

CENTRAL CITY URBAN FOREST

PRECINCT PLAN

2013-2023



CITY OF MELBOURNE

CENTRAL CITY URBAN FOREST

PRECINCT PLAN 2013 – 2023

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

Introduction to the precinct plans	4
How does Melbourne's urban forest measure up?	8
What will the precinct plans achieve?	10
Community priorities	14
Central City's urban forest in 2013 and its projected future	18
Prioritising tree planting in streets	20
Map 1: Planting Priorities	22
Major streetscape redesign opportunities	23
Guiding principles and considerations for tree planting	24
Map 2: Key planting constraints	29
Map 3: Natural and open space context	31
Map 4: Strategic context	32
Map 5: Planting sub-precincts	34
Map 6: Canopy cover and biodiversity outcomes	37
Map 7: What should stay and what should change?	39
Planting Strategies	40
Map 8: Long-term Planting Strategy	41
Map 9: 10-Year Planting Plan	43
Species Palette	44

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?

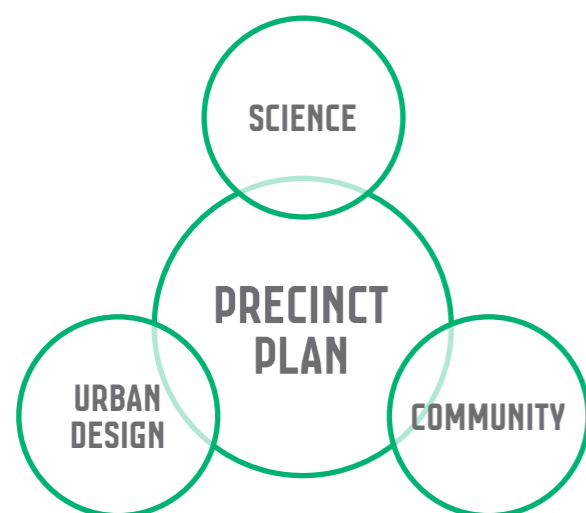
The urban forest comprises all of the trees and other vegetation – and the soil and water that supports it – within the municipality. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, green walls, balconies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

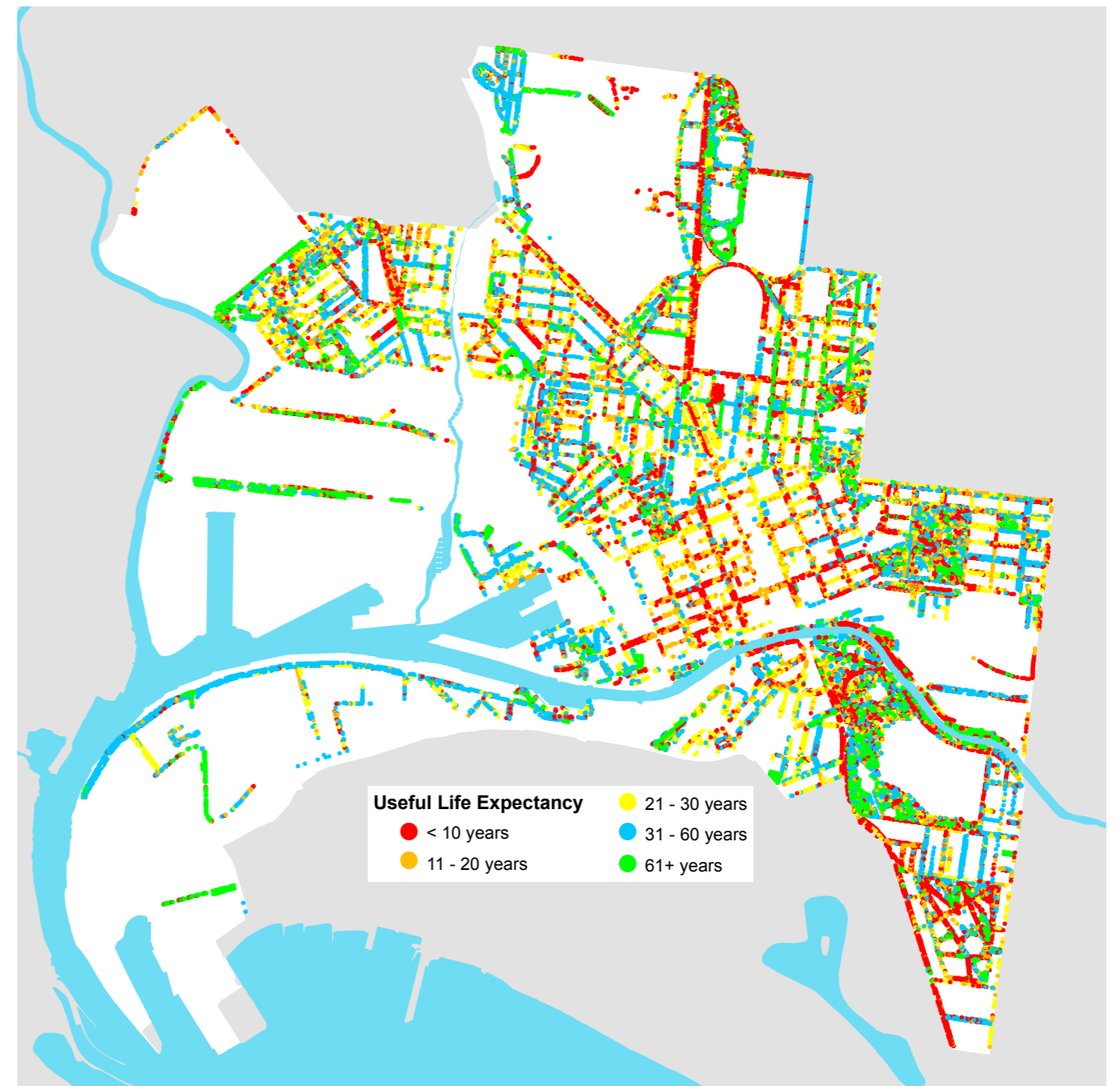
The urban heat island effect (whereby urban areas are several degrees hotter than surrounding rural areas) means that central Melbourne will reach threshold temperatures for heat related illness in vulnerable populations more often and for a longer duration

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 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 Strategy* 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

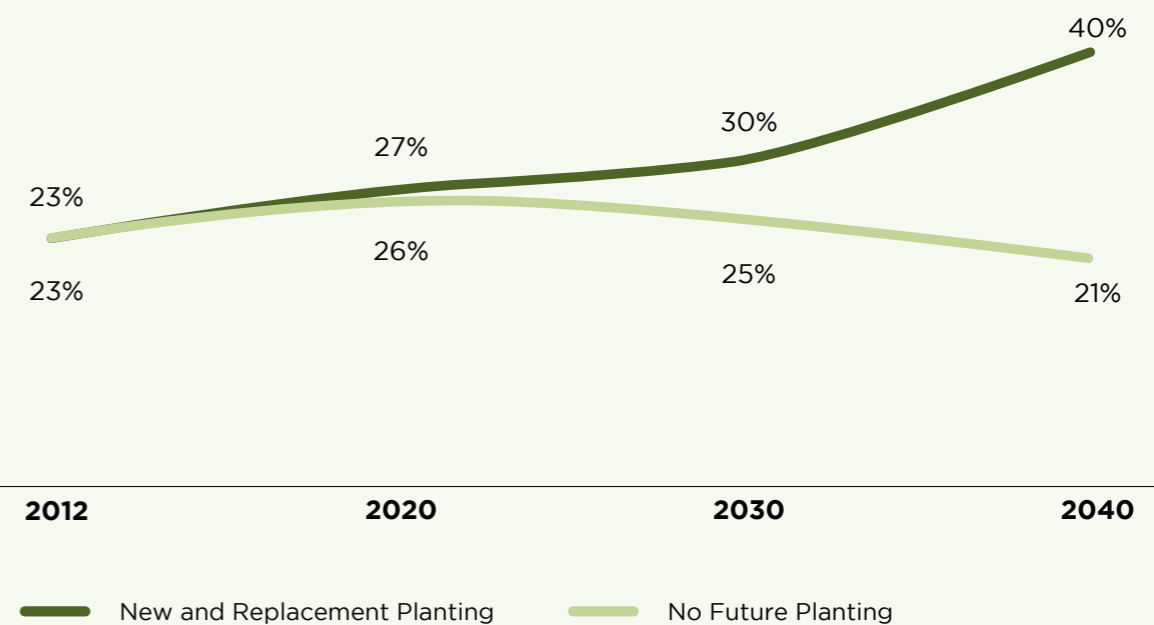
water that would otherwise go down the drain. This water is being used to water the vegetation in our urban landscapes.

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.

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 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

