



City of
STONNINGTON

2017 – 2022

Urban Forest Strategy

Adopted by Council June 2017

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Executive summary



The importance of the urban forest to a city's liveability, environment and prosperity is widely recognised. Trees and green spaces play an important role in our physical and mental wellbeing and are an essential element of any city. The City of Stonnington is fortunate to have a diverse and mature urban forest that underpins the character and amenity of the City.

The urban forest is facing a range of pressures, principally from housing development and increasing urban densification. It is estimated that in excess of 1,000 established trees are being removed from private land within the City of Stonnington every year.

The rapid loss of trees on private land places an increasing importance on growing the urban forest in the public realm. This includes both protecting established trees as well as planting new trees. New and innovative approaches are needed to grow larger trees in areas that present significant

physical constraints to tree growth, such as the dense residential and commercial areas in the western end of the municipality.

Through the City's annual tree planting programs, there is a net increase in tree stock on public land every year. Encouraging and requiring the protection, replacement and planting of trees on private land is also essential to ensure the stability and success of the urban forest.

The City of Stonnington's *Council Plan 2017 – 2021* outlines four key pillars of Community, Liveability, Environment

and Economy that guide the vision, direction and provision of Council services. A thriving urban forest helps to support all of these pillars and is a core element of the character of the City.

The Urban Forest Strategy has been developed to help enable the protection and enhancement of the urban forest in the face of the many challenges that affect urban trees. The Strategy provides clear direction for Council and the community on tree management in both the public and private realm.

Vision ▼

The City of Stonnington will have a healthy, resilient, diverse and valued urban forest that will continue to be a core element of the character and liveability of the City. The urban forest will underpin the health and wellbeing of the community, increase biodiversity and environmental outcomes and help strengthen economic activity.

Outcomes ▼

The Urban Forest Strategy seeks to achieve the following outcomes:

- › Increased vegetation cover
- › Improved health and quality of the urban forest
- › Greater resilience to a changing climate
- › Reduced urban heat island effect
- › Enhanced amenity and liveability

Key directions ▼

The Urban Forest Strategy will realise its vision by enacting eight key directions:

01 Protect and value existing trees

02 Sustain and support a healthy and safe urban forest

03 Renew ageing trees

04 Grow the urban forest

05 Create feature boulevard plantings

06 Create habitat

07 Manage the interface between trees and infrastructure

08 Increase the cover of alternative Green Infrastructure



Introduction



Urban forests are a significant element of the character, identity and liveability of cities, which are generally dominated by buildings, infrastructure and other hard surfaces. Trees provide a visual relief from the built form and a sense of seasonality and connection to nature often lacking in urban areas.

The urban forest contributes significantly to improving the physical and mental wellbeing of a city's residents and visitors. Trees also provide many other benefits to the community, the environment and local economic activity including improved air quality, cooler streets, reduced UV exposure, improved water management and reduced energy costs.

Stonnington is fortunate to have a diverse, mature and extensive urban forest that is widely recognised and appreciated by residents and visitors and helps to create a city in which people love to live and work. Approximately 25 per cent of the municipality is covered by tree canopy, which places Stonnington amongst the Melbourne municipalities with the highest canopy covers. This high canopy cover is largely due to the spreading mature trees that are found within the City's streets, parks and private gardens. As the large number of mature trees managed by the City of Stonnington continue to age, they will start to decline. If the succession of these mature trees is not properly managed it could result in a noticeable reduction in tree canopy cover across the municipality.

Challenges to growing and sustaining an urban forest

Increasing levels of development and housing densification on private land is resulting in decreasing numbers of private trees within the City and reduced opportunities for future tree growth. This places an increased importance on maximising, where possible, the inclusion of canopy trees in new developments and retaining and growing large canopy trees on public land.



The Urban Forest Strategy aims to provide clear direction for the protection, management and planting of trees on public and private land across Stonnington and addresses the key challenges facing Stonnington's urban forest.

The challenges to growing and sustaining a healthy, resilient, diverse and valued urban forest include:

- › population and housing growth
- › competition for limited space
- › conflict with surrounding infrastructure
- › a changing climate
- › an ageing tree population
- › community perceptions and acceptance of trees, and
- › tree related risk.

These challenges are explored in detail on pages 20-27 of this strategy.

There is a long lead time between when a tree is planted and when it can start providing significant benefits to the community and the environment. Consequently, there is a critical need for long term strategic planning and decisive action to protect existing trees, plan for future canopy cover and to maximise the health, resilience and value of the urban forest.

Community perceptions of the Urban Forest



A review of feedback from the 2016 community consultation survey reveals:

- › The City's trees and green spaces are highly valued by the community.
- › Residents recognise that trees contribute greatly to the appearance of public areas and improve the local environment.
- › Residents are concerned about the protection and enhancement of the City's trees.
- › Increased shading is desired, particularly in parks.



What is an urban forest?

An urban forest comprises all trees, shrubs and other vegetation growing across public and private land. This includes vegetation within parks, reserves, private gardens, along railways and waterways, street trees and other green infrastructure such as green walls and roofs.

While the urban forest encompasses all types of vegetation, perhaps the most important, intensively

managed, increasingly regulated and iconic element of an urban forest is its trees. Trees provide the most significant environmental, community and economic benefits, therefore this Strategy largely focuses on the protection, management and expansion of the City's urban tree population. The importance of other types of vegetation is also acknowledged.



Benefits of trees and other vegetation in the urban landscape



The City of Stonnington is characterised by its tree-lined boulevards, leafy streetscapes and historic parks. The intrinsic beauty of trees in an urban area is well understood – they soften the built landscape, give a sense of scale to built-up areas, and can add change and seasonality to a generally static backdrop.

Trees and other vegetation in the urban landscape also provide essential environmental services and offer extensive social and economic benefits. These values and benefits increase significantly with

tree age and maturity. Larger trees have more sizeable canopies which provide greater shade, remove more air pollutants, capture more rainwater and have a greater visual impact on the streetscape.

Trees provide many important environmental, community and economic benefits:

Environmental ▼	Community ▼	Economic ▼
Clean the air	Cool the city	Increase property value
Store carbon	Improve mental health and wellbeing	Reduce energy costs
Cycle nutrients	Reduce noise and wind	Create more attractive areas that increase economic activity
Provide habitat and food sources	Provide a connection to nature	Reduce UV damage to infrastructure
Reduce stormwater runoff	Add character and beauty to a city	Reduce health costs
Improve water quality	Encourage physical activity	Improve productivity

While built infrastructure generally provides a single function or benefit, trees can provide many different benefits simultaneously. For example, a sail over a playground provides shade. Trees planted around a playground provide shade, beauty, habitat for wildlife, evaporative cooling, carbon storage, air pollution reduction and a connection to nature.

The value of trees

Tree valuation methods attempt to put a monetary value on the benefits that a tree provides. These methods can take into account the environmental services that trees provide, such as energy savings and air cleaning as well as more intangible

benefits such as the amenity provided to the community. Such methods should be used with caution as no amount of money can replace an established urban forest with trees that have been growing for many decades.

The urban heat island effect



The urban heat island effect is a well-known phenomenon where urban centres are hotter than their surrounding rural areas.

This effect is caused by many factors, including:

- › extensive hard surfaces that absorb heat, such as brick and concrete
- › an increase in heat production from residential, industrial and transport processes
- › greater amounts of pollution preventing the escape of radiation
- › changes in wind speed and direction due to high-rise buildings preventing the passage of cooling winds, and
- › the reduction of evapotranspiration due to reduced vegetation cover, soil and open water sources.

