SOUTHBANK URBAN FOREST

PRECINCT PLAN

2015-2025

CITY OF MELBOURNE

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

CONTENTS

Disclaimer

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?

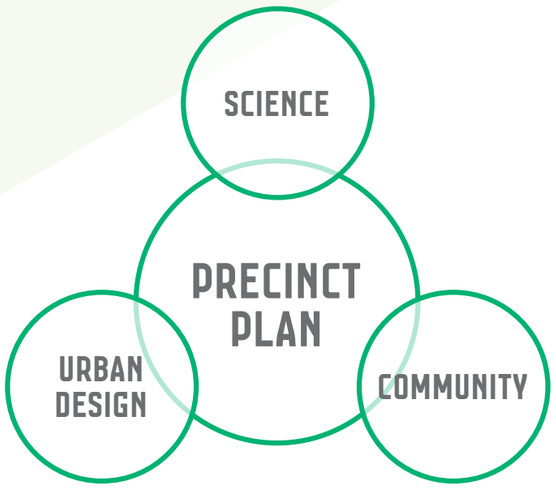
The urban forest comprises all of the trees and other vegetation – and the soil and water that supports it – within the municipality. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, green walls, balconies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

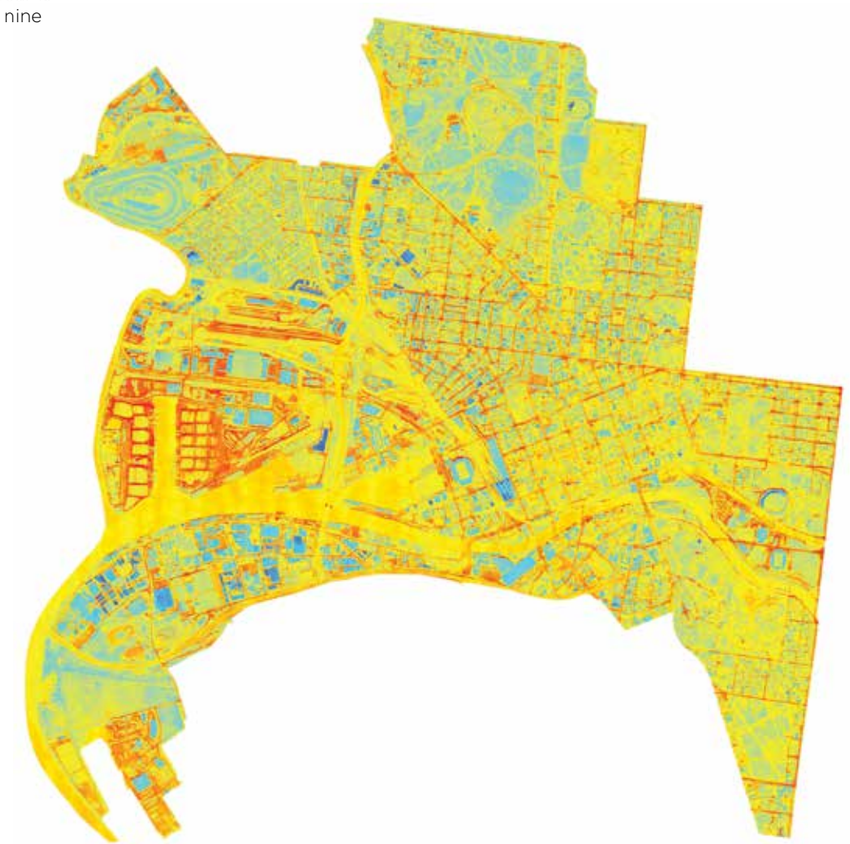
INTRODUCTION TO THE PRECINCT PLANS CONTINUED

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 durationthan 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.

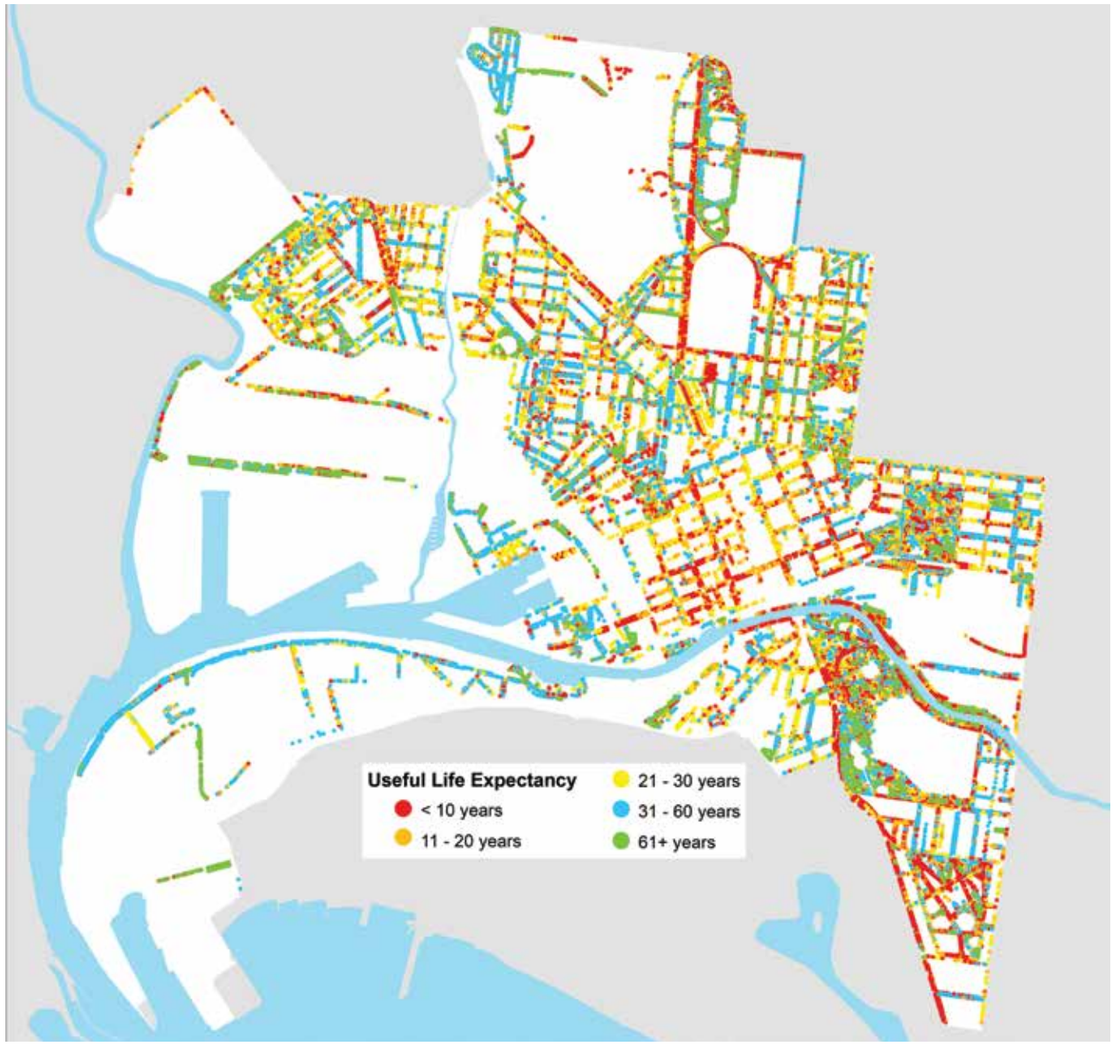


Thermal imaging of Melbourne, taken late at night, showing how paved, unshaded surfaces store heat from solar radiation and contribute to increased temperatures in urban areas.

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.

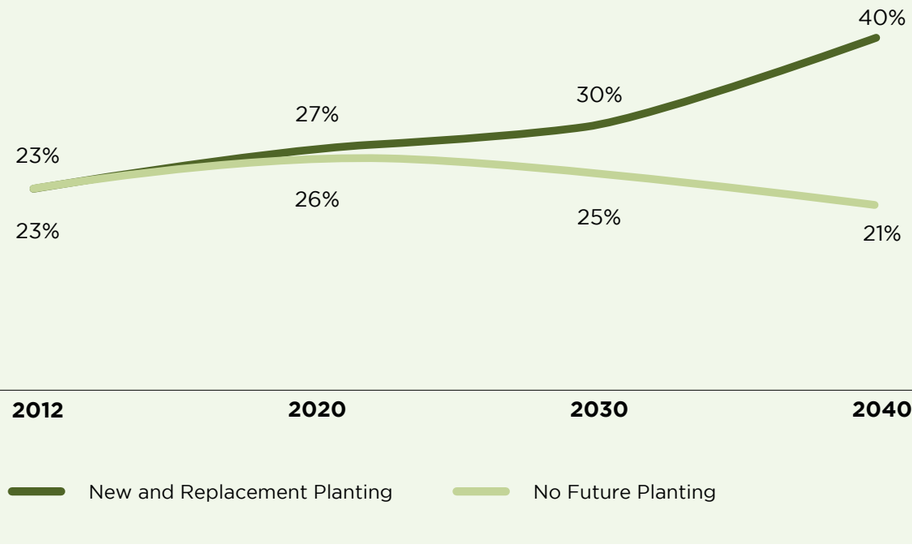
Access to ample soil moisture enables trees to actively transpire and cool the surrounding air. Adequate soil moisture is critical for healthy vegetation. A number of active and passive approaches are currently undertaken to replenish soil moisture and ensure it is maintained at levels to provide healthy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