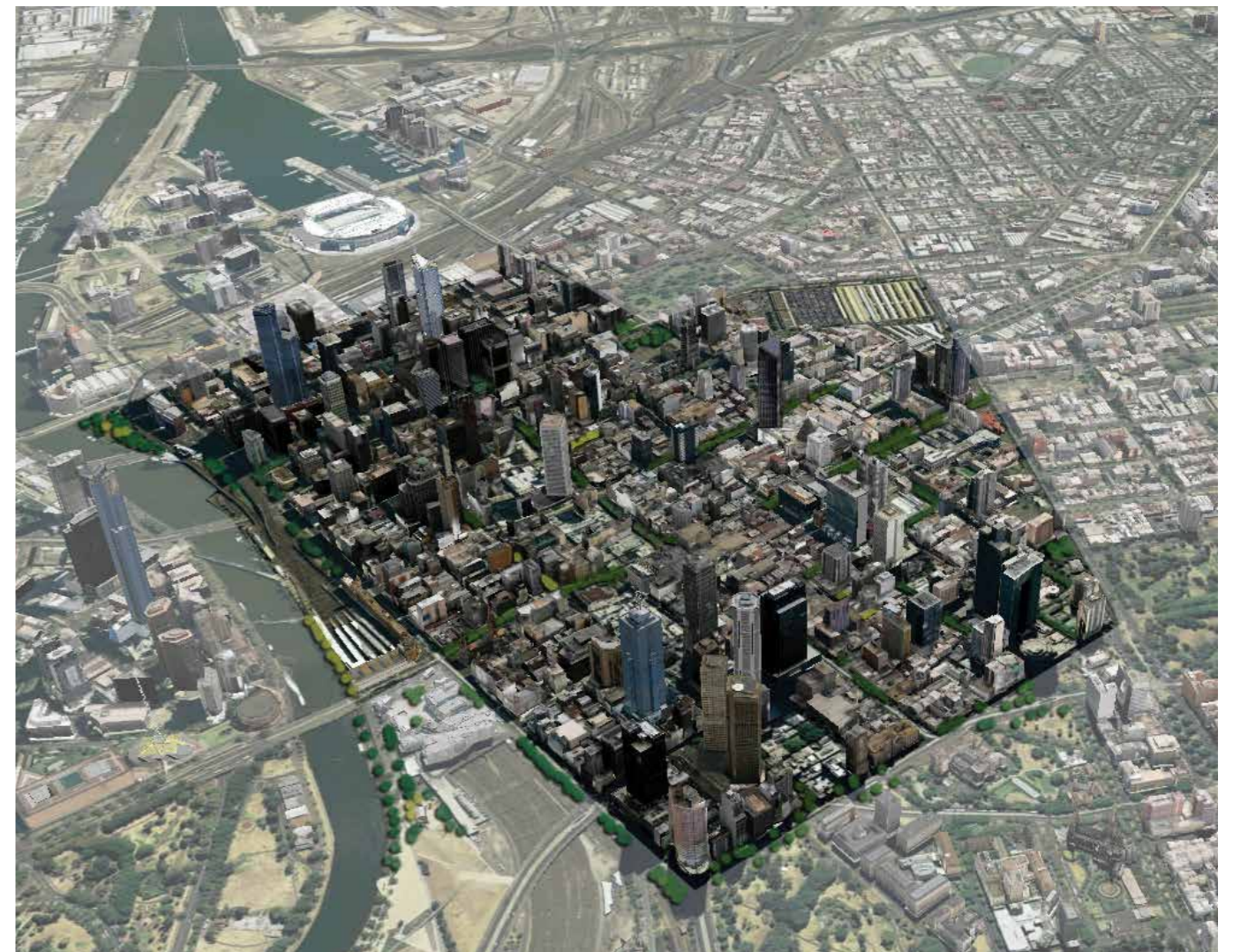
The relationships between the precinct plans and City of Melbourne policy documents are outlined in the *Urban Forest Strategy*. Within the central city the heritage overlays, *Open Space Strategy* and the *City North Structure Plan* strongly influence the future character of the precinct.



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

THE VISION FOR THE CENTRAL CITY'S URBAN FOREST

THE CENTRAL CITY'S URBAN FOREST WILL PROVIDE A SAFE AND INVITING HABITAT FOR PEOPLE. THE FOREST WILL BE BEAUTIFUL, COLOURFUL AND DIVERSE, ACHIEVING WHIMSY IN PLAYFUL SPACES AND ELEGANCE ALONG GRAND CITY STREETS.



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 8% 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.

The City of Melbourne 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 an adjacent to the central city precinct, RMIT, the College of Surgeons, the State Library and state government 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.

The setting and role of the CBD urban forest

The central city's streets are laid out in a uniform grid of wide (30m) main streets, subdivided by narrower (10m) east-west 'little' streets and a number of laneways. Expansive parklands and the Yarra River corridor adjoin the central city but there is little parkland within it; streets are the main public open spaces that people in the CBD use and enjoy. The amenity of streets is therefore especially important, and trees are vital contributors to that amenity. Given the height of many city buildings, quite large street trees are required to have a proportional visual impact that maintains a sense of human scale throughout the city.

Street conditions

Despite the uniformity of the grid as a whole, the 30m streets vary, with tramways in some and medians or centre-of-road parking in others, and relatively wide or narrow footpaths in different streets. Varied building heights and characters also make some streets sunnier or shadier, and more or less enclosed, but in general large buildings face directly onto the footpaths and create continuous walls along the sides of the street.

Historical and existing tree plantings

The first significant street tree plantings in central Melbourne occurred about 1875, when elms were planted in Collins Street near the Town Hall and towards the east end of the city. Plane trees were also planted in a number of streets in the following decades. However, many streets remained treeless throughout this period and beyond, and attention was lavished instead on pockets of land such as Gordon Reserve, which was heavily planted. Other tree species were planted in the twentieth century: for example, Ash trees were planted along much of Collins Street and next to St Pauls Cathedral in the 1940s, and Paperbarks were planted along Latrobe Street in the 1970s.

Despite these varied plantings in the past, the existing street tree population in the central city is now dominated by Plane trees (74%, being mostly *Platanus x acerifolia* with some other cultivars). Some of these have been here for decades, and mature Planes with their limbs arching over the roadway add greatly to the city's character and

amenity. In the 1980s and 90s Planes exclusively were planted, replacing poorly performing Ash trees, healthy but under-scaled Paperbarks and a scattering of Elms in various streets.

While Planes have been favoured because of their large scale and robustness in harsh city growing conditions, the result is a virtual monoculture. Transforming from monoculture into a more diverse urban forest while respecting the formal dignity of the city's regular street grid is an important challenge for the precinct plan.

Little streets, lanes and plazas

Planting opportunities in little streets, lanes and the city's handful of plaza spaces contribute to their amenity. Some add important touches of local character, like the ginkgo in Cohen Place (Chinatown) and the Jacarandas in Brown Alley. The fronds of the *Phoenix reclinata* palms hanging over the back wall of the Melbourne Club's garden add significantly to Little Collins Street. However, these plantings are limited in number and require intensive site-specific investigation in proportion to the extent of greening provided, and are therefore not addressed in detail in this plan.



Latrobe Street c1870. Like many other CBD streets it remained treeless for decades. [Mitchell Library]



The east end of Collins Street, showing elms or planes planted in the 1870s.



Gordon Reserve, showing the changing plantings in the 1880s and 1930s. Small reserves like this, in combination with the larger public gardens, provide a green edge for the CBD.



Swanston Street in 1987 and 1995. The widening of footpaths in 1991 created an opportunity to transform the street with new tree plantings.

COMMUNITY PRIORITIES

Central city'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 central city's urban forest.

The central city is full of opportunities for greening to create safe and inviting habitats for people. City spaces need to be multi-purpose, and tree planting or greening should be fit for purpose and creative. Achieving the vision for Melbourne's future urban forest is a shared responsibility and needs to be a collaborative effort between government, residents, developers, businesses and the community at large.

Consultation with the central city community indicated a preference for trees that would provide large, arching canopies over streets. Trees that would provide colour and seasonal interest were also preferred.



Desired future states defined by the community

- Beautiful, safe, healthy, valuable, ambient, soft, elegant, whimsical, playful
- Diverse, different, colourful, seasonal, green - native, evergreen, deciduous
- Healthy, robust, long-lived, low maintenance
- Pedestrian amenity, inviting, multi-purpose
- Forest-like with greening everywhere



Images selected as representing a preferred future for the central city urban forest that includes colour, canopy, shade, seasonal change and habitat.

COMMUNITY PRIORITIES CONTINUED

INTEREST

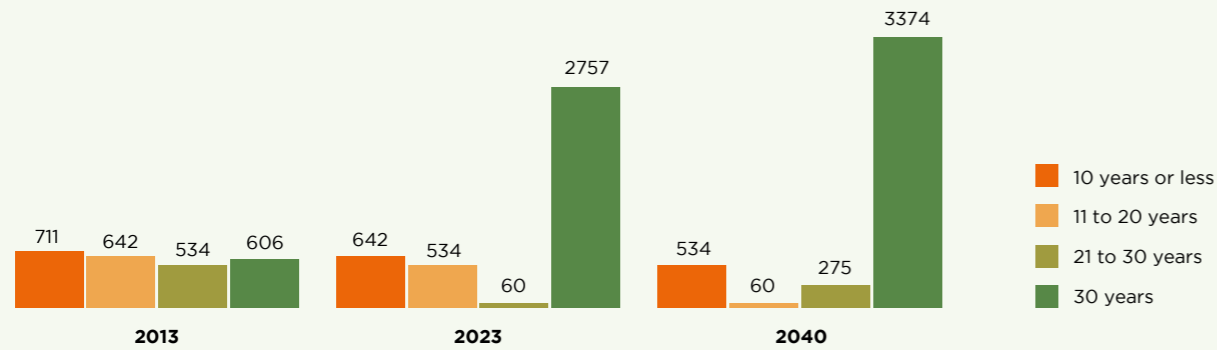


Central City community members developing priorities for planting in the precinct. (opposite)



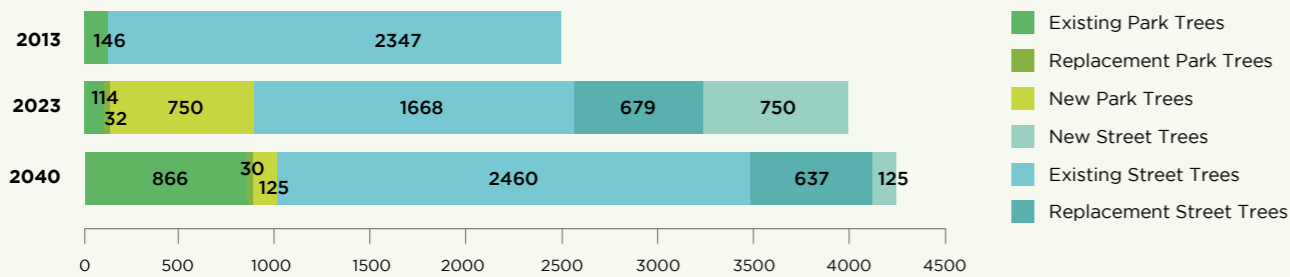
CENTRAL CITY'S URBAN FOREST IN 2013 AND ITS PROJECTED FUTURE

TREE HEALTH (ULE) - PUBLIC REALM



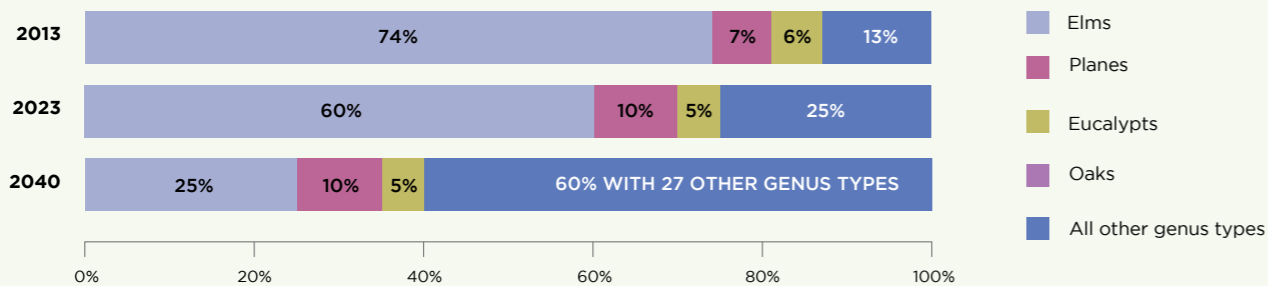
Tree counts for CBD, categorised by useful life time expectancy (ule) in years