The increases in temperature in urban areas can have major health impacts on residents, wildlife and vegetation. The urban heat island can increase the duration and intensity of heat waves, significantly affecting human health and comfort. Hard surfaces absorb heat during the day and release it at night, resulting in higher night time temperatures. If there is no night time respite, resilience to and recovery from heat stress is limited.

How vegetation cools cities

Vegetation can help to reduce the temperature of local areas. Trees shade buildings and pavement, which reduces the temperature of these surfaces and the surrounding air. Vegetation also undergoes transpiration, providing an additional cooling effect. Transpiration is typically greater with trees than other vegetation as their more extensive root systems allow for greater exploration and uptake of water.

Green roofs and walls provide buildings with both shade and additional insulation, resulting in noticeable temperature decreases within the building. This can have a direct impact on energy consumption by reducing the need for air-conditioning. Large green spaces, such as parks and gardens, are noticeably cooler than surrounding streets, particularly if these areas are irrigated.

The City of Stonnington commissioned satellite mapping to determine land surface temperature and vegetation cover across the municipality. The mapping identified key hot spots within the City, which correlated strongly with areas of low vegetation cover. This data helps to target and prioritise where additional planting could most effectively reduce the heat island effect in the City of Stonnington. See page 13 for details.



The urban heat island effect



Policy context



The development of an Urban Forest Strategy was identified as a priority in the Council Plan 2013 – 2017. The Strategy has been developed within the framework of a number of key Council documents:

Council Plan 2013 – 2017

Mandates the development of an Urban Forest Strategy to identify opportunities for additional tree planting throughout Stonnington to increase tree canopy in the public domain and reduce the heat island effect.

Municipal Public Health & Wellbeing Plan 2013 – 2017

Seeks to maintain and increase street and park tree canopy to provide shade and cooling as a key strategy for reducing the potential health effects of climate change.

Promotes outdoor activity through the provision of green, open spaces.

Public Realm Strategy 2010 (in review)

Provides a framework for improving the quality of the public realm including the benefits of urban trees.

Strategies for Creating Open Space

Promotes the importance of canopy trees for enhancing street amenity and developing linear forms of public open space.

Sustainable Environment Strategy 2013 – 2017

Promotes the value of urban trees for enhancing local biodiversity through the provision of food and habitat for local fauna.

Activity Centres Strategy (in development)

Provides an overarching plan for Council's Activity Centres focusing on improving the public realm with landscaping and enhanced walking and cycling access.

Resilient Melbourne Strategy

The City of Stonnington is a partner to the Resilient Melbourne Strategy, which sets out a series of distinct, yet connected, actions that will help make Melbourne a viable, liveable and prosperous city, long into the future.

Stonnington's urban forest today



The City of Stonnington is known for its tree lined streets and established parks and gardens. The City contains many significant avenues of mature deciduous and evergreen trees as well as trees of botanical and horticultural significance on both public and private land.

The urban forest is central to the City's amenity and helps define the character and heritage of Stonnington. Other than a few remnant trees and the occasional self-seeded tree, the overwhelming majority of Stonnington's tree population are trees that have been purposefully planted since European settlement. The current tree population includes trees that were planted from well over a hundred years ago to trees that were planted this year.

A history of Stonnington's urban forest

Different garden styles can be identified throughout the City, providing an insight into the people of the time. This heritage reflects the changing cultural trends of garden and tree preferences as well as management practices and species availability in the horticultural trade. Many of the mature conifers and Canary Island Date Palms are the result of extensive planting in the Victorian and Edwardian eras when these trees were popular. Peppercorns were typically planted around railways in the 1900s and remnants of these plantings can still be seen along many of Melbourne's train lines. A number of the City's parks and private gardens date from the late 19th and early 20th centuries. Malvern Public Gardens and Victoria Gardens are two excellent examples of Victorian-era public gardens that retain many original design features.

There are 19 trees on the National Trust Register within the City of Stonnington, six of which are of State significance. Some of these trees are listed due to their horticultural or botanical rarity, others because they are exceptional specimens due to their outstanding size or form.

Biodiversity in Stonnington's urban forest

While the natural landscape of the city has been extensively altered since European settlement, a few small sections of remnant vegetation and scattered remnant trees remain. A number of these remnant trees, mainly River Red Gums (*Eucalyptus camaldulensis*), are recorded and it is likely that more undocumented remnant trees are present in private gardens. Remnant and revegetated areas provide habitat for many native fauna including the Tawny Frog Mouth, Superb Fairy Wren, Eurasian Coot and the Eastern Spine Bill.

There are seven key biodiversity sites within the City of Stonnington that have been chosen for environmental enhancement where indigenous species are planted in an attempt to recreate the pre-European settlement environment. These sites are managed and maintained to increase biodiversity outcomes. These sites are:

- › Glenburn Bend Park
- › Muswell Bend Park
- › Glen Iris Wetlands
- › Darling Park
- › Malvern Valley Golf Course
- › Urban Forest Reserve, and
- › Yarra River Corridor.

Vegetation, both native and exotic, on public and private land outside of these remnant and revegetated areas also support biodiversity and a healthy environment. Private gardens, particularly gardens with a diversity of species and structural complexity, can offer a range of resources and habitat throughout the year regardless of the species' origins.

Despite the highly modified environment that is characteristic of urban areas, the City can still provide resources to support native flora and fauna.

Privately managed trees

Over 90 per cent of the land area of the City of Stonnington is privately owned and private trees comprise a significant proportion of Stonnington's urban forest. While the City of Stonnington is responsible for managing the majority of the trees growing on public land, an engaged community is essential to sustain and support a healthy, diverse and extensive urban forest in the private realm.

The City of Stonnington can help to encourage the planting and maintenance of vegetation on private land and can regulate vegetation removal through the planning process and the tree protection provisions in the City of Stonnington's Local Law. However, the extent to which Council can influence private land management is limited and the community will play a major role in the success and expansion of the urban forest.

Council runs many workshops and events through its annual calendar of environmental events. This includes Spring into Gardening, community and school planting days and gardening workshops. These programs aim to raise awareness and equip residents with the knowledge and skills to pursue activities at home.

The Council managed tree population



The City of Stonnington manages a mature and diverse population of approximately 55,500 trees in the public realm including street trees, park trees, trees in Council managed facilities and trees on the Malvern Valley Golf Course.

A tree inventory has been developed to help Council arboriculture staff manage and monitor individual trees in the public realm and the public tree population as a whole. The tree inventory is continuously updated as monitoring, pruning, removal and planting works on individual trees are undertaken. The species, height, age and health of each tree is recorded in the inventory and this data has been used to develop a profile of the trees in the public realm.



Canopy Cover



Canopy cover, rather than number of trees, is regularly used as the key indicator of the quality and function of an urban forest.

It is a simple measure of how much of the municipality, when viewed from above, is covered by tree canopy. A 2014 report prepared by the Institute for Sustainable Futures¹ presents tree canopy cover data for the City of Stonnington and other municipalities around Australia. This study showed the total canopy cover in the City of Stonnington, including trees on both private and public land, is 25 per cent of the land area, or covering approximately 6km². Stonnington has the second highest canopy cover of an inner Melbourne metropolitan council.

