and medical institutions that sit on the junction of Flemington Road and Royal Parade.

West Parkville Precinct

This residential pocket is a finer grain than the other areas of Parkville. Narrower streets limit tree planting to the footpaths, and parking bays. This precinct sits on the west facing embankment of the Moonee Ponds Creek, and is bisected by the rail corridor and capital city cycle trail.

Parkville Gardens Precinct

This precinct was formerly the Royal Park Psychiatric Institute and was redeveloped as the athlete's village for the 2005 Commonwealth Games. More recent street tree planting in footpath nature strips is interspersed with older specimen trees which were incorporated in the various pocket parks. Whilst currently separated by the freeway on the west, this precinct is part of the Moonee Pond Creek Valley and the central open spaces continue to play an important ecological and drainage function.

Poplar/Park Street Precinct

This industrial and institutional precinct includes Poplar and Park Streets. Characterised by their wide grassy road verges, there are opportunities for larger trees in this precinct.

Royal Park Precinct

The character and planting of streets surrounding and within Royal Park are guided by the Royal Park Master Plan.



Walker Street roundabout: view towards the Royal Melbourne Zoo



Story Street row of Planes and Golden Elms



Parkville Ave, row of Spotted Gums



Trin Warren Tam-Boore wetlands, Royal Park

MAP 5: PLANTING SUB-PRECINCTS



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

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

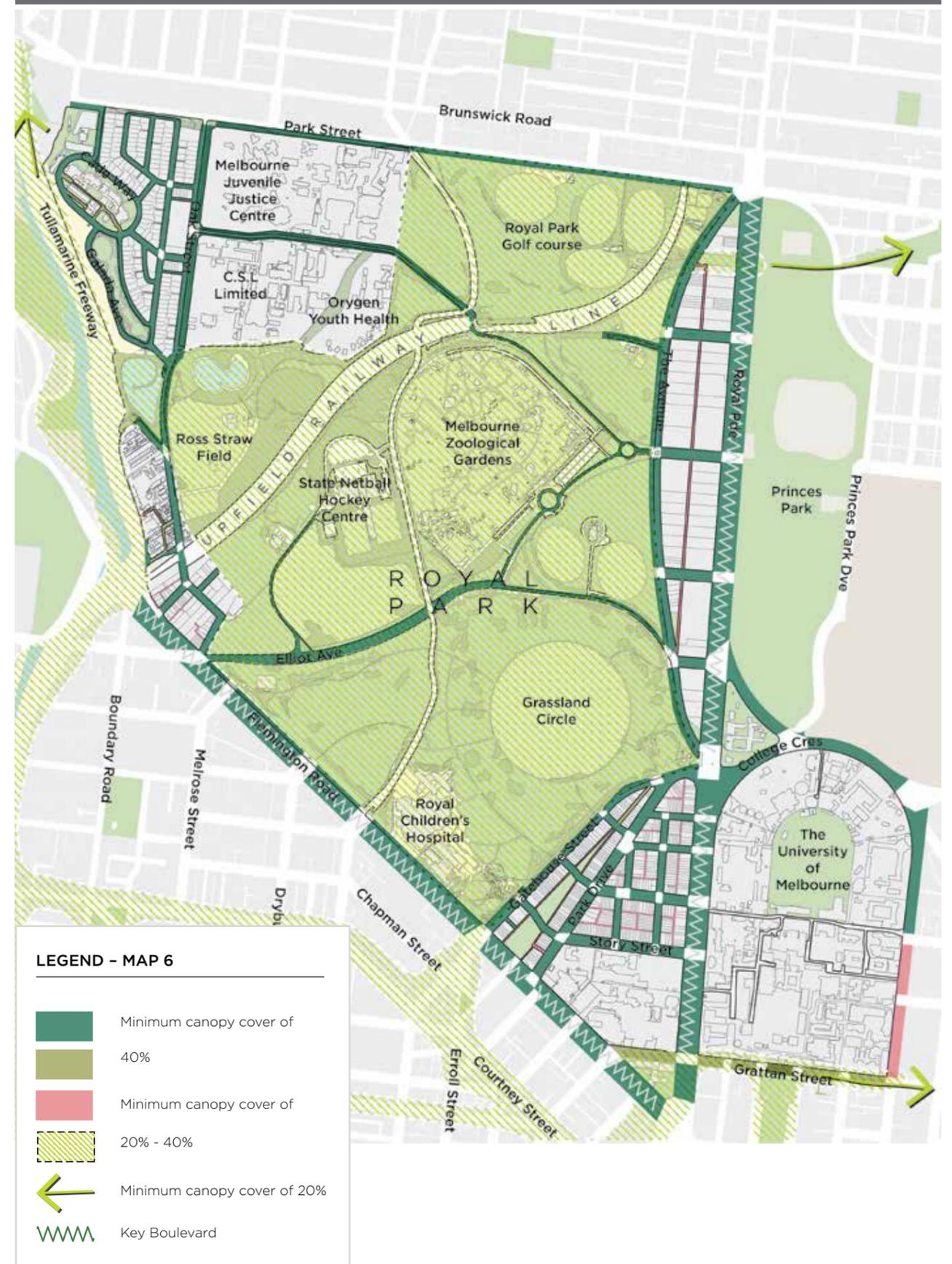
Royal Park is an area of ecological significance in the inner Melbourne region due to its large size, native landscape character and valuable habitats, such as the Trin Warren Tam-boore wetlands, native grasslands and remnant vegetation. The Parkville urban forest has an important role to play in retaining and enhancing biodiversity corridors into and out of Royal Park.

