

Greening Port Phillip

STREET TREE PLANTING PROGRAM

2017-2022

08 January 2019

City of Port Phillip



Contents

1. Introduction	04	3. Implementation by Neighbourhood	26
1.1. Greening Port Phillip	05	3.1. Implementation	27
1.2. About This Document	07	3.1.1 Prioritising streets	28
1.4. What Is The Urban Forest?	08	3.1.2 Other Considerations	28
1.3. The Benefits Of Greening	08	3.1.3 Prioritising parks	28
1.3.1 Economic Benefits	09	3.2. Analysis	30
1.4.1 Environmental Benefits	10	3.3. East St Kilda	32
1.4.2 Community Benefits	11	3.4. Elwood and Ripponlea	36
1.5. Greening Objectives	13	3.5. Middle Park and Albert Park	40
1.6. Desired Outcomes	13	3.6. Fishermans Bend - Montague	46
2. The Urban Forest Today	14	3.7. Fishermans Bend - Sandridge / Wirraway	47
2.1. Summary Of Current Tree Population	15	3.8. Port Melbourne	48
2.2. Challenges To Implementation	16	3.9. South Melbourne	52
2.2.1 Climate change	16	3.10. St Kilda	56
2.2.2 Water management	16	3.11. St Kilda Road	60
2.2.3 Trees and urban infrastructure	16	3.12. Additional resources	64
2.2.4 Tree establishment in the urban environment	16	4. Appendices	65
2.2.5 Ensuring resilience	16	4.1. Neighbourhood Tree Species Palettes	66
2.2.6 Connectivity for biodiversity	16	4.2. FAQ To Tree Planting	68
2.2.7 Planting within the street	17		
2.3. Urban Heat Island	18		
2.3.1 Impacts On Health And Wellbeing	18		
2.3.2 Pavements Gets Hot	19		
2.3.3 De-paving	19		
2.3.4 Porous / Permeable Surfaces	19		
2.4. Walk and Bike Plan	21		
2.5. Planting Opportunities	21		

Acknowledgements

202020 Vision

www.202020vision.com.au

ASPECT Studios

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1. Introduction



1.1. Greening Port Phillip

The City of Port Phillip is located in a landscape of considerable natural beauty that includes the rich foreshore of Port Phillip Bay and a network of beautiful and green historic parks, public and private gardens and many tree lined streets that stand as testament to its long history of good planning. Most of the City's neighbourhoods benefit from the canopy cover of mature trees.

Greening Port Phillip – An urban forest approach 2010 is City of Port Phillip's key document outlining a strategy for creating a sustainable, resilient and biodiverse city that meets the aspirations of Council and the residents of the City of Port Phillip. Those aspirations are summarised in the Greening Port Phillip vision:

The City of Port Phillip will have a healthy and diverse urban forest that uses innovative greening solutions to enhance the community's daily experience, ensuring environmental, economic, cultural and social sustainability for future generations.

Key goals set out in Greening Port Phillip are the need to:

- **Increase canopy cover;**
- **Reduce the Urban Heat Island (UHI);**
- **Increase biodiversity; and**
- **Improve amenity.**

Trees are a fundamental component of the urban landscape and are crucial to the achievement of council's Greening Port Phillip vision.



Objectives

Council want to see the following achieved by 2027 (Council Plan 2017-27)

Direction 3: We have smart solutions for a sustainable future

3.1 A greener, cooler and more liveable City

- Increasing canopy cover and diversity of tree species across our streets and open spaces.
- Facilitating the greening of our built environment, through green roofs, walls and facades.

Direction 4: We are growing and keeping our character

4.1 Liveability in a high density City

Deliver open space and streetscape works in Fishermans Bend, particularly in the Montague neighbourhood and at the Ferrars Street Education and Community Precinct.

4.2 A City of diverse and distinctive neighbourhoods and places.

- Ongoing investment in upgrading the foreshore including vegetation projects and maritime infrastructure renewals

priorities for the next four years:

- Promote the greening of buildings through the application of environmentally sustainable design planning policy and guidelines.
- Develop a heat management plan to help 'cool the City'.
- Implement and review progress on the Greening Port Phillip Plan - An Urban Forest Approach, including implementing the street tree planting program 2017-2022 and ongoing investment in street and park trees and streetscape improvements, including in Fishermans Bend.
- Investigate opportunities to protect vegetation and increase canopy cover on private property.
- Complete an Ecological Biodiversity Study, in partnership with the EcoCentre and local experts.



1.2. About This Document

In responding to the direction set out in Greening Port Phillip, this Street Tree Planting Program for the urban forest aims to prioritise street tree and park tree planting throughout the City of Port Phillip for the next five years – 2017–2022.

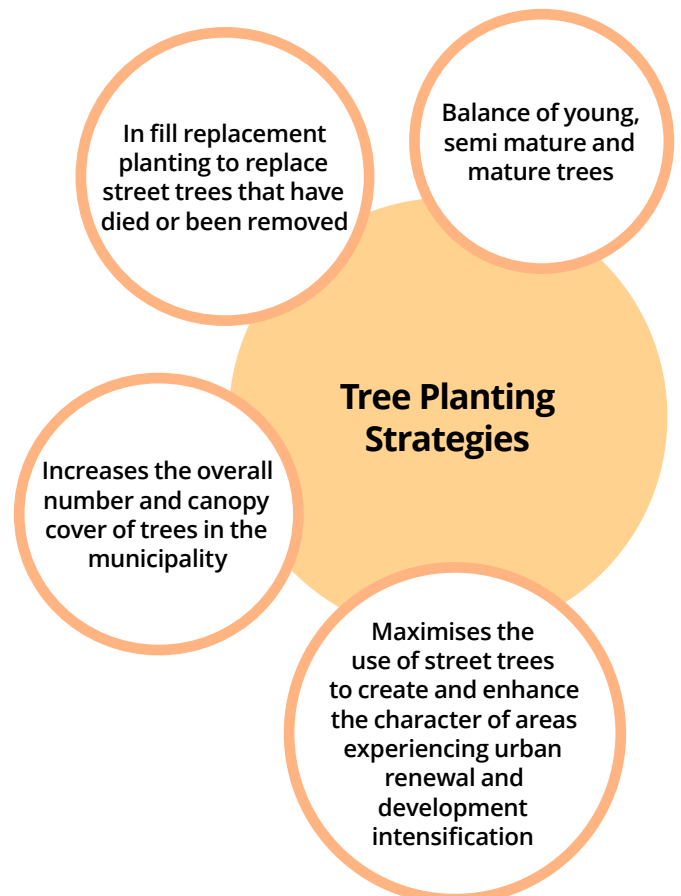
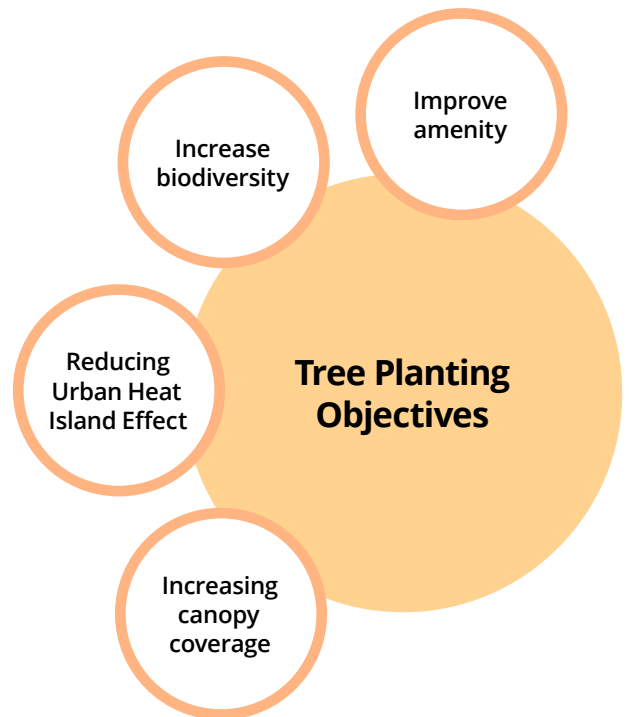
Trees are long term investments that require careful planning and management as a collective resource, to ensure that optimum tree canopy cover, and mix of tree type and diversity of age, are achieved for current and future generations.

This document takes a neighbourhood approach, considering the City of Port Phillip as comprising 9 neighbourhood precincts. Within each precinct, streets are prioritised by the extent that they are covered by tree canopy. The Street Tree Planting Program for the urban forest recommends a palette of species for each precinct, but does not prescribe where and what each tree will be. Final location- and species-specific decisions will be the subject of further detailed assessment beyond the scope of this document. Park and significant streetscapes will be planted using existing master plans and site specific plans.

The Street Tree Planting Program for the urban forest is a living document that will be revised on a 5 yearly basis to reflect the changing qualities and significance of the City's urban forest and to ensure that council:

- Maintains a balance of young, semi mature and mature trees across the municipality;
- Undertakes in-fill/replacement planting to replace street trees that have died or been removed;
- Increases the overall number and canopy cover of trees in the municipality; and
- Maximises the use of street trees to enhance the character of areas experiencing urban renewal and development intensification.

In addition, annual review of tree planting priorities will ensure that the tree planting program maintains the flexibility to respond to issues that arise from the dynamic nature of the urban context.



1.4. What Is The Urban Forest?

An urban forest is the sum total of all trees and associated vegetation growing within an urban area. In the City of Port Phillip, the urban forest includes:

- Front and backyard gardens;
- Balcony gardens;
- Rooftop gardens and green roofs;
- Vertical gardens – vegetation growing up the walls of buildings and fences;
- Street trees, shrubs and ground covers on nature strips, median strips and roundabouts;
- Trees and gardens in public parks and reserves; and
- Trees and gardens in other open spaces – shopping strips, industrial properties, etc.

Taken together, these green spaces provide an essential balance to the highly urbanised environment of the City of Port Phillip, and contribute to the liveability of the city in the long term for residents and visitors alike.

The concept of an urban forest enables a united approach to the management of our green spaces by considering the role of public and private trees and vegetation in regional planning and development.

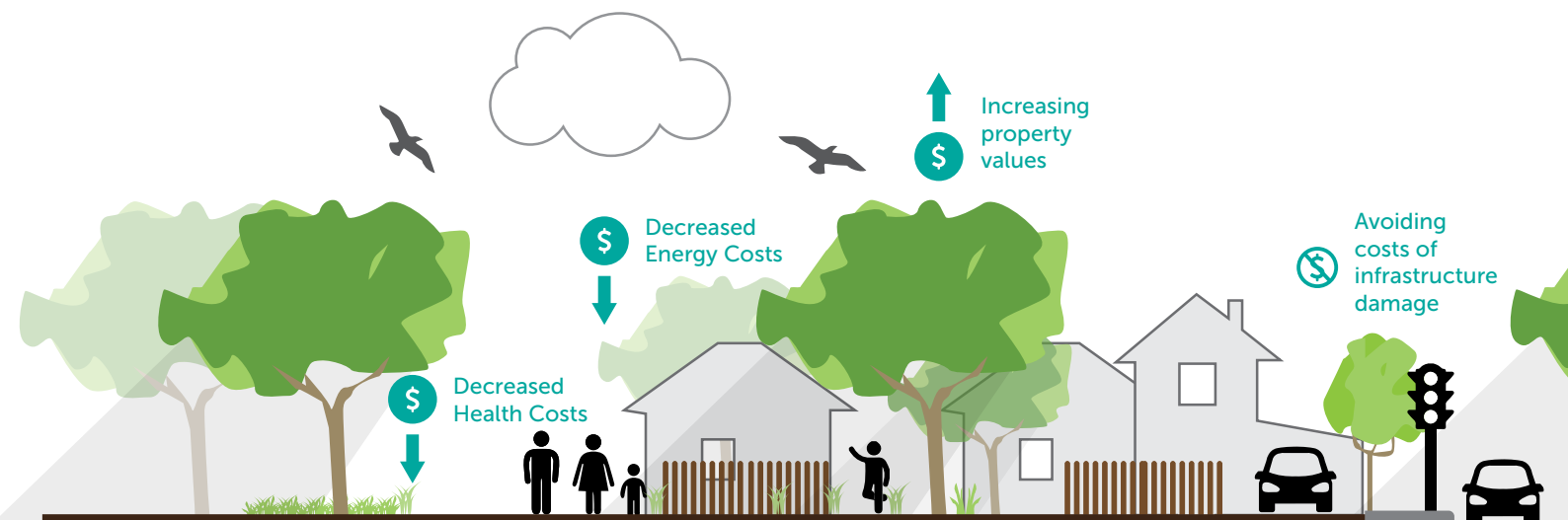
1.3. The Benefits Of Greening

The value of trees in the urban environment is widely accepted. Trees are not only beautiful in themselves; collectively they add beauty to our urban landscapes, soften the harsh lines of buildings or complement architecture, screen unsightly views, provide privacy and a sense of security, while contributing to the landscape character and provide a sense of place.

Trees perform important functions that help maintain the sustainability of our cities.

Research is proving that trees provide greater benefits in terms of ecology and economy than the cost to plant and maintain over time.

The benefits of urban forests span environmental, economic and social domains. These benefits are interrelated, with each cumulatively feeding into the creation of a more resilient and sustainable City of Port Phillip.



1. Introduction

1.3.1 Economic Benefits

The direct economic benefits of the urban forest span a range of industries and disciplines including health, engineering, planning and real estate.

Reducing energy costs

Major economic benefits come through shading buildings in summer, reducing the need for air-conditioning and, in turn, cutting energy costs. Well-placed shade trees can reduce home energy consumption by as much as 30%.

Increasing property values

Trees in streets enhance the appearance of the neighbourhood and have been proven to increase property values. In some instances, properties in tree-lined streets have been valued at almost 30% higher than those in streets without trees.

Avoiding costs of infrastructure damage and renewal

The shading provided by the urban forest can significantly improve the lifespan of roads, footpaths and other assets, preventing damage from heat related swelling and shrinking, as well as the harmful effects of ultraviolet radiation.

Decreasing health costs

Research suggests that healthy green cities help alleviate the burden on national health systems. While it is difficult to create a direct link and quantify dollar savings, it is likely that urban forests reduce health costs associated with sedentary behaviour, obesity, and mental illness.

Marketing the city

Green spaces play a role in defining the culture and image of a city, with the potential to make a city more competitive, thus expanding its political and economic influence.

Nature boosts business

Research has shown that nature can boost the viability of businesses by drawing shoppers into business districts and encouraging them to spend more. One study found that customers prefer shopping in well-tended streets with large trees. The study also found these customers would pay 9–12% more for goods sold in central business districts with high quality tree canopy, and would travel further to, visit more often, pay more for parking, and stay longer in a well-treed shopping district.



1.4.1 Environmental Benefits

Key environmental benefits include:

Reducing the Urban Heat Island

Metropolitan areas have been shown to be hotter than surrounding rural areas because hard surfaces such as concrete, brick and asphalt that are exposed to the sun for extended periods absorb large amounts of heat. This effect is called the Urban Heat Island (UHI). The UHI exacerbates the problems associated with increased heat, such as heat stress related mortality (and people living in high density areas are at greater risk during heat events as a result of the UHI), and costs such as those that arise from increased use of air-conditioning. The elevated temperatures also contribute to the formation of ground-level ozone – the main component of smog. Considerable research demonstrates that the addition of trees and vegetation in the built environment is one of the most effective ways for mitigating the UHI. Through the natural process of transpiration, trees help reduce day and night time temperatures in cities, especially during summer. Trees provide shade for streets and footpaths and their leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day.