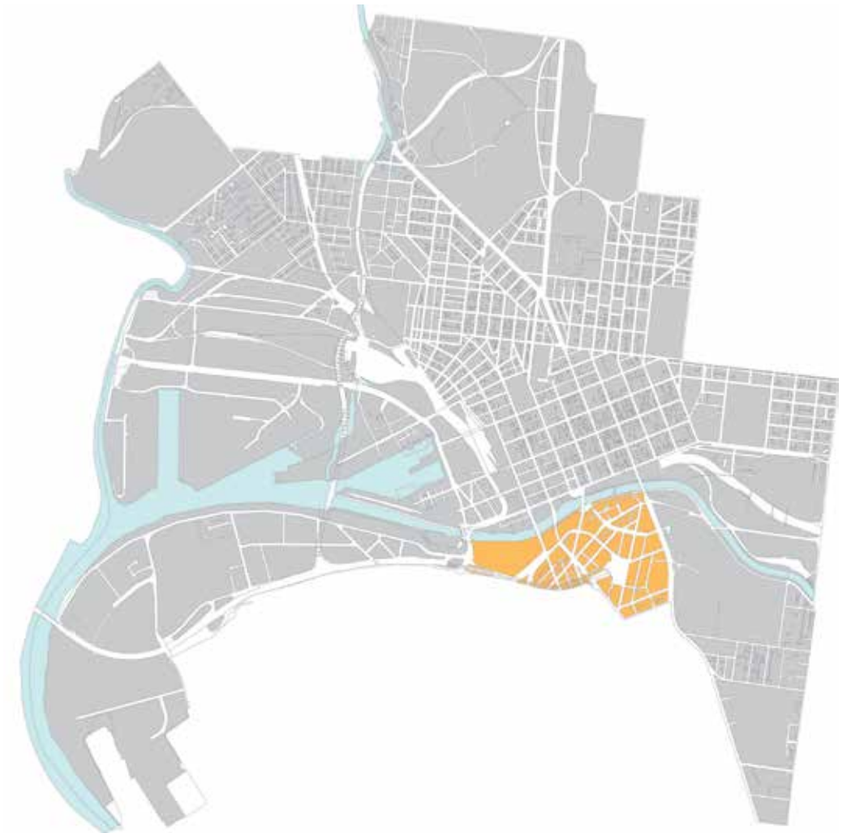
The precinct plans will help to guide implementation of the urban forest strategy in Melbourne's streets. The information provided in the plans will direct the annual tree planting program to achieve urban forest strategy objectives, protect and enhance neighbourhood character, and to prioritise works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

THE VISION FOR SOUTHBANK'S URBAN FOREST

THE SOUTHBANK URBAN FOREST WILL HAVE WATER SENSITIVE AND INNOVATIVE GREEN CORRIDORS FOR PEDESTRIANS AND WILDLIFE THAT INTEGRATE THE PUBLIC AND PRIVATE REALM.

A NETWORK OF DIVERSE AND VIBRANT PUBLIC SPACES WILL PROVIDE AN IMMERSIVE, SENSORY EXPERIENCE AT STREET LEVEL AND FROM ABOVE.

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 on-going community engagement work.

Within Southbank the Arts Centre, National Gallery of Victoria, Victorian College of the Arts, Australian Centre for Contemporary Art, Department of Defence, Crown Casino, Transurban and the Exhibition Centre 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 the 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

Prior to European settlement, the south bank of the Yarra River was a significant camping and meeting place for the Boonwurrung and Woiwurrung of the Kulin people. The area that is now Southbank was part of a fresh water wetland complex.

The original single span Princes Bridge was built across the Yarra in 1848 to provide access to Port Melbourne. When that bridge was replaced with today's three span bridge in 1886 the river channel was widened and deepened. The new south bank was formed and the low lying land was drained and developed for industrial use. Tree planting occurred along St Kilda Road from approximately the 1850s onward but efforts at beautification had limited success until the plantations visible in the image adjacent were planted in the early 1900s.

Hamer Hall, the Arts Centre and National Gallery were built up over parkland and the old Wirth's Circus site in the 1970s and '80s, and the cultural precinct grew around it. In the 1990s an urban renewal program was initiated to build apartment and office buildings in Southbank and today it is a thriving arts and culture precinct with a growing residential population. With the exception of St. Kilda Road, tree planting on Southbank streets is a recent occurrence coinciding with urban renewal.

Southbank character

Present day Southbank differs dramatically from its presettlement character, with the recent growth in population making it Melbourne's most densely occupied suburb.

Southbank's street network is a legacy of its previous industrial use with its roads focused towards vehicles rather than people. Wayfinding and streetscape pedestrian amenity are poor throughout Southbank. Further impacting this are the tower developments which impact the microclimate at street level with increased wind and minimised sunlight.

There are some great opportunities within Southbank to create a more connected public realm and the urban forest will play a key part in this. Street tree planting will strengthen the local character of the sub precincts, offer a more human scale experience for people and mitigate the dominance of built form.

Aerial image looking south towards Southbank. Victorian Railways Photographer. 1938 or 1939.

Painting looking north towards Melbourne with the Yarra's south bank and St Kilda Road in the foreground. The City of Melbourne. N. Whittock (Nathaniel) artist. London : Lloyd Brothers & Co. 1855.

Photograph looking south with the Yarra's north bank and St Kilda Road visible in the distance. The original Princes Bridge is just visible on the very right hand side of the image. Paterson Bros. 1875.

COMMUNITY PRIORITIES

The Southbank Urban Forest Precinct Plan has been developed in collaboration with the community, which is reflected in the character, vision and planting priorities set out in this document.

Consultation highlighted that Southbank is a highly urbanised setting that presents opportunities for a greatly expanded and innovative urban forest that enhances the function of the water cycle. There was a strong sense that the urban forest should enhance the pedestrian experience within Southbank, creating places for people and mitigating the built form on both public and private land.

Our work with the Southbank community indicated a preference for trees that will support people and animals through the provision of canopy, habitat, sensory stimulation, social opportunity and seasonal variety.

COLOUR

Desired future states defined by the community:

- Diverse species choice (native and exotic) with seasonal variety
- Multi-layered planting
- Shady, sheltered from wind
- Sensory stimulation – colour, texture, scent, shape
- Water sensitive

Urban forest benefits highlighted through community consultation:

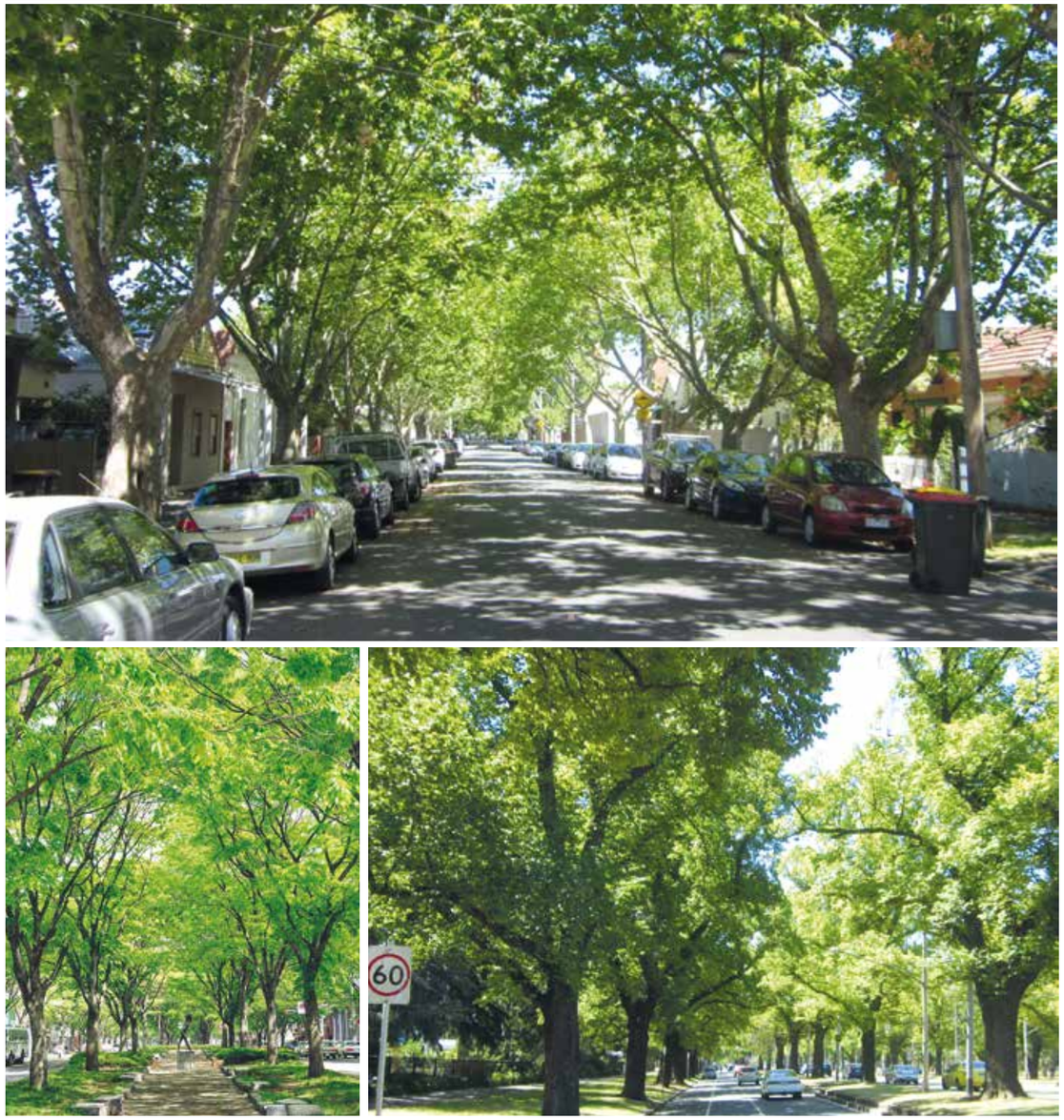
- Biodiversity
- Shade
- Mitigating the built form
- Creates pedestrian corridors and spaces
- Facilitates social connection by creating spaces for people
- Water capture and storage
- Aesthetic beauty

SHAPE, DIVERSITY AND LAYERS

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

COMMUNITY PRIORITIES
CONTINUED

STREETSCAPE

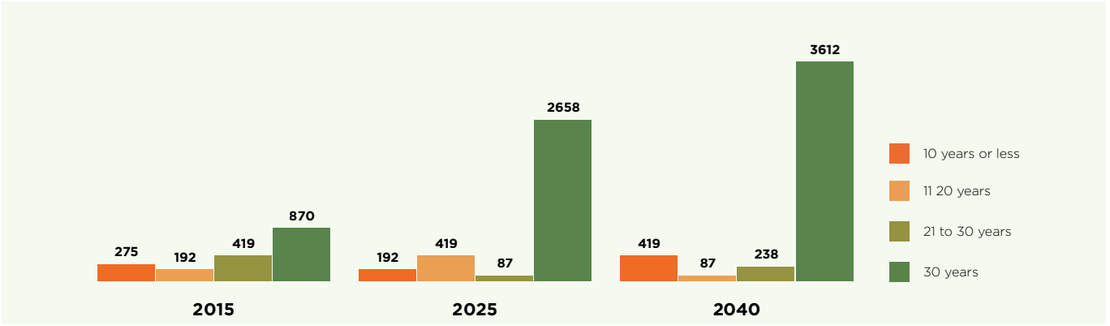


COMMUNITY

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

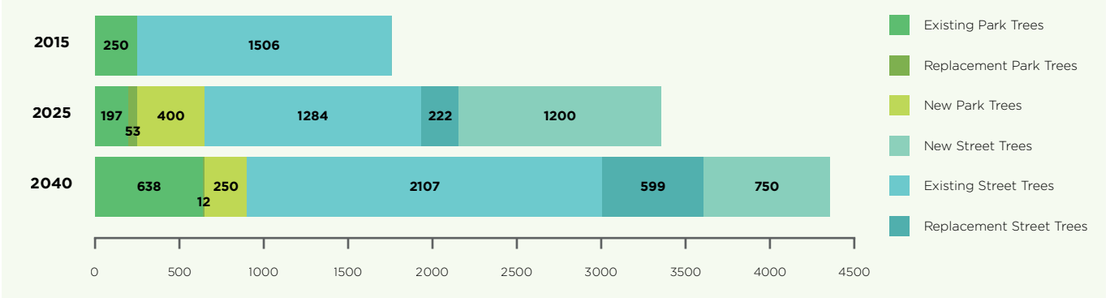
SOUTHBANK URBAN FOREST IN 2014 AND ITS PROJECTED FUTURE