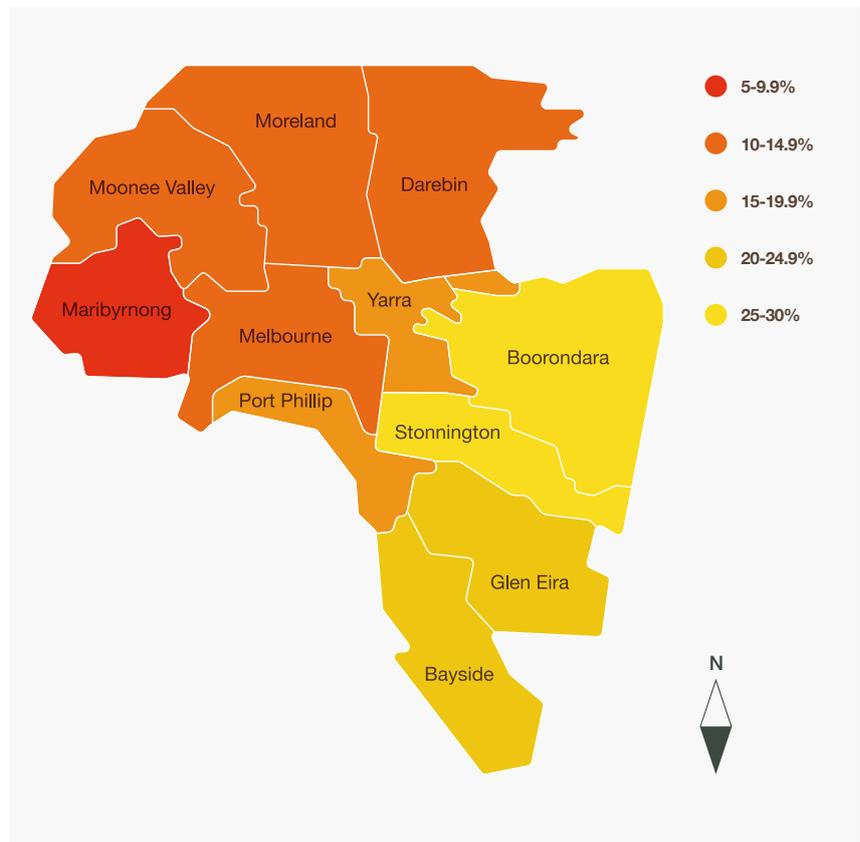


Trees with large canopies provide the greatest benefits to the community and the environment.

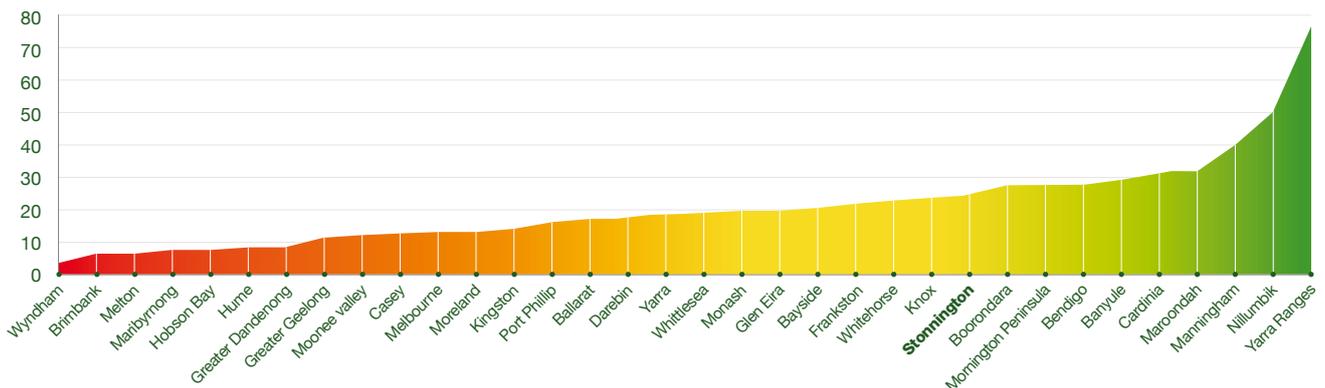
Compared to smaller trees, large trees with spreading canopies provide more shade and cooling, have a greater visual impact, reduce larger volumes of stormwater runoff, remove more air pollutants and provide more habitat. An urban forest comprised of trees with larger canopies will provide greater benefits than an urban forest with a large number of small trees.

¹ Jacobs, B., Mikhailovich, N., and Moy, C. (2014) Benchmarking Australia's Urban Tree Canopy: An i-Tree Assessment, prepared for Horticulture Australia Limited by the Institute for Sustainable Futures, University of Technology Sydney.

Canopy cover of municipalities within 5km of the CBD



Canopy cover for Victoria Local Government Areas



Correlation between canopy cover and urban heat

While the average canopy cover of the municipality is comparatively high, there is significant spatial variability in canopy cover across Stonnington. Satellite mapping identified some residential areas that have a canopy cover approaching 80 per cent. Areas that tend to have low canopy cover are commercial precincts, such as sections of Glenferrie Road, Malvern Road and Chapel Street, as well as the high density residential streets at the western end of the municipality. This is principally due to the constrained physical environment

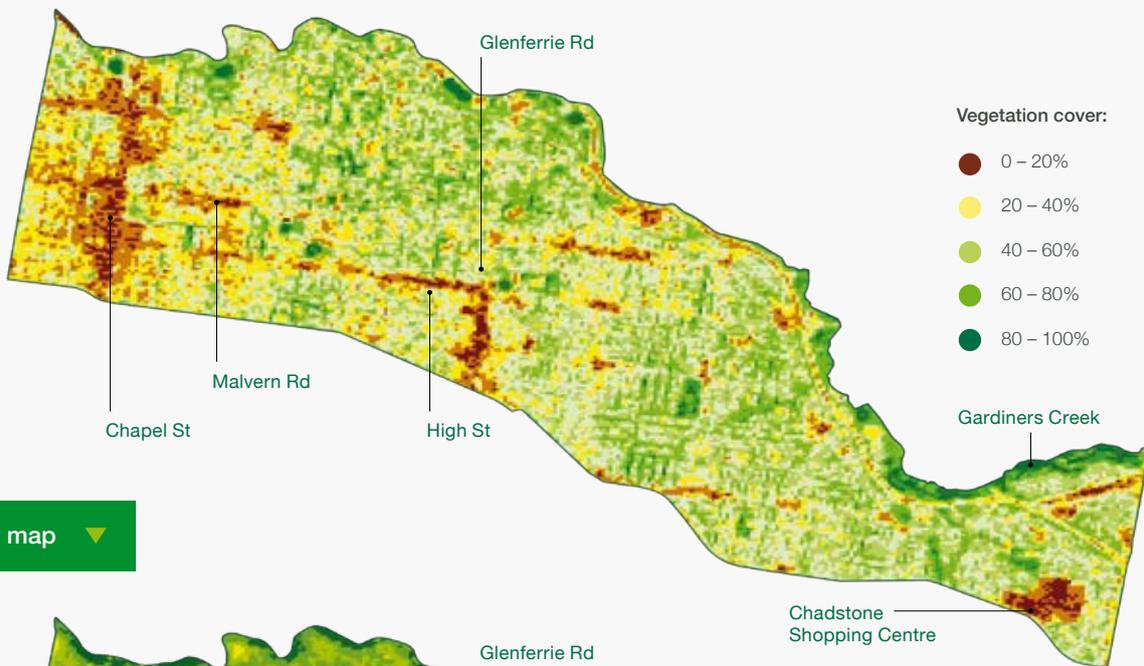
in these areas offering limited space to plant, establish and maintain large canopy trees. There is also increased competition for this limited space from the greater number of services required in these areas.