Reducing stormwater flows and nutrient loads

Tree canopies and root systems reduce stormwater flows and nutrient loads that end up in our waterways. Broad tree canopies intercept and mitigate the impact of heavy rainfall. Healthy tree roots help reduce the nitrogen, phosphorus and heavy metal content in stormwater, and well as making the soil more porous and absorbent, further retarding storm water flows into waterways.

Reducing air pollution

Through the process of photosynthesis, trees take up carbon dioxide, nitrous oxides, sulphur dioxide, carbon monoxide and ozone, removing these pollutants from the atmosphere. Leaf surfaces capture fine air-borne particulates that can be dangerous to health.

Resilience in the face of climate change

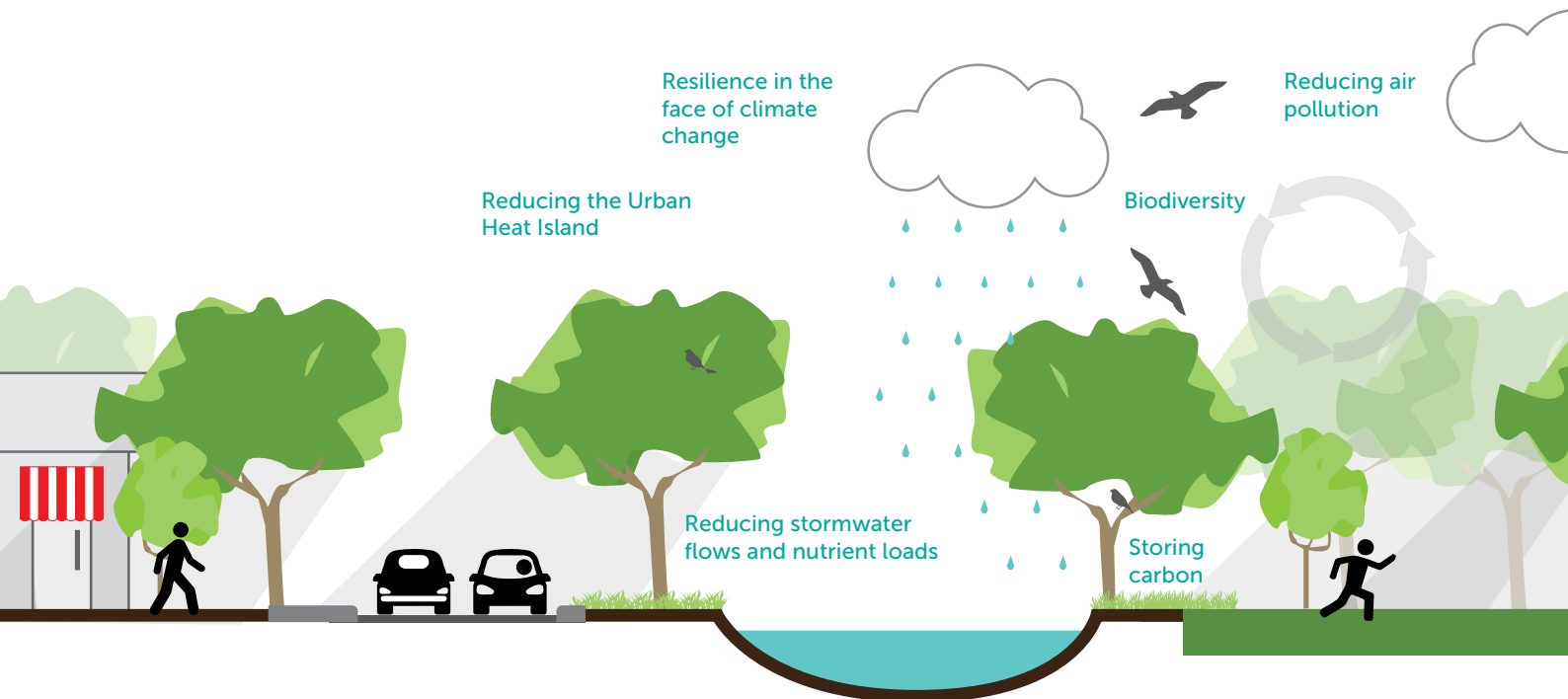
The capacity of healthy and well-designed urban forests to contribute to mitigation and adaptation to climate change is broad and well-documented – for more references and research please see the the Further Reading section.

Storing carbon

Trees absorb and store carbon from the atmosphere through the process of photosynthesis, making a significant contribution to slowing climate change.

Biodiversity

A healthy urban forest provides habitat for a variety of wildlife. Urban forests around the world have been shown to support a wide range of species, even including endangered animals and other species of high conservation value. By ensuring a range of age strata and vegetation types, a wider range of habitats, food and other resources, and opportunities for movement, the biodiversity of the City of Port Phillip can be enhanced.



1.4.2 Community Benefits

In an urban environment, street trees and other landscape plantings provide the community with a critical link to the natural world with which we have co-evolved. The urban forest helps restore the mind and spirit.

Providing a sense of place and creation of local identity

A city's landscape helps define its character. Differences in the landscape contribute to distinguishing neighbourhoods. Landscapes are the setting for many everyday recreational opportunities such as organised sport, walking the dog or having a picnic, and help to create a sense of connection to place.

Improving community cohesion

Urban forests and green open space provide the place for major events, festivals and celebrations throughout the city. Events and spaces can bring diverse groups of people together through the provision of a public realm that is available for everyone to enjoy. Green spaces play an important role in the integration of minority groups and can assist in the adaptation process of immigrants into their host country.

Encouraging outdoor activity

Trees can significantly increase the walkability of streets by creating a pleasant environment, providing shade from the sun and protection from rain and wind. Well-treed parks, gardens and streets encourage the use of open spaces, which has multiple flow-on health benefits such as reduction in obesity and improvement in general physical and mental wellbeing. Lifestyle-related illnesses are prevalent and 61% of Australian adults are overweight or obese, and obesity cost Australia's healthcare industry \$58 billion in 2008. Increased walkability (and bikeability) also takes cars off the road, thereby reducing greenhouse emissions and other pollution, improving overall amenity, and helps make streets places for people, not spaces for cars. Having better streets is good for our local economy. The more people get out and about, the more they see what's on offer.

Reconnecting children with nature

Studies have shown that green spaces allow children creativity of mind, encourage exploration and adventure, promote physical activity, build resilience and enhance experiential learnings.

Reducing people's exposure to sun

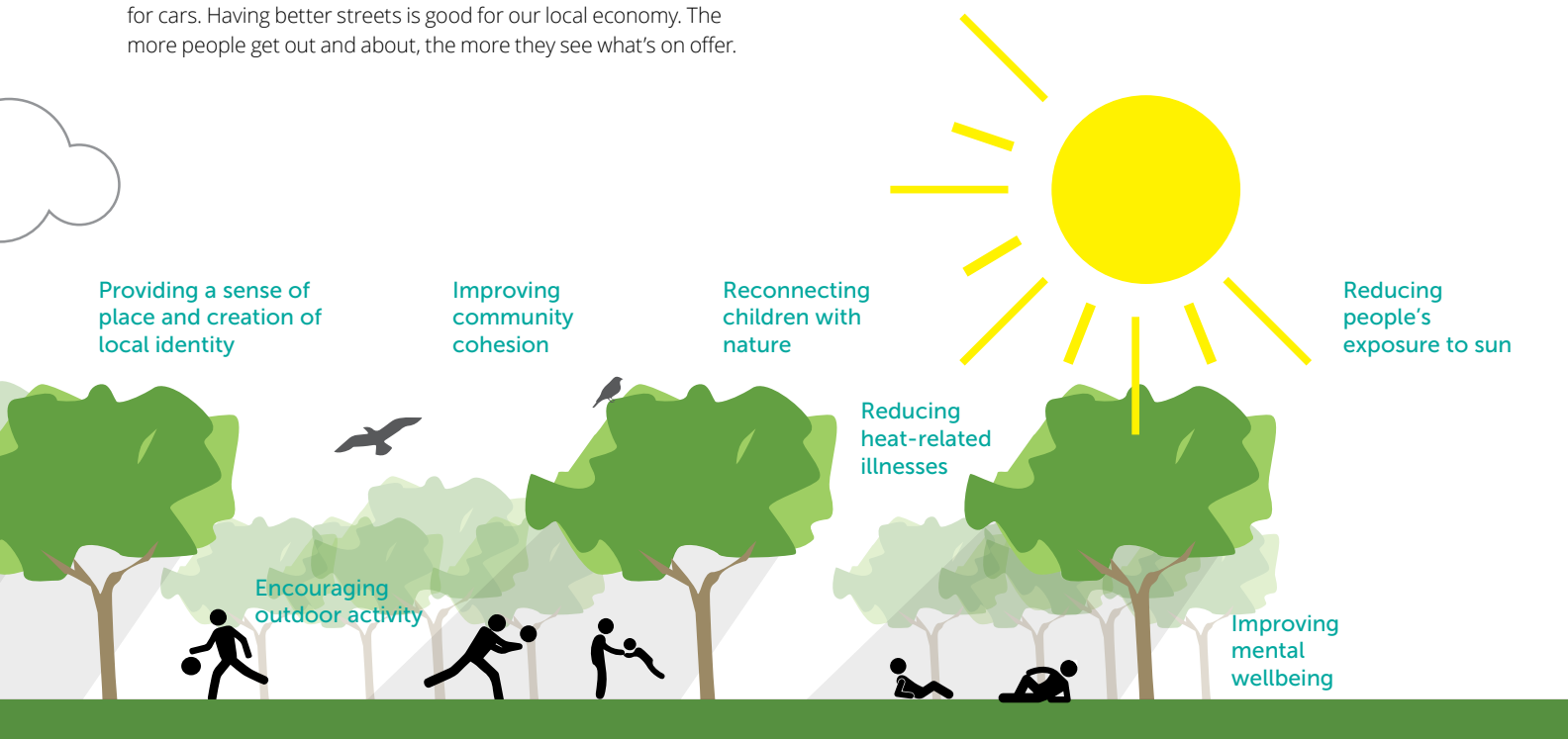
Skin cancer and other sun exposure illnesses highlight the importance of protection from sunlight's UV rays. Shade alone can reduce overall exposure to UV radiation by up to 75%. Trees with broad canopied street and park trees provide the most shade.

Reducing heat-related illnesses

Heat waves kill more Australians than any other natural disaster, and have led to many deaths in Victoria, and currently heat related deaths in Victoria exceed the annual road toll. Evidence suggests that occupants of buildings with little or no surrounding vegetation are at higher risk of heat-related morbidity. Extreme environmental heat can trigger the onset of acute conditions, including heat stroke and dehydration, as well as exacerbate a range of underlying illnesses. The elderly, the very young, and those with pre-existing illnesses are the most vulnerable. In this context, the public health benefits of increased shading from greater canopy coverage are clear.

Improving mental wellbeing

The availability of, access to and even the ability to view green spaces and trees have positive effects on people's wellbeing. Many studies have explored the relationships between the amount of green in the landscape and associated levels of wellbeing or depression. In the Netherlands, disease rates, including mental disease, were shown to be lower in areas with more green spaces within a 1km radius compared to areas with less green space.





1.5. Greening Objectives

Objectives

Council want to see the following achieved by 2027 (Council Plan 2017-27)

A greener, cooler and more liveable City

- A. Increasing canopy cover and diversity of tree species across our streets and open spaces.
- B. Facilitating the greening of our built environment, through green roofs, walls and facades.

priorities for the next four years:

- Promote the greening of buildings through the application of environmentally sustainable design planning policy and guidelines.
- Develop a heat management plan to help 'cool the City'.
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- Investigate opportunities to protect vegetation and increase canopy cover on private property.
- Complete an Ecological Biodiversity Study, in partnership with the EcoCentre and local experts.

1.6. Desired Outcomes

The City of Port Phillip will have a healthy and diverse urban forest that uses innovative greening solutions to enhance the community's daily experience, ensuring environmental, economic, cultural and social sustainability for future generations.

Progress towards achieving the Greening Port Phillip vision will be measured using five key indicators.

Indicator	Desired outcome	Measure – reported every 5 years
Number of hot spots*	A reduction in the total number of hot spots contributing to the UHI	Total percentage reduction in hot spots and percentage increase in cooling and temperature control in treated hot spot areas
Tree canopy cover	An increase in the total area of tree canopy cover in the City of Port Phillip	Total tree canopy cover
Number of trees	An increase in the number of trees in streets and parks in the City of Port Phillip	Total number of trees in streets
Alternative greening activity	New greening initiatives undertaken where trees are not an option, e.g. De-paving	Number of alternative greening activities undertaken in streets that cannot be planted with trees eg. depaving
Community satisfaction with trees	The City of Port Phillip community is satisfied with the action being undertaken by Council to maintain the urban forest	Levels of satisfaction with council action being taken

*Hot spots - sites that show up as hotter than surrounding areas using thermal imaging.

Table 1: City of Port Phillip Greening Targets

2. The Urban Forest Today



Tree Health

Health of a tree as determined by factors such as leaf colour and size, shoot growth extension and percentage of living canopy. It is worth noting that tree health does fluctuate and they have the ability to improve, naturally and with specific tree management.

Good Tree is largely unaffected by pests, diseases and has no significant deadwood or crown dieback.

Fair Tree is in 'normal' health. Some pests, diseases, deadwood, minor crown dieback may be present but not considered to be severely affecting the tree's health.

Poor Tree Determined by any single or combination of factors. Tree health is declining or has declined usually due to pest, disease, senescence, unsuitable site conditions or physiological damage such as root severance or root death due to soil cut, fill or compaction.

Tree Health

Existing

64%

Good Health

32%

Fair Health



2.1. Summary Of Current Tree Population

43,894
Total Trees



31,042

71% Street trees

12,550

29% Park trees

Tree Type

Tree Type	No of Trees	%
Park Trees	12852	29
Street Trees	31042	71
Total No of Trees	43894	

Top 3
Tree Species



10%

Platanus X acerifolia

4%

Banksia integrifolia

4%

Lophostemon confertus

Key Species - Streets & Parks

Species		Total	% of Tree Species
<i>Platanus X acerifolia</i>	London Plane Tree	4207	10%
<i>Lophostemon confertus</i>	Queensland Brush Box	1689	4%
<i>Banksia integrifolia</i>	Coastal Banksia	1634	4%
<i>Allocasuarina verticillata</i>	Drooping Sheoak	1591	4%
<i>Phoenix canariensis</i>	Canary Island Date Palm	1103	3%
<i>Ulmus procera</i>	English Elm	1037	2%
<i>Fraxinus oxycarpa</i>	Desert Ash	939	2%
<i>Olea europaea subsp europaea</i>	Olive Tree	833	2%
<i>Pyrus calleryana</i>	Ornamental Pear	820	2%
<i>Corymbia maculata</i>	Spotted Gum	799	2%

Canopy
Coverage - Existing



22%

Elwood & Repponlea have the highest canopy coverage

11%

Port Melbourne has the lowest canopy coverage

Species
Native Vs Exotic



51%

Native

49%

Exotic

Tree Health

Tree Health	Number of Trees	%
Good	25242	64%
Fair	12610	32%
Poor	1182	4%

Existing Tree Canopy Coverage per Neighbourhood - All Land Uses

Neighbourhood	Neighbourhood Area (ha)	Tree Canopy Area (ha)	% Canopy Coverage Per Neighbourhood
East St Kilda	235	42	18%
Elwood & Ripponlea	264	58	22%
Middle Park & Albert Park	319	41	13%
Port Melbourne	436	47	11%
South Melbourne	275	35	13%
St Kilda	335	55	16%
St Kilda Road	173	23	13%
Montague	454	27	6%
Sandridge	1,871	111	6%

2.2. Challenges To Implementation

Climate change, water management, the resilience of the urban forest to a range of threats, and the distinctive pressures placed on trees within the urban environment, all need to be considered in implementing a tree planting strategy.