Important linkages include the Moonee Ponds Creek and Upfield Rail Line. The streets of West Parkville and Parkville Gardens also provide connection between the Moonee Ponds Creek and Trin Warren Tam-boore wetlands in Royal Park. The precinct plan will look to enhance the habitat value of these corridors.

Opportunities to enhance biodiversity in streets include selecting bird and pollinator attracting species, and adding layers of vegetation to provide structural diversity. When asked, the community said that the urban forest in Parkville should support biodiversity through the use of understory planting across the precinct.

Species choices for understory 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 6: CANOPY COVER AND BIODIVERSITY OUTCOMES



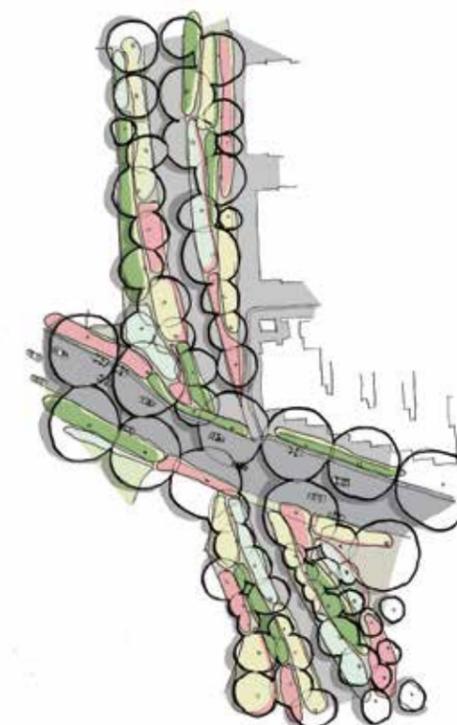
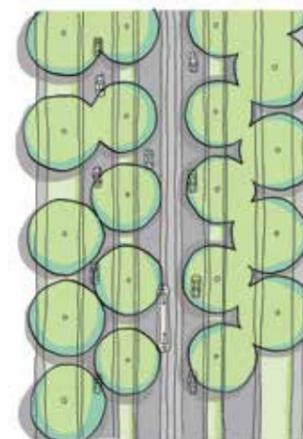
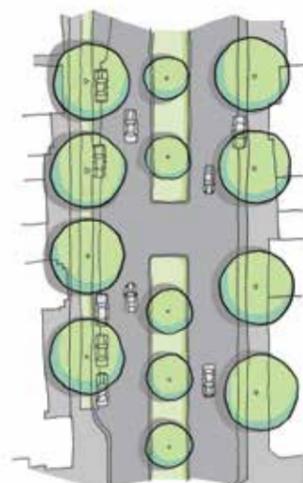
GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING **CONTINUED**