TREES - PUBLIC REALM



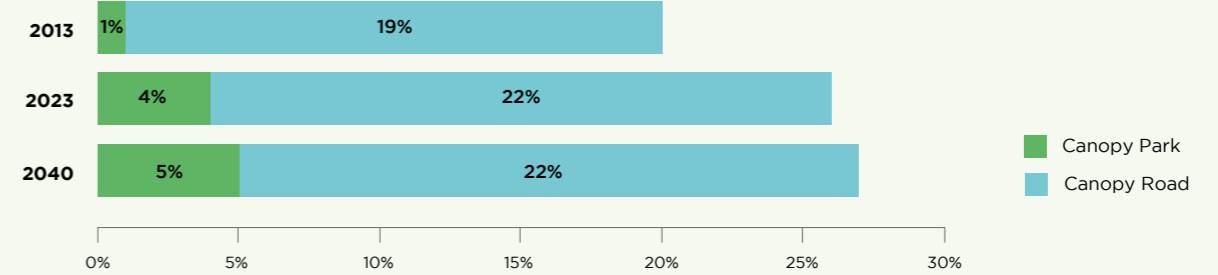
Tree counts and planting by City of Melbourne in CBD

DIVERSITY (BY GENUS) - PUBLIC REALM



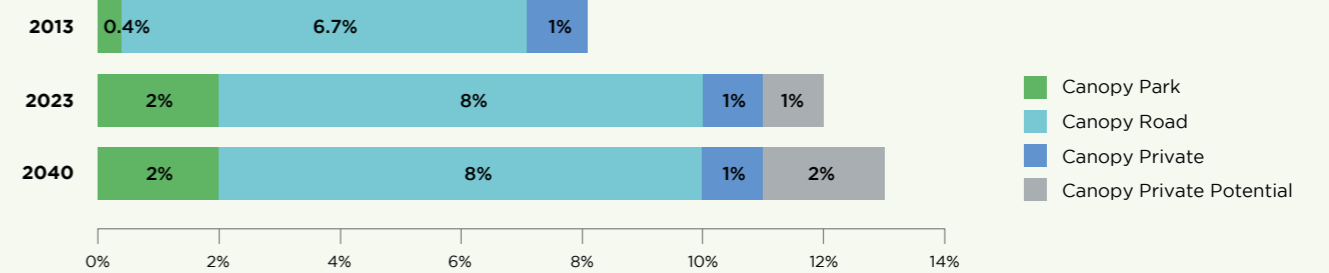
Main genus types for CBD

CANOPY - PUBLIC REALM



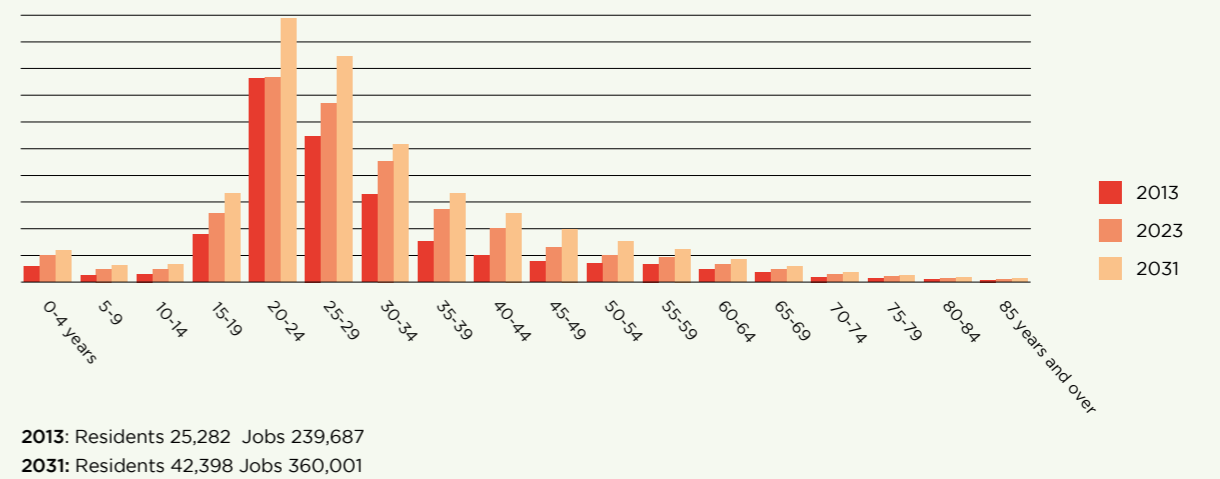
Tree canopy and locations for CBD

CANOPY - ENTIRE PRECINCT



Tree canopy and locations for CBD

PRECINCT POPULATION DISTRIBUTION - RESIDENTS



Projected resident population by age for CBD

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. Hot and very hot streets



4. Tree replacements required in next 10 years



5. Canopy Cover <20%



Prioritising tree planting in streets

When prioritising where and when to plant, it is important to focus resources in the locations that need it most. This includes consideration of where opportunities exist 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. Community priority is also used as a criterion in other precincts but, given that all streets in the central city were highlighted as a priority in community consultation, it is not represented as a separate layer. Census and mapping data were used to spatially define streets with these conditions and are defined on the maps overleaf.

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. For example, development on the former Spencer Street power station and The Age sites are likely to damage trees in the western-most block of Lonsdale Street, although this otherwise stands out as a major short term planting opportunity. Conversely, the potential to radically improve growing conditions by rebuilding centre islands/medians with better subsoil preparation gives replacement of the central plantings in Exhibition, Russell, Queen and Lonsdale St a high priority even though these are relatively well shaded at present. Unforeseen opportunities for streetscape improvement may also alter scheduled planting.

Streets prioritised for work in Years 1 – 4 (2013 – 2016) 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: very low canopy cover, temperature hot spot or replacements required.

Streets prioritised for work in Years 5 – 7 (2017 – 2019) include those which:

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

Streets scheduled for Years 8 – 10 (2020 – 2023) include those with only:

1. a high number of vulnerable people; or a combination of:
2. very low canopy cover
3. temperature hot spot; or
4. replacements required.

HOW THE PRECINCT PLAN GUIDES ANNUAL PLANTING



Set annual planting program

Priorities (Map 1)
Streets undergoing unforeseeable 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

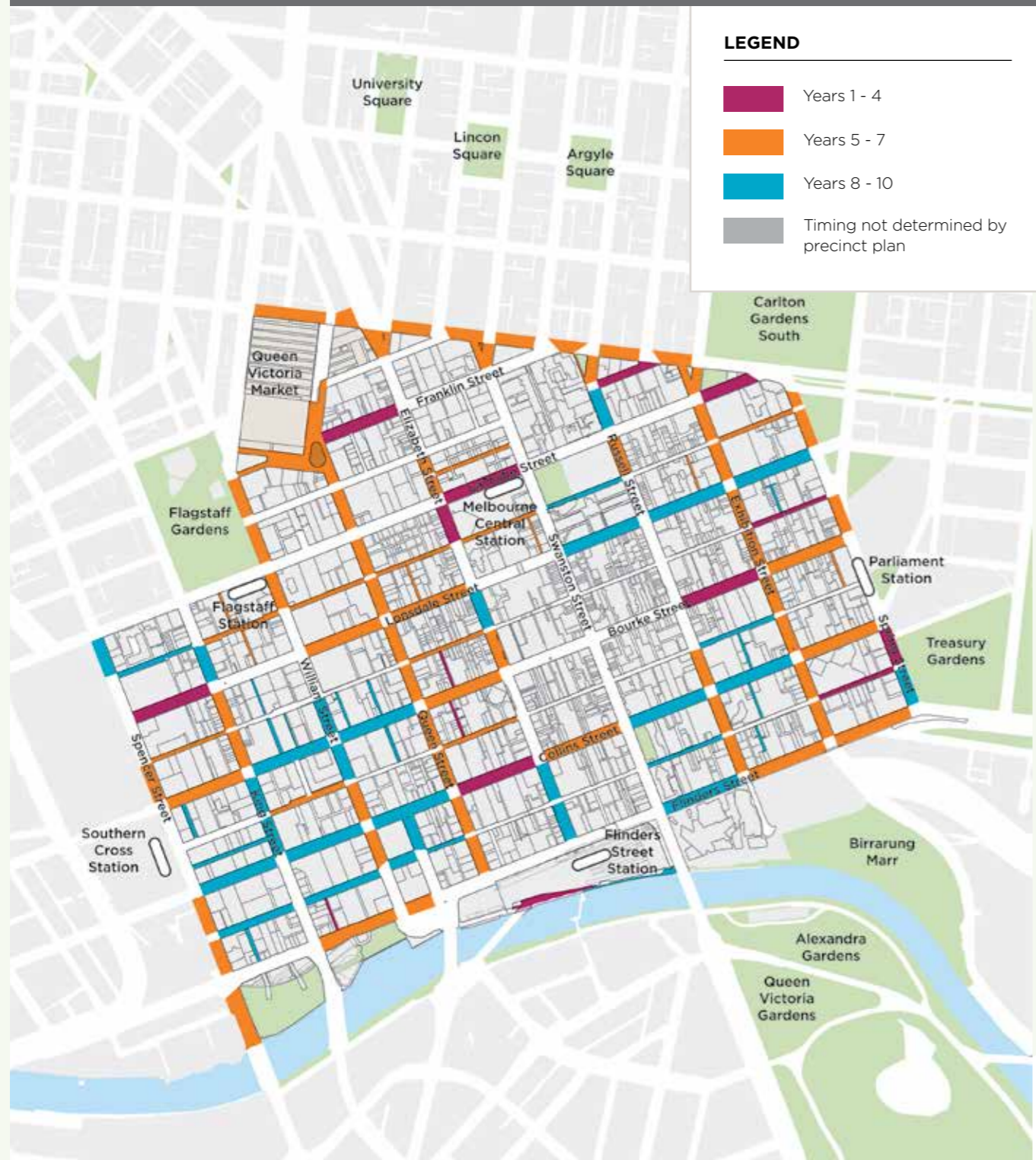
Review Streetscape objectives
Review What should change (Map 7)
Review Planting plans (Map 8, 9 & 10)
Review species palette



Implement planting

Produce streetscape design options
Consult with residents
Plant

MAP 1: PLANTING PRIORITIES



LEGEND

- Years 1 - 4
- Years 5 - 7
- Years 8 - 10
- Timing not determined by precinct plan

MAJOR STREETScape REDESIGN OPPORTUNITIES

There are opportunities for significant redesign in some streets, which should be resolved before any replanting of trees is undertaken in these locations. They may include:

Elizabeth St and William St: universal access tram stops

Lonsdale St: redesign post closure of power station and The Age

Dudley St-Franklin St: link across QVM car park

Victoria St: traffic downgrade following QVM link

Flinders St (Exhibition to Russell): widen footpath to incorporate plane trees now in carriageway

Exhibition St and Queen St: bike lanes and medians

Spring St at College of Surgeons: excess road space allows for greening and WSUD initiatives

STREET REDESIGN OPPORTUNITIES



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 you should refer to when designing or planting any streetscape; however central city specific principles are outlined below.