2.2.1 Climate change

Climate change is expected to bring warmer, wetter winters, warmer drier summers, and rates of fire and insect disturbance are expected to increase. In addition, these effects will interact with existing urban stresses such as air pollution, soil compaction and the UHI. As the climate progressively changes, many of the trees now in the City of Port Phillip will require more care than previously. Managing for tree health will become increasingly important, and selection for tree species and varieties that are drought, heat and insect resistant will become even more necessary.

2.2.2 Water management

A key element in the success of tree growth is the amount of water the tree receives. Many urban landscapes are dependent on supplementary watering to maintain them in a healthy, vigorous condition. Prolonged drought and associated water restrictions in recent years have made some landscapes and certain tree species vulnerable. Major changes have occurred both in the health of urban landscapes and management of these landscapes. Strategies to adapt trees to a reduced water environment include:

- Estimating water requirements of trees and landscapes;
- Using water sensitive urban design initiatives such as bioretention tree pits and rain gardens to harvest stormwater;
- Selecting drought tolerant species;
- Providing appropriate space (rooting volume) for trees; and
- Selecting species to ensure the right tree is chosen for the right location.

2.2.3 Trees and urban infrastructure

Trees are easily damaged as a consequence of a variety of pressures, conflicts, changes to land-use and public requirements, and damage may affect the trees' function and viability in the landscape.

A range of strategies needs to be considered, such as species selection, site assessment, root pruning and barrier placement to avoid or manage tree root conflicts with infrastructure.

Most of Port Phillip's streets have above ground power and communication cables. Council is obliged by legislation to meet certain clearance requirements for trees around powerlines. This means trees must be regularly pruned.

As population increases and re-development occurs there is also pressure to increase the size and number of vehicle crossovers, which can increase pressure on existing trees. In such instances, coordination with service providers and other council departments is required to ensure sustainable management of street trees.

2.2.4 Tree establishment in the urban environment

The urban forest is subject to a variety of pressures, local climate conditions, varying soil types, soil compaction, variances in soil moisture, and vandalism, which may affect the establishment and optimum growth of individual trees. Many trees on streets situated close to the foreshore in the City of Port Phillip have to contend with salt spray and salty soils and these conditions preclude many tree species from thriving. Careful choice of tree species is required to ensure minimum tree loss over time. Detailed site assessment is required for all street tree and park planting to determine local site conditions and minimise establishment issues.

2.2.5 Ensuring resilience

It is also important to ensure a diverse tree population that minimises potential losses from pathogens such as Myrtle Rust. Myrtle rust affects species in the Family Myrtaceae, which includes XXX. It is therefore important to avoid having too great a proportion on such species in the City of Port Phillip's urban forest.

Similarly, to avoid the risk of mature tree loss claiming a significant portion of the urban forest all at one period in the future, it is important to ensure a spread of ages throughout the urban forest.

2.2.6 Connectivity for biodiversity

Biodiversity in the City of Port Phillip is made up of both public and private space and is characterised by the significant public reserves within the municipality. Key sites include the Port Phillip Bay Foreshore, which runs along the western edge of the municipality, and Albert Park. These large reserves are complimented by smaller reserves allowing for broader ecological connectivity. These include Elwood Canal, St Kilda Botanical Gardens and Alma Park. The ecology in the City of Port Phillip is connected to the broader landscape and significant public reserves beyond the municipal boundaries, including West Gate Park to the north, the Royal Botanic Gardens Melbourne, The Shrine of Remembrance and Fawkner Park to the east, and Elsternwick Park to the south. It is important to consider if and how these major sources of ecological resilience can become better connected through strategic improvements in the urban forest.

2.2.7 Planting within the street

Street tree planting works involves three different programs within a street or street section. These are:

- **In-fill planting**, which primarily addresses planting out with same or similar species.
- **Partial renewal**, which may involve the removal of some declining or inappropriate trees and in-fill planting to reinforce a preferred tree species. This program may also involve the construction of new or improved planting sites, such as in-road planters or expanded sites in hard surfaces.
- **Renewal**, which involves the removal of most, if not all, inappropriate or declining street trees and replacing with appropriate species. This program may also incorporate the creation of new or improved planting sites.

Planting trees in streets presents a variety of challenges. Given the varied development patterns throughout the City of Port Phillip a site specific approach is required to deliver successful tree planting within a street.

Site-specific challenges and opportunities include:

- **Narrow footpaths:** here on-road planting between car spaces may be possible, and locating trees in areas such as no standing zones and adjacent to cross-overs;
- **Power lines:** broad spreading trees may be preferable here;
- **Wide roads:** these allow the potential inclusion of outstands and median strips as sites for additional tree planting;
- **WSUD treatments:** tree pits, infiltration pits, bioswales and rain gardens all have potential to improve the amount of water available for trees, and to introduce more vegetation into the streetscape;
- **De-paving:** reducing the amount of hard surfaces can create spaces for tree planting and other vegetation, as well as improving the infiltration of water into the soil and slowing peak flows to waterways; and
- **Compacted/poor soils:** these are common within the urban environment, can severely impact tree growth, and a range of treatments can be used to improve soils and protect them from future compaction.

Planting Review

Total Trees Planted by Year 2010 - 2016

Year	Total Trees Planted
2010	1256
2011	1543
2012	1754
2013	1550
2014	1375
2015	1568
2016	1282



2.3. Urban Heat Island

The urban heat island (UHI) is the condition where by it is hotter in metropolitan areas than it is in surrounding rural areas. UHI is greatly influenced by impermeable surfaces such as concrete, brick and asphalt that are exposed to the sun for extended periods, absorbing large amounts of heat and releasing this heat throughout the day and night.

In the City of Port Phillip the UHI effect is felt more in areas where there is limited tree canopy, large areas of impermeable surfaces and minimal chance of cooling breezes from the Bay. Levels of air pollution can also contribute to the UHI.

Urban trees provide important shade to ease the urban heat island effect. They contribute to biodiversity, assist with storm water management, and make green spaces attractive and appealing and as a result active.

The creation of an urban forest includes not only trees but all vegetation in the municipality and the soil and water that supports it. Broad calculations from the 'Growing Green Guide' produced in 2014 suggest that large mature trees provide 75% more environmental benefits than smaller trees.

Whilst the environmental benefits of trees can be clearly identified, the broader social and cultural impacts are less studied but just as important.

2.3.1 Impacts On Health And Wellbeing

The City of Port Phillip is exposed to hot summers and regular heat events; numerous studies have associated high temperatures with adverse health. Extreme environmental heat can trigger the onset of acute conditions, including heat stroke and dehydration, as well as exacerbate a range of underlying illnesses.

During prolonged heat events the impact of UHI effect on our health and wellbeing is exacerbated. Heat waves already kill more Australians than any other natural disaster, and have led to many deaths in Victoria, currently heat related deaths in Victoria exceed the annual road toll. People living in high density areas are at greater risk during heat events as a result of the UHI.

Ultra violet (UV) radiation is also an important consideration as skin cancers are currently accounting for around 83% of all new cancers diagnosed each year in Australia.

Improving tree canopy and other measures to increase shade within the municipality can reduce overall exposure to UV radiation by about 75% and concurrently reduce surface and ambient temperatures to minimise the UHI effect.



Figure 1: Aerial Thermal Image of the City of Port Phillip from the CSIRO My Climate website
Source: <http://thermalweb.it.csiro.au/arcgis/myclimate/index.html>



Figure 2: Aerial Thermal Images
Road Surface Temperature with no shade



Figure 3: Aerial Thermal Images
Park Surface Temperature with no shade



Figure 4: Aerial Thermal Images
Park Surface Temperature with tree shade



Figure 5: Aerial Thermal Images
Tree Canopy Surface Temperature

2.3.2 Pavements Gets Hot

Pavement increases the summertime temperatures in cities and suburbs. This 'heat island effect' in urban areas often increases temperatures by about 4 degrees (C) higher than surrounding rural areas. This in turn increases the need for electricity to power fans and air conditioning units. The elevated temperatures also contribute to the formation of ground-level ozone – the main component of smog.

2.3.3 De-paving

Reducing the Urban Heat Island throughout CoPP is one of the major goals of Greening Port Phillip. One of the ways to achieve this outside of providing shade is to remove the hard surfaces themselves, replacing with permeable/ porous materials and or vegetation.

Impervious surfaces such as concrete and asphalt can be useful for providing access for pedestrians, bicyclists, wheelchair users, and cars. However, the paving over of millions of acres of land and vegetation have contributed to numerous economic and environmental problems. In many cities, over half of the urban land is paved for roadways and parking lots. While we may need sidewalks and roadways, we can minimize the pavement we use for driveways and parking areas, and thereby restore the natural environment.

Impervious surfaces prevent rainwater from entering the soil and instead divert it to nearby waterways. Along the way, the rainwater carries pollutants such as oil, plastics, pesticides, and heavy metals from the roads into local streams and rivers and Port Phillip Bay.

2.3.4 Porous / Permeable Surfaces

Pervious surfaces can be either porous or permeable; both surfaces are preferred over impervious surfaces where practical. The important distinction between the two is:

- Porous surfacing is a surface that infiltrates water across the entire surface.
- Permeable surfacing is formed of material that is itself impervious to water but, by virtue of voids formed through the surface, allows infiltration through the pattern of voids.

Permeable surfaces provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers.

The water can be temporarily stored before infiltration to the ground, reused, or discharged to a watercourse or other drainage system. Surfaces with an aggregate sub-base can provide good water quality treatment.

2.3.5 Cool Roads

Conventional asphalt used for road surfaces in our streets absorb heat due to the dark colour, low reflectivity of light and mass.

Emerging technologies such as light coloured roads can assist with lowering surface and ambient air temperatures, lowering energy costs of nearby buildings and supporting the growth of nearby trees and vegetation.

We are monitoring outcomes of studies into light coloured roads to determine their effectiveness and impacts to immediate urban surrounds.



Figure 6: Photo of City of Port Phillip Street January, 2016

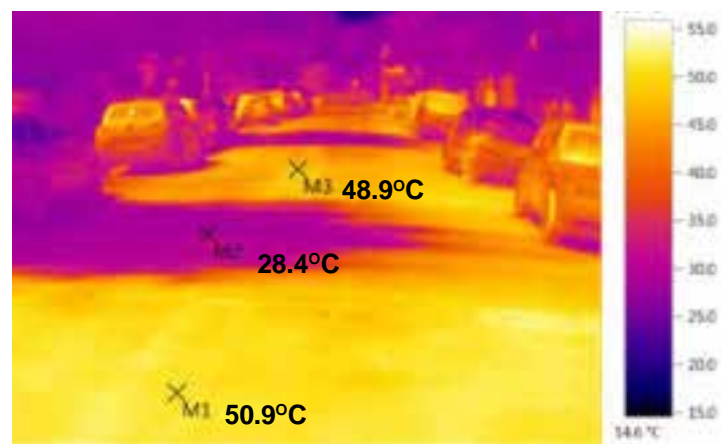


Figure 7: Thermal Image of City of Port Phillip Street January, 2016. The temperature was 27°C when the image was taken.



Figure 8: Recent work undertaken in in Bridge Street, Port Melbourne, provided an opportunity to depave the existing median, providing tree and understory planting opportunities to assist in mitigating urban heat island effect.

2.3.6 Cool Buildings

As redevelopment pressures on private lot developments within the municipality continue to reduce vegetation coverage and permeability it is important that features such as green roofs and walls and new vegetation is considered within redevelopments.

Alternatives such as white roof and wall claddings can also reduce surface and ambient temperatures providing for improved thermal comfort in both indoor and outdoor environments.



2.4. Walk and Bike Plan

The City of Port Phillip's Walk Plan 2011-2020 and The Plan 2011-2020 are about making Port Phillip better for walking and biking. Prioritising walking and biking is vital if Port Phillip is to remain a great place to live, work and visit.

One of the objectives of Greening Port Phillip is to other objectives to help encourage residents and visitors to walk and bike more, which can be achieved by increasing shade and amenity along this network.

Port Phillip has set the ambitious target of reducing its community greenhouse gas emissions 50% by 2020 and getting more people on out of cars is important to achieving this. Currently, up to 20% of car trips in Australia are less than 5 kilometers, which is a convenient distance to ride. If we cycle for just 5% of our car trips we have the potential to reduce our greenhouse gas emissions by up to 8%.

In response to this, Port Phillip has challenged the traditional hierarchy of road users which emphasises the dominance of motor vehicles. Our road user hierarchy places the needs of pedestrians first, followed by bicycles, public transport users and finally, motor vehicles. It's about making our streets people places, not spaces for cars.

Some quick benefits of walking and biking are:

- Helps keeps us fit and healthy and is a great way to exercise for all ages. Just walking to public transport can contribute to achieving the recommended 30 minutes of daily exercise.
- Important to build the connections between people that form the social fabric of our communities meet friends and neighbours and feel part of what's going on. Leaving our cars at home also reduces traffic congestion and helps make our neighbourhoods and streets active, more enjoyable and safer.
- Is good for our local economy. The more people get out and about, the more they see what's on offer. Walking is also related to social equity, car ownership should be an option rather than a necessity.

For further information please see below:

City of Port Phillip – Walk Plan 2011-2020 http://www.portphillip.vic.gov.au/default/SustainableEnvironmentDocuments/WalkPlan_FeetFirst_v16.pdf

City of Port Phillip – Bike Plan 2011-2020 http://www.portphillip.vic.gov.au/default/SustainableEnvironmentDocuments/BikePlan_PedalPower_v14.pdf

2.5. Planting Opportunities

Street tree planting works involves three different programs within a street or street section. These are:

- **In-fill planting**, which primarily addresses planting out with same or similar species.
- **Partial renewal**, which may involve the removal of some declining or inappropriate trees and in-fill planting to reinforce a preferred tree species. This program may also involve the construction of new or improved planting sites, such as in-road planters or expanded sites in hard surfaces.
- **Renewal**, which involves the removal of most if not all, inappropriate or declining street trees and replacing with appropriate species. This program could also incorporate the creation of new or improved planting sites.

Planting tree in streets present a variety of challenges. Given the varied development patterns throughout the City of Port Phillip a site specific approach is required to deliver tree planting within a street.