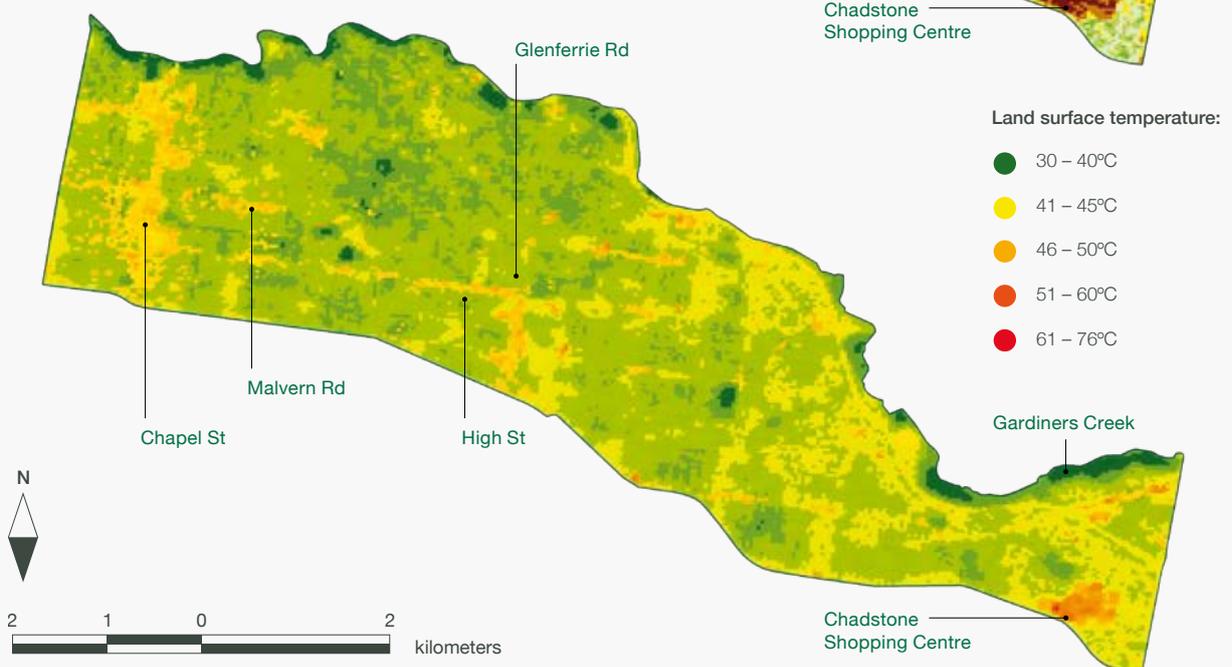
Heat mapping of the municipality shows that hot areas correlate strongly with areas of low or non-existent canopy cover.

This presents an opportunity to target tree planting in low canopy cover areas to help mitigate the effects of the urban heat island. Innovative practices are required to manage the associated challenges of growing trees in these highly urbanised areas.

Vegetation cover map



Heat map



Species diversity



A diverse mix of tree species is important to maintain a healthy and resilient urban forest. This is principally because some groups of plants, such as a species, a genus or a family, may be vulnerable to specific pests and diseases or unsuited to future environmental conditions.

Diseases that target specific groups include Elm Leaf Beetle (affects some species in the genus *Ulmus* – the elms), Myrtle Rust (affects plants in the family Myrtaceae, which includes gums and wattles) and the Sycamore Lace Bug (affects the genus *Platanus* – plane trees). While the threat of known pests and diseases can be monitored, it is difficult to predict what groups of plants may be vulnerable to additional pests and diseases in the future. Diversifying the species composition of the urban forest reduces the risk of a large proportion of trees being affected by any one pest or disease.

Most common tree species in Stonnington

There are approximately 520 different tree species planted in the City of Stonnington's parks and streets. The ten most common species are a mixture of native, exotic, deciduous and evergreen species.

London Plane trees are the most numerous species, comprising almost 10 per cent of all trees in the City and lining many of the main roads. Many of the avenues of London Planes were created over 40 years ago and some of the City's avenues are much older;

the London Planes along Rockley Road were likely planted around 100 years ago. Council has not created any new avenues of London Plane trees for over a decade. The few London Planes that have been planted in recent years are tree replacements along established avenues.

A resilient urban forest



A resilient urban forest requires diversity.

Council continues to pursue diversity by planting a range of species in its streets, parks and gardens every year. This is particularly important given the greater variety of pests and diseases that are likely to affect the urban forest in the future.

The City of Stonnington's urban forest meets the commonly accepted tree diversity target for metropolitan Councils:

- > no more than **30 per cent** of any one **family**
- > no more than **20 per cent** of any one **genus**
- > no more than **10 per cent** of any one **species**

Most common tree families in the City of Stonnington – Target: no more than 30 per cent of any one family

Common names	Family	%
Eucalypts, Paperbarks, Bottlebrushes etc.	Myrtaceae	30
Planes	Platanaceae	10
Pears, Crabapples, Prunus etc.	Rosaceae	10
Wattles, Gleditsia, Robinia etc.	Fabaceae	10

Most common tree genera in the City of Stonnington – Target: no more than 20 per cent of any one genus

Common Names	Genus	%
Eucalypt	<i>Eucalyptus</i>	15
Plane	<i>Platanus</i>	10
Wattle	<i>Acacia</i>	8



Most common tree species in the City of Stonnington – Target: no more than 10 per cent of any one species

			
<p>Common Name: London Plane</p> <hr/> <p>Latin Name: <i>Platanus x acerifolia</i></p> <hr/> <p>#: 9.4</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>	<p>Common Name: Callery Pear</p> <hr/> <p>Latin Name: <i>Pyrus calleryana</i></p> <hr/> <p>#: 4.7</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>	<p>Common Name: Queensland Brush Box</p> <hr/> <p>Latin Name: <i>Lophostemon confertus</i></p> <hr/> <p>#: 4.2</p> <hr/> <p>Origin: Native</p> <hr/> <p>Trait: Evergreen</p>	<p>Common Name: River Red Gum</p> <hr/> <p>Latin Name: <i>Eucalyptus camaldulensis</i></p> <hr/> <p>#: 3.5</p> <hr/> <p>Origin: Native</p> <hr/> <p>Trait: Evergreen</p>
			
<p>Common Name: Sweet Gum</p> <hr/> <p>Latin Name: <i>Liquidambar styraciflua</i></p> <hr/> <p>#: 3.4</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>	<p>Common Name: Pin Oak</p> <hr/> <p>Latin Name: <i>Quercus palustris</i></p> <hr/> <p>#: 2.3</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>	<p>Common Name: Blackwood</p> <hr/> <p>Latin Name: <i>Acacia melanoxylon</i></p> <hr/> <p>#: 2.2</p> <hr/> <p>Origin: Native</p> <hr/> <p>Trait: Evergreen</p>	<p>Common Name: Claret Ash</p> <hr/> <p>Latin Name: <i>Fraxinus angustifolia subsp. oxycarpa 'Raywood'</i></p> <hr/> <p>#: 2.1</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>
			