 Minimum canopy cover of 20%

 Minimum canopy cover of 20 - 40%

 Minimum canopy cover of 40%

 Biodiversity objective maximise canopy



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

What should stay and what should change?

Elms, Corymbia, Lophostemon, Angophora and Eucalypts are core genera within Parkville's urban forest today. That is not proposed to change; but 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 targets by providing an opportunity to change species.

The use of elms and planes will be limited to replacements in locations where they are already planted. A species change is proposed along the northern section of College Crescent to create a break between the Elm populations on Royal Parade and College Crescent/Cemetery Road. New plantings of oaks, except as feature trees, should generally be limited to those streets where they are completing an avenue. 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.

LEGEND - MAP 7

- Existing open space
- Proposed genus change
- Street with majority brush box tree (Lophostemon) population
- Street with brush box tree (Lophostemon) integrated with other tree species
- Street with majority elm tree (Ulmus) population
- Street with elm tree (Ulmus) integrated with other tree species
- Street with majority gum tree (Corymbia) population
- Street with gum tree (Corymbia) integrated with other tree species
- Street with majority gum tree population (Eucalyptus)
- Street with gum tree integrated with other tree species (Eucalyptus)
- Street with majority gum tree species (Angophora)
- Street with gum integrated with other tree species (Angophora)