Planting types and locations: preference large canopy trees

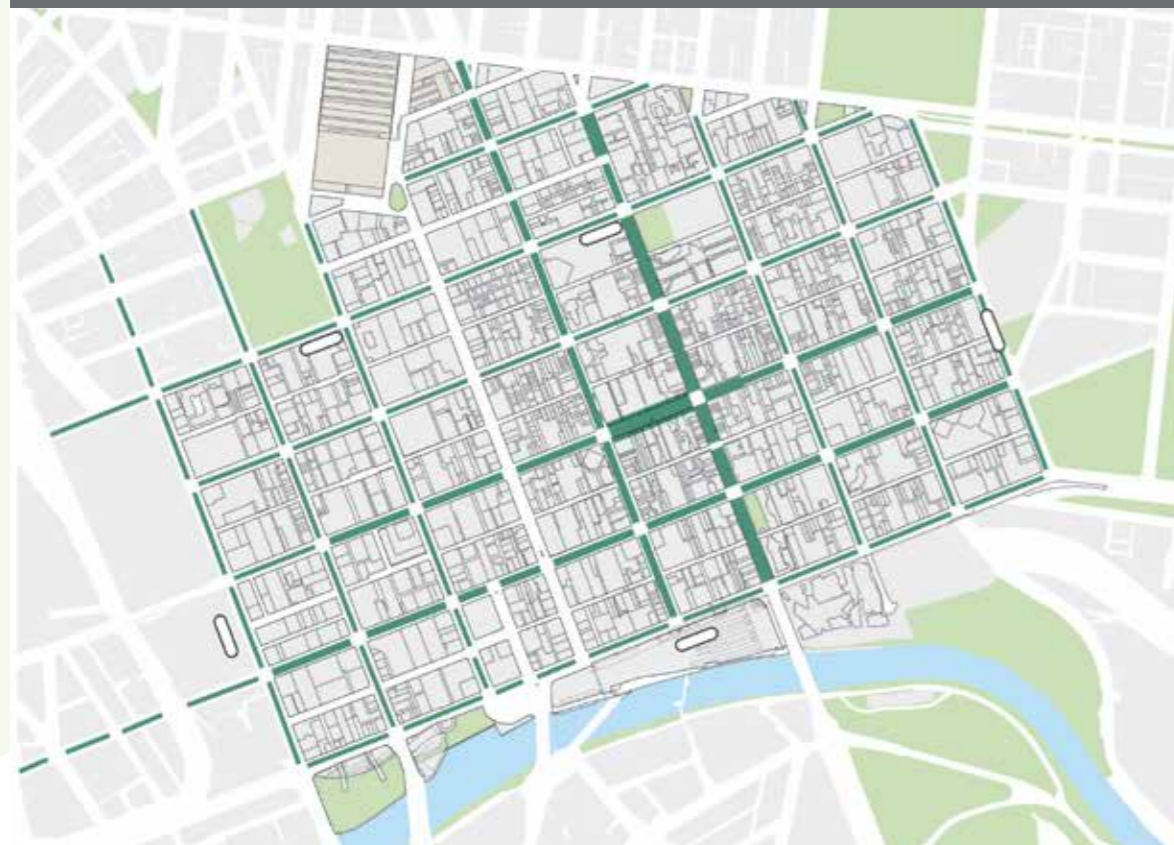
Most streets in Melbourne's CBD are heavily used and the area for planting is limited by competing demands for access, parking and other activities. To maximise canopy cover despite this constraint it is best to use large canopy trees that will spread across and shade wide carriageways without blocking access and visibility.

However, tree size may be limited by the position in a street. Large tree trunks simply won't fit in some narrow footpaths and retain adequate space for pedestrian access; some of the tree pits for mature Plane trees in Collins Street, for example, are wider than entire footpaths in other streets. Large trees also have large root systems and create the risk of lifting pavements and creating trip hazards in footpaths.

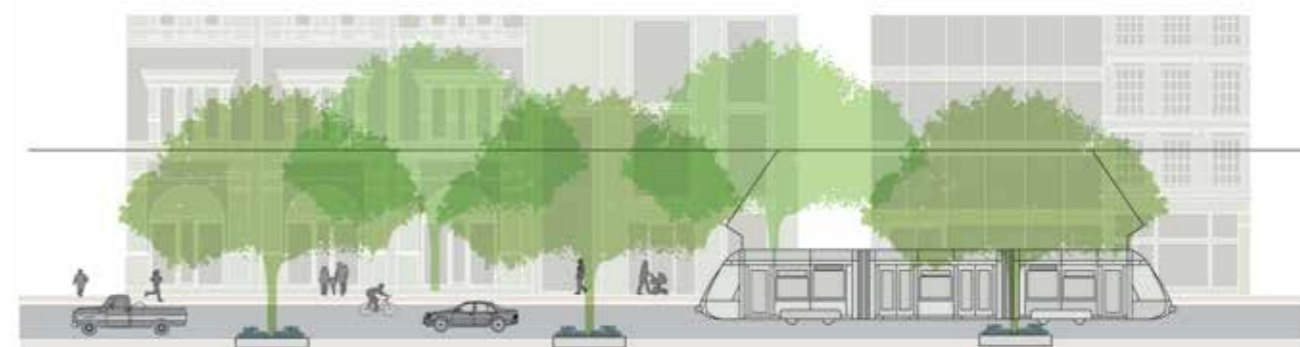
Both overhead and underground factors commonly make planting in or near the centre of streets a lower-risk option than planting near the sides of a street. Underground services are a major consideration because there is a risk of damage to services by tree roots, and there is perhaps an even greater risk of damage to tree roots when works occur on services - excavations for services occur frequently in the CBD - and services are typically less of

a constraint towards the centre of streets than near the edges. Trees located near or between traffic lanes are also more effective at shading road pavements than if they are located near the edge of the street reserve.

FOOTPATH WIDTHS



Map indicating footpath widths ranging from narrow (-3.6 m) to moderate (-5.4 m) to wide (-8.5 m).



Streetscape constraints and opportunities to consider when selecting species and planting locations

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

Planting patterns and species choice: Adopt planting patterns that increase diversity

The convention of planting consistent avenues with a single kind of tree limits species diversity. However, avenue plantings are important to local character in many Melbourne streets and parks, not least in the CBD.

To balance these conflicting pressures, it is necessary to identify ways to minimise the extent of uniform avenues while maintaining a strong design outcome. A variety of approaches may be appropriate to do this, e.g.:

- Establish a hierarchy of streets identifying those that are most important to plant with continuous avenues and those where avenue plantings are less important.

- Avoid planting avenues where it they are unlikely to be successful in achieving uniformity. Factors that may interrupt avenues include underground or overhead services, roads traversing bridges, and overhanging trees from adjoining gardens.
- Identify logical points along the length of streets where species may change. This could include places where streets adjoin parks or important public spaces.
- Use asymmetrical treatments in narrow streets and where overhead wires affect only one side.
- Use informal mixes of species, e.g. along perimeters of parks, in streets where most trees are senescent yet important established specimens remain,

and where vegetation from private gardens occasionally overhangs into the street.

Consistency of planting using a few species contributes importantly to the character of some precincts but works against species diversity objectives. It is therefore sometimes appropriate to maintain "over-representation" of key species in certain places, while minimising the use of these species elsewhere. London Plane trees are currently the dominant species in the CBD, and even if their use is substantially reduced it is likely that they will continue to be represent a much higher proportion of the tree population than the target maximum of 5% per species. This implies significant pressure to minimise the use of Planes in other precincts.



Establish a hierarchy of streets identifying those that are most important to plant with continuous avenues and those where avenue plantings are less important.

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

Most trees grow best where the soil can be emended to improve fertility, moisture retention, drainage, aeration and freedom of root growth. However, pavements limit access to improve soil. Where possible, it is desirable to improve soil conditions under paving to support tree growth e.g.:

- Undertake continuous trenching and soil improvement in medians and centre of road parking zones.

- Create structural soils below pavements that remain permeable despite compaction required to support the paving.