<p>Common Name: English Oak</p> <hr/> <p>Latin Name: <i>Quercus robur</i></p> <hr/> <p>#: 2.1</p> <hr/> <p>Origin: Exotic</p> <hr/> <p>Trait: Deciduous</p>	<p>Common Name: Yellow Box</p> <hr/> <p>Latin Name: <i>Eucalyptus melliodora</i></p> <hr/> <p>#: 1.9</p> <hr/> <p>Origin: Native</p> <hr/> <p>Trait: Evergreen</p>		

Age diversity

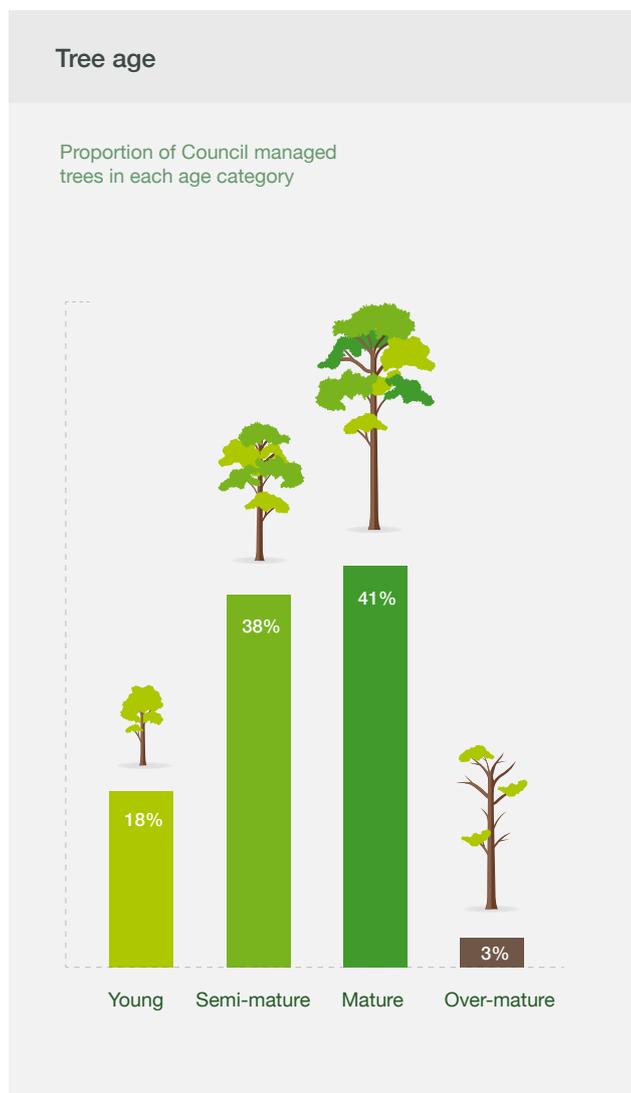


Urban forests containing a balanced mix of tree age ranges are more stable over time. While there is no well-established guideline that defines the proportion of each category that should be present in an urban forest, having an adequate number of young trees in the population is important. These young trees make up the replacement stock for trees in all other age classes.

The majority of trees managed by the City of Stonnington are semi-mature, mature or over-mature and less than a fifth of them are young. While the mature trees provide the greatest benefits to the community, over time they will age and decline and will need to be removed. If there is an insufficient number of younger trees to replace maturing and aged specimens, the urban forest of the future will be significantly depleted.

As large mature trees provide the greatest benefit to the community, there exists tension between wanting to retain large trees and ensuring trees are not retained past the end of their useful lives. Retaining trees past the end of their useful lives is undesirable, as is removing trees too early. It is optimal to remove aged trees when their canopy is significantly reduced and provides limited further benefit to the community.

The current spread of tree age classes in Stonnington is heavily weighted towards older trees. In order to establish an urban forest that has a stable canopy cover over time, a sufficient number of young trees are required that can grow to replace mature trees as they require removal. The preferred option to achieve a more stable balance of age classes is to grow the urban forest by planting trees. This will increase the proportion of young trees in the urban forest. These trees can be planted as replacements for trees that have reached the end of their useful lives, or in new planting sites that are found.



Tree health



Maintaining a high proportion of healthy trees in a population is important as healthy trees are more aesthetically pleasing, have greater longevity, have reduced management inputs and provide greater benefits to the community.

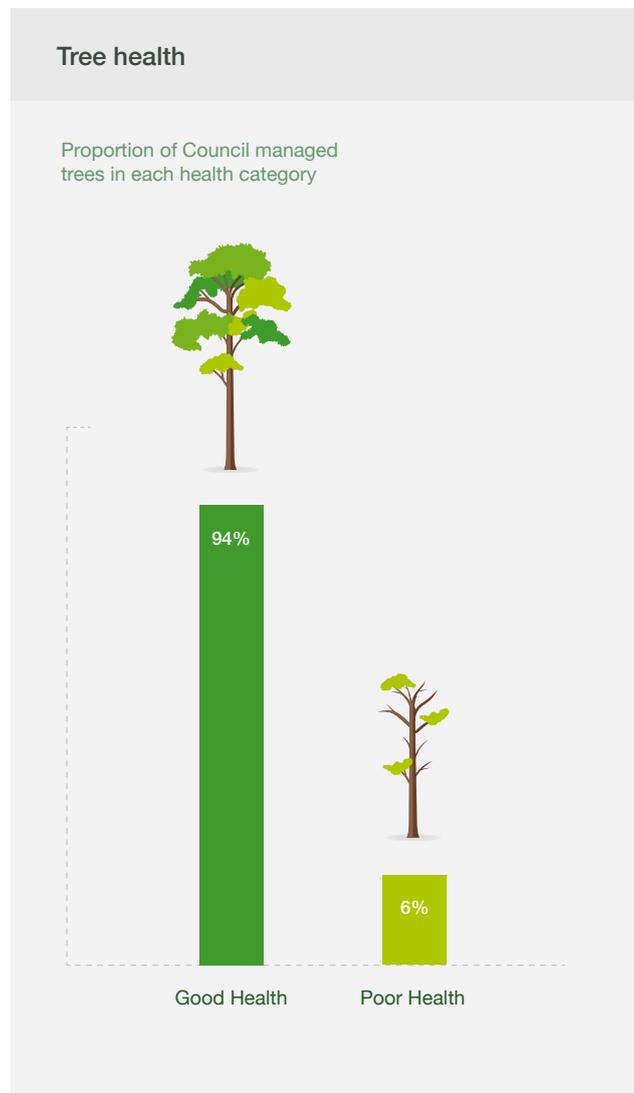
The industry health target for an urban tree population is 90 per cent of trees being healthy. The City of Stonnington exceeds these targets as 94 per cent of trees managed by Council are currently categorised as being in good health. Tree health is a dynamic measurement that changes over time. It is not directly correlated with the age of the tree but is dependent on many factors, including environmental conditions, soil conditions, pests and diseases, maintenance history and history of root disturbance. Tree health will not reach a peak from which it slowly declines but will improve or decline depending on these factors.

Within each health category, there exists a continuum of tree health. For trees in poor health, this can range from trees that are in a state of irreversible decline to trees that have temporarily reduced health status. The 6 per cent of trees that are classified as having poor health may become healthy with time and proactive management. Equally, the number of trees in good health may decline in the future if tree protection measures and adequate management adaptations to future climatic conditions does not occur.