Challenges include:

- Narrow footpaths – on road parking between car spaces utilising Not standing zones, next to cross-overs etc
- Power lines – broad spreading trees
- Wide roads – outstand/median strips
- WSUD treatments
- De-paving
- Compacted/poor soils

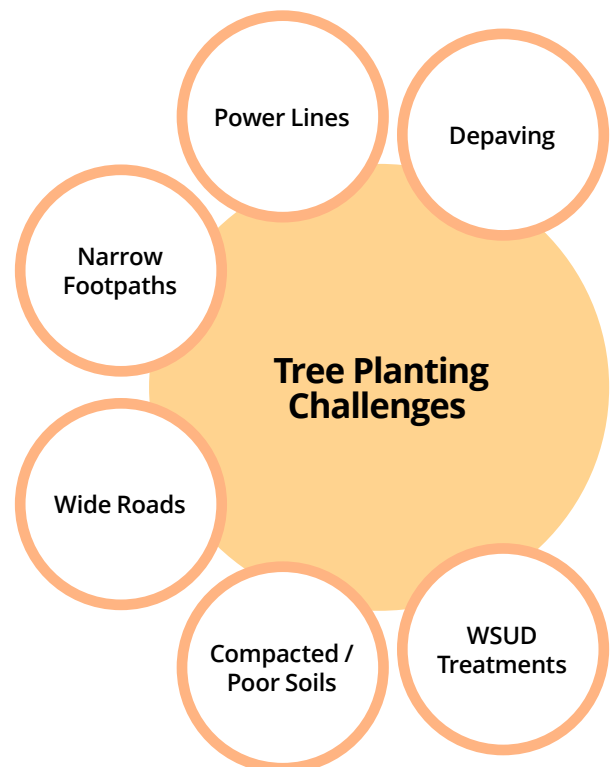


Figure 9: Bicycle path along Beaconsfield Parade

CASE STUDY : BRIDGE STREET

Location: Between Pickles Street and Esplanade East

No. trees planted: 36

De-paving achieved: 350sqm.

Forecasted additional canopy: 500sqm.

Bridge Street, Port Melbourne is a wide residential street with angle parking on both sides of the street, generous footpath widths and a median running through its centre.

Prior to the upgrade there were large spaces between existing trees, both on the footpath and median.

There was a lot of opportunity to develop an attractive streetscape with broad canopied trees and consistent spacing.

The most significant change to the streetscape was converting the paved median into a garden bed with new tree planting, this has significantly improved the look and feel of the street and will only improve as the trees continue to grow.



Bridge Street Before



Bridge Street After



Bridge Street After

CASE STUDY : HOTHAM STREET

Location: Between Dorcas Street and Coventry Street

No. trees planted: 6

De-paving achieved: 18sqm.

Forecasted additional canopy: 40sqm.

Hotham Street, South Melbourne is a narrow street in an older industrial area which has since become a mixture of residential and commercial.

The street is one way with narrow footpaths, and not a lot of space for trees.

The road was a good option for tree planting, it allows more space for the trees to spread and receive additional water from the road run-off.

Tree plots were installed without impacting on car park numbers.



Hotham Street Before



Hotham Street After



Hotham Street After

CASE STUDY : JAMES SERVICE PLACE

Location: Between Cecil Street and Ferrars Place

No. trees planted: 31

De-paving achieved: 250sqm.

Forecasted additional canopy: 200sqm.

James Service Place, South Melbourne is an extremely wide residential street with grass nature strips on each side.

Prior to the upgrade there was un-marked angle parking on both sides of the street with small trees in the road surface.

The street had a number of obstacles that needed to be negotiated as part of the design and community consultation. Half the street has a large stormwater pipe through the centre, the views down the street are protected and there is an historic marching ground on the road surface in front Memorial Hall.

The road was a good option for tree planting to help narrow the road and in the future cover the large expanse of asphalt with canopy. To help facilitate the addition of trees, line marking was put in to control how and where people parked their cars.

Garden beds were installed at each intersection which were planted with low cover natives and trees. All new garden beds and tree plots were built with bluestone edges to tie into the streets heritage character and allow water run-off to passively irrigate them.



James Service Place Before



James Service Place After



James Service Place After

2. Current Urban Forest Situation



James Service Place After



James Service Place After



James Service Place After

3. Implementation by Neighbourhood



3.1. Implementation

The list of which streets are prioritised for tree planting was developed predominately through consideration of the amount of canopy cover that is present in each street across the City of Port Phillip.

Canopy cover across the City of Port Phillip was measured using a multispectral image and then aerial photographs were used to confirm the accuracy of the measurements. Specialist GIS software was then used to divide the mapped canopy into various land use types, including streets and parks. The canopy cover for each street and lane in the City of Port Phillip was then calculated.

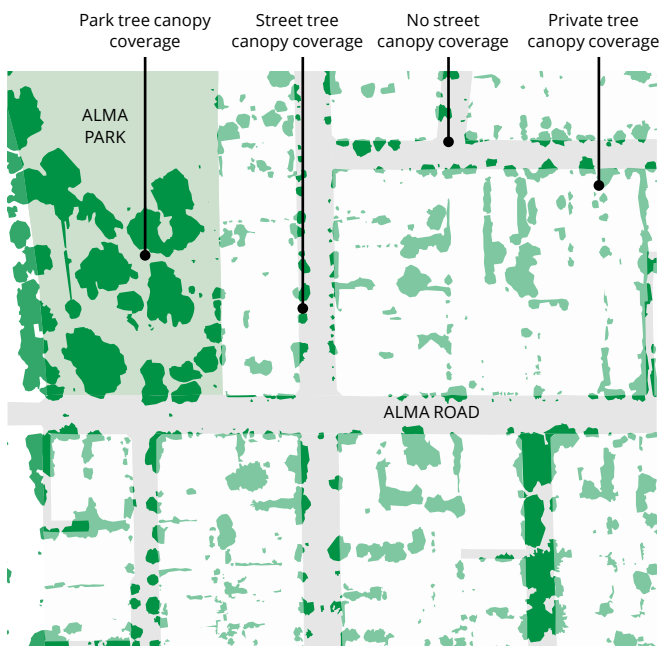
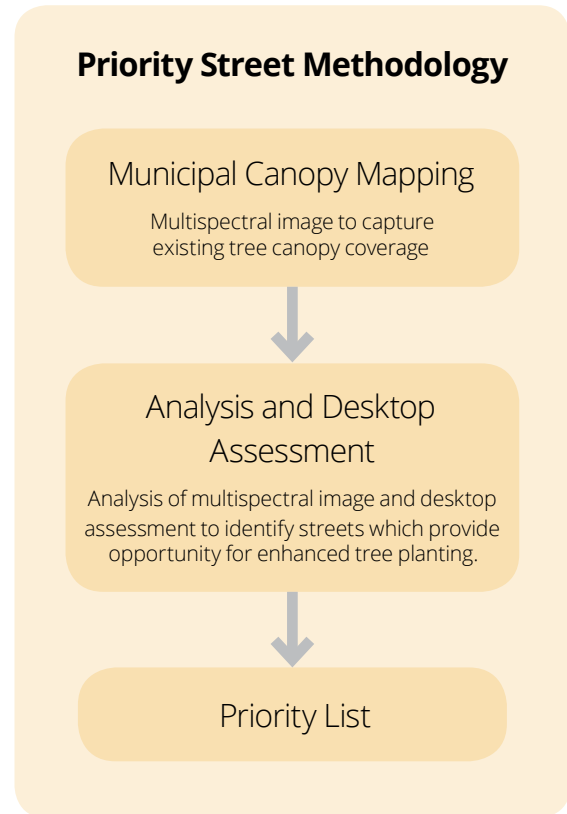
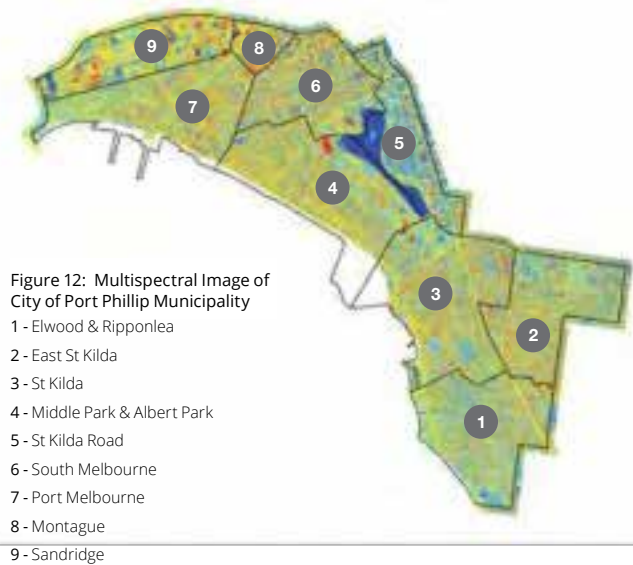


Figure 10: Existing Tree Canopy Mapping in East St Kilda - Plan

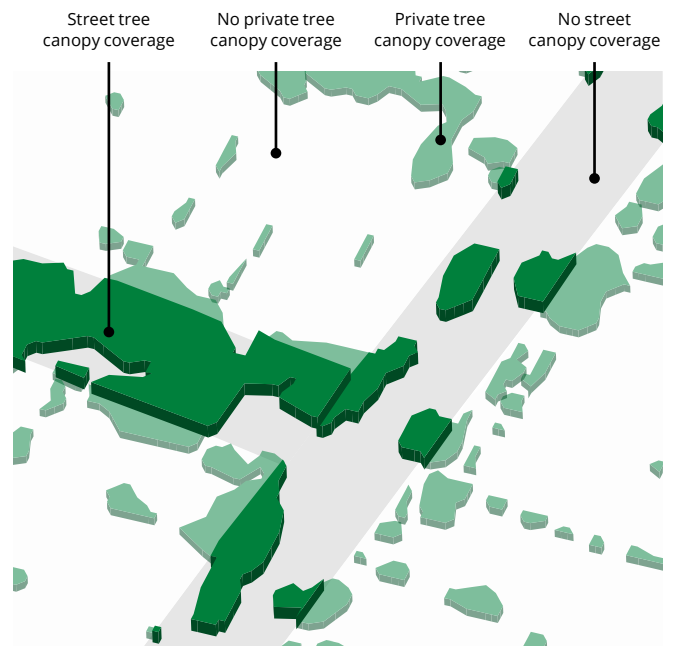


Figure 11: Existing Tree Canopy Mapping in East St Kilda - Plan

3.1.1 Prioritising streets

A neighbourhood approach was then used to prioritise streets. Seven neighbourhood precincts were identified in the City of Port Phillip. They are:

- East St Kilda;
- Elwood and Ripponlea;
- Middle Park and Albert Park;
- Port Melbourne
- Fishermans Bend Urban Renewal Area; Montage and Sundridge / Wirraway
- South Melbourne;
- St Kilda; and
- St Kilda Road.

Within each precinct, streets have been ranked by the extent that they are covered by tree canopy. All streets with low canopy (0–20%) were inspected to determine their appropriateness for tree planting.

Every precinct will have its share of streets prioritised for planting. Works will focus on streets with 0–10% canopy cover first, and then on streets with 11–20% canopy cover as budget allows.

The inspection process, coupled with existing data, clarified the age, species and health of all trees within the City of Port Phillip. From such data, a valuable understanding of which species contribute to which neighbourhood's character, and which species are likely to survive and thrive in which urban settings, can be established.

3.1.2 Other Considerations

A number of additional circumstances can contribute to the benefits that street trees provide, according to circumstances, the types of benefits considered, and on a case by case basis. Social needs can be taken into account, for instance by using shading to help the vulnerable, so where there are schools, hospitals, bus stops, retirement homes, the provision of street trees may be considered important. Similarly, commercial areas and public transport interchanges will have greater foot traffic and so street trees may perform a greater role in these areas.

More benefit from shading also occurs where exposure to the sun is greatest. These areas include north and west facing slopes and areas with a lot of unshaded impermeable surface. Conversely, less shading benefit is provided in areas where street trees are in turn shaded by adjacent structures, such as taller buildings. In addition, recent research has shown tree canopy provides greater human thermal comfort in streets oriented North–South compared to East–West, because of where and when the shade falls.

The biodiversity benefits of street trees are often greater for native species compared to exotic species, so when in-fill is likely to utilise native species that planting could be prioritised. Similarly, it is important to support areas of high biodiversity, so strengthening those areas with the addition of appropriate trees may be therefore a priority.

Streets in areas with less public open space could be prioritised over streets in areas rich with parklands. And when it comes to value for money, it is often practical to coordinate tree planting with other planned works, such as road renewal, kerb, channel and pit works, maintenance of underground services and so forth. It may also be cheaper to install street trees in infill projects than in more complex retrofitting situations. The cost of traffic management during tree planting programs can also be quite significant.

3.1.3 Prioritising parks

Park plantings will occur in tandem with street plantings, though the criteria used to select parks for prioritisation will be different to the criteria used to prioritise streets. Rather than the amount of canopy cover, those parks with a high percentage of trees in poor or declining health will be prioritised for additional planting.

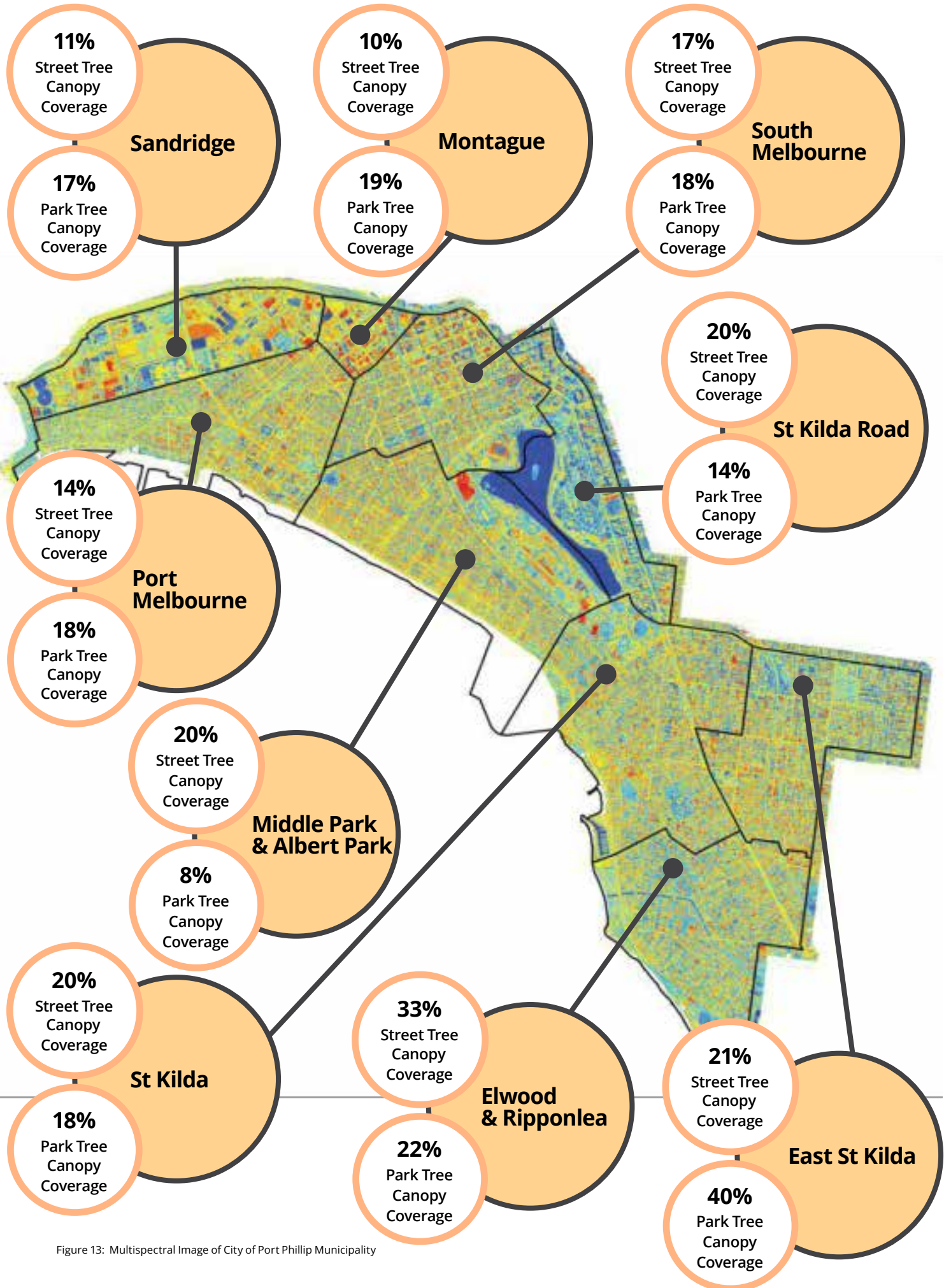


Figure 13: Multispectral Image of City of Port Phillip Municipality

3.2. Analysis

The size of the different neighbourhoods and their character has an impact on opportunities for improving the urban forest situation across the municipality.