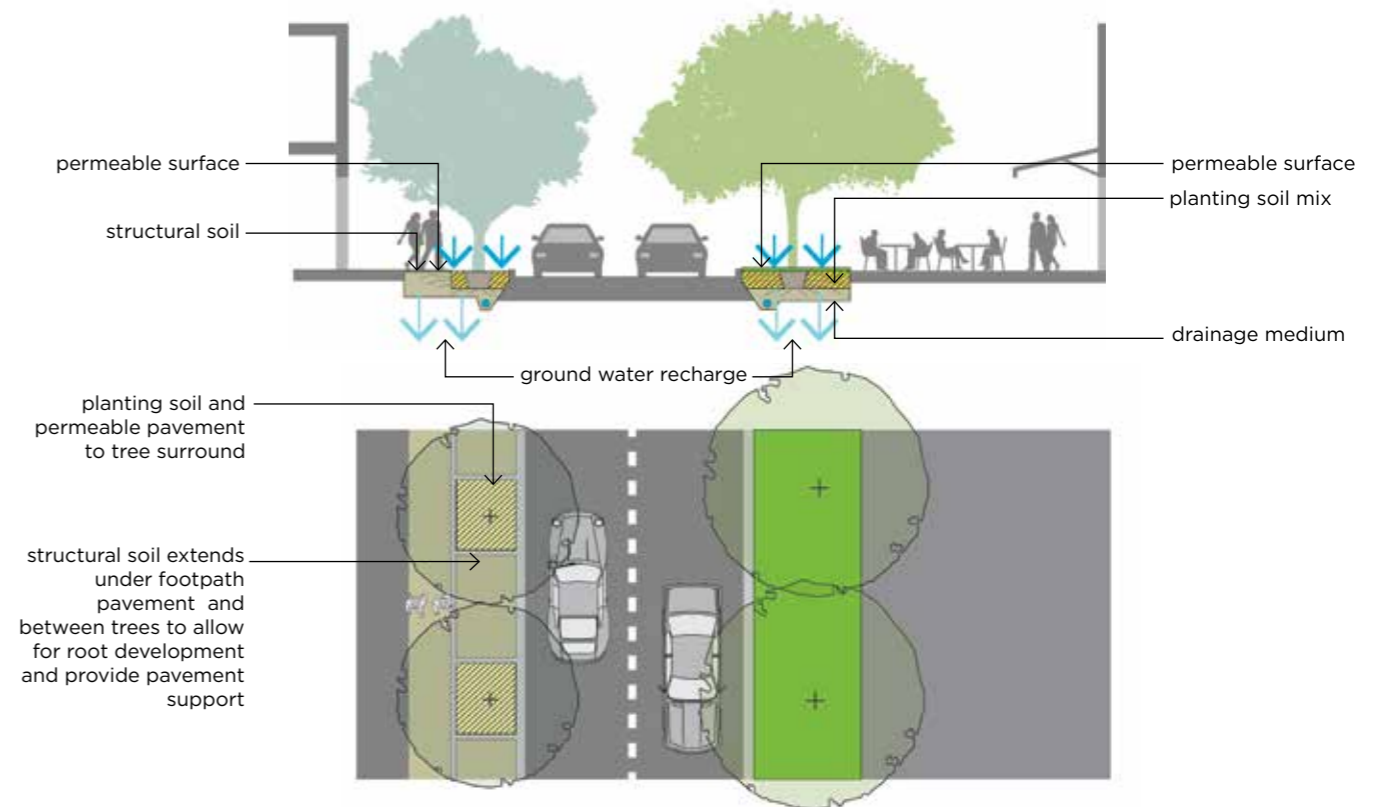
These concerns are particularly important in areas with bluestone paving, as the bluestone (on a concrete slab) is even less permeable than ordinary asphalt.

Passive irrigation using rainwater runoff should also be used to support tree growth while minimising use of mains water. Ways to achieve this include:

- Plant in or along low-lying locations and drainage zones where possible.

- Create permeable pavements in areas of low loading and risk, i.e. in footpaths, parking lanes.
- Construct rainwater infiltration pits located on the uphill side of side-entry or grated stormwater pits.
- Use planting pits that capture rainwater. These are particularly helpful for tree establishment.

There have been very few records of problems with tree growth in the CBD due to poor soil drainage. This might be a result of a multitude of underground services trenches that are backfilled with sand or screenings.



Improving below ground growing conditions for trees in streets

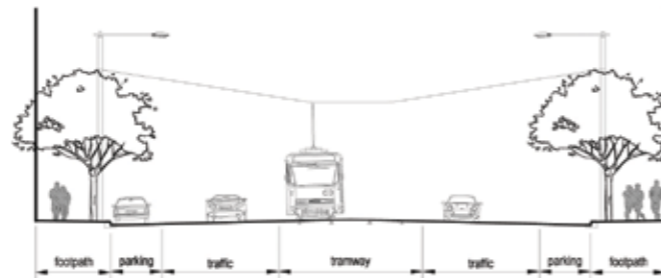
GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

In addition to the typologies of streets relating to trams, centre medians and footpath widths noted previously, several factors in different parts of the CBD affect tree planting. Despite the existing almost uniform planting of Plane trees, planting conditions across the city are not uniform. This, in part, explains the inconsistencies and variable success of existing trees.

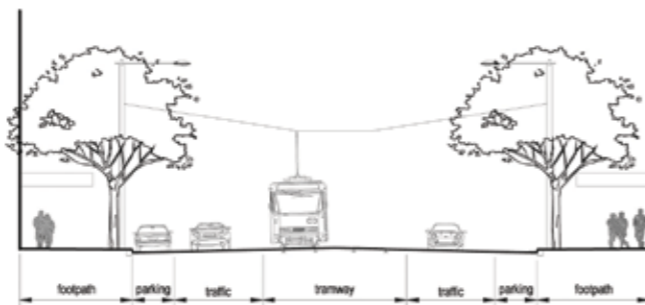
These factors will continue to affect tree planting and growth into the future. While they create gaps and defects in a scheme that now aims for uniformity of planting across the city street grid, they can be used positively to define new character for the urban forest, which aligns with other objectives.

Locations where planting is precluded by overhead and underground structures include rail loop stations, railway viaducts, tramways, streets on bridges and below pedestrian overpasses. In locations with areas on structural decks above railways, conventional tree planting is not sustainable. Locations with 30m wide main streets that do not carry tramways and feature central medians or centre-of-road parking interspersed with tree islands provide opportunities for large canopy trees.

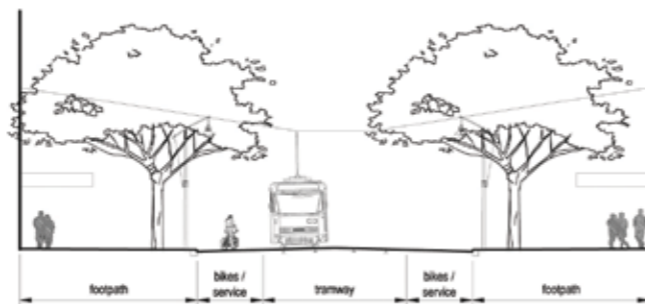
The cross sections at right illustrate typical arrangements of footpaths, tramways and traffic lanes in the 30m wide main streets of Melbourne's city centre. Footpath widths vary significantly even in these wide streets, and the presence of centre-of-road islands or medians opens up possibilities not present where there are tramways. Planting opportunities vary in relation to these typologies, and should influence the type of construction or excavation for planting as well as the selection of species.



30m street with tramway + 3.6m footpaths (Flinders St, Latrobe St)



30m street with tramway + 5.4m footpaths (Collins, Bourke, Elizabeth)

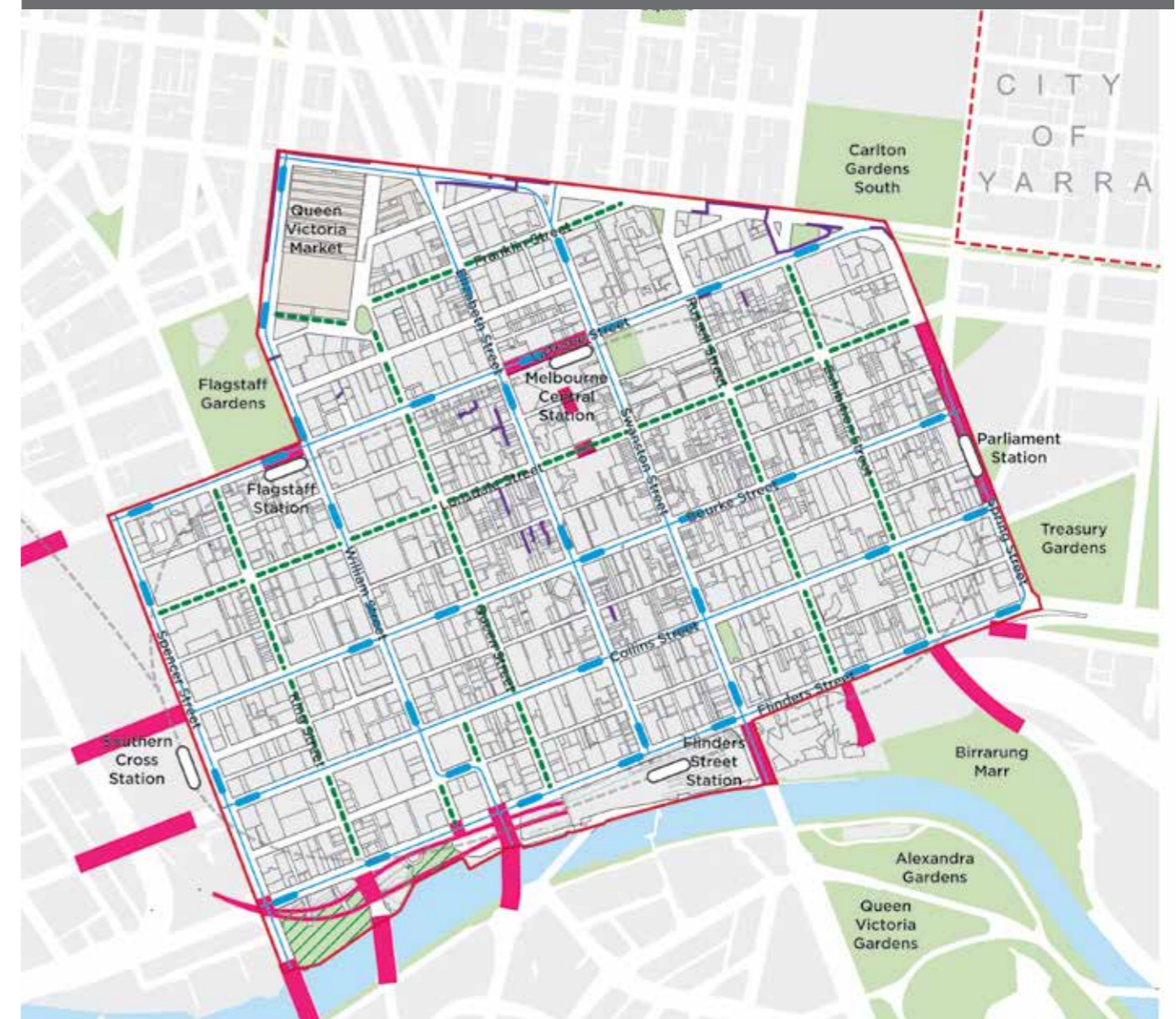


30m street with tramway + 8.5m footpaths (Swanston St)








30m street with centre parking + 3.6m footpaths (Exhibition, Queen, etc.)