TREE HEALTH (ULE) – PUBLIC REALM



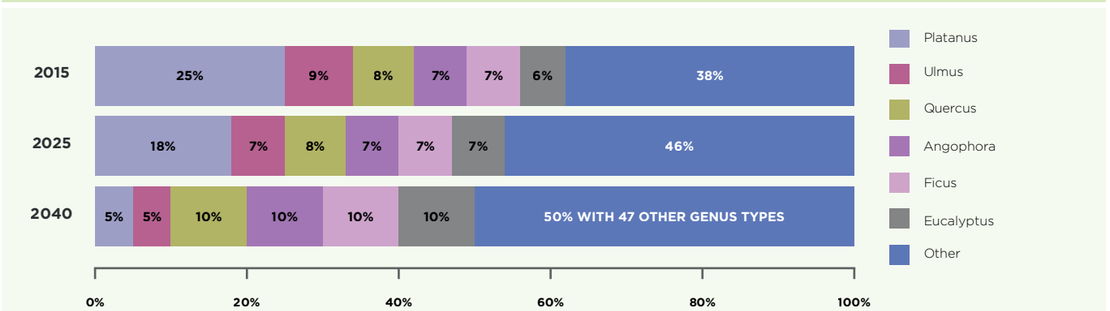
Tree counts for Southbank categorised by useful life time expectancy (ule) in years

TREES – PUBLIC REALM



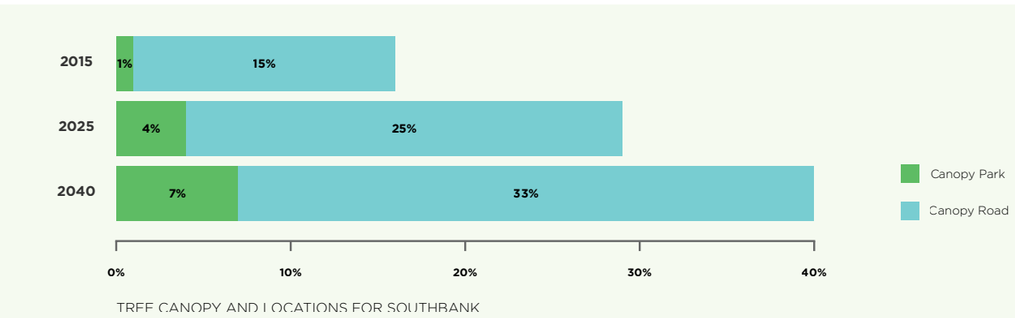
Tree counts and planting by City of Melbourne in Southbank

DIVERSITY (BY GENUS) – PUBLIC REALM



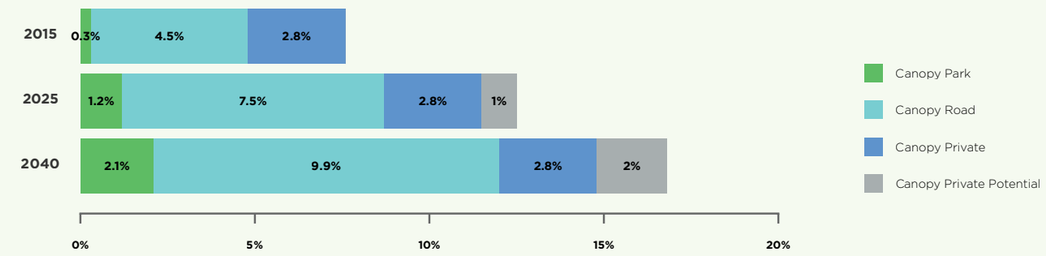
Main genus types for Southbank

CANOPY – PUBLIC REALM



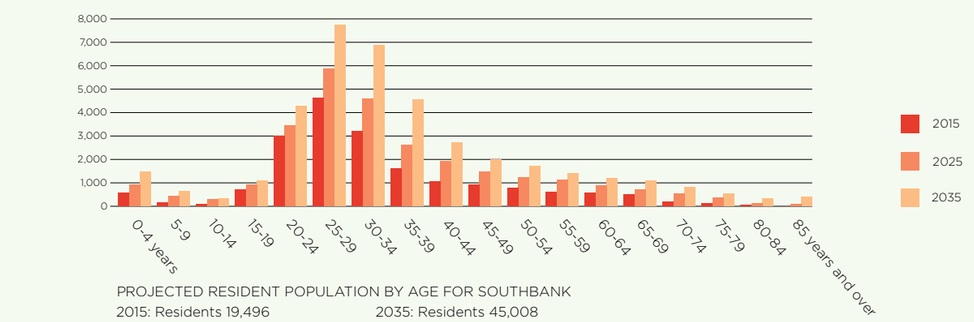
Tree canopy and locations for Southbank

CANOPY – ENTIRE PRECINCT



Tree canopy and locations for Southbank

PRECINCT POPULATION DISTRIBUTION – RESIDENTS



Projected resident population by age for Southbank

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

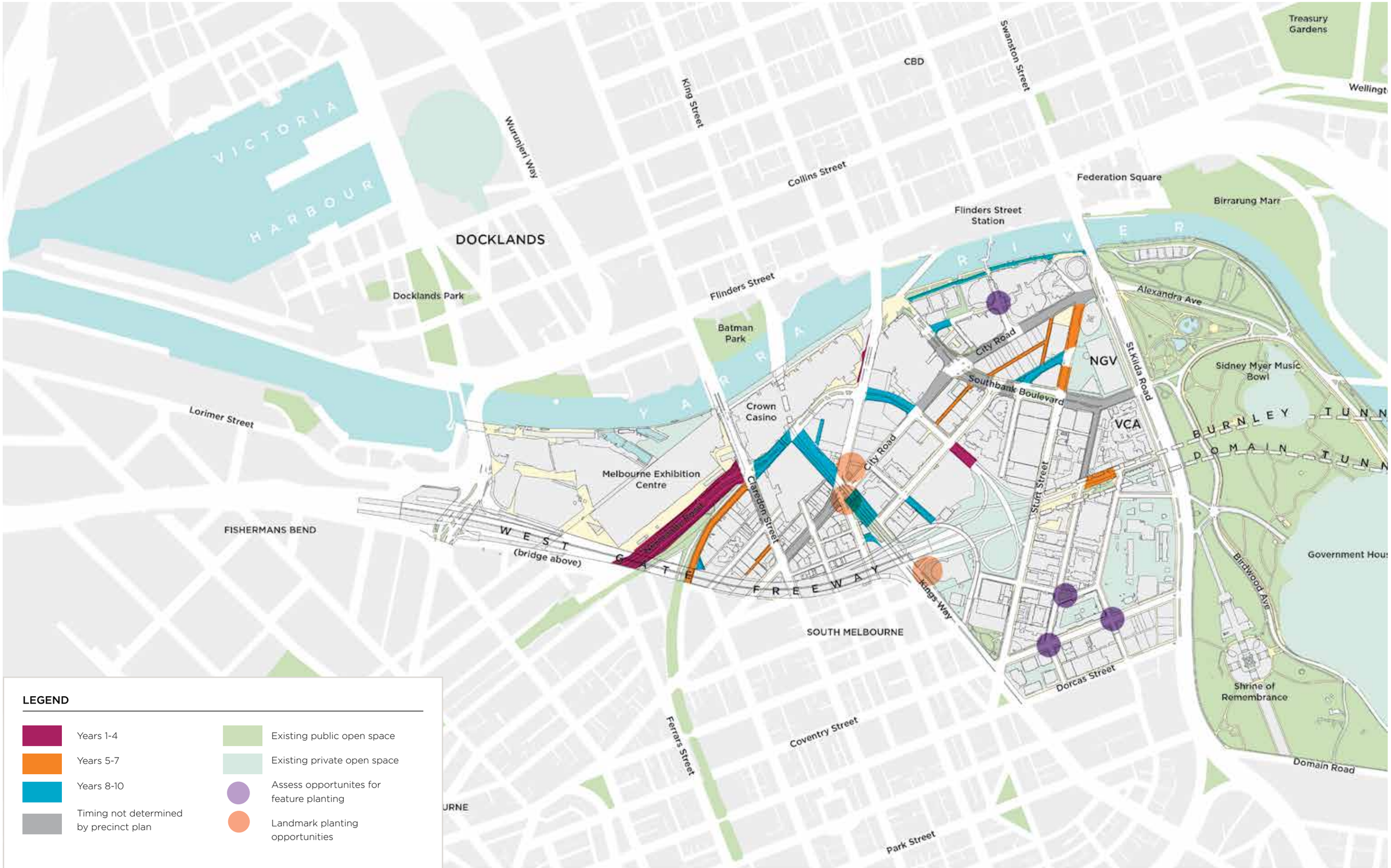
Select species

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

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
- Existing public open space
- Existing private open space
- Assess opportunites for feature planting
- Landmark planting opportunities

PRIORITISING TREE PLANTING IN STREETS CONTINUED

Planting in streets presents a variety of challenges, and there are important principles to use in responding to those challenges that will help to meet the Urban Forest Strategy targets. A complete and expanded set of these principles is included in the Urban Forest Diversity Guidelines and should be referred to when designing or planting any streetscape; however Southbank 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. Southbank's mix of street typologies means that the large canopy trees must generally be planted in the footpath or roadway.

A limited number of streets have nature strips or centre medians that provide planting opportunities. Given the limited sites available for tree planting, the largest tree appropriate for the site should be selected to maximise the canopy and shade potential.

Kerb outstands should be considered as opportunities to plant species drawn from a wider palette that are unique to that location or intersection and provide visual interest. Roundabouts and closed road ends should be considered as opportunities to plant large canopy trees and create landmark feature landscapes with supporting understorey planting.