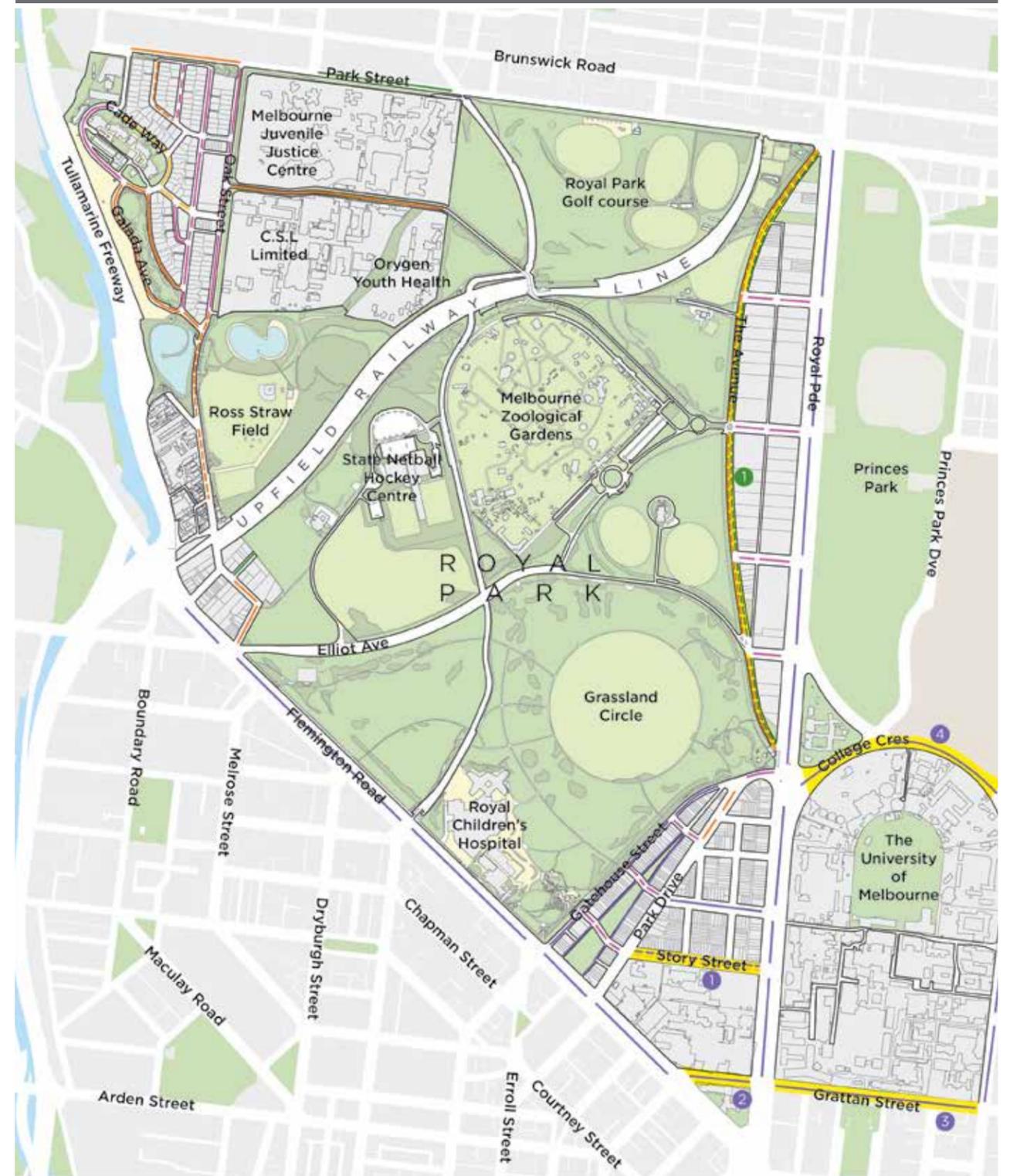
Change from elms in roadside

- 1
- 2
- 3
- 4

Change from Lophostemon:

- 1

MAP 7: WHAT SHOULD STAY AND WHAT SHOULD CHANGE?