MAP 2: KEY PLANTING CONSTRAINTS

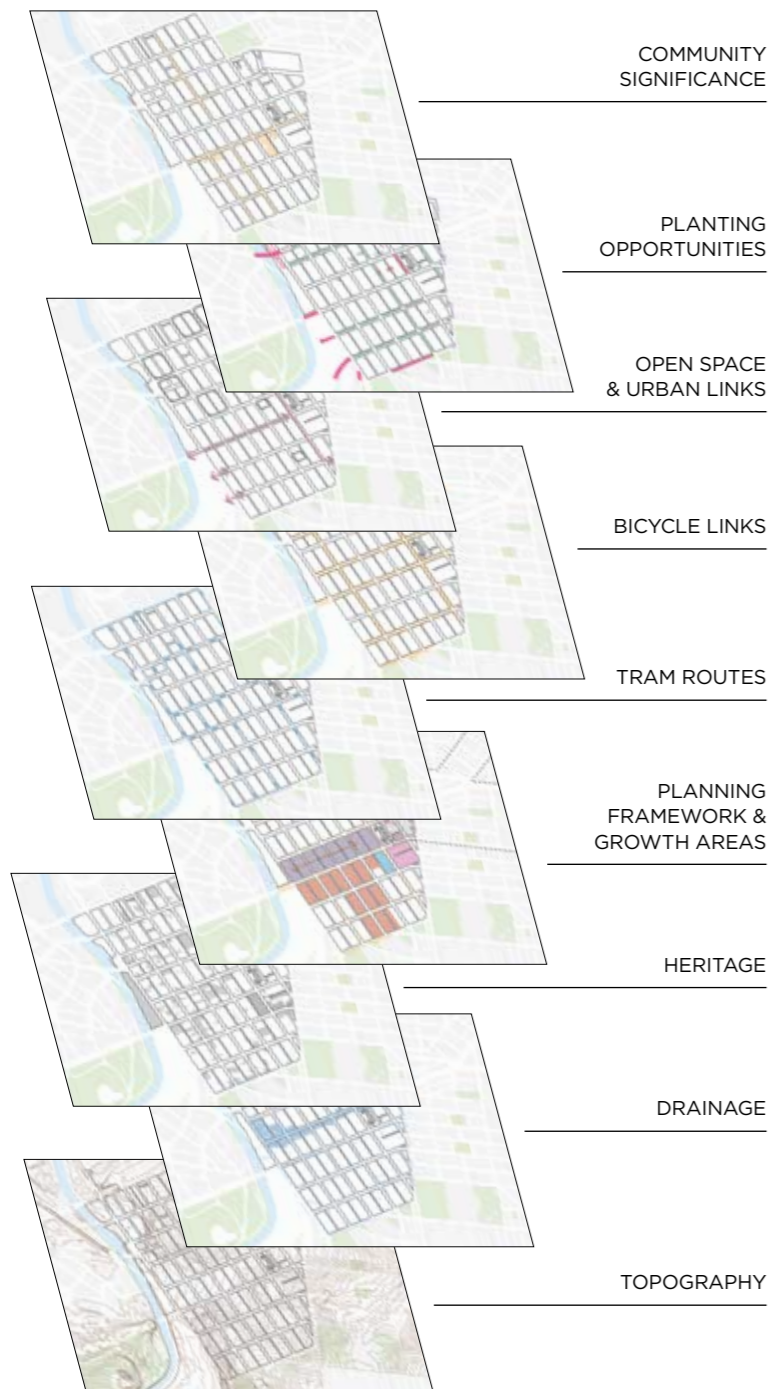


LEGEND

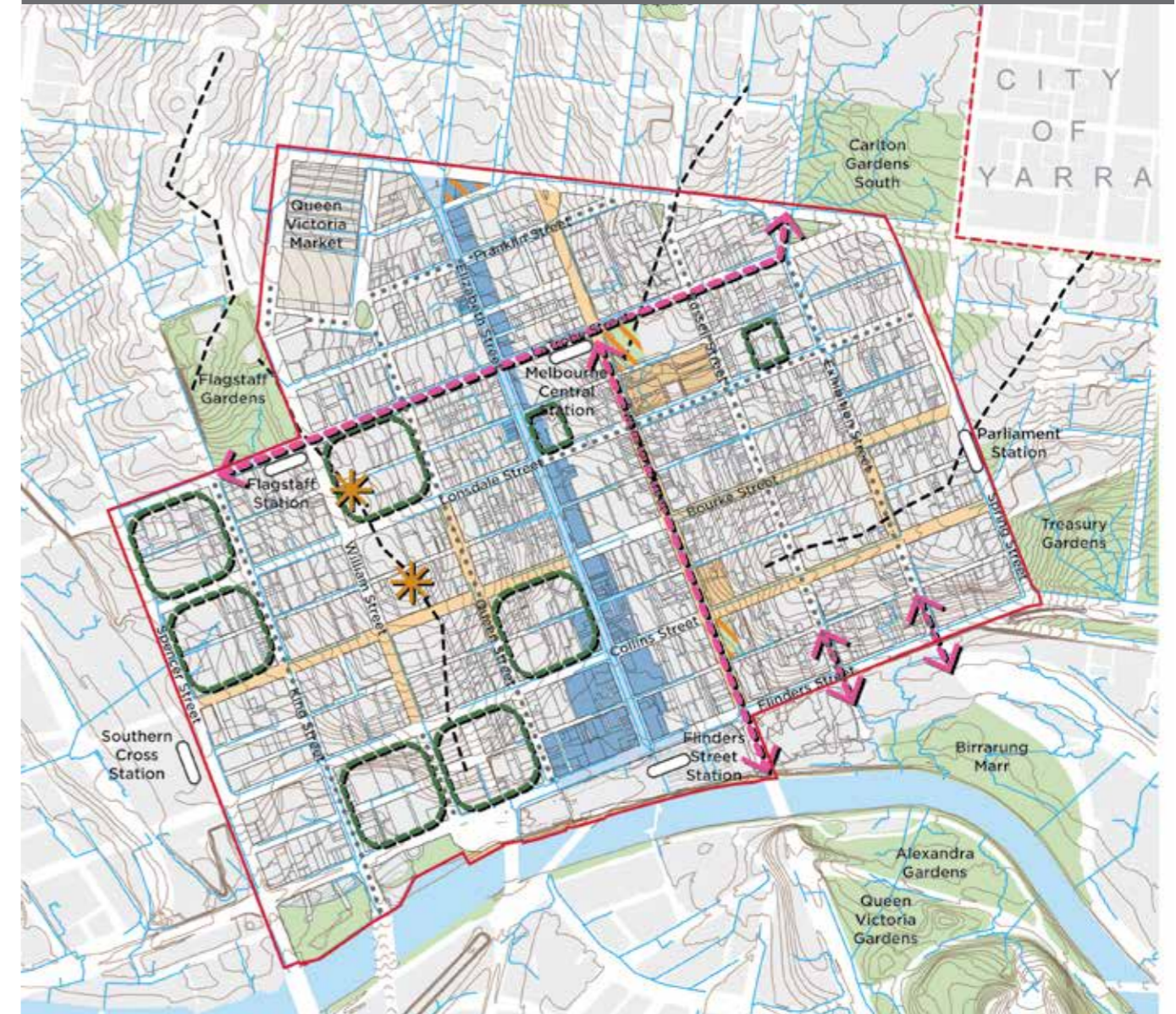
-  Existing tram line with tram stop
-  Low voltage powerlines
-  High voltage powerlines
-  Areas on structure which limits planting
-  Central median planting opportunity
-  Existing ridge line
-  Boundary for CBD precinct

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

These maps show some of the many layers of information that influence the opportunities and objectives for tree planting in central city streets.