The City's proactive maintenance program has allowed a healthy tree population to be attained as poorly performing trees are identified and appropriately managed.

The City of Stonnington will continue to monitor and identify trees in poor health and manage them appropriately. This may mean undertaking proactive maintenance works such as mulching, treating for pests or diseases, deep watering or adding additional nutrients. If the tree is beyond arboricultural management, removal may be the only practicable solution.





Summary



The City of Stonnington's current urban forest is extensive, healthy and diverse. The spread of age categories shows that the urban forest has an over representation of mature trees. Without appropriate succession planning, the canopy cover across the municipality will be considerably reduced as these trees age and are removed.

While the current canopy cover of the urban forest is relatively high, there is significant spatial variability in canopy cover across the municipality. Areas with very low canopy cover are in the most densely populated areas and are the hottest parts of the city.

There is a need to supply greenery in the public realm both to help cool these areas and to support the health and wellbeing of the growing population that have little private access to vegetation.



Issues and challenges



Urban forest management needs to address the specific issues and challenges that are, and will continue to, impact tree populations. This includes the range of challenges associated with the changing climate, challenges due to the inherent physical characteristics of urban environments and challenges centred around the relationship between people and trees.

Issues and challenges facing urban tree populations include:

- › population and housing growth
- › competition for limited space
- › conflict with surrounding infrastructure
- › a changing climate
- › an ageing tree population
- › community perceptions and acceptance of tree traits, and
- › tree related risk.



Population and housing growth



Rapid densification is occurring throughout inner city municipalities. The increasing number of people who want to live and work within the inner city places an increasing demand on many public assets and services, including existing and future tree populations. With the transition from low-density, single dwelling housing to medium- and high-density units and apartments, the amount of private open space typically decreases. This can have both an immediate and ongoing impact on the extent of the urban forest.

The removal of existing large trees to accommodate new developments with larger footprints immediately reduces canopy cover on private land. Equally, if little space is provided to plant trees in new developments, both at ground level and underground, the ability to provide replacement canopy cover in the future is reduced. New developments can also impact the permeability of the site, limiting the opportunity for water infiltration, gas exchange and nutrient uptake into the soil, providing a less healthy growing environment.

Development on private land can also affect tree health and longevity through:

- › damage caused by machinery
- › soil compaction from increased traffic and temporary storage of materials
- › chemicals absorbed into the soil, and
- › cutting through root systems to accommodate foundations, basements and underground services.

High levels of development are characteristic of a highly urbanised inner city municipality, and are required to house the increasing number of people wanting to live in the City of Stonnington. Planning is required to ensure development is undertaken in a way that allows the existing leafy character of the City be maintained for current and future residents.

Development on private land typically results in a progressive loss of private trees, and loss of space to grow replacement trees in the future. While Council has a regulatory framework to prevent the unchecked removal of private trees, a growing importance is placed on the planting and preservation of large canopy trees in the public realm.



The planning scheme

The Victorian Government recently introduced three new residential zones into local government planning schemes. Two of the three new residential zones allow councils to protect neighbourhoods with special character and heritage value from inappropriate development by directing housing growth to areas around main roads, shopping centres and transport hubs.

The third new zone, the Residential Growth Zone, encourages housing development at higher intensities and provides for a greater diversity of permissible uses. The protection of neighbourhood character in this zone will be of a lower priority and as such the protection of existing vegetation may be more difficult to achieve.

Loss of trees on private land

Trees, including large established trees, are being progressively lost from private land across Stonnington. While comprehensive data is not available on the total number of trees removed, Council does have access to limited sources of information that paint a very clear picture about the rate of loss of trees on private land.

Council has a number of controls in place to protect existing trees on private land. These include provisions under the local law for the protection of significant trees on private land. The planning process also regulates proposed vegetation removal on development sites.

Local law permits to remove significant trees on private land

The City of Stonnington has a local law aimed at the protection of Significant Trees on private land.² The local law requires a permit to be obtained to prune or remove a tree classified as significant. In total approximately 240 significant trees are removed from private land each year under a local law permit.

Planning permits involving vegetation removal

Council's arboricultural services unit receives in the order of 400 planning referrals each year relating to proposed vegetation removal and landscape management on development sites. Planning referrals involve consideration of all vegetation on private and public land and are not limited to trees classified as 'significant' under the local law. The number of referrals received has increased by 400 per cent between 2009 and 2015. While exact figures are not available, it is estimated that in excess of 500 trees are removed from private land each year under a planning permit.

Other tree removal

The extent of other tree removal, whether legal or illegal, is unknown. However, it is expected that as population and housing density continues to increase, together with shifting community sentiments about trees growing in proximity to homes, the number of other trees removed from private land each year would be substantial.³



It is estimated that more than 1,000 trees are removed from private land each year and it is possible that the number may be in the several thousands.

² A large tree of a certain trunk circumference, as defined under the City of Stonnington Protection of Trees Local Law, or listed on the Significant Tree Register.

³ Anecdotally, Council hears many concerns about large trees growing near homes due to safety fears and perceived impact on buildings.

Competition for limited space



Commercial shopping strips and dense residential areas are generally characterised by high density housing on small parcels of land. This provides very little space to grow trees in the private realm. The importance of retaining and growing large canopy trees in the public realm in these areas is of increased importance as they are not accommodated for in the private realm.



Within Stonnington, commercial shopping strips and dense residential areas have notably lower vegetation cover compared to other parts of the City.

These landscapes are dominated by the built form, with few green elements. The streetscape provides the most significant opportunity to increase tree canopy cover in highly urbanised and increasingly developed areas however, these streets also present the greatest challenges to growing large trees. There is generally limited space available as roads and footpaths tend to be narrower and there is also greater demand for this space from the increased concentration of infrastructure required to service the area.

Standard planting techniques in these highly urbanised and impermeable areas involves planting trees into the existing soil through a small cutout in the pavement.

These techniques do not provide the best outcomes for tree health, growth and longevity and only a small number of species can tolerate these conditions. These species are typically small trees with small canopies that have a limited impact on enhancing and cooling the streetscape. Finding new and innovative ways to grow large trees in these areas is needed to increase canopy cover.

The increased assets and services required in dense residential and commercial areas can limit the number and size of trees that can be planted:

- › Higher demand for car parking and clearway times reduces or prevent in-road tree planting.
- › New pavement cutouts should not reduce the width of footpath so they are not accessible for prams and wheelchairs.
- › More services (stormwater, gas, sewerage and water) underneath the footpath limits planting locations.
- › Shop awnings, tram wires, lighting and road signage restrict the space for tree canopies.
- › Sight lines to bus and tram stops reduces tree planting.



Conflict with surrounding infrastructure



Within an urban environment, trees are located alongside public and private assets.

These assets, such as footpaths, roads, fences, electricity wires and underground services change very little over time and rely on a stable environment. In contrast, trees grow and change significantly over their lifetimes and their requirements and impacts also change. In such environments there are inherent conflicts between trees and these other assets.

Most of these conflicts can be mitigated or avoided by either management or design techniques, however, these techniques are generally most effective when installed prior to a new tree being planted. The available techniques to minimise conflict are more limited for established trees and it is not always possible to remove all conflict between trees and infrastructure. Retaining large trees in the landscape is critically important, given the time it takes for a tree to grow to a functional size.