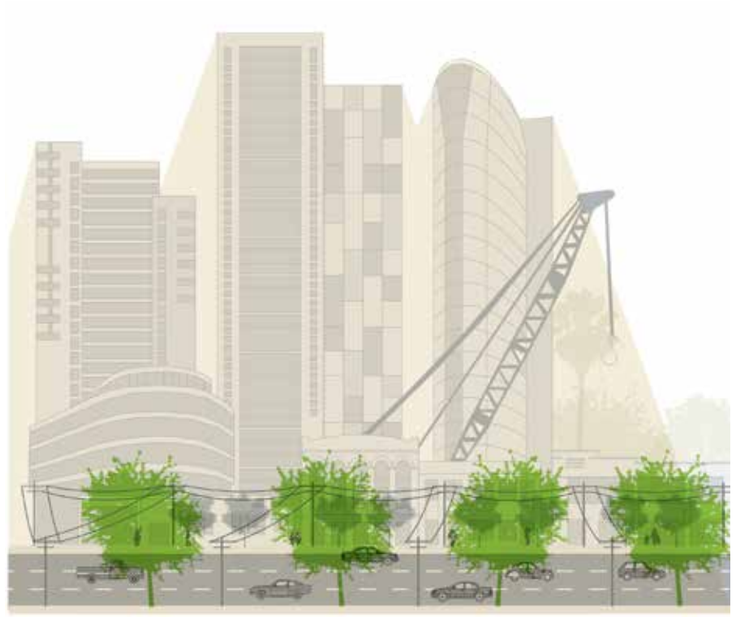
Low voltage overhead wires are present throughout Southbank streets south of City Road which limit the potential for large, natural canopy growth. Where medians or nature strips exist for large canopy tree planting, select small to medium trees on the side with overhead constraints. In streets where footpath trees provide the only canopy, select medium to large trees that can be effectively pruned around power lines. Always consider opportunities to bundle or underground power lines. Underground and overhead road structures compromise the opportunity for plantings in some streets.

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

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

Preferencing large canopy trees for shading and cooling in streets

Trimming trees below low voltage powerlines



Small trees trees below low voltage powerlines

PRIORITISING TREE PLANTING IN STREETS 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 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 species that relate to the scale and character of the surrounding built form, including those that maximise the performance of microclimate at street level.

Use a balance of proven and trial species to increase diversity but limit the use of trial species in streets to less than 10% of the precinct tree population.

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

Use mixed avenues of two or more species of similar form and character where appropriate

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

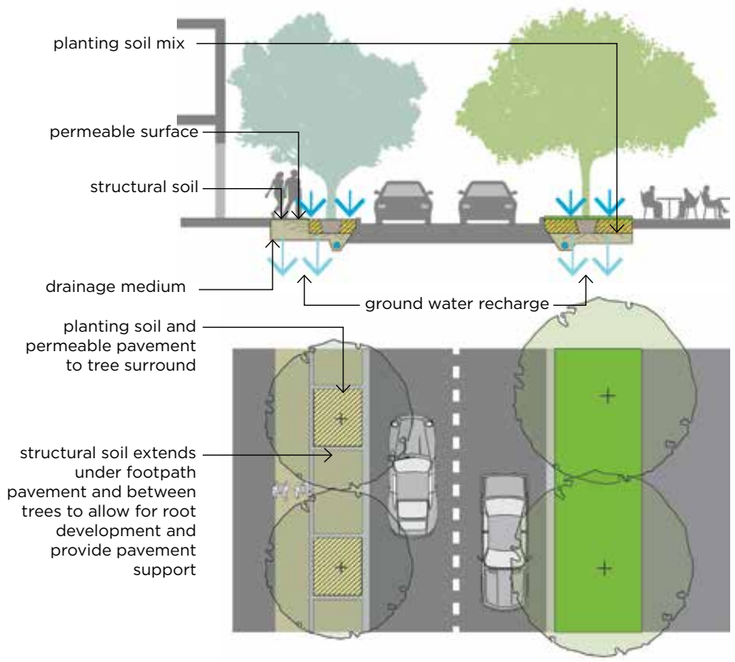
Always consider opportunities to undertake soil volume improvement in planting areas and to increase permeability or water infiltration where needed. Assessment for these interventions is particularly necessary at sites where trees are being replaced because they failed to thrive. Interventions to consider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

- systematic trenching in landscaped areas, in medians, between tree plots and centre of road parking zones
- structural soils or cells below permeable paving
- increasing soil volume
- WSUD tree pits or infiltration pits
- stormwater harvesting
- improving existing soil quality and water holding capacity

Southbank is built on an alluvial flat with native soils of medium to heavy textured clay with some sand. However, it is likely that fill was widely used when the area was converted to industrial use so soil conditions are likely to have been altered in many locations. For example, the area from the Arts Centre to Princes Bridge is located on fill, which was brought in to raise the height of land well above the river. St Kilda Road is roughly on the boundary of a change in native soil types. St Kilda Road south of the Arts Centre is Silurian mudstone capped by tertiary sands.

The water table is expected to be relatively shallow throughout the precinct, with the exception of the raised areas on St Kilda Road. Periodic inundation with saline water and waterlogging may be encountered due to Southbank's low, flat elevation, proximity to the river and low water table.

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



Improving below ground growing conditions for trees in streets

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING

MAP 2: KEY PLANTING CONSTRAINTS

There are a range of constraining factors that influence opportunities for planting in Southbank. Map 2 illustrates some of the complex site conditions as well as underground and over head infrastructure which need to be considered when looking at opportunities for planting.

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

(Refer Map 2 on page 30)

Small tree under powerlines

Tree trimmed under powerlines

MAP 3 & 4: PLANTING OPPORTUNITIES

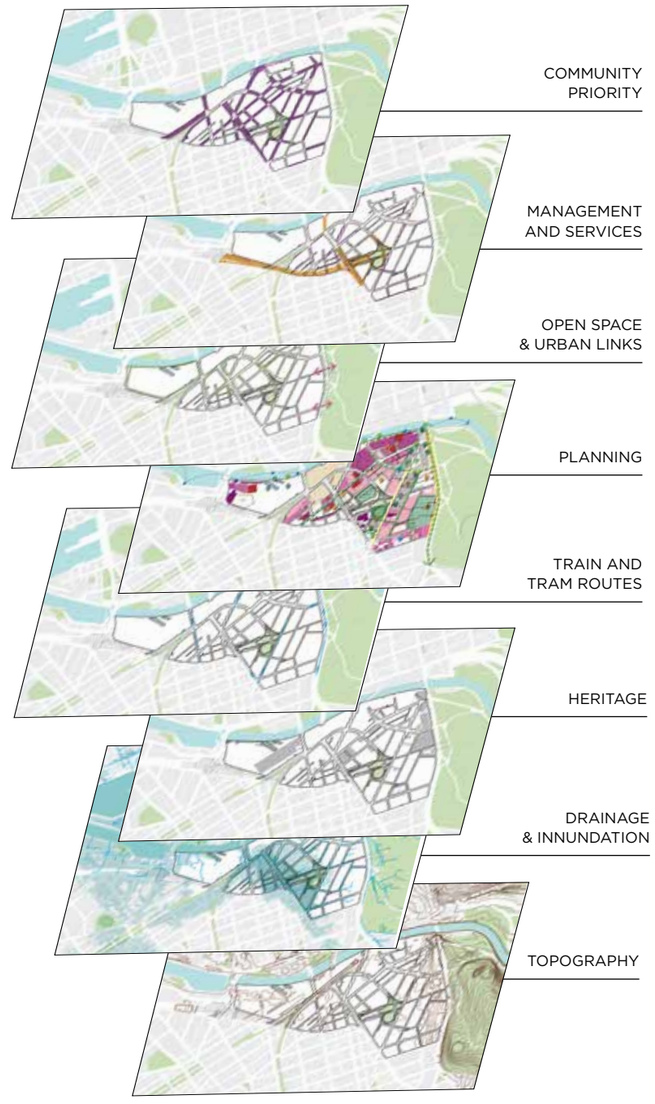
These maps show some of the many layers of information that influence the opportunities and objectives for tree planting in Southbank's Streets.

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

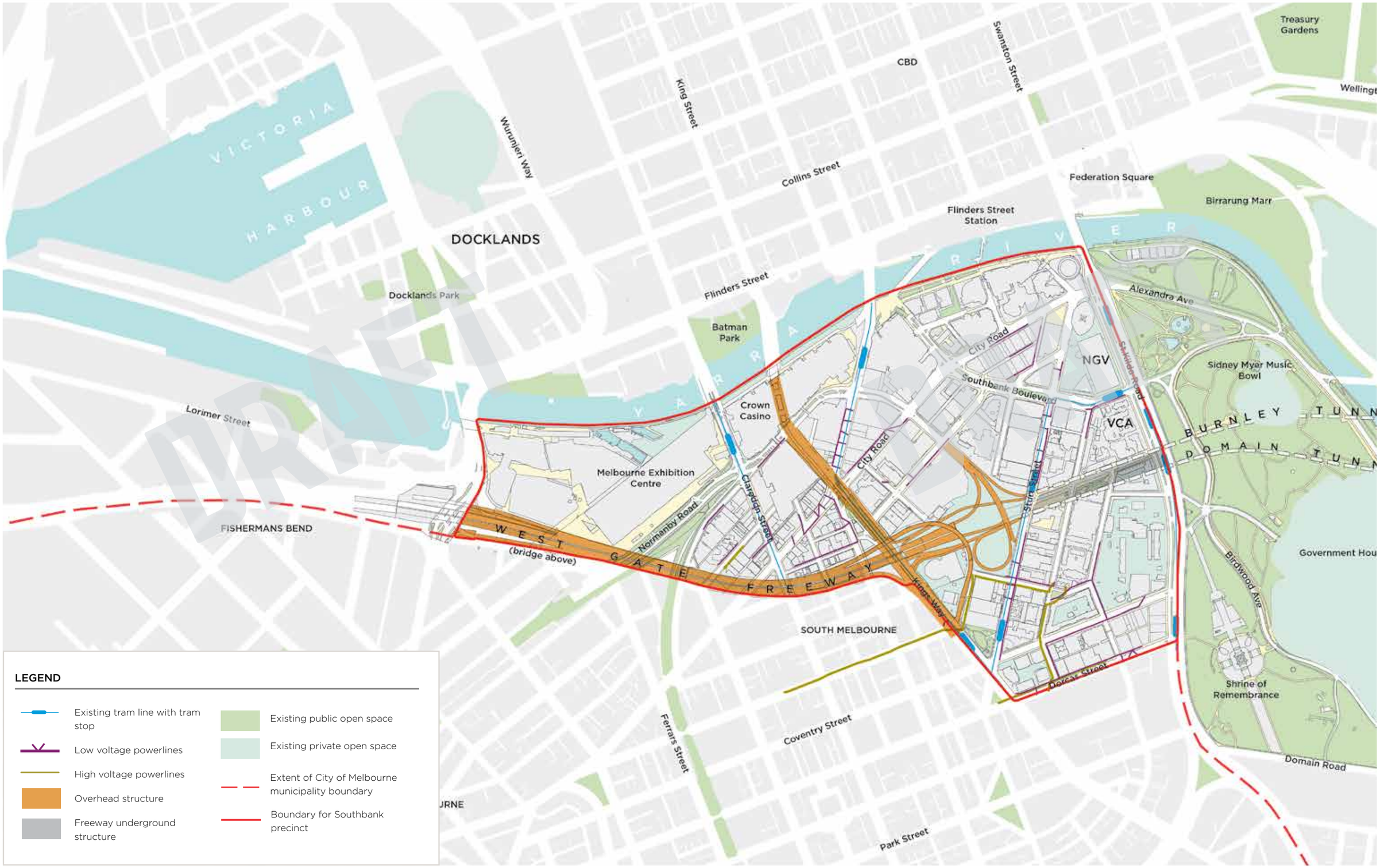
Map 4 identifies the Strategic Context for Southbank. This plan combines planning and urban design factors, land use and connectivity.