MAP 3: NATURAL AND OPEN SPACE CONTEXT

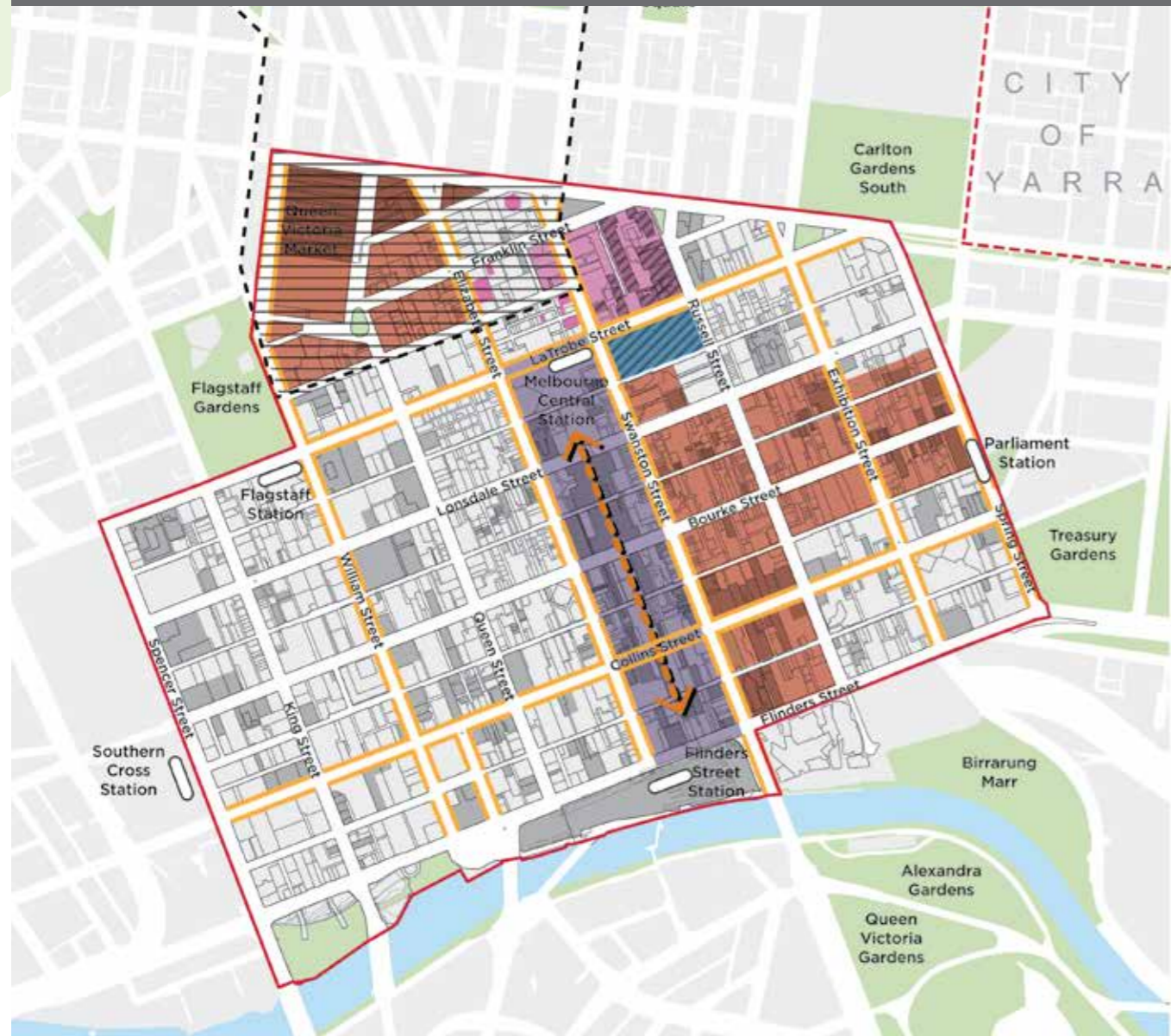


LEGEND













- Existing open space
- Significant open space identified by the community
- Significant section of street identified by community
- Special building overlay (buildings subject to flood damage adjacent to flood plain)
- Area for proposed open space defined in CoM open space strategy
- Existing high point
- Proposed open space links horizontal / vertical
- Median / centre road
- Existing ridge line
- Existing contours 1m
- Existing drainage line
- Extent of City of Melbourne municipality boundary
- Boundary for CBD precinct

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

MAP 4: STRATEGIC CONTEXT



LEGEND

	Existing open space		State Library (with heritage overlay)		North south movement across streets
	Heritage listed property		City North structure plan area within CBD boundary		Existing bike lane
	RMIT University building		Retail core with relatively low building height limits		Boundary for CBD precinct
	RMIT University building (with heritage overlay)		Other areas with building height limits		Extent of City of Melbourne municipality boundary

Balancing diversity and formal structure

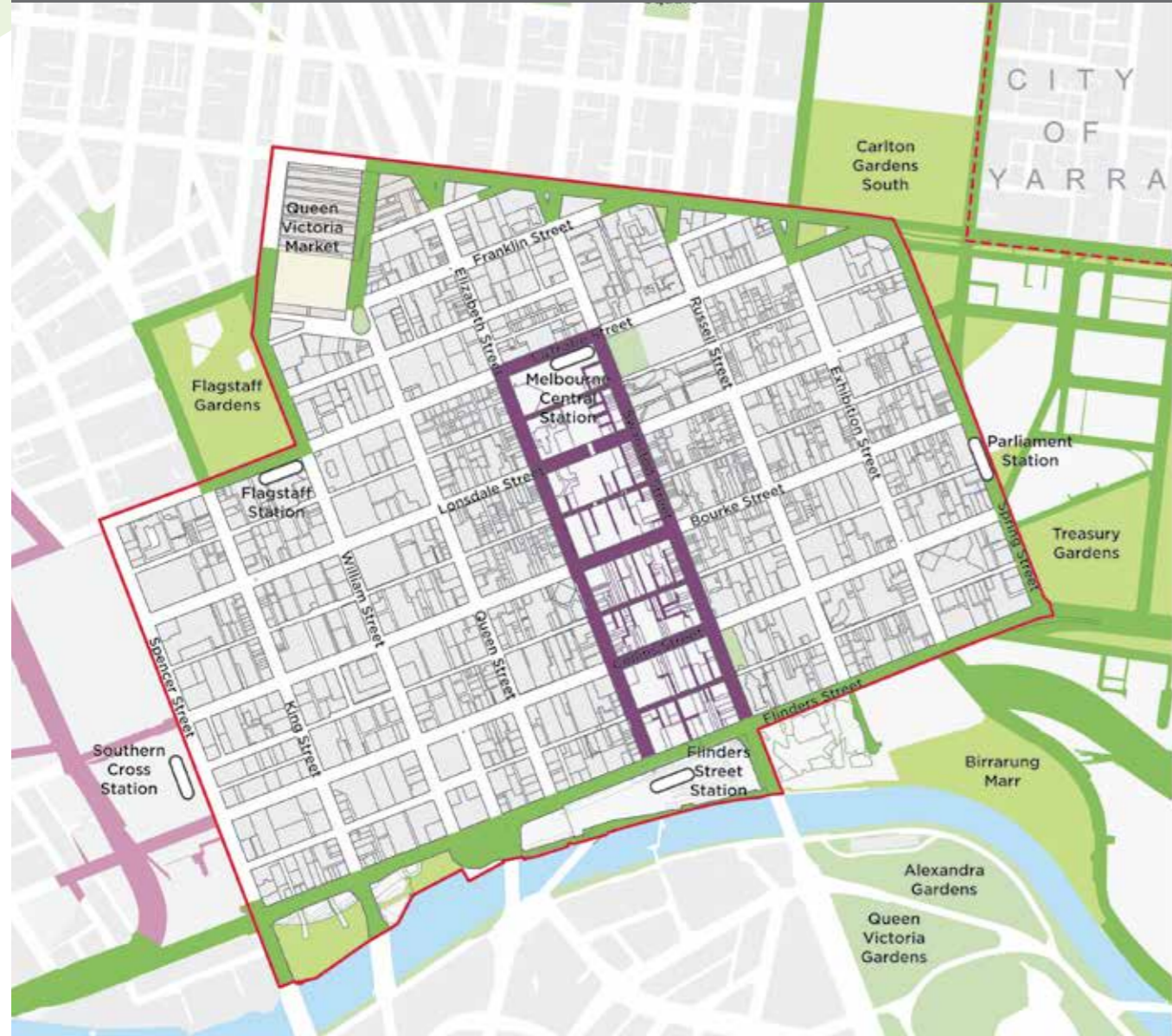
One issue that is particular to the CBD Precinct Plan, in comparison to implementation of the *Urban Forest Strategy* in other parts of Melbourne, is the challenge of defining a planting scheme that allows for far greater species diversity and interest than exists at present, while maintaining a design structure that gives the CBD a cohesive character and formal dignity appropriate to a place that is the state's premier office and retail centre, visitor destination, and seat of government.

Two major factors will shape this scheme: the typologies of streets (with or without trams, retail streets with wide footpaths, etc.) and the composite effects of factors that effectively break the central city into sub-precincts. These precincts are defined only from the perspective of tree planting (not on the basis of factor such as those used to define Chinatown or the Greek Precinct). In particular they reflect the factors noted on preceding pages, i.e.:

- Overhead and underground structures that preclude planting and growth of trees.
- Changes in topography.
- Changes in building height controls that affect light and wind conditions on the street.
- The presence or absence of significant parkland and green open spaces other than streets.

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

MAP 5: PLANTING SUB-PRECINCTS



LEGEND

- Planting sub-precinct 1
- Planting sub-precinct 2
- Planting sub-precinct 3
- Boundary for CBD precinct

Parklands and civic open spaces

Parks and other open spaces are associated with the changing street alignments to the south, east and north of the CBD. A consistent planting approach for these areas, which contrasts with typical street tree plantings, will help to emphasise the identity of the CBD as a distinctive place.

Retail core

The central city's retail heart is distinct because of its situation in a valley between hills to the east and west ends of the city, lower building heights, the extensive pedestrian traffic crossing streets mid-block, the extent of verandas over footpaths that limit tree planting, and special treatment of the Bourke Street Mall.


Spencer Street railway decking


The link to Docklands over the Spencer Street railways is made up of streets and other spaces on structure, where conventional tree planting is not sustainable. Although Collins St and Latrobe St extend through the length of the central city and into Docklands, continuous uniform tree plantings along them are not possible.

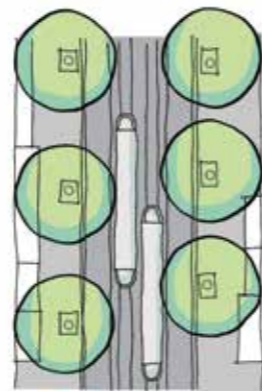
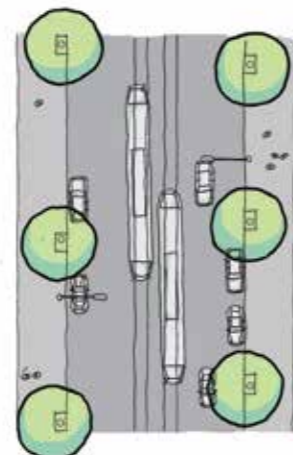
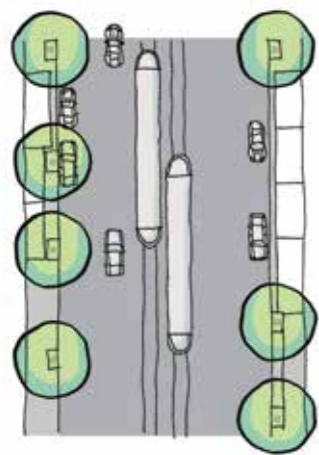
GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING **CONTINUED**

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.

 Minimum canopy cover of 20%

 Minimum canopy cover of 20 - 40%




 Minimum canopy cover of 40%



MAP 6: CANOPY COVER AND BIODIVERSITY OUTCOMES



LEGEND

-  Minimum canopy cover of 40%
-  Minimum canopy cover of 20% - 40%
-  Minimum canopy cover of 20%

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

What should stay and what should change?

In general the following should change.

- Regular avenue plantings in locations suitable for incremental replacement as individual existing trees decline.
- Trees significantly damaged by construction projects, suitable for full removal and replacement.
- Trees requiring removal in existing centre tree islands with capacity for reconstruction (as continuous medians or separate islands) with radically improved subsoil conditions.
- Planes in relatively narrow and congested footpaths where scale is provided by centre median trees, to be replaced by smaller species.
- In little streets and laneways avoid using trees planted in the main streets.








In specific locations the following should remain the same.