Elwood - Ripponlea - Is an established neighbourhood with wide streets and iconic boulevards. The Port Phillip Bay Foreshore is a key characteristic of the open space network. Existing tree canopy coverage in both streets and parks is above the municipal average.

East St Kilda - Is an established neighbourhood with a high density of residential dwellings and the lowest open space area in the municipality. Existing tree canopy coverage in streets and parks is above the municipal average.

St Kilda - Compared to other neighbourhoods, St Kilda has higher areas of Streets and Parks. Existing Street canopy coverage is above the municipal average, while park canopy coverage is below the municipal average.

Middle Park - Albert Park - Is another established neighbourhood with close proximity to Port Phillip Bay and Albert Park, with iconic treed streets. It has the largest area of parks in the municipality. Tree canopy coverage in streets is above the municipal average, while tree canopy in parks is below the municipal average.

St Kilda Road - is the smallest neighbourhood but has the second highest park area in the municipality. Street canopy coverage is below the municipal average while Park canopy coverage is below the municipal average.

South Melbourne - has both a residential and commercial character and is located adjacent to the Melbourne CBD. Existing street canopy coverage is above the municipal average while park canopy coverage is below the municipal average.

Port Melbourne - With is the largest neighbourhood in the COPP. Its proximity to the Melbourne CBD and commercial and industrial focus, it has the highest street area in the municipality. Existing tree canopy coverage in both streets and parks is below the Municipal average.

Montague - Sandridge - These precincts differ substantially from other neighbourhoods, they are planned to transition from predominantly industrial land uses to a genuine mix of residential, office, retail, entertainment and education. The area have relatively low levels of canopy cover, well below the Municipal average, and as such there are discrepancies between the various streets and parks with the other neighbourhood precincts.



Figure 14: Neighbourhood Area Comparison

Percentage Street and Park Areas Compared to Overall Neighbourhood Area

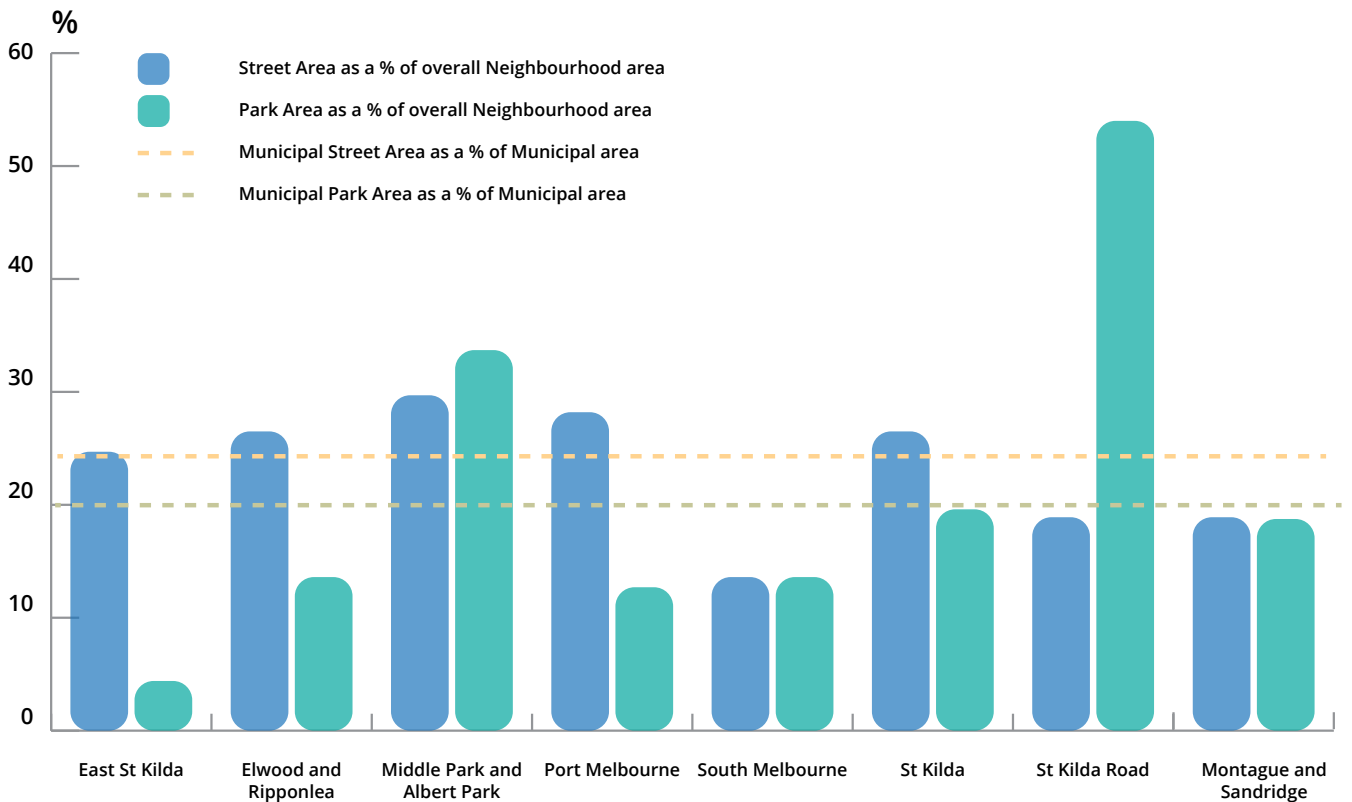


Figure 15: Neighbourhood Street and Park Area Compared to Overall Neighbourhood Area

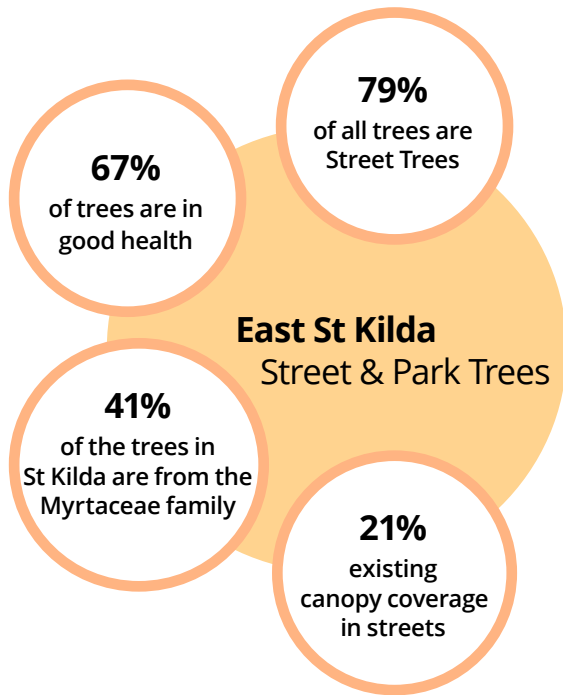
Percentage Street and Park Canopy Cover Per Neighbourhood



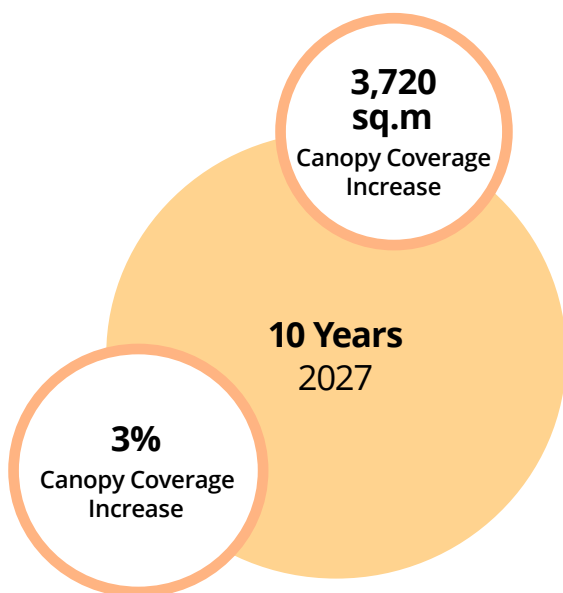
Figure 16: Neighbourhood Street Canopy and Park Canopy Coverage Percent Per Neighbourhood

3.3. East St Kilda

East St Kilda is an established neighbourhood with a high density of residential dwellings and the lowest open space area in the municipality. Existing tree canopy coverage in streets and parks is above the municipal average.



New Street Tree Planting 10 Year Canopy Targets



East St Kilda Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	58.1	12.4	21%
Parks	10.2	4.1	40%
Residential	140.3	21.9	16%
Commercial	8.1	0.3	3%
Industrial	1.2	<0.0	2%
Other Public Land	17.1	3.2	19%

Tree Summary	Quantity
Street Trees	3464
Park Trees	902
Total	4366

Tree Health Summary	Quantity
Good	2912
Fair	1328
Poor	117

Most Common Tree Species in East St Kilda

Family	Common Example	Quantity
Myrtaceae	Myrtle	1779
Platanaceae	Plane	430
Oleaceae	Olive	344
Rosaceae	Rose	194
Ulmaceae	Elm	188
Lythraceae	Crepe Myrtle	134
Cupressaceae	Cypress	121
Hamamelidaceae	Witch-hazel	111
Magnoliaceae	Magnolia	109
Anacardiaceae	Cashew	96

Figure 17: Opposite page, Aerial Image of East St Kilda



East St Kilda

Streets prioritised for tree planting works in the next 5 years for East St Kilda

0-10% Existing Canopy Coverage

- 01 CARDIGAN STREET
- 02 CARLISLE STREET
- 03 CHAPEL STREET
- 04 EVELYN STREET
- 05 HOTHAM STREET
- 06 JERVOIS STREET
- 07 MARLBOROUGH STREET
- 08 MARTIN STREET
- 09 SHIRLEY GROVE
- 10 THE AVENUE
- 11 WILLIAM PLACE
- 12 WOODSTOCK STREET
- 13 YOUNG STREET

10%-20% Existing Canopy Coverage

- 14 ALBION STREET
- 15 ALFRED STREET
- 16 ARGYLE STREET
- 17 BALSTON STREET
- 18 BOWEN STREET
- 19 BRUNNING STREET
- 20 CAMDEN STREET
- 21 CHARLES STREET
- 22 DUKE STREET
- 23 FULTON STREET
- 24 GIBBS STREET
- 25 GLEN EIRA AVENUE
- 26 GOURLAY STREET
- 27 KING STREET
- 28 KURRAJONG AVENUE
- 29 LAMBERT GROVE
- 30 NIGHTINGALE STREET
- 31 OAK GROVE
- 32 PALM COURT
- 33 SEBASTOPOL STREET
- 34 SYCAMORE GROVE
- 35 WILGAH STREET
- 36 WILLIAM STREET

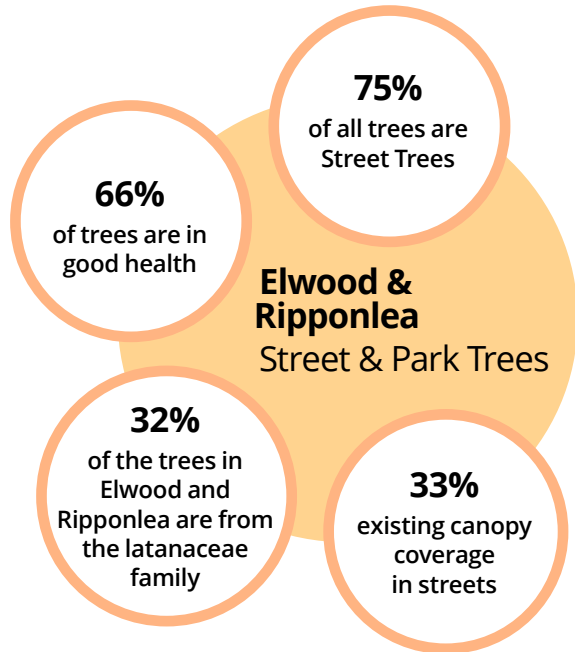


LEGEND

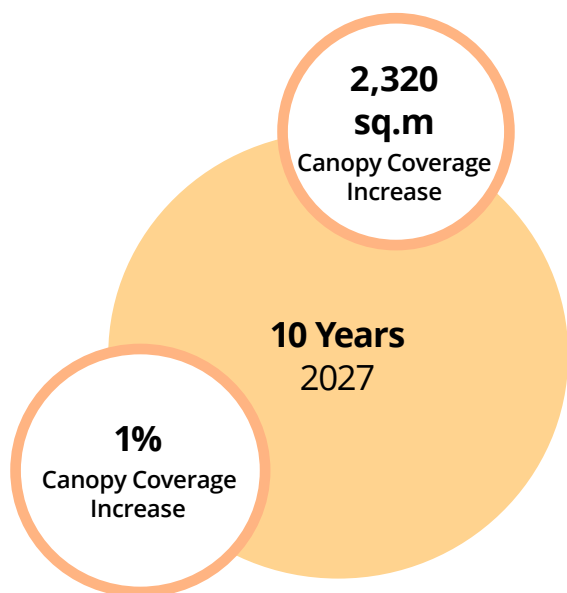
- CANOPY COVER**
- <10% CANOPY COVER
- 10-20% CANOPY COVER
- 20 - 50% CANOPY COVER
- LANDUSE**
- OPEN SPACE
- STREET
- PUBLIC LAND
- COMMERCIAL
- INDUSTRIAL
- RAIL LINE

3.4. Elwood and Ripponlea

Elwood - Ripponlea is an established neighbourhood with wide streets and iconic boulevards. The Port Phillip Bay Foreshore is a key characteristic of the open space network. Existing tree canopy coverage in both streets and parks is above the municipal average.