Impact of electricity infrastructure on trees

Almost 50 per cent of Stonnington's street trees are growing beneath powerlines. As trees growing in close proximity to powerlines can cause fires or blackouts, Council must comply with a series of regulatory requirements in terms of their management. These requirements can sometimes result in a significantly altered tree form.

The City of Stonnington develops an annual Electric Line Clearance Management Plan, which aims to:

- › minimise the potential for contact between powerlines and vegetation, and
- › reduce any adverse effect of the pruning of trees near electric lines on the appearance and longevity of the city's trees.

Road reconstruction projects

As part of road reconstruction projects, an opportunity exists to redesign the road layout or engineer the growing environment to provide better outcomes for street trees. If existing trees are in poor condition, road reconstruction projects allow for the total or partial replacement of the existing tree stock with new trees in enhanced growing environments. As many of these improvements cannot be retrofitted around existing trees, installation may only be possible for new or replacement tree planting.

Providing high quality public infrastructure, while also maintaining and expanding the urban forest, is important to ensure the ongoing liveability of the City. Large trees provide the greatest benefit to the community, however, large trees have a correspondingly large root system. There is an obvious tradeoff between sustaining large trees in the streetscape and the increased potential for conflict with other assets and services. These conflicts need to be managed to ensure the best environmental and community outcome. If a tree is in conflict with existing private or public infrastructure all possible arboricultural, design and engineering solutions are examined before the tree's removal is considered.



Public infrastructure maintenance

Tree roots can cause footpaths and road surfaces to move, creating potential tripping hazards. The City of Stonnington has an ongoing footpath maintenance program that responds to works that are brought to Council's attention as well as proactively monitors, repairs and replaces footpaths.

Trees are a valuable asset to the community and take many years to reach maturity. Once removed, the many benefits they provide cannot be quickly or easily replaced.



Council seeks to resolve conflicts between trees and existing infrastructure without removing or significantly compromising the health or safety of the tree.

The ongoing footpath maintenance program allows conflict between tree roots and roads and footpaths to be managed without necessitating the removal of trees. Where trees provide ongoing maintenance issues, innovative solutions to modify the surrounding infrastructure will be sought.

A changing climate



It is widely accepted that climate change will alter global and local climatic conditions. This will result in warmer average temperatures, more frequent and severe heatwaves, more fire danger days, reduced average rainfall, more variable rainfall, more frequent and intense storms, increased incidence of drought, and sea level rise.



This will impact the existing and future urban forest in the City of Stonnington in a number of ways:

- › Tree species suitable for the environmental conditions of the past may no longer be suitable.
- › Existing trees are likely to experience increased water and heat stress, which may result in reduced life expectancy and increased vulnerability to pests and disease.
- › Increased incidence of pests and diseases may occur due to changes in habitat ranges and their improved ability to survive winter.
- › Increased frequency of storms may result in more frequent branch and tree failures.

The projected changes have significant implications for the management of Council's existing tree population. Management practices need to be optimised for changing conditions. This includes assessing mulching and watering practices for new and established trees, investigating additional water sources for vegetation, particularly during water restrictions, and undertaking targeted tree inspections after storm events.



Maintaining a diverse tree population lowers the risk of significant tree loss from extreme environmental events or from pests and disease.

Tree selection for planting in the public realm should focus on:

- › Maintaining a high diversity of species across the municipality to maintain or enhance the current population's resilience.
- › The species' tolerance to future climatic conditions.
- › Trees likely to perform well in hotter and drier climates.

Maintaining a tree population that has a suitable mix of trees in all age classes also increases the resilience of the urban forest.

Vegetation plays an important role in helping cool cities and minimising the effects of climate change and the urban heat island. Trees with large canopies will have the greatest effect on improving human and animal thermal comfort as they transpire more and can provide shade for larger areas.

An ageing tree population



In order to maintain an urban forest that is stable over time, a tree population with a balanced mix of trees in different age classes is required.



The tree population managed by the City of Stonnington has a high proportion of mature trees. Over time these trees will age and decline.



Considered and proactive management of the ageing tree population is needed to avoid a wide scale reduction in canopy cover across the municipality within a relatively short period.

Trees are living organisms, which means they have a finite life. As they become mature they provide the greatest benefits to the community. As they continue to age, they reach a stage of reduced health and vigour, which results in a decline in the extent and health of the canopy. With further decline, trees reach the end of their 'useful lives' where they have significantly declined to the point where they contribute little benefit to the community.

Maintaining and managing a population of such trees is not desirable as they contribute little to the beauty of the streetscape, present a greater risk of failure and prevent the planting of a replacement tree. The removal of an over-mature tree that has reached the end of its useful life is compensated for by the increase in canopy cover and amenity provided by the replacement planting in the medium to long-term.

Importance of young and semi-mature trees

The young and semi-mature trees in the tree population are the City's future mature trees. While these trees may have only been growing for a few years, if young and semi-mature trees are regularly removed to accommodate development, future tree populations will be depleted of mature trees.

Avenues of maturing trees

Many of the City's streets contain avenues of mature trees that are the same age. These trees tend to age and decline around the same time, presenting a management challenge. Mass removal and replanting has the benefit of creating a consistent avenue of trees that are a similar size, however this results in a sudden significant change in the appearance of the streetscape. A gradual renewal, where trees are removed and replaced over a long time frame, does not produce such a drastic change but does result in an avenue of trees that are not uniform in size. Community engagement and consultation is required to establish the best management option for each avenue.

Community perceptions and acceptance of trees



The value that trees provide to the City of Stonnington is widely appreciated by the community.



However, there is occasional pressure from residents to remove single, mature trees located near their properties due to specific concerns. These concerns generally relate to a personal preference for a type of tree (for example a native or exotic species) a tree characteristic, (eg. dropping of leaves or fruit) or the tree being associated with a perceived nuisance, (eg. birds or possums in the tree).

Seasonal traits

Trees are living organisms that respond to changes in the environment. Flowering, berry production and leaf dropping are all seasonal traits that are part of a tree's life-cycle. All trees have some seasonal traits that may, at times, be perceived to be an inconvenience. Trees provide many benefits to local residents and the wider community that generally far outweigh the inconvenience caused.



Council does not support the removal of a mature, established tree because of a seasonal trait.

Additional pruning of the tree can help to resolve or minimise many perceived problems. For example, trees can be pruned away from buildings to reduce the volume of leaves falling into gutters. Pruning practices must always take into account the long-term health and form of the tree and pruning to the extent desired by a resident is not always possible.

Street trees are owned and managed by the City of Stonnington for the community as a whole. As their lifespan is generally decades long, street trees often grow out the front of a property, which may change ownership multiple times. A nuisance for one resident may be a desirable trait for

another. For example, Council receives complaints regarding the volume of leaf drop in autumn, but also receives correspondence affirming the beauty of the changing autumn streetscape.

Uniform street plantings

Where possible, the City of Stonnington strives to achieve uniform plantings in streets as it creates a defined character with the feeling of a planned landscape. To achieve this, the City of Stonnington cannot satisfy individual preferences for a particular street tree but seeks to engage with residents to help direct tree selection as part of whole-street renewal projects.

Tree related risk



There are approximately 55,500 trees within the City of Stonnington’s streets, reserves, parks, gardens, Council facilities, car parks and other public open space.



These trees must be maintained in a safe, healthy and aesthetically appealing condition to maximise their many environmental, social and economic benefits. As a tree grows, so does its benefits and its risks. A proactive management process is required to minimise and manage risk and enhance the health and structural condition of the tree population.