PLANTING STRATEGIES

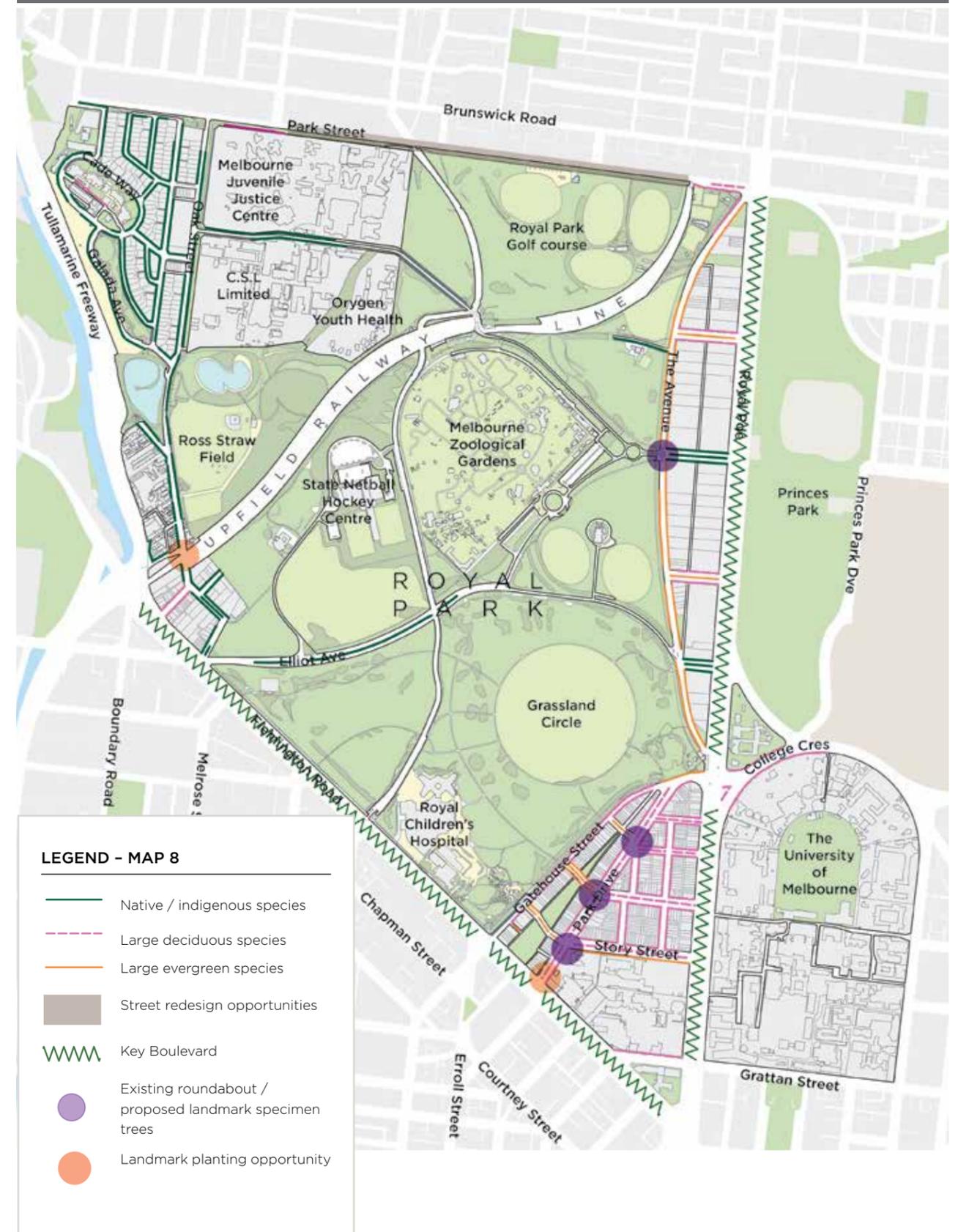
Long-term Planting Strategy

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 the following:

- Enhance the character of park perimeter streets through plantings that respond to the character and scale of the park perimeter.
- Green park connector streets should include a diversity of tree and understorey plantings. These streets will provide connections between Parkville's open spaces, reinforcing the character of Royal and Princes Parks.
- Where large canopy trees in central medians are possible, smaller ornamental trees may be appropriate in the footpath if not precluded by verandas or other features.
- Long north-south tree avenues should have consistent form and character in centre and roadside plantings with species changing at sub-precinct boundaries.
- Where trees are in footpaths, deciduous trees should be favoured while trees in medians may be evergreens.
- Landmark specimen trees at key roundabouts and intersections will provide way finding and diversity.
- Incorporate colour and seasonal change into species selections.