New Street Tree Planting 10 Year Canopy Targets



Elwood and Ripponlea Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	70.0	23.2	33%
Parks	35.9	7.7	22%
Residential	143.0	23.9	17%
Commercial	5.9	0.6	10%
Other Public Land	9.3	2.4	26%

Tree Summary	Quantity
Street Trees	3797
Park Trees	1251
Total	5048

Tree Health Summary	Quantity
Good	3318
Fair	1500
Poor	182

Most Common Tree Species in Elwood and Ripponlea

Family	Common Example	Quantity
Platanaceae	Plane	1628
Myrtaceae	Myrtle	1364
Casuarinaceae	Casuarina	1093
Proteaceae	Banksia	762
Mimosaceae	Acacia	526
Oleaceae	Olive	270
Rosaceae	Rose	197
Araucariaceae	Pine	145
Hamamelidaceae	Which-hazel	137
Arecaceae	Palm	136

Figure 18: Opposite page, Aerial Image of Elwood and Ripponlea



Elwood and Ripponlea

Streets prioritised for tree planting works in the next 5 years for Elwood and Ripponlea

0 - 10% Existing Canopy Coverage

- 01 BIBLE STREET
- 02 GLEN EIRA AVENUE
- 03 MARINE PARADE
- 04 MASON AVENUE
- 05 OAK GROVE
- 06 ORMOND ESPLANADE

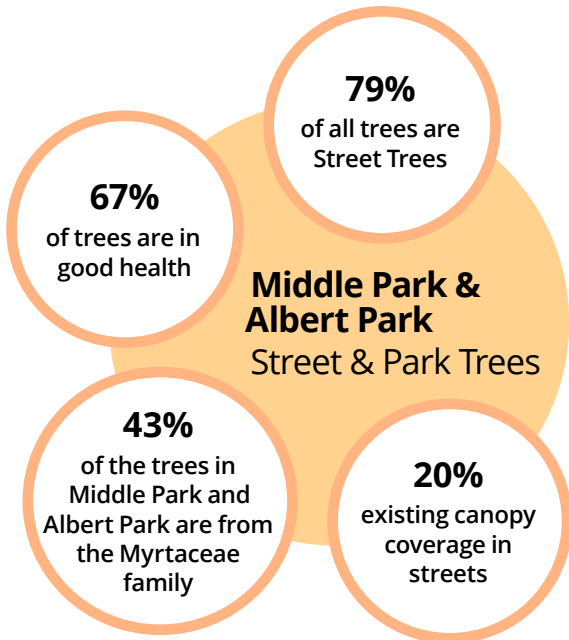
10%-20% Existing Canopy Coverage

- 07 BELL STREET
- 08 BRIGHTON ROAD
- 09 CLARKE STREET
- 10 GLEN HUNTLY ROAD
- 11 HOTHAM STREET
- 12 KNIGHT STREET
- 13 MORRES STREET
- 14 ORMOND ROAD
- 15 SOUTHEY COURT

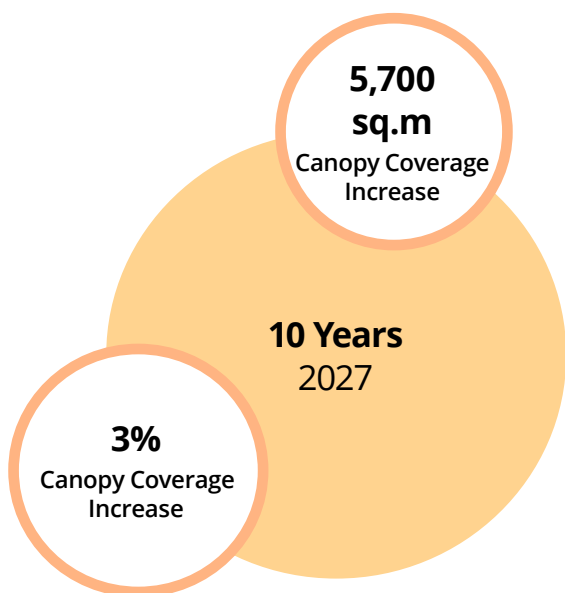


3.5. Middle Park and Albert Park

Middle Park - Albert Park is an established neighbourhood with close proximity to Port Phillip Bay and Albert Park, with iconic treed streets. It has the largest area of parks in the municipality. Tree canopy coverage in streets is above the municipal average, while tree canopy in parks is below the municipal average.



New Street Tree Planting 10 Year Canopy Targets



Middle Park and Albert Park Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	94.8	19.0	20%
Parks	107.7	8.8	8%
Residential	101.2	9.7	10%
Commercial	6.6	0.3	4%
Other Public Land	9.1	3.0	33%

Tree Summary	Quantity
Total Number of Trees	3464
Park Trees	902
Total	4366

Tree Health Summary	Quantity
Good	2912
Fair	1328
Poor	117

Most Common Tree Species in Middle Park and Albert Park

Family	Common Example	Quantity
Myrtaceae	Myrtle	1884
Platanaceae	Plane	913
Ulmaceae	Elm	504
Oleaceae	Olive	495
Rosaceae	Rose	335
Proteaceae	Banksia	314
Malvaceae	Hibiscus	294
Arecaceae	Palm	239
Mimosaceae	Acacia	189
Lythraceae	Crepe Myrtle	189

Figure 19: Opposite page, Aerial Image of Middle Park and Albert Park



Middle Park and Albert Park

Streets prioritised for tree planting works in the next 5 years for Middle Park and Albert Park

0 - 10% Existing Canopy Coverage

- 01 ASHWORTH STREET
- 02 BEACONSFIELD PARADE
- 03 BEVAN STREET
- 04 BRIDPORT STREET
- 05 CANTERBURY PLACE
- 06 GATEHOUSE LANE
- 07 HERBERT PLACE
- 08 LITTLE GRAHAM STREET
- 09 NEVILLE STREET
- 10 SMITH STREET

10%-20% Existing Canopy Coverage

- 11 BOYD STREET
- 12 CANTERBURY ROAD
- 13 CARTER STREET
- 14 DINSDALE STREET
- 15 DURHAM STREET
- 16 FERRARS STREET
- 17 FOOTE STREET
- 18 HERBERT STREET
- 19 JOHNSON LANE
- 20 KERFERD PLACE
- 21 KERFERD ROAD
- 22 LANGRIDGE STREET
- 23 MADDEN STREET
- 24 MERTON PLACE
- 25 MILLS STREET
- 26 NIMMO STREET
- 27 PATTERSON STREET
- 28 PHILIPSON STREET
- 29 VICTORIA AVENUE
- 30 WITHERS STREET
- 31 WRIGHT STREET



LEGEND

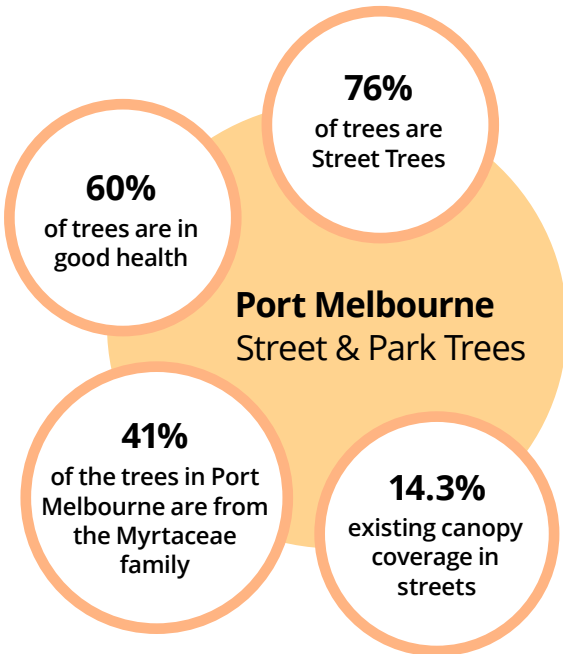
- CANOPY COVER**
- <10% CANOPY COVER
- 10-20% CANOPY COVER
- 20 - 50% CANOPY COVER
- LANDUSE**
- OPEN SPACE
- STREET
- PUBLIC LAND
- COMMERCIAL

3. Implementation By Neighbourhood



3.6. Port Melbourne

Port Melbourne is the largest neighbourhood in the COPP. Its proximity to the Melbourne CBD and commercial and industrial focus, it has the highest street area in the municipality. Existing tree canopy coverage in both streets and parks is below the Municipal average.



Port Melbourne Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	122.7	17.6	14%
Parks	55.5	9.9	18%
Residential	116.4	10.7	9%
Commercial	128.4	4.9	4%
Industrial	6.2	1.7	27%
Other Public Land	6.1	1.9	31%
Special Purpose	0.3	<0.0	4%

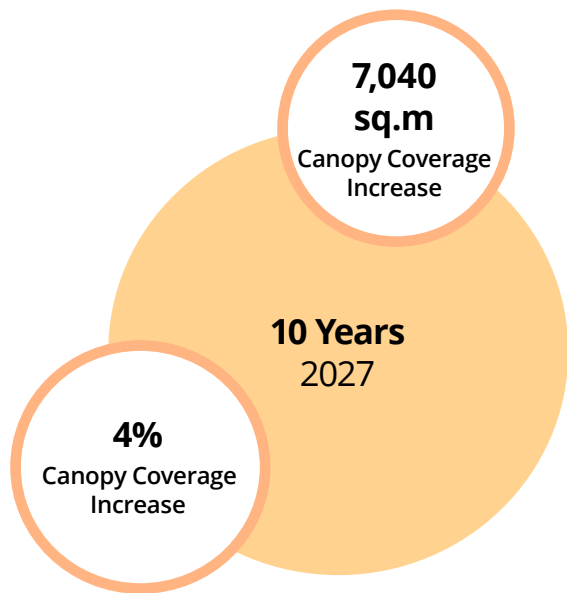
Tree Summary	Quantity
Street Trees	7565
Park Trees	2350
Total	9915

Tree Health Summary	Quantity
Good	5922
Fair	3620
Poor	315

Figure 20: Below, Aerial Image of Port Melbourne



New Street Tree Planting 10 Year Canopy Targets



Most Common Tree Species in Port Melbourne

Family	Common Name	Quantity
Myrtaceae	Myrtle	4049
Oleaceae	Olive	650
Rosaceae	Rose	543
Proteaceae	Banksia	521
Casuarinaceae	Casuarina	504
Arecaceae	Palm	453
Meliaceae	Lilac	438
Platanaceae	Plane	355
Mimosaceae	Acacia	324
Ulmaceae	Elm	298



Port Melbourne

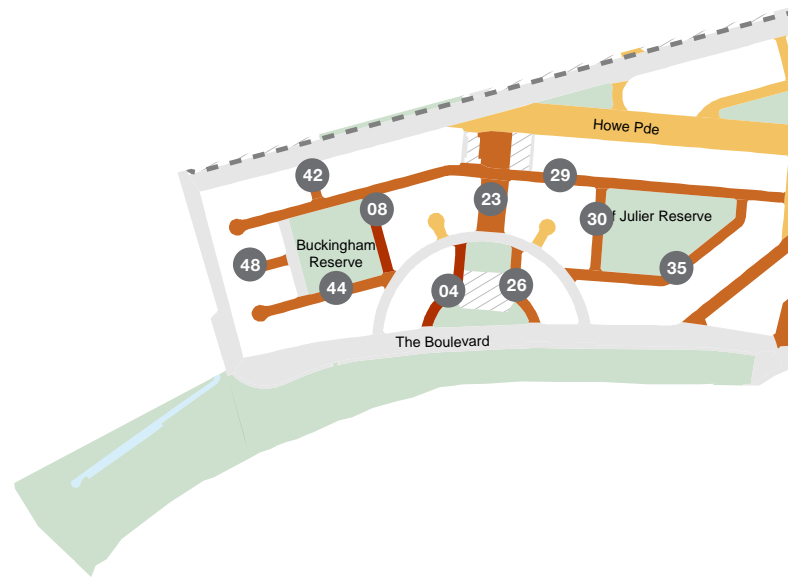
Streets prioritised for tree planting works in the next 5 years for Port Melbourne

0 - 10% Existing Canopy Coverage

- 01 ALBERT STREET
- 02 ALFRED STREET
- 03 BATH PLACE
- 04 BATMAN ROAD
- 05 CAMBRIDGE STREET
- 06 CANBERRA MEWS
- 07 CROCKFORD STREET
- 08 ENTERPRISE AVENUE
- 09 GRAHAM STREET
- 10 INGLES STREET
- 11 LITTLE DOW STREET
- 12 LITTLE INGLES STREET
- 13 MARKET PLACE
- 14 MCCORMACK STREET
- 15 MORLEY MEWS
- 16 NELSON STREET
- 17 PECKVILLE STREET
- 18 ROUSE STREET

10%-20% Existing Canopy Coverage

- 19 AUSTRALIS CIRCUIT
- 20 BARAK ROAD
- 21 BEACON ROAD
- 22 BYRNE STREET
- 23 CENTRE AVENUE
- 24 CRUIKSHANK PLACE
- 25 CRUIKSHANK STREET
- 26 CUMBERLAND ROAD
- 27 DANKS STREET WEST
- 28 DERHAM STREET
- 29 DUNSTAN PARADE
- 30 EDINA AVENUE
- 31 ELLINIS MEWS
- 32 FARRELL STREET
- 33 FLORENCE PLACE
- 34 GARTON STREET
- 35 GELLIBRAND ROAD
- 36 JOHNSTON STREET
- 37 MELVILLE STREET
- 38 NORMA BARNETT LANE
- 39 PAGE AVENUE
- 40 POOLMAN STREET
- 41 PRINCES STREET
- 42 PYE STREET
- 43 RAGLAN STREET
- 44 SANDRIDGE AVENUE
- 45 STRATHAIRD MEWS
- 46 SWALLOW STREET
- 47 TOM HILLS COURT
- 48 WEEROONA STREET



LEGEND

- CANOPY COVER**
- <10% CANOPY COVER
 - 10-20% CANOPY COVER
 - 20 - 50% CANOPY COVER

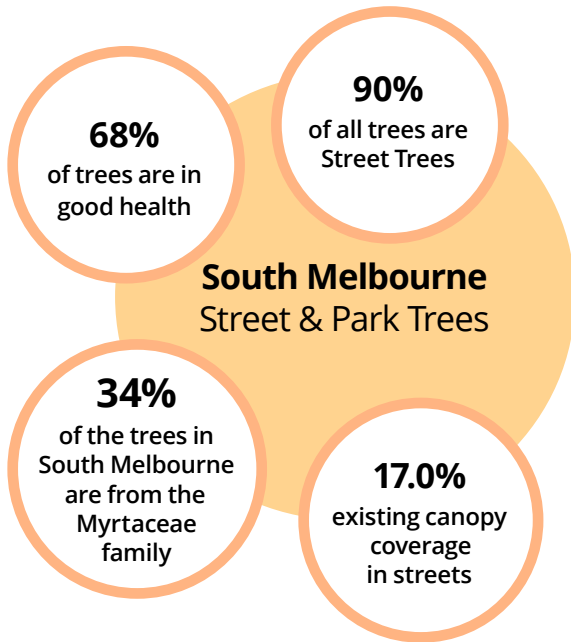
- LANDUSE**
- OPEN SPACE
 - STREET
 - PUBLIC LAND
 - COMMERCIAL
 - INDUSTRIAL
 - FISHERMANS BEND RENEWAL AREA

3. Implementation By Neighbourhood

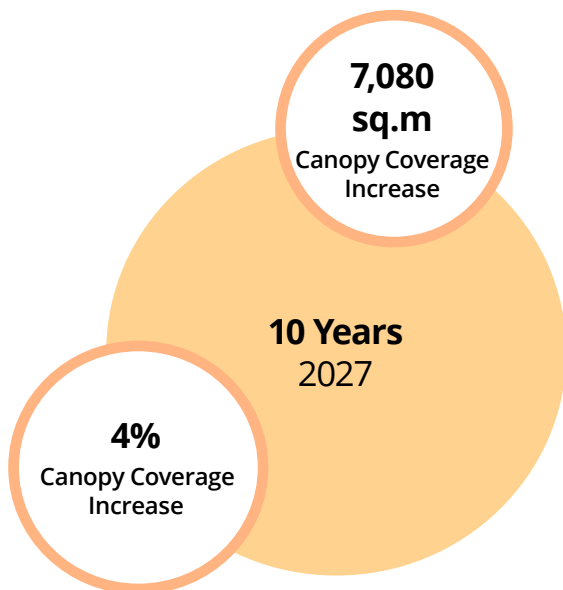


3.7. South Melbourne

South Melbourne has both a residential and commercial character and is located adjacent to the Melbourne CBD. Existing street canopy coverage is above the municipal average while park canopy coverage is below the municipal average.