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

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



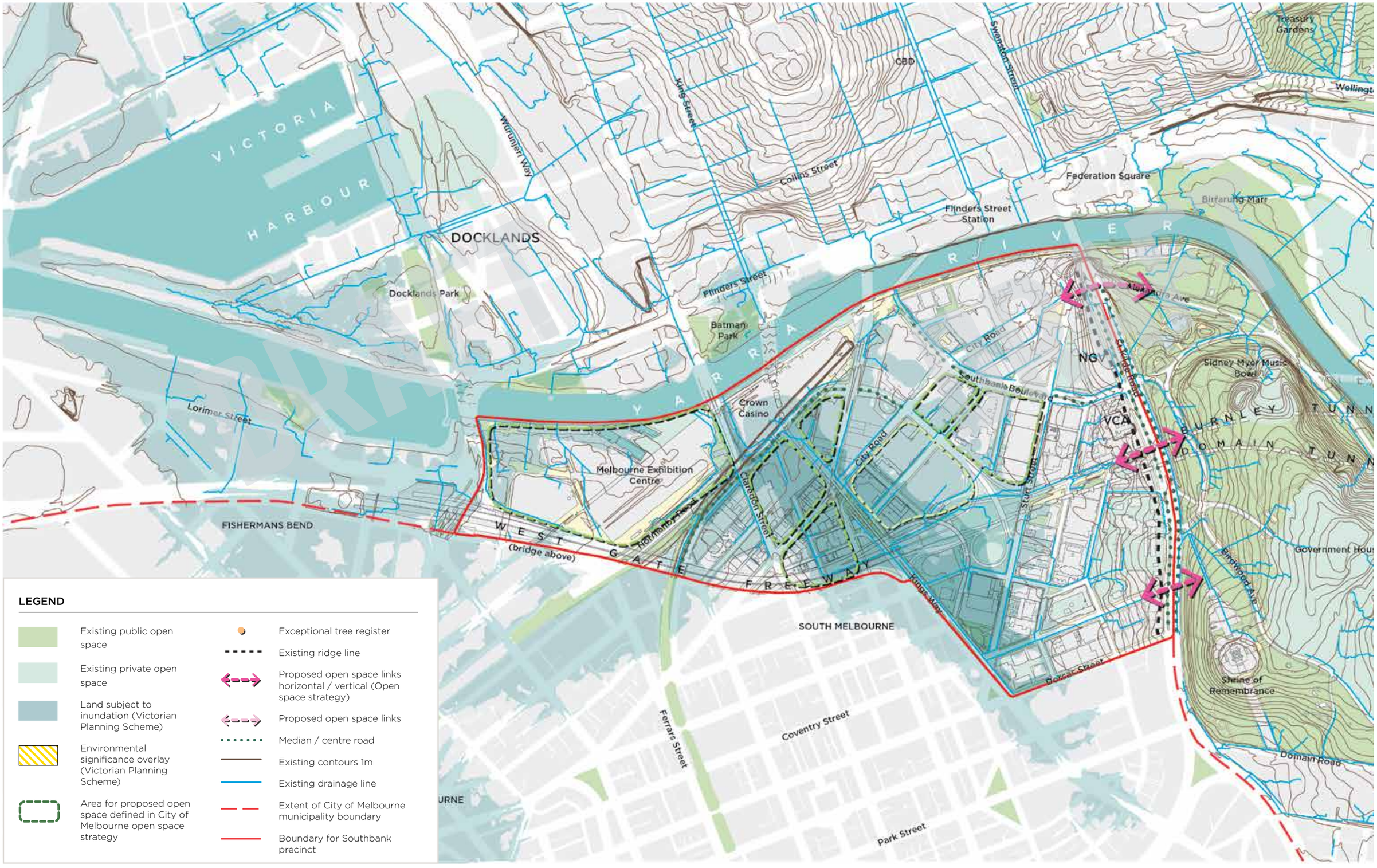
MAP 2: KEY PLANTING CONSTRAINTS



LEGEND

- Existing tram line with tram stop
- Low voltage powerlines
- High voltage powerlines
- Overhead structure
- Freeway underground structure
- Existing public open space
- Existing private open space
- Extent of City of Melbourne municipality boundary
- Boundary for Southbank precinct

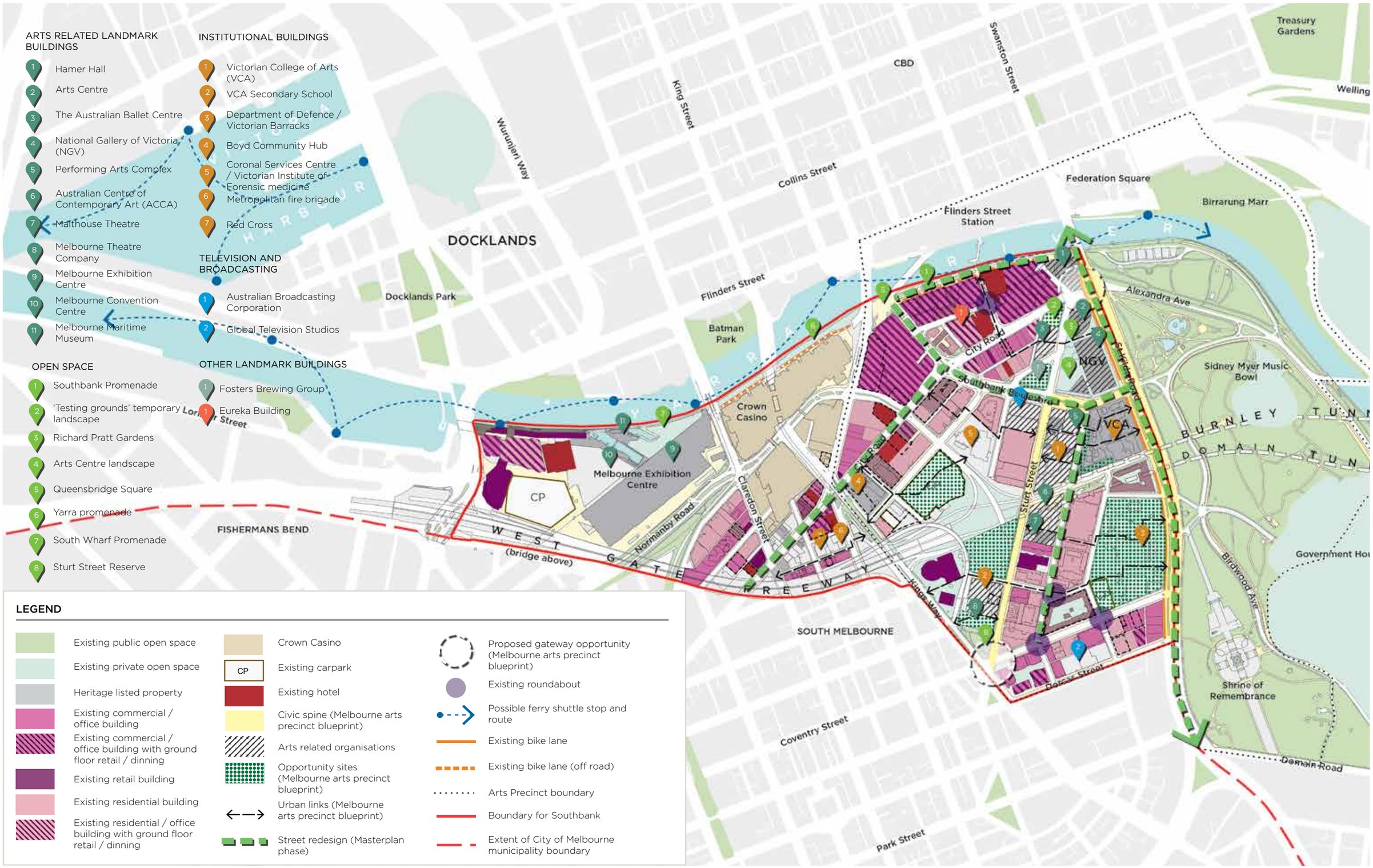
MAP 3: NATURAL AND OPEN SPACE CONTEXT



LEGEND

- Existing public open space
- Existing private open space
- Land subject to inundation (Victorian Planning Scheme)
- Environmental significance overlay (Victorian Planning Scheme)
- Area for proposed open space defined in City of Melbourne open space strategy
- Exceptional tree register
- Existing ridge line
- Proposed open space links horizontal / vertical (Open space strategy)
- Proposed open space links
- Median / centre road
- Existing contours 1m
- Existing drainage line
- Extent of City of Melbourne municipality boundary
- Boundary for Southbank precinct

MAP 4: STRATEGIC CONTEXT



GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

Planting sub-precincts

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

Exhibition & Entertainment Precinct

This precinct is primarily private land to the river edge and includes a number of landscapes on structure. The treed avenues on Whiteman St help to mitigate the density of built form as you move away from the river edge. There is opportunity to improve the connection of this precinct with the character and ecology of the river.

Clarendon Precinct

This section of Southbank has a strong physical and character to the streetscapes of adjacent South Melbourne. It is includes a mix of finer grain urban form and low rise industrial buildings amongst the newer tower developments. The elevated Kingsway overpass defines the southern boundary. This area is subject to flooding as it is at the low end of the local catchment. The urban forest will need to be tolerant of and resilient to inundation, and exploit opportunities for integrated stormwater management.