MAP 8: LONG-TERM PLANTING STRATEGY



PLANTING STRATEGIES CONTINUED

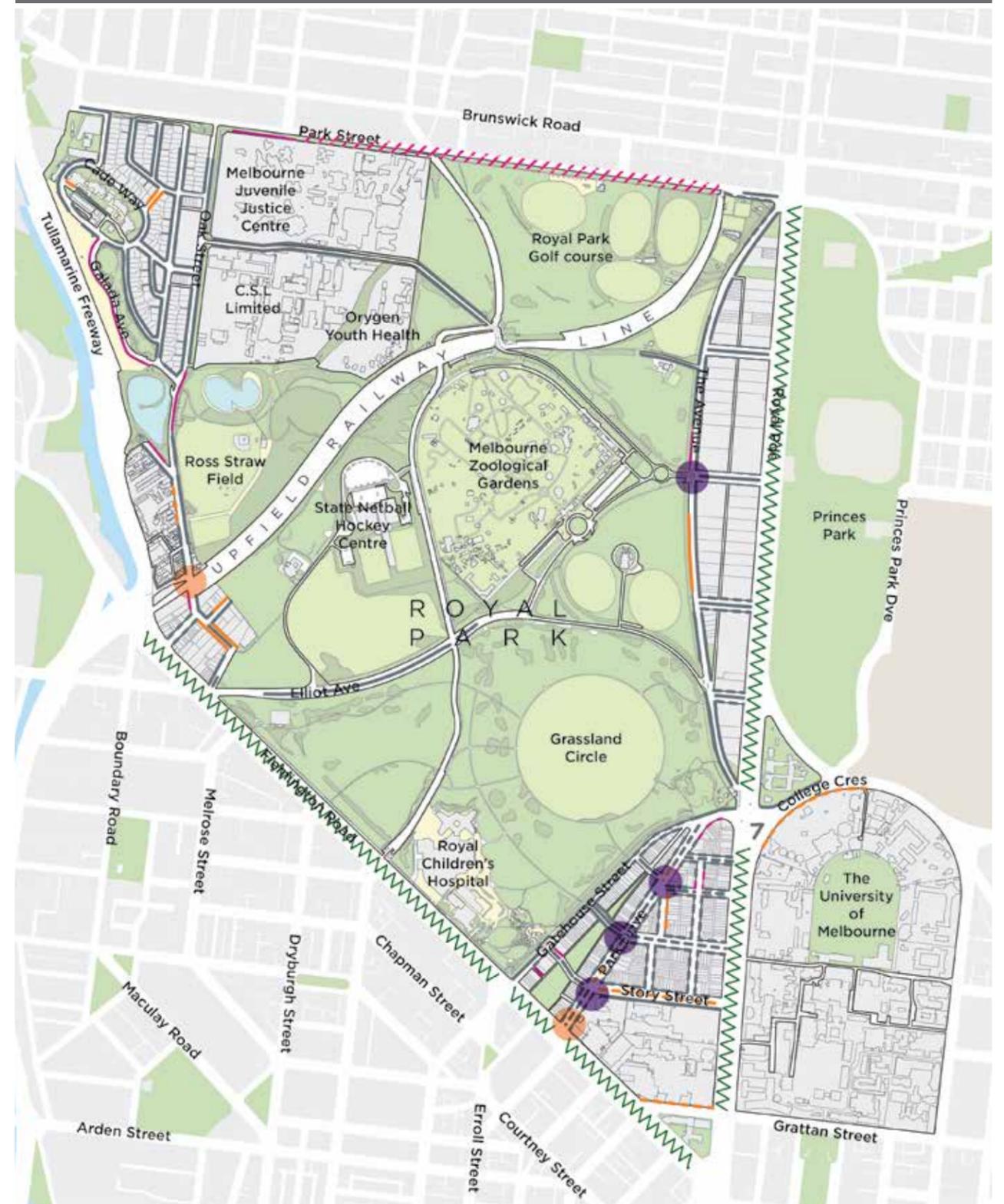
10-year Planting Plan

This plan provides direction on where new and replacement planting is to occur across Parkville. 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 advise 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.

LEGEND - MAP 9

- Existing open space
 - Street re-design opportunities
 - Key Boulevard
 - Existing roundabout / proposed landmark specimen trees
 - Landmark planting opportunity
- EXISTING**
- Large evergreen tree
 - Large deciduous tree
 - Medium - small deciduous tree
- REPLACEMENT**
- Large evergreen tree
 - Large deciduous tree
 - Medium - small deciduous tree
- NEW**
- Large evergreen tree
 - Large deciduous tree
 - Medium - small deciduous tree