New Street Tree Planting 10 Year Canopy Targets



South Melbourne Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	104.2	17.7	17%
Parks	37.4	6.7	18%
Residential	59.8	6.7	11%
Commercial	64.8	0.13	2%
Industrial	0.8	<0.0	2%
Other Public Land	8.1	2.3	29%

Tree Summary	Quantity
Street Trees	5486
Park Trees	818
Total	6119

Tree Health Summary	Quantity
Good	4145
Fair	1849
Poor	109

Most Common Tree Species in South Melbourne

Family	Common Example	Quantity
Myrtaceae	Myrtle	2050
Ulmaceae	Elm	900
Rosaceae	Rose	505
Oleaceae	Olive	375
Platanaceae	Plane	312
Betulaceae	Birch	239
Fagaceae	Oak	157
Bignoniaceae	Bignonia	153
Arecaceae	Palm	146
Lythraceae	Crepe Myrtle	117

Figure 21: Opposite page, Aerial Image of South Melbourne



South Melbourne

Streets prioritised for tree planting works in the next 5 years for South Melbourne

0-10% Existing Canopy Coverage

- 01 BEVAN STREET
- 02 CITY ROAD
- 03 COOTE STREET
- 04 COVENTRY PLACE
- 05 EVILLE STREET
- 06 FRANCIS STREET
- 07 KINGS WAY
- 08 LAW STREET
- 09 LITTLE BOUNDARY STREET
- 10 LITTLE IFFLA STREET
- 11 LITTLE LYELL STREET
- 12 LITTLE MOUNTAIN STREET
- 13 MORRIS STREET
- 14 NELSON PLACE
- 15 NORMANBY STREET
- 16 PATTERSON PLACE
- 17 QUEEN STREET
- 18 STURT STREET

10%-20% Existing Canopy Coverage

- 19 ALBERT ROAD
- 20 CANTERBURY ROAD
- 21 CECIL STREET
- 22 CHURCH STREET
- 23 CLARENDON STREET
- 24 COVENTRY STREET
- 25 DALY STREET
- 26 DORCAS LANE
- 27 DORCAS STREET
- 28 EMERALD HILL PLACE
- 29 EMERALD STREET
- 30 FERRARS STREET
- 31 FITZPATRICK STREET
- 32 JAMES SERVICE PLACE
- 33 MARKET STREET
- 34 MCLARTY LANE
- 35 MERTON STREET
- 36 MORAY STREET
- 37 PALMERSTON CRESCENT
- 38 PERRINS STREET
- 39 RAGLAN PLACE
- 40 SMITH STREET
- 41 ST VINCENT PLACE SOUTH
- 42 VICTORIA STREET

LEGEND

- CANOPY COVER**
- <10% CANOPY COVER
- 10-20% CANOPY COVER
- 20 - 50% CANOPY COVER
- LANDUSE**
- OPEN SPACE
- STREET
- PUBLIC LAND
- COMMERCIAL
- INDUSTRIAL
- FISHERMANS BEND RENEWAL AREA

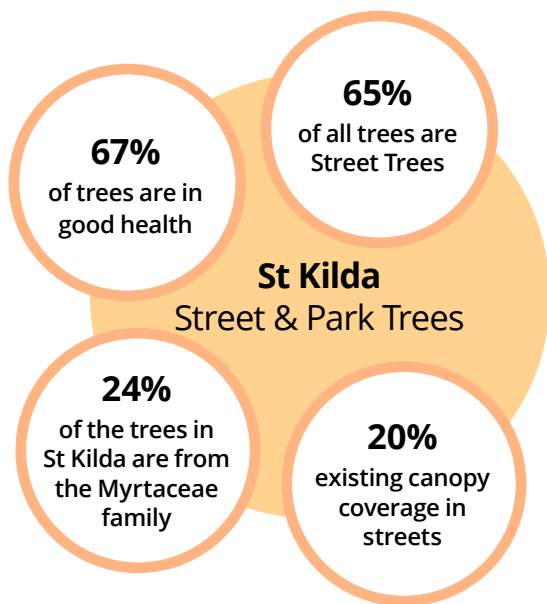


3. Implementation By Neighbourhood

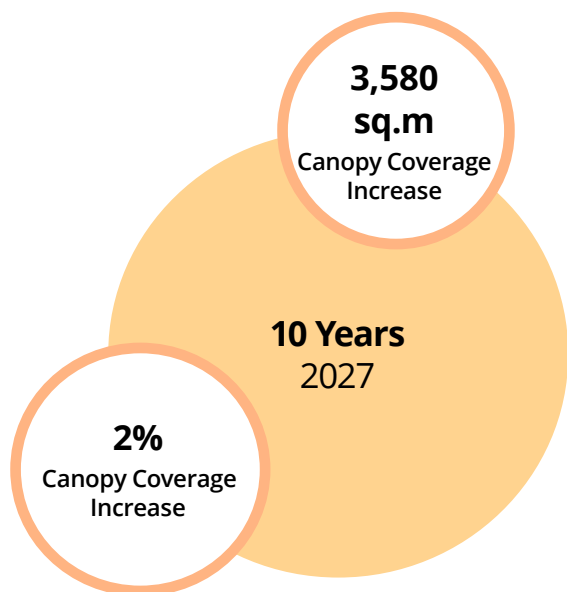


3.8. St Kilda

Compared to other neighbourhoods, St Kilda has higher areas of Streets and Parks. Existing Street canopy coverage is above the municipal average, while park canopy coverage is below the municipal average.



New Street Tree Planting 10 Year Canopy Targets



St Kilda Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	88.7	17.9	20%
Parks	65.6	11.5	18%
Residential	147.5	23.3	16%
Commercial	25.7	1.5	6%
Special Purpose	4.2	0.1	3%
Other Public Land	3.4	0.8	24%

Tree Summary	Quantity
Street Trees	4224
Park Trees	2226
Total	6450

Tree Health Summary	Quantity
Good	4314
Fair	1752
Poor	236

Most Common Tree Species in St Kilda

Family	Common Example	Quantity
Myrtaceae	Myrtle	1529
Platanaceae	Plane	800
Arecaceae	Palm	618
Ulmaceae	Elm	457
Oleaceae	Olive	351
Proteaceae	Banksia	260
Mimosaceae	Acacia	218
Rosaceae	Rose	200
Lythraceae	Crepe Myrtle	180
Casuarinaceae	Casuarina	171

Figure 22: Opposite page, Aerial Image of St Kilda











St Kilda

Streets prioritised for tree planting works in the next 5 years for St Kilda

0 - 10% Existing Canopy Coverage	10%-20% Existing Canopy Coverage
01 ALBERT STREET	20 BALLUK WILLAM COURT
02 ALFRED SQUARE	21 BARKLY STREET
03 ARGYLE STREET	22 BELFORD STREET
04 BEACONSFIELD PARADE	23 BRIGHTON ROAD
05 CAVELL STREET	24 BROWNING STREET
06 CHAPEL STREET	25 BURNETT STREET
07 COWPER STREET	26 CANTERBURY ROAD
08 ENFIELD STREET	27 CHARNWOOD CRESCENT
09 FARMER STREET	28 CLYDE STREET
10 IRWELL STREET	29 DRYDEN STREET
11 JACKA BOULEVARD	30 EILDON COURT
12 LYELL STREET	31 EMILTON AVENUE
13 MARINE PARADE	32 FITZROY STREET
14 MORONEY STREET	33 FOSTER STREET
15 NELSON STREET	34 FRAMPTON STREET
16 NEPTUNE STREET	35 HENRYVILLE STREET
17 SHAKESPEARE GROVE	36 LAMBETH PLACE
18 VICTORIA STREET	37 MARKET STREET
19 WORDSWORTH STREET	38 MARLTON CRESCENT
	39 MARRIOTT STREET
	40 MILTON STREET
	41 MITCHELL STREET
	42 PARK LANE
	43 PRINCES STREET
	44 SMITH STREET
	45 SOMERSET STREET
	46 SPENSER STREET
	47 ST KILDA ROAD
	48 ST LEONARDS AVENUE
	49 ST LEONARDS PLACE
	50 STEELE AVENUE
	51 VALE STREET
	52 WATERLOO CRESCENT
	53 WELLINGTON STREET

LEGEND

	CANOPY COVER <10% CANOPY COVER		LANDUSE OPEN SPACE
	10-20% CANOPY COVER		STREET
	20 - 50% CANOPY COVER		PUBLIC LAND
			COMMERCIAL
			INDUSTRIAL

3. Implementation By Neighbourhood

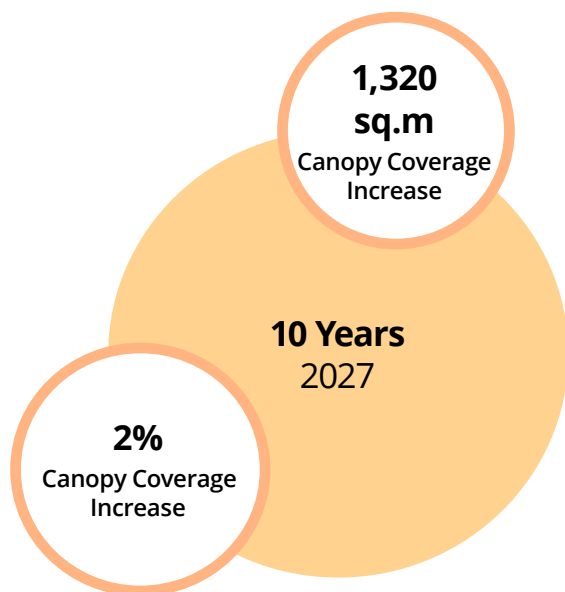


3.9. St Kilda Road

St Kilda Road is the smallest neighbourhood but has the second highest park area in the municipality. Street canopy coverage is below the municipal average while Park canopy coverage is below the municipal average.



New Street Tree Planting 10 Year Canopy Targets



St Kilda Road Tree Analysis

Tree Canopy Analysis			
Land Use	Land Use Area (ha)	Canopy Area (ha)	% Canopy Coverage
Street	32.6	6.6	20%
Parks	93.2	12.7	14%
Residential	18.0	1.7	10%
Commercial	28.9	2.0	7%
Other Public Land	<0.0	<0.0	50%

Tree Summary	Quantity
Street Trees	906
Park Trees	48
Total	946

Tree Health Summary	Quantity
Good	662
Fair	273
Poor	8

Most Common Tree Species in St Kilda Road

Family	Common Example	Quantity
Ulmaceae	Elm	332
Platanaceae	Plane	211
Myrtaceae	Myrtle	125
Caesalpiniaceae	Golden Rain	69
Sterculiaceae	Chestnut	34
Betulaceae	Birch	31
Oleaceae	Olive	25
Casuarinaceae	Casuarina	23
Meliaceae	Lilac	20
Fagaceae	Oak	15

Figure 23: Opposite page, Aerial Image of St Kilda Road



St Kilda Road

Streets prioritised for tree planting works in the next 5 years for St Kilda Road

0-10% Existing Canopy Coverage

- 01 BOWEN LANE
- 02 HENRY STREET
- 03 KINGS PLACE
- 04 PALMERSTON CRESCENT
- 05 WELLS STREET

10%-20% Existing Canopy Coverage

- 06 BANK STREET
- 07 BOWEN CRESCENT
- 08 DORCAS STREET
- 09 HIGH STREET
- 10 LEOPOLD STREET
- 11 LORNE STREET
- 12 PUNT ROAD
- 13 QUEENS ROAD
- 14 RALEIGH STREET
- 15 ROY STREET

3. Implementation By Neighbourhood



Fishermans Bend - Montague and Sandridge / Wirraway

The Fisherman's Bend area has relatively low levels of canopy cover, and as with the other neighbourhood precincts there are discrepancies between the various streets.

The prioritisation of street tree planting within Fisherman's Bend will be approached differently compared to the other 7 neighbourhood precincts, which have been prioritised by existing canopy cover.

City of Port Phillip will prioritise the upgrades of streets within FBURA will be staged to align with development and population growth. 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.

Desired Outcomes within Fishermans Bend

The following principles will guide the future streetscapes within the Montague and Sandridge/Wirraway Neighbourhoods, a healthy urban forest is critical in achieving the following:

- Prioritising walking and bike riding as principle modes of transport. This will be achieved through 'low speed' streets and the provision of dedicated, safe and legible walking and cycling networks both within and to/from Montague Precinct
- Enhancing the open space network by creating pedestrian friendly streetscapes, separated from vehicles, that encourage people to interact and dwell
- Minimising space for private vehicle trips and on-street car parking

- Ensuring independent mobility is achieved for 8 to 80 year olds, resulting in less vehicle trips
- Meeting the challenges of a changing climate by providing elements to mitigate stormwater impacts and the urban heat island effect
- Being aspirational with how the streetscapes can perform and contribute to place making and community building

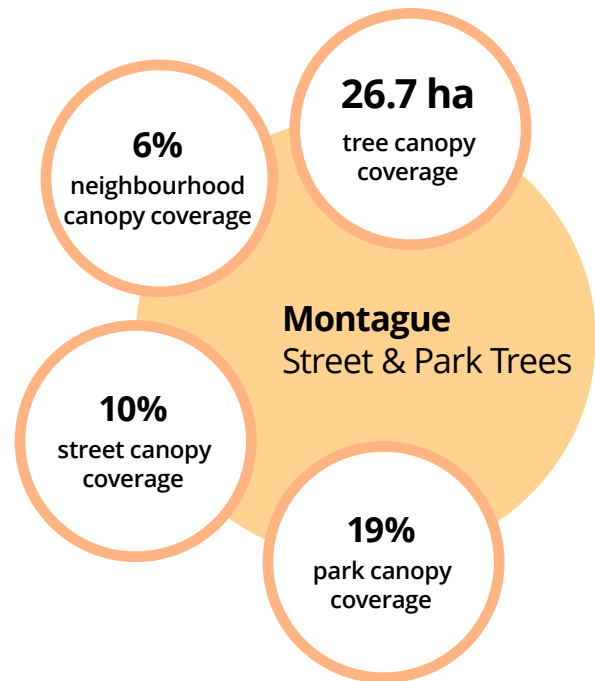


Figure 24: Below, Aerial Image of Fishermans Bend



Transitional Controls

The future street profiles will be a significant change from the current industrial streetscapes within Fishermans Bend. Future tree planting will be based on these upgrades.