Normanby Road and the light rail corridors provide the potential for ecological corridor connections to Port Philip Bay and Albert Park. The eclectic character of planting here provides a key entry from Port Melbourne, and can be further enhanced to support biodiversity of vegetation and wildlife.

Boyd Residential & Community Precinct

The former Boyd school forms the community hub of this predominantly residential precinct.

Tall residential towers are increasingly dominating the skyline in this area and impacting on the access to sun and generating windier conditions at street level. Opportunities are to be explored to improve the public realm to create more space and comfortable microclimates, to provide for day to day amenity for local people.

New planting will help support better connectivity and way finding. It is proposed that each section of City Road would differ in its vegetation character to make the most of the varying planting opportunities.

Queensbridge Freshwater Precinct

At the centre of Southbank, this wedge between City Road & Queensbridge Street is the convergence of multiple bridges and links across the Yarra. Mixed use commercial and residential apartments and waterfront open space. Improvements will be made to the connections through to other areas of Southbank. The urban forest should enhance the relationship of this space to the river, and explore opportunities for plantings that can enhance the microclimate for people, visibility and wayfinding.

Southgate

The Southgate sub precinct includes the riverside dining and retail precinct, Yarra Promenade, and a series of more local service streets. The vegetation in this precinct has a key role to play in the character of Southbank as it is viewed from across the river.

South Wharf promenade

Waterhousea on Haig Street

Southbank Promenade

Beyond the Promenade the multilevel structures make wayfinding difficult and the level changes at the east are a barrier to connecting to other areas of Southbank. Improvements to Riverside Quay and Southbank Boulevard which provide an improved gateway as well as greater amenity for local residents. The character of new planting will need to support this in improving visibility and aid in mitigating the wind and solar impacts of highrise development.

Fawkner Precinct

This small precinct is characterised by its mix of industrial character and fine grain ground level activity. Set amongst tall buildings and laneways this precinct has much in common with the central city and the laneway character should be optimised through the use of interesting plant species to add character and improve wayfinding in these limited spaces.

Arts Precinct

Strategically guided by the Arts Blueprint vision, the Southbank Arts institutions have a significant impact on the character and activity of this part of Southbank.

With minimal green space elsewhere in Southbank, the arts institutions from the Yarra River at Hamer Hall, the Arts Centre and National Gallery, and the Victorian College of the Arts campus and ACCA are an important part of public realm and the urban forest.

Substantial opportunities exist to create a diverse and characterful urban forest in this precinct with the proposed Southbank Boulevard open spaces and Dodd Street closures providing new public realm and open space.

South residential Precinct

Extending from Grant Street to Dorcas Street, this area is predominantly lower rise apartment buildings and includes the Grant Street Reserve and the Victoria Barracks.

In contrast to the exposed streetscape of Grant Street (where tree planting is limited over the Domain Tunnel alignment), existing shaded streets at Dorcas and Coventry Streets represent the optimisation for canopy cover in an urban context.

The low lying area to the south experiences occasional flooding. Water sensitive urban design initiatives could be explored to aid in mitigating these events.

Further exploration of Grant Street should look at opportunities for further tree planting, and open space amenity, as well as connections with Dodd Street and the expansive ACCA forecourt to improve wayfinding and permeability.

Citylink/gateway Precinct

Framing the freeway embankments at the entry to the Citylink tunnel, this roadside vegetation is an important visual part of the Southbank urban forest. Whilst not accessible to the public, there are important habitat values and visual amenity this space provides which should be enhanced, and linked to other parts of the precinct. On Kings Way, landmark Eucalypts mark the exit from Citylink tunnel and Sturt Street Reserve is an isolated pocket of open space fronting Kings Way. Opportunities to better connect this precinct should be explored including looking at more continuous plantings to improve the amenity of the traffic dominated streets for pedestrians.

Lophostemon sp. on Coventry Street

MAP 5: PLANTING SUB-PRECINCTS

GUIDING PRINCIPLES AND CONSIDERATIONS FOR TREE PLANTING CONTINUED

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

MAP 6: CANOPY COVER AND BIODIVERSITY OUTCOMES

Canopy cover

Anticipated canopy cover at maturity is represented as shading in streets on the map. In some streets the maximum canopy cover is limited due to constraints such as tram routes and other infrastructure that limits the opportunities for tree planting. Planting configuration should seek to maximise canopy cover in all cases.

Biodiversity

The Yarra River is a critical part of the city's ecology corridors and the Precinct Plan will look to enhance habitat and biodiversity connections along the waterways, drainage lines and through connected open space.

Opportunities to enhance biodiversity would include selecting bird and pollinator attracting species and adding layers of vegetation to provide structural diversity. Avenue and linear open space corridors along Southbank Boulevard and Normanby Road will also play a key role.

Other streets may also provide opportunities for understorey planting.

Species choices for understorey planting should factor in light conditions, competition with existing plantings and maintenance requirements related to irrigation and access.

(See adjacent images for examples of canopy cover and biodiversity outcomes)

MAP 7: WHAT SHOULD STAY AND WHAT SHOULD CHANGE?

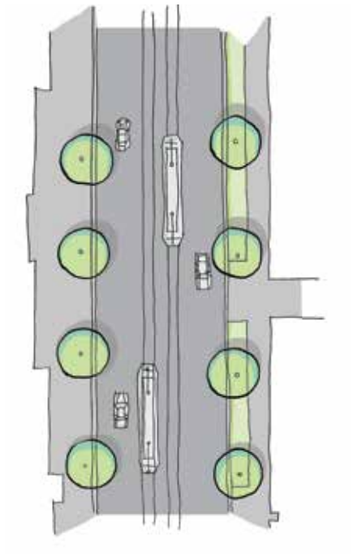
Myrtaceae family should be targeted at streets where they can provide connecting corridors between open space for native birds, however it is preferable that different genera and species be planted in segments or as mixed plantings to increase diversity.