- 1 Healthy Spotted Gums in Franklin St median/centre islands merit retention (ad hoc replacement of individual trees may be required).
- 2 Planes in Swanston St form a consistent and relatively healthy avenue and merit retention (ad hoc replacement of individual trees may be required).
- 3 Planes in key visitor/retail streets with wide footpaths, meriting retention with the same proven large-scale species (ad hoc replacement of individual trees may be required).
- 4 Senescent elms in Collins St are in need of short term replanting.

MAP 7: WHAT SHOULD STAY AND WHAT SHOULD CHANGE?



LEGEND

- | | | | |
|---|---|---|---|
|  | Existing open space |  | Street with majority gum tree (<i>Corymbia</i>) population |
|  | Street with plane tree (<i>Platanus</i>) integrated with other tree species |  | Street with <i>Waterhousea</i> integrated with other tree species |
|  | Street with majority plane tree (<i>Platanus</i>) population |  | Street with majority <i>Waterhousea</i> population |
|  | Street with gum tree (<i>Corymbia</i>) integrated with other tree species | | |

PLANTING STRATEGIES

Long-term Planting Strategy

This plan provides direction for new and replacement planting across the CBD. 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.

- In streets with tramways, the principle tree plantings will be in the footpaths.
- In streets without tramways, medians will accommodate the largest canopy trees in the CBD and help to create a visual structure that ties the sub-precincts of the Hoddle grid together as well as linking the civic and parkland precincts around its edges.
- 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.
- Where trees are in footpaths, deciduous trees should be favoured while trees in medians may be evergreens.
- A consistent visual structure should be created for the main street grid (30m streets) with consistent, regularly-spaced lines of trees along the length of each street.

Contrasting with this formal structure in the major grid, plantings in little streets, lanes and plazas should be highly varied both in species selection and planting arrangements, to add an element of surprise, whimsy and local colour as well as adding to species diversity. Planting arrangements in these areas will often need to be irregular and opportunistic.

Tram streets: Principal plantings in footpaths. Use deciduous species. Wide footpaths in key retail streets (Bourke, Collins, Elizabeth and Swanston) suit the largest reliable species: London Plane. Use other species in Flinders, Latrobe, Spencer and William Streets.

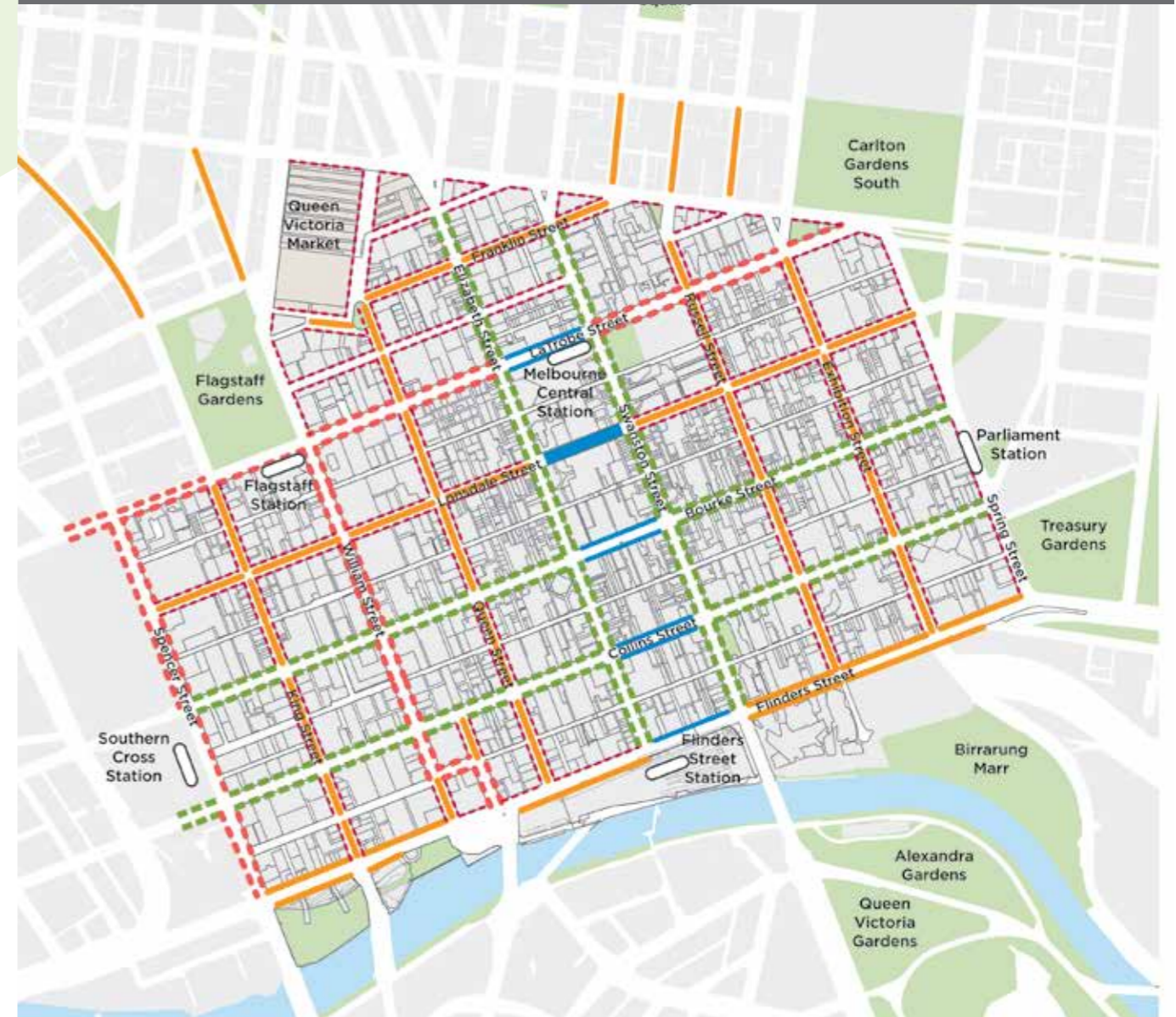
Median streets: Principal plantings in median / tree islands. Canopy height and breadth to be prioritised above other selection criteria (except hardiness) to ensure shading of the roadway. Evergreens an option. Trees at the side of the road, if any, may be smaller ornamental species.

Park-edge streets: On the park side, plant trees in the open space, not the footpath. In tram streets, plant trees in footpaths on the built side only. Plant medians as extensions of the adjoining park. Prioritise evergreens on the park side, deciduous on the built side.

Retail core: Species to contrast with those in the extensions of each street beyond the core.

Little streets, lanes and plazas: Select species as planting opportunities are identified. Aim to add to the diversity of species and vegetation type; species used in the main streets should not be used. Consider trees as small groups or individual specimens. Repetition of the same species should be limited in these smaller streets to encourage a sense of uniqueness when you step away from the larger streets. These trees can include some of those species less suited to avenue planting and can be quite dramatic in their seasonal change.

MAP 8: LONG-TERM PLANTING STRATEGY



LEGEND

- Plane trees
- - - Medium deciduous species
- - - Large deciduous species
- Large evergreen species
- Other contrasting species

PLANTING STRATEGIES CONTINUED




10-year Planting Plan

This plan provides direction on where new and replacement planting is to occur across the central city over the next 10 years. 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 with a complexity of issues and where planting alone will not achieve a substantial improvement; these streets require a more comprehensive design process considering a range of functions. A species palette is provided at the end of this document.

MAP 9: 10-YEAR PLANTING PLAN



LEGEND

	Existing open space	REPLACEMENT	
	Street re-design opportunities		Large evergreen tree
			Large deciduous tree
			Medium - small deciduous tree
EXISTING		NEW	
	Large evergreen tree		Large evergreen tree
	Large deciduous tree		Large deciduous tree
	Medium - small deciduous tree		Medium - small deciduous tree

SPECIES PALETTE

The following species are provided for guidance and illustration only and do not preclude the use of other trees that suit the design criteria set out in the planting plan and other site-specific requirements that may be identified in the course

Core Central City Trees (Limited New Plantings)

Platanus sp., plane

Dominant Species

Large Deciduous Trees for Tram Streets

Celtis australis, European nettle tree

Flindersia australis (trial), Crow's ash (semi-deciduous)

Platanus x acerifolia, London Plane (for Collins, Bourke, Swanston and Elizabeth Streets)

Quercus cerris, Turkey oak

Quercus coccinea, Scarlet oak

Quercus frainetto, Hungarian oak

Quercus palustris, Pin oak

Ulmus procera, English elm

Zelkova serrata, Japanese zelkova

Large Evergreen Trees for Medians

Agathis robusta, Queensland kauri

Angophora costata, Smooth-barked apple

Corymbia maculata, Spotted gum

Corymbia citriodora, Lemon scented gum

Ficus rubiginosa, Rusty fig

Flindersia australis (trial), Crow's ash (semi-deciduous)

Retail Core Feature Trees

Ficus macrophylla, Moreton Bay fig

Phoenix canariensis, Canary Island date palm

of preparing detailed plans for specific locations. When available, larger stock should be planted in the central city so that tree canopies clear pedestrian height as soon as possible following planting.

Other Species

Medium Trees for Footpaths in Streets with Medians

Corylus colurna (trial), Turkish hazel

Fraxinus americana, White ash

Ginkgo biloba, Ginkgo

Pyrus sp., Flowering pear

Tilia cordata, Small-leaved lime

Ulmus parvifolia, Chinese elm

Medium Trees for Footpaths in Small Streets and Laneways

Small streets and laneways provide opportunities for creative plantings and are not limited to this list:

Allocasuarina cunninghamiana, River she-oak

Calodendron capense, Cape chestnut

Livistonia australis, Cabbage tree palm

Populus simonni, Chinese poplar

Stenocarpus sinuatus, Firewheel tree

Waterhousea floribunda, Weeping lilly-pilly

Washingtonia robusta, Mexican fan palm

Large trees for “park” edges and reserves

Agathis robusta, Queensland kauri

Araucaria heterophylla, Norfolk Island pine

Araucaria cunninghamii, Hoop pine

Cedrus deodara, Deodar cedar

Corymbia citriodora, Lemon scented gum

Ficus macrophylla, Moreton Bay fig

Jacaranda mimosifolia, Jacaranda

Phoenix canariensis, Canary Island palm

Pinus canariensis, Canary Island pine

Quercus canariensis, Algerian oak

Quercus ilex, Holm oak

Washingtonia robusta, Mexican fan palm

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 treeplanning@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 treeplanning@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
03 9280 0717	廣東話
03 9280 0718	Ελληνικά
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)