A key requirement of any streetscape works is to ensure at the end of the process the street can function safely with minimal requirements for maintenance in the short term.

In an area of transition such as Fishermans Bend this is likely to require streetscapes to be delivered after the majority of development has occurred. This reduces the chances of construction activity damaging streetscapes resulting in the need for costly repairs and maintenance.

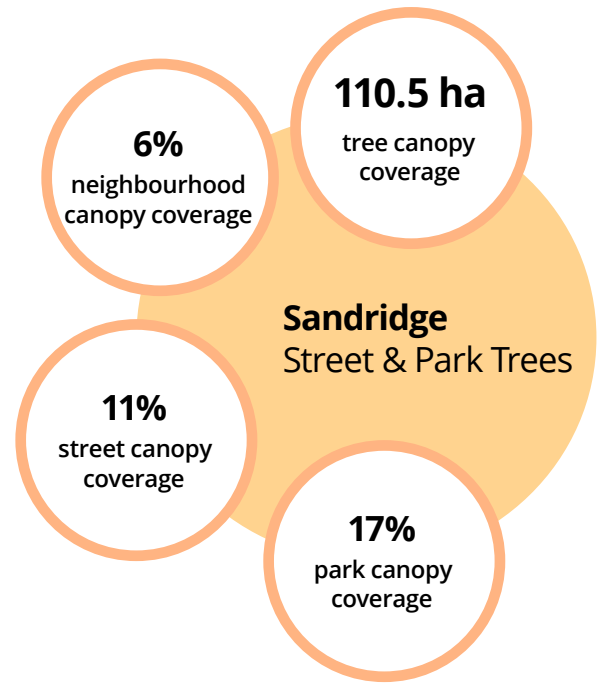
The City of Port Phillip will investigate innovative pop-up streetscapes / temporary installations provide an indication of the future streetscapes without having to invest in major capital upgrades. This may include new parklets, tree planter boxes, temporary bicycle separators. Pop-up and temporary items can be easily moved or reused as required to meet the needs of construction across the precinct.

Planting types and locations

Environmental conditions within FBURA make greening challenging. A high saline water table, poor soils, and coastal winds, combined with contamination and tall buildings mean robust species selections are necessary.

A healthy urban forest is critical to cooling the city, maintaining the health, wellbeing and happiness of residents and stimulating economic activity and property values. Additional benefits include air and water purification, and provision of habitat for birds and pollinators.

There is a preference for 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.



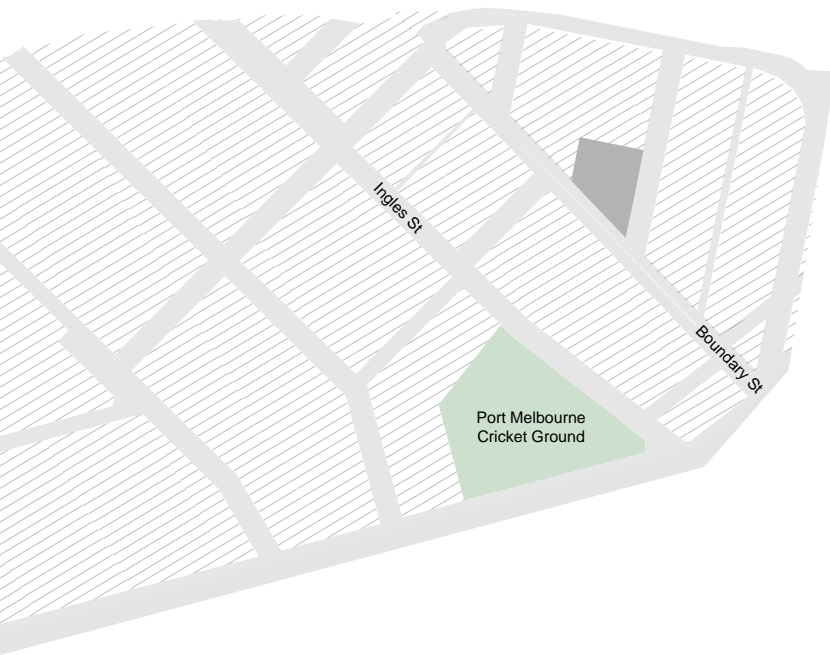
3.10. Fishermans Bend - Montague

Streets prioritised for tree planting works in the next 5 years for Fishermans Bend - Montague

LEGEND

- CANOPY COVER**
 - <10% CANOPY COVER
 - 10-20% CANOPY COVER
 - 20 - 50% CANOPY COVER
- LANDUSE**
 - OPEN SPACE
 - STREET
 - PUBLIC LAND
 - COMMERCIAL
 - INDUSTRIAL



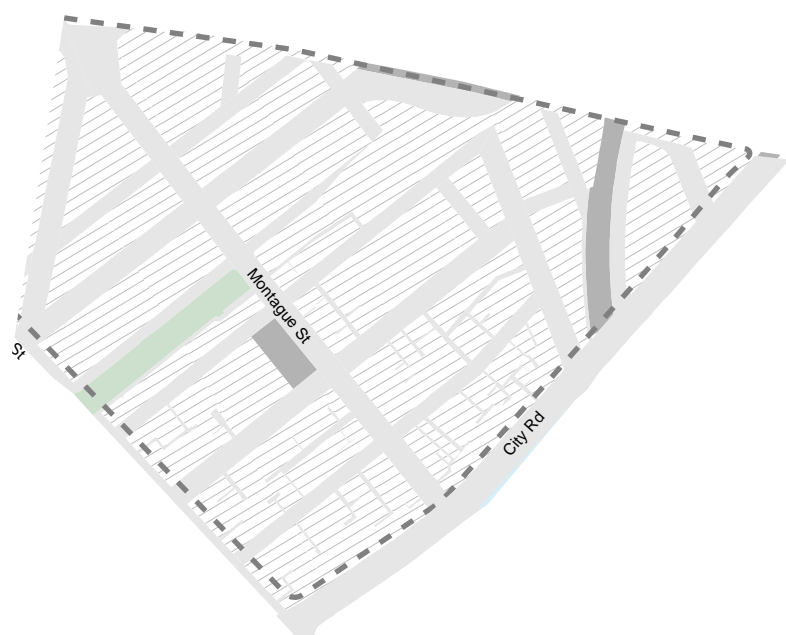


3.11. Fishermans Bend - Sandridge / Wirraway

Streets prioritised for tree planting works in the next 5 years for Sandridge / Wirraway

LEGEND

- CANOPY COVER**
- <10% CANOPY COVER
- 10-20% CANOPY COVER
- 20 - 50% CANOPY COVER
- LANDUSE**
- OPEN SPACE
- STREET
- PUBLIC LAND
- COMMERCIAL
- INDUSTRIAL



3.12. Additional resources

For further information please see below:

City of Port Phillip – Walk Plan 2011-2020 http://www.portphillip.vic.gov.au/default/SustainableEnvironmentDocuments/WalkPlan_FeetFirst_v16.pdf

City of Port Phillip – Bike Plan 2011-2020 http://www.portphillip.vic.gov.au/default/SustainableEnvironmentDocuments/BikePlan_PedalPower_v14.pdf

4. Appendices



4.1. Neighbourhood Tree Species Palettes

The following tree species lists are based on tree species commonly used in each neighbourhood that are known to be suitable for the area. This list is not exclusive and new species are continuously being assessed for their potential to be used for new plantings or to replace species that are not coping with the changing climatic conditions. Council officers will review and update the species palettes every two years with new tree species in line with aesthetic, functional, climatic and environmental requirements.

Existing Neighbourhood Street Tree Species List

			East St Kilda	Elwood and Ripponlea	Middle Park and Albert Park	St Kilda	South Melbourne	Port Melbourne	St Kilda Road	Montague	Sandridge
Small trees < 9 metres											
Species	Common Name	Origin and type									
<i>Acer buergerianum</i>	Trident Maple	Exotic deciduous	●	●							
<i>Allocasuarina verticillata</i>	Drooping She Oak	Native evergreen						●			●
<i>Banksia marginata</i>	Silver Banksia	Native evergreen			●						
<i>Callistemon 'Harkness'</i>	Harkness Bottlebrush	Native evergreen	●	●	●	●	●	●	●	●	●
<i>Cupaniopsis anacardioides</i>	Tuckeroo	Native evergreen						●			●
<i>Eucalyptus leucoxylon 'Magnet'</i>	Euky Dwarf Yellow Gum	Native evergreen	●		●						
<i>Lagerstroemia indica X L. fauriei var.</i>	Indian Summer Crepe Myrtle varieties	Exotic deciduous	●		●	●	●	●	●	●	●
<i>Leptospermum laevigatum</i>	Coast Tea Tree	Native evergreen			●						
<i>Malus ioensis 'Plena'</i>	Bechtel Crabapple	Exotic deciduous				●					
<i>Morus alba 'Pendula'</i>	Weeping Mulberry	Exotic deciduous					●			●	
<i>Tristaniopsis laurina</i>	Kanooka, Water Gum	Native evergreen	●			●		●			●
<i>Olea europaea ssp. europaea 'Tolley's Upright'</i>	European Olive variety	Exotic evergreen	●	●	●		●	●		●	●

Existing Neighbourhood Street Tree Species List

East St Kilda
 Elwood and
 Ripponlea
 Middle Park and
 Albert Park
 St Kilda
 South Melbourne
 Port Melbourne
 St Kilda Road
 Montague
 Sandridge

Medium trees 9-15 metres

Species	Common name	Origin and type	East St Kilda	Elwood and Ripponlea	Middle Park and Albert Park	St Kilda	South Melbourne	Port Melbourne	St Kilda Road	Montague	Sandridge
<i>Acer truncatum</i> X <i>A. platanoides</i> 'Keithsform'	Norwegian Sunset Shantung Maple	Exotic deciduous		●							
<i>Agonis flexuosa</i>	Willow Myrtle	Native evergreen	●	●	●						
<i>Allocasuarina verticillata</i>	Drooping She Oak	Native evergreen		●	●						
<i>Banksia integrifolia</i> var. <i>integrifolia</i>	Coast Banksia	Native evergreen			●	●		●			●
<i>Brachychiton populneus</i>	Kurrajong	Native evergreen					●	●		●	●
<i>Corymbia eximia</i>	Yellow Bloodwood	Native evergreen		●							
<i>Corymbia ficifolia</i>	Red-flowering Gum	Native evergreen	●	●	●	●		●	●		●
<i>Eucalyptus pauciflora</i> subsp. <i>pauciflora</i>	Snow Gum	Native evergreen				●					
<i>Fraxinus ornus</i> var.	Flowering Ash	Exotic deciduous				●					
<i>Jacaranda mimosifolia</i>	Jacaranda	Exotic deciduous				●					
<i>Lophostemon confertus</i>	Queensland Brush Box	Native evergreen	●	●	●	●	●	●		●	●
<i>Melaleuca linariifolia</i>	Snow-in-summer	Native evergreen	●			●	●	●		●	●
<i>Melia azedarach</i> 'Elite'	White Cedar variety	Exotic deciduous	●	●		●	●	●	●	●	●
<i>Pistacia chinensis</i>	Chinese Pistachio	Exotic deciduous		●	●						
<i>Pyrus calleryana</i> var.	Callery's Pear varieties	Exotic deciduous	●	●	●	●	●	●		●	●

Large trees > 15 metres

Species	Common name	Origin and type	East St Kilda	Elwood and Ripponlea	Middle Park and Albert Park	St Kilda	South Melbourne	Port Melbourne	St Kilda Road	Montague	Sandridge
<i>Angophora costata</i>	Smooth-barked Apple	Native evergreen		●				●			●
<i>Corymbia maculata</i>	Spotted Gum	Native evergreen			●	●	●	●	●	●	●
<i>Eucalyptus leucoxylon</i>	Yellow Gum	Native evergreen	●		●	●	●			●	
<i>Eucalyptus sideroxylon</i>	Red Ironbark	Native evergreen					●			●	
<i>Fraxinus pennsylvanica</i> 'Cimzam'	Cimmaron™ Green Ash	Exotic deciduous		●			●	●		●	●
<i>Livistona australis</i>	Cabbage Palm	Palm			●	●					
<i>Phoenix canariensis</i>	Canary Island Date Palm	Palm			●	●		●			●
<i>Platanus orientalis</i> 'Autumn Glory'	Oriental Plane variety	Exotic deciduous	●	●	●	●	●	●	●	●	●
<i>Platanus X acerifolia</i>	London Plane	Exotic deciduous	●	●	●	●	●	●	●	●	●
<i>Waterhousea floribunda</i>	Weeping Lilly Pilly	Native evergreen	●		●	●	●	●		●	●
<i>Ulmus procera</i>	English Elm	Exotic deciduous			●		●		●	●	
<i>Quercus acutissima</i>	Bristle-tipped Oak	Exotic Deciduous					●			●	
<i>Quercus palustris</i>	Pin Oak	Exotic deciduous					●	●		●	●
<i>Ulmus parvifolia</i> var.	Chinese Elm varieties	Exotic deciduous					●	●		●	●
<i>Washingtonia robusta</i>	Washington Palm	Palm						●			●

4.2. Frequently Asked Questions To Tree Planting

Q: Do I need a permit to cut down a tree on my property?

A: If the trunk is greater than 1.5m in circumference at 1m above ground, it is classified as a significant tree and you do need a permit. To apply for a permit, contact ASSIST on 9209 6777.

Q: Can I apply to have a tree planted out the front of my house in the nature strip?

A: Yes. To initiate this process contact ASSIST on 9209 6777 and file a tree planting request. Once the request is made a council arborist will inspect the site to determine if planting is appropriate. If the street meets planting requirements, a tree species and location will be selected. Trees will be listed for planting and scheduled in the current planting season. You will be notified of the outcome of this process in a letter. Tree planting is undertaken during the months of April to October by council contractors.

Q: How do I get new trees planted in my street?

A: This document provides council with a 5 year plan and priorities for streetscape that council has committed to greening. If your street has been listed, the Parks and Open Space team will undertake an assessment of the streetscape, engage the community, develop a plan and select an appropriate tree species for the delivery of the project. If your streetscape is not noted within the first 5 years it will be assessed for future planting in the 2014 streetscape assessment.

Q: What is the process if a tree is hanging low over a pedestrian footpath from private property?

A: Contact ASSIST on 9209 6777 and provide the location and details of the issue. A local laws officer will contact property owners to undertake the pruning within a specified timeframe.

Q: What is the process if I think the street trees need pruning?

A: Contact ASSIST on 9209 6777 and a street tree maintenance request will be generated and directed to Council's tree maintenance contractor for action. All pruning is undertaken according to the appropriate Australian Standards and/or contract specification. Should further pruning be necessary it will require approval from council's arborist.

Q: What is the process for having a street tree removed and replaced that I think is dangerous or dying?

A: Contact ASSIST on 9209 6777 and provide the location and details of the issue. A tree removal request will be generated for assessment by Council's arborist. A condition report is produced and presented to the Tree Removal Assessment Panel (TRAP) for approval. If removal is approved, the tree and stump will be scheduled for removal and the nearby residents notified. If removal is not approved you will be advised in writing.