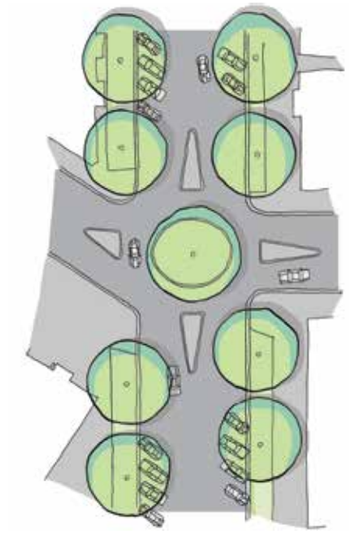
Minimum canopy cover of 20%

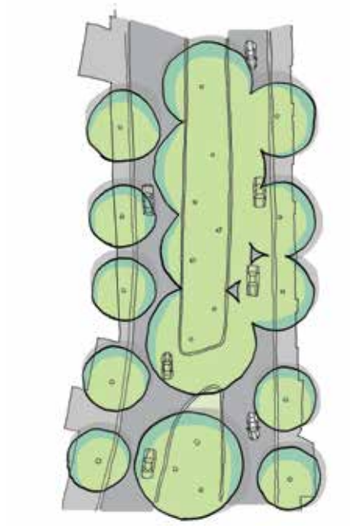
Minimum canopy cover of 20 - 40%

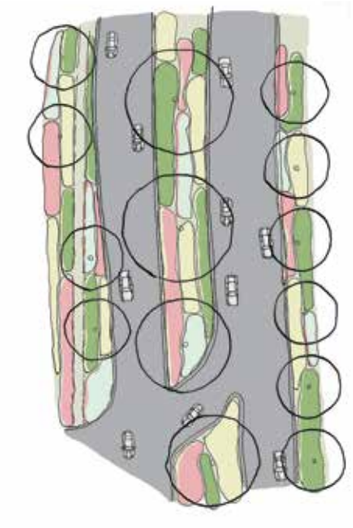
Minimum canopy cover of 40%

Biodiversity objective maximise canopy

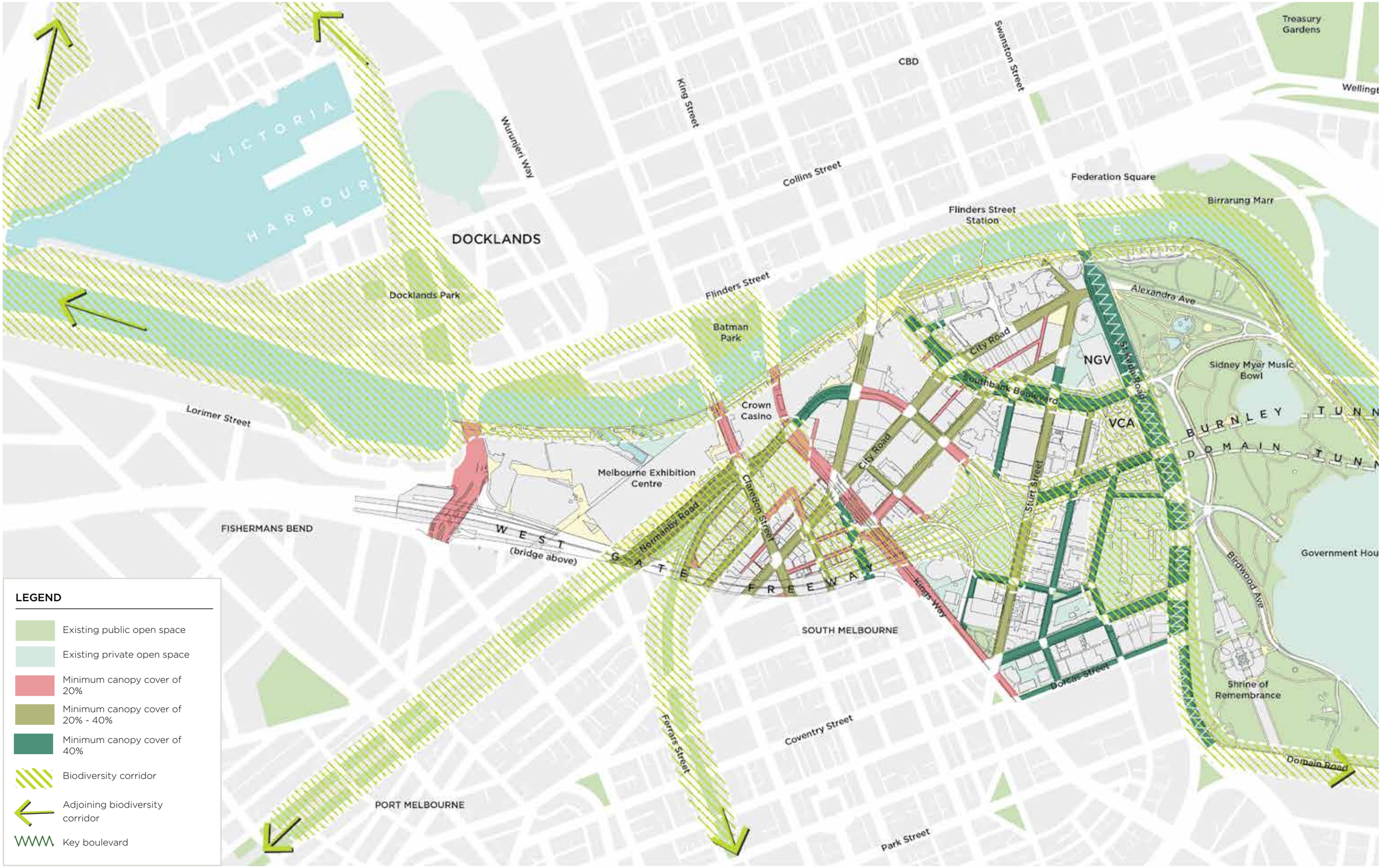




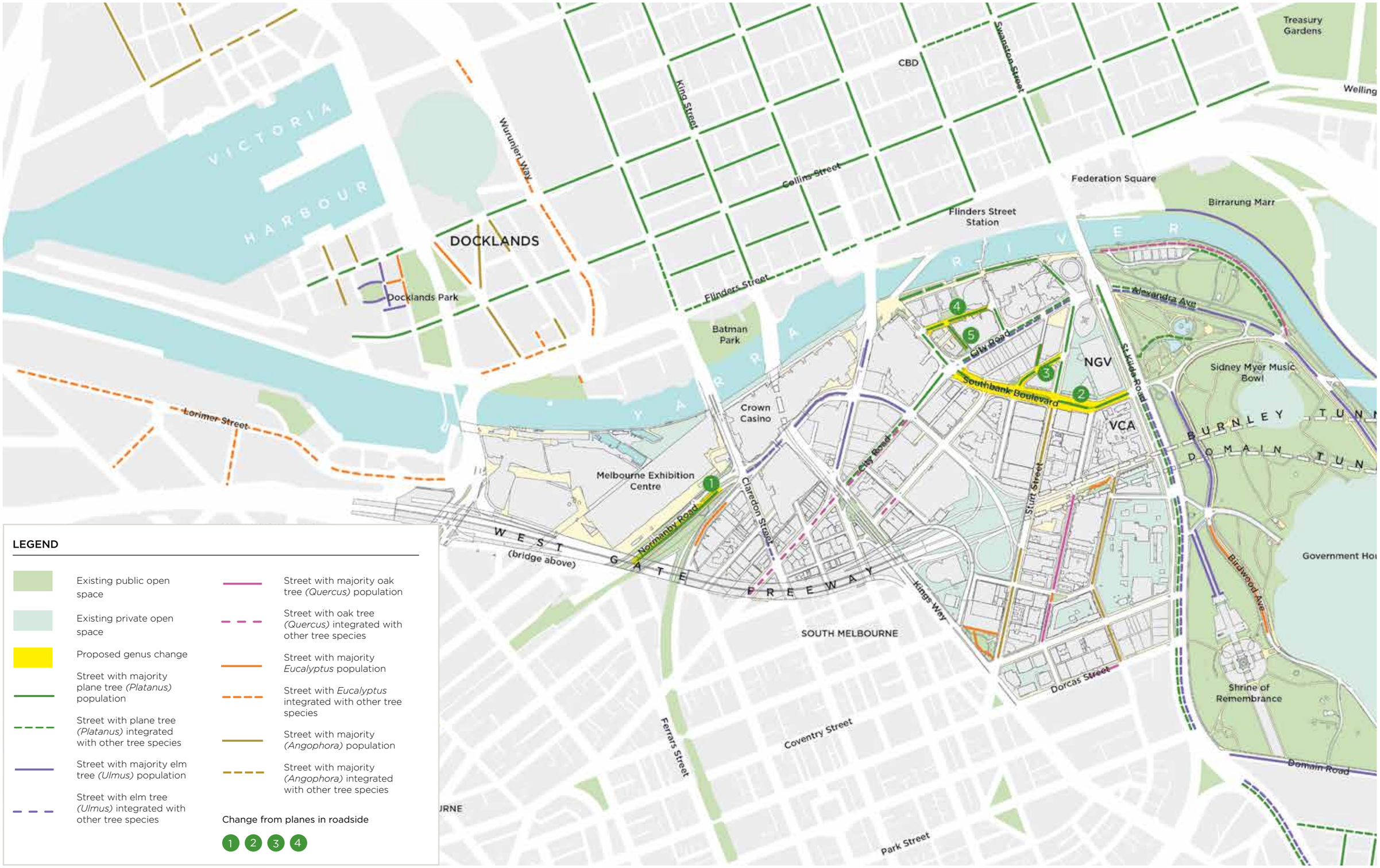




MAP 6: **CANOPY COVER AND BIODIVERSITY OUTCOMES**



MAP 7: WHAT SHOULD STAY AND WHAT SHOULD CHANGE?



LEGEND

- Existing public open space
- Existing private open space
- Proposed genus change
- Street with majority plane tree *(Platanus)* population
- Street with plane tree *(Platanus)* 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 oak tree *(Quercus)* population
- Street with oak tree *(Quercus)* integrated with other tree species
- Street with majority *Eucalyptus* population
- Street with *Eucalyptus* integrated with other tree species
- Street with majority *(Angophora)* population
- Street with majority *(Angophora)* integrated with other tree species

Change from planes in roadside

1 2 3 4

PLANTING STRATEGIES

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

MAP 8: LONG-TERM PLANTING STRATEGY

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

Overarching principles affecting the planting plan include:

- enhance the character of park perimeter streets through plantings that respond to the character and scale of the park perimeter.
- maximise the potential for tree canopy where planting opportunities are limited.
- enhance the connections of the streetscape to the ecology of the Yarra River corridor.
- create streets that provide connections between open spaces.
- incorporate diversity, colour and seasonal change into species selections.
- provide planting that offers visible greening

MAP 9: 10-YEAR PLANTING PLAN

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

MAP 10: GUIDE TO SPECIES CHANGE

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

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

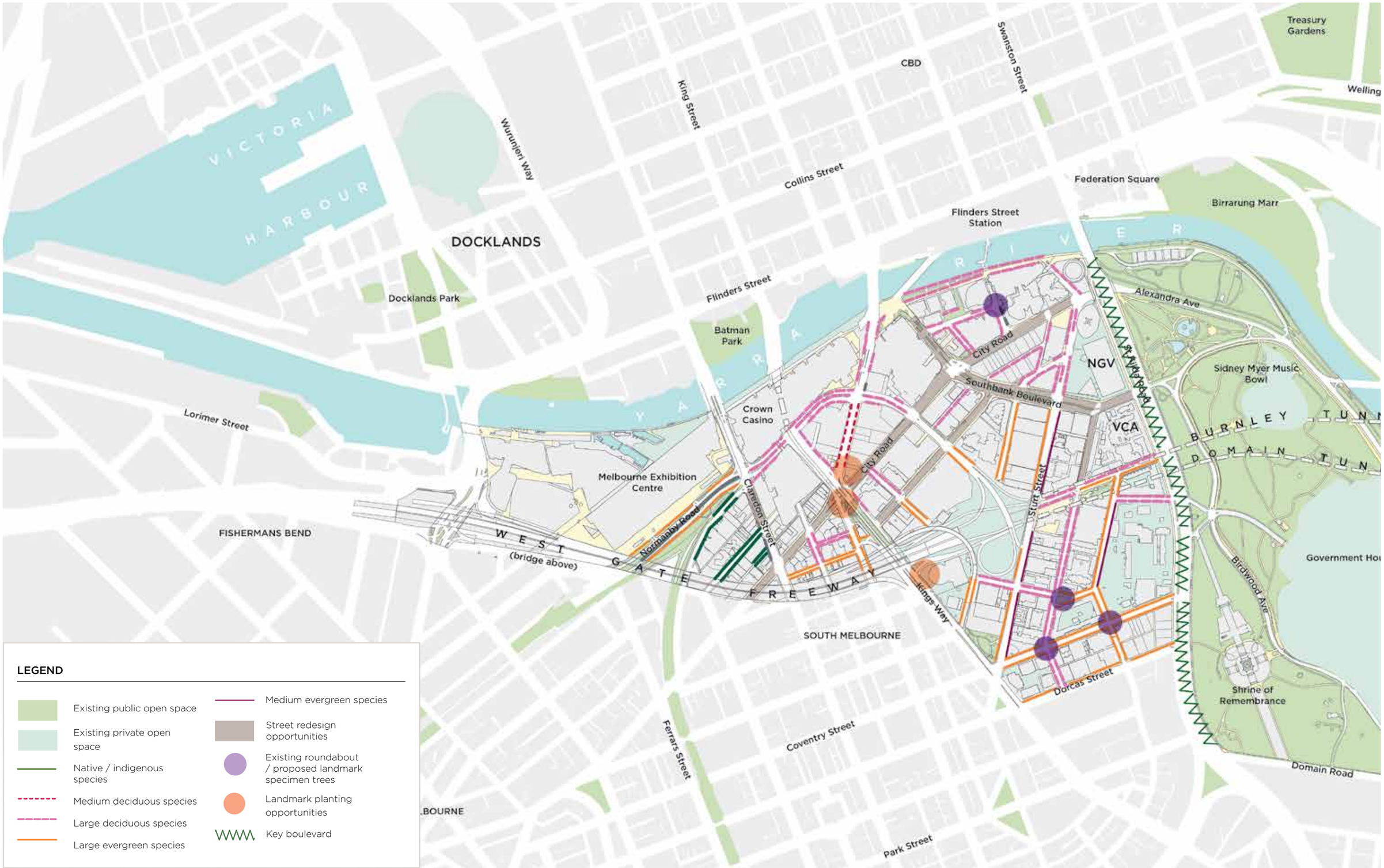
These illustrations provide an example of how these three aspects would apply in a particular street.

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.