MAP 9: 10-YEAR PLANTING PLAN



PLANTING STRATEGIES CONTINUED

Guide to species change

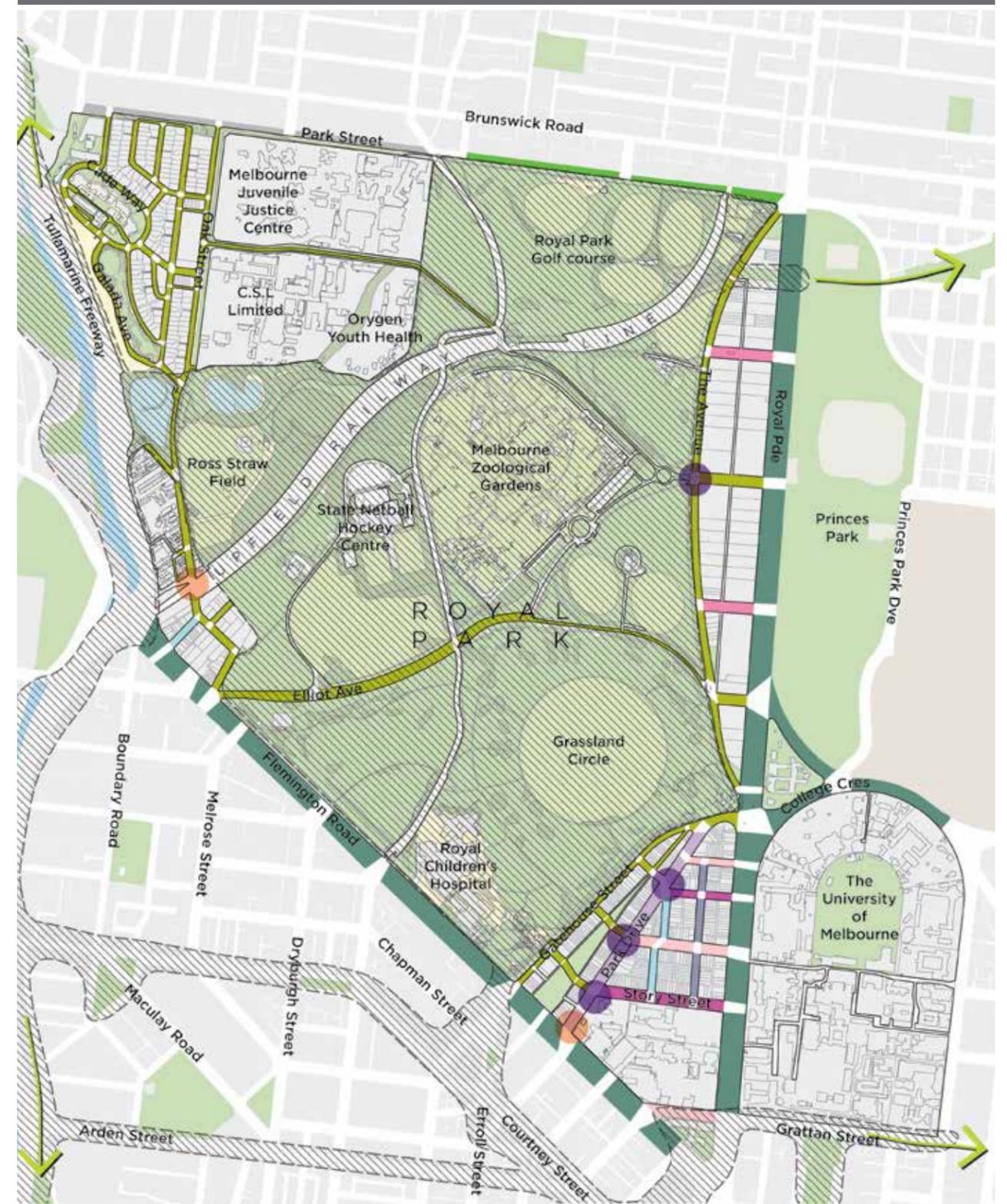
This map indicates locations along streets where a change in species is logical based on sub-precinct boundaries, topographic factors or objectives defined for streets within this plan. The colours do not indicate species distribution or specific species. Rather, they represent points of species change, 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 short east-west blocks, kerb outstands, roundabouts and road ends. Long north south tree avenues should have consistent form in centre and roadside plantings with species changing at sub-precinct boundaries. In long streets with roadside plantings, use a single species for multiple segments then change between sub-precinct and topographic 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 smaller parks and gardens or where vegetation from private gardens overhangs the streets.