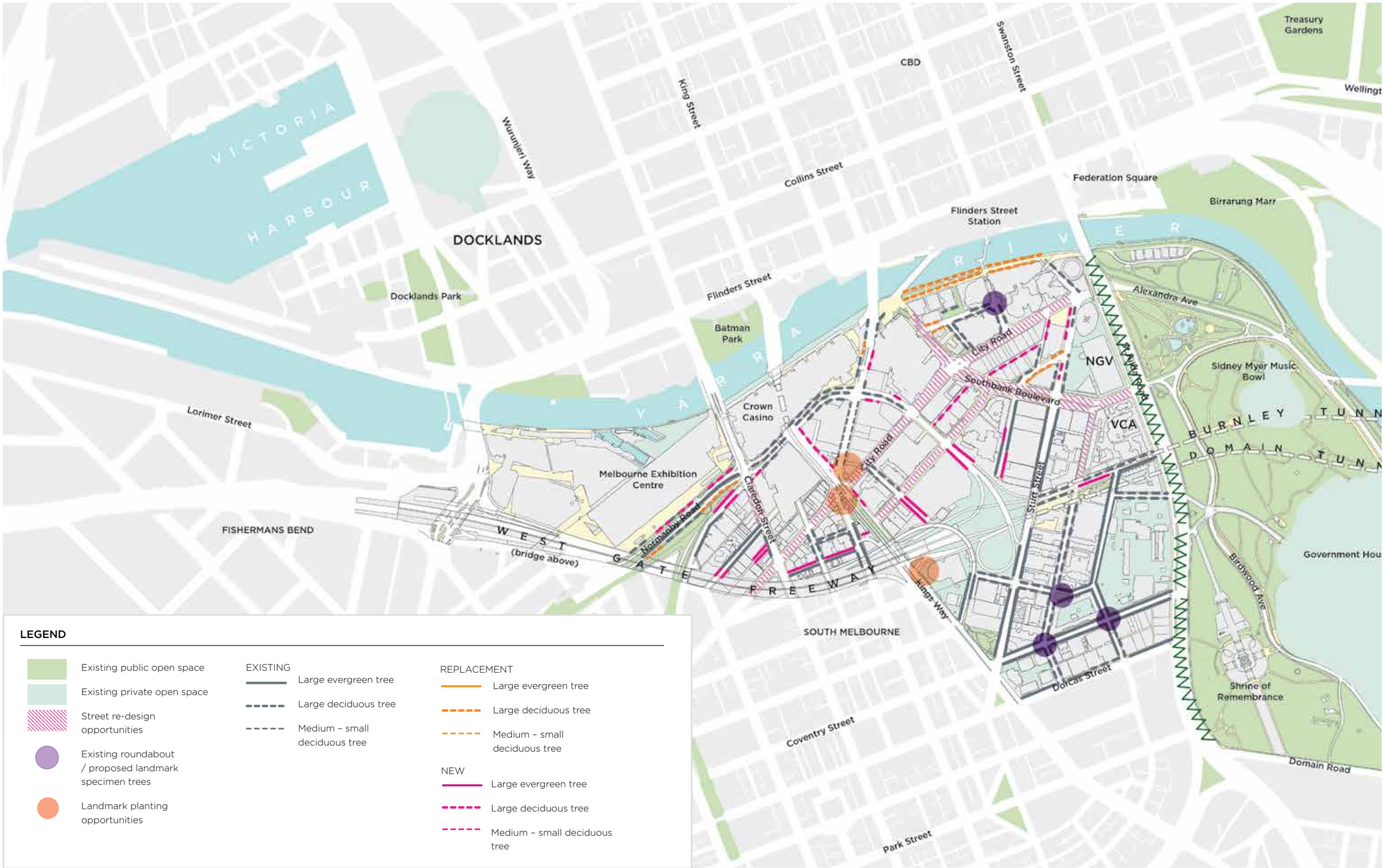
Long term planting plan: This strategy provides the long-term direction for planting in the precinct

10-year planting plan: New and replacement planting is to occur across Southbank

MAP 8: LONG TERM PLANTING PLAN



MAP 9: 10-YEAR PLANTING PLAN



LEGEND

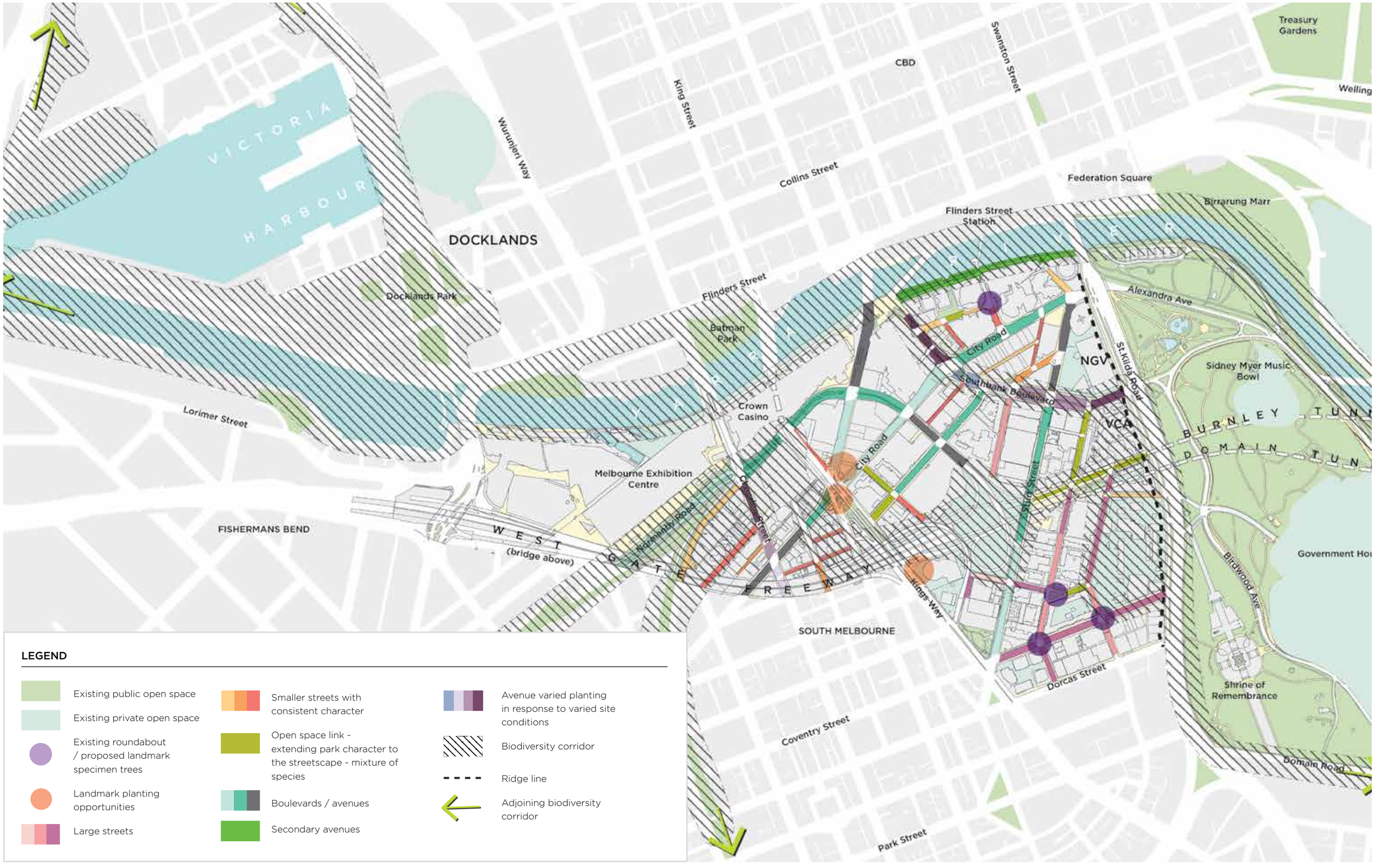
- Existing public open space
- Existing private open space
- Street re-design opportunities
- Existing roundabout / proposed landmark specimen trees
- Landmark planting opportunities

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 10: GUIDE TO SPECIES CHANGE



LEGEND

- Existing public open space
- Existing private open space
- Existing roundabout / proposed landmark specimen trees
- Landmark planting opportunities
- Large streets
- Smaller streets with consistent character
- Open space link - extending park character to the streetscape - mixture of species
- Boulevards / avenues
- Secondary avenues
- Avenue varied planting in response to varied site conditions
- Biodiversity corridor
- Ridge line
- Adjoining biodiversity corridor

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 Southbank, Guiding Principles and Planting Plan. Elms, Planes, Oaks and Angophora are key genera within Southbank, 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 Southbank'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 Southbank trees (limited future use)

- *Platanus x acerifolia (*London Plane*)*
- *Angophora costata* (Smooth-barked Apple)
- *Ulmus spp.* (Elms)
- *Quercus spp.* (Oaks)

Large trees for streets

Evergreen

- *Calodendron capense* (Cape Chestnut)
- *Casuarina cunninghamiana* (River She-oak)
- *Cinnamomum camphora* (Camphor Laurel)
- *Eucalyptus leucoxylon* subsp. *connata* (Yellow Gum)
- *Ficus macrophylla* (Moreton Bay Fig)
- *Ficus platypoda* (Rock Fig)
- *Grevillea robusta* (Silky Oak)
- *Schinus terebinthifolius* (Brazilian Pepper Tree)
- *Vitex lucens* (Puriri)

Deciduous

- *Maclura pomifera* 'Wichita' (Wichita Osage Orange)
- *Taxodium distichum* (Bald Cypress)
- *Tipuana tipu* (Rosewood)
- *Quercus cerris* (Turkey Oak)
- *Quercus phellos* (Willow Oak)
- *Quercus rubra* (Red Oak)

Medium to small trees for streets

Evergreen

- *Acacia melanoxylon* (Blackwood)
- *Cupaniopsis anacardioides* (Tuckeroo)
- *Ceratonia siliqua* (Carob Tree)
- *Eleocarpus reticulatus* (Blueberry Ash)
- *Eucalyptus torquata* (Coral Gum)
- *Harpephyllum caffrum* (South African Wild Plum)
- *Harpulia pendula* (Tulipwood)
- *Hymenosporum flavum* (Native frangipani)
- *Hibiscus tiliaceous* (Coast Cottonwood)
- *Olea europaea* (Olive)

Deciduous

- *Fraxinus velutina* (Velvet Ash)
- *Fraxinus pennsylvanica* (Green Ash)
- *Gleditsia triacanthos f. inermis* (Thornless Honey Locust)
- *Pyrus calleryana* (Callery Pear)
- *Sapium sebiferum* (Chinese tallow tree)

Large feature trees

- *Araucaria columnaris* (Cook's Pine)
- *Araucaria heterophylla* (Norfolk Island Pine)
- *Butia capitata* (Jelly palm)
- *Ceiba speciosa* (Silk-floss Tree)
- *Dracaena draco* (Dragon Tree)
- *Phoenix reclinata* (Senegal Date Palm)
- *Pinus halepensis* (Aleppo Pine)
- *Pinus nigra* (Black Pine)
- *Pinus pinea* (Stone Pine)
- *Quercus suber* (Cork Oak)

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 benefi ts of having trees in ur 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

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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)

CITY OF MELBOURNE