LEGEND - MAP 10

-  Existing roundabout / proposed landmark specimen trees
-  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
-  Historic avenue
-  Open space link - extending park character to the streetscape - mixture of species
-  Biodiversity corridor
-  Adjoining biodiversity corridor

MAP 10: GUIDE TO SPECIES CHANGE



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 Parkville, Guiding Principles and Planting Plan. Elms, Corymbia, Lophostemon, Angophora and Eucalypts are key genera within Parkville, 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 Parkville'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 species (Limited new plantings)

- *Ulmus spp.*
- *Eucalyptus spp.*
- *Corymbia spp.*

Large Trees for Streets

Evergreen

- *Corymbia citriodora*[^] (Lemon scented gum)
- *Eucalyptus polyanthemos* (Red box)
- *Eucalyptus tricarpa* (Red ironbar)
- *Ficus platypoda* (Rock fig)
- *Flindersia australis* (Crow's ash)
- *Pinus patula* (Patula pine)
- *Quercus ilex* (Holm oak)

Deciduous

- *Celtis australis* (European nettle tree)
- *Fraxinus americana* (American ash)
- *Liquidambar styraciflua* (Liquidambar styraciflua)
- *Maclura pomifera* 'Wichita' (Osage Orange)
- *Quercus coccinea* (Scarlet oak)
- *Quercus rubra* (Red oak)
- *Tilia cordata/tomentosa* (Small-leaved Linden)

Small to Medium Trees for Street

Evergreen

- *Acacia pendula* (Weeping myall)
- *Brachychiton x roseus*
- *Buckinghamia celsissima* (Ivory curl tree)
- *Ceratonia siliqua* (Carob tree)
- *Corymbia eximia* (Yellow Bloodwood)
- *Geijera parvifolia* (Wilga)
- *Eucalyptus leucoxyton* subsp *connata*^{**} (Yellow Gum)
- *Magnolia grandiflora* (Southern magnolia)

Deciduous

- *Acer buergerianum* (Trident Maple)
- *Acer platanoides* (Norway maple)
- *Cercis siliquastrum* (Judas tree)
- *Fraxinus ornus* (Manna ash)
- *Gleditsia triacanthos* var. *f. inermis* (Thornless Honeylocust)
- *Koelreuteria paniculata* (Goldenrain)
- *Zelkova serrata* (Green Vase)[^]
- *Melia azederach*[^] (White cedar)
- *Pyrus calleryana* (Callery pear)
- *Ulmus parvifolia* (Chinese elm)

Large Feature Trees

- *Catalpa bignonioides*⁺ (Cigar tree)
- *Flindersia maculosa*⁺ (Leopardwood)
- *Ficus macrophylla* (Moreton Bay fig)
- *Pinus canariensis* (Canary Island pine)
- *Podocarpus falcatus*⁺ (Outeniqua yellowwood)
- *Quercus acutissima* (Sawtooth oak)
- *Ginkgo biloba* (Maidenhair tree)
- *Grevillea robusta* (silky oak)
- *Brachychiton populneus* (Kurrajong)

Small to Medium Feature Trees

- *Acacia implexa*^{*} (Lightwood)
- *Acacia melanoxylon*^{*} (Australian blackwood)
- *Allocasuarina verticillata* (Drooping sheoak)
- *Corymbia calophylla* (Marri gum)
- *Hakea bucculenta* (Red pokers)
- *Leptospermum petersonii* (Lemon-scented tea tree)
- *Styphnolobium japonicum*⁺ (Japanese pagoda tree)

[^]Limited new plantings

^{*}Locally Indigenous (Royal Park)

⁺Trial species

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?

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 learn more about the Citizen Forester volunteer program, please email your details to melbourneurbanforest@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 melbourneurbanforest@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 melbourneurbanforest@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

Translation services:

03 9280 0716	አማርኛ
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03 9280 0719	Bahasa Indonesia
03 9280 0720	Italiano
03 9280 0721	國語
03 9280 0722	Soomaali
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)