Tree inspection process

The City of Stonnington has a risk-based approach to the management of trees for which it is responsible, including a proactive inspection process that monitors trees based on a risk profile. These inspections help to identify trees requiring intervention to prolong their lives, pruning to comply with line clearance regulations, pruning to improve structural defects, or identify trees that have declining health and need to be removed. Programmed works resulting from these inspections include the removal of deadwood and declined branches,

line clearance pruning, weight reduction of over-extended branches, treatment of pests and disease and crown uplift pruning to improve clearance over the road and footpath.

Management practices for newly planted trees

Best practice tree management of newly planted trees allows trees to become established quickly and improves tree health and structure which ultimately reduces potential risks associated with ageing trees.

Best practice tree management includes:

- › sourcing quality tree stock
- › planting new trees to specifications
- › mulching, staking and watering newly planted trees, and
- › undertaking formative pruning on young trees.

Council has a formative pruning program for all newly planted trees. This program allows for branch defects to be identified and rectified while the tree is still young. This presents the best outcomes for both tree health and risk management as trees do not develop large branches that have an increased risk of failing. This also means that problematic branches can be removed without creating large pruning wounds that can increase the incidence of pests and diseases.



Council's inspection and management processes enable the development of a healthy and safe tree population and systematically identifies trees that pose an unacceptable risk so that they can be corrected or removed.

Key directions

The Urban Forest Strategy aims to direct the long-term planning and management of Stonnington's urban forest. Framed around eight key directions, this section sets out a range of strategic actions that Council will pursue to achieve its vision and the desired outcomes.

Vision ▼

The City of Stonnington will have a healthy, resilient, diverse and valued urban forest that will continue to be a core element of the character and liveability of the City. The urban forest will underpin the health and wellbeing of the community, increase biodiversity and environmental outcomes and help strengthen economic activity.

Outcomes ▼

- › increased vegetation cover
- › improved health and quality of the urban forest
- › greater resilience to a changing climate
- › reduced urban heat island effect, and
- › enhanced amenity and liveability.

Key Directions ▼

The Urban Forest Strategy will realise its vision by fulfilling the strategic actions in eight key directions:

- | | |
|--|---|
| 01 protect and value existing trees | 05 create feature boulevard plantings |
| 02 sustain and support a healthy and safe urban forest | 06 create habitat |
| 03 renew ageing trees | 07 manage the interface between trees and infrastructure |
| 04 grow the urban forest | 08 increase the cover of alternative green infrastructure |

01 Protect and value existing trees

Objective: To maximise the protection and retention of existing trees in the urban landscape.

Urban forests are the cumulative result of the planting and management of trees and other vegetation over many decades. The City is fortunate to have a mature and healthy urban forest that covers a quarter of the municipality in tree canopy.

Given the time it takes for trees to grow to maturity and provide the maximum social, economic and environmental benefits, Council's highest priority is to protect and retain the urban forest that already exists.

Trees and the community

As over 90 per cent of the land area of the City of Stonnington is privately owned, the community valuing and protecting existing trees is essential for the success of the urban forest. Council promotes and supports the celebration and continued protection of the urban forest through the diverse environmental events and education program. These events aim to increase the understanding of the many benefits that trees and other vegetation provide to both the community and the environment.

Trees and development

Development on private land and increasing densification remain a key challenge for achieving this objective. Council policy and a strong regulatory framework support the protection and retention of trees on both public and private lands while also allowing appropriate development. Where a tree is to be retained in or adjacent to a development, Council requires tree protection measures to be carried out. This generally involves fencing off a 'Tree Protection Zone' where works cannot occur, and requiring trees to be mulched and watered during works. Tree protection measures can be applied to both street trees and private trees as part of planning permit conditions.

Trees and vehicle crossovers

The City of Stonnington regularly receives requests to install new vehicle crossovers in locations that would directly impact the health and stability of established street trees. Generally, Council does not support the removal of an established, healthy street tree to accommodate for a new vehicle crossover. The Vehicle Crossover Policy outlines the minimum clearance distance required between a street tree and the edge of the proposed crossover to maintain the health and structural integrity of the tree.

Council will:

- › Promote the value and importance of retaining trees in urban landscapes.
- › Maximise the retention of high-value trees and established trees with large canopies.
- › Protect trees defined as Significant Trees through continued administration of the Local Law.
- › Minimise tree removals through the land use planning process.
- › Ensure permit conditions are complied with through the planning and building enforcement processes.
- › Require tree protection during construction works.
- › Prioritise the retention of established street trees when considering requests for vehicle crossovers.
- › Ensure the timely planting of an appropriate replacement tree is a condition on tree removal permits.
- › Only support the removal of healthy, established trees when there is a compelling arboricultural, community safety or public value reason to do so.
- › Protect trees listed by the National Trust and other State and Federal heritage lists.

02 Sustain and support a healthy and safe urban forest



Objective:

To manage the existing tree population to minimise risk and maximise the health, vigour and structural condition of the urban forest.

The City of Stonnington is responsible for approximately 55,500 trees in the public realm, all of which must be maintained in a safe, healthy and aesthetically appealing condition.



A proactive management process is required to minimise and manage risk and enhance the health and structural condition of the tree population.

Tree risk

There is an inherent risk associated with all trees as they are living things that coexist with people and property. As the many benefits provided by trees cannot be adequately replaced by infrastructure, the City of Stonnington minimises tree-associated risks through careful and proactive management, rather than by reducing the extent of the urban forest.

Water availability

As the climate becomes hotter and drier, water availability increasingly limits plant growth. Ensuring sufficient availability of water helps to increase plant growth and health and allows a wider range of species to be planted.

Innovative solutions are required to increase water availability and improve the growing environment. Incorporating Water Sensitive Urban Design treatments into streetscapes provides an additional passive water source to help support tree growth and improve stormwater outcomes.

Council will:

- › Undertake risk assessments on Council managed trees.
- › Routinely inspect the health, structure, form, age and size of Council managed trees in accordance with Council specifications.
- › Implement an ongoing proactive pruning program for Council-managed trees to maximise tree health, vigour and structural condition.
- › Treat and prevent identified incidences of pests and diseases.
- › Assess and respond to the watering requirements of new and established trees.
- › Respond to reactive requests for tree assessments and pruning works on Council-managed trees.
- › Select tree species that are tolerant of predicted future climatic conditions, resistant to pests and diseases and appropriate for the location.
- › Avoid selecting species that are known to have poor structural architecture as mature specimens.
- › Incorporate Water Sensitive Urban Design treatments into streetscapes.

03 Renew ageing trees



Objective:

To strategically plan for the removal and replacement of the ageing tree population to ensure a stable canopy cover over time.

A large proportion of the trees managed by the City of Stonnington are mature or over-mature. It is expected that in the coming decades, many of these trees will reach the end of their useful lives and will need to be removed. Trees at the end of their useful lives offer little to no benefits to the wider community, present a greater risk of failure and also prevent the planting of replacement trees.

A proactive plan is required to ensure that the current high canopy cover can be maintained or increased into the future. Transitioning to an urban forest with a more balanced age structure will help to achieve this.

This includes:

- › planting and establishing young trees
- › maintaining semi-mature trees
- › retaining and protecting healthy mature trees, and
- › removing trees that have reached the end of their useful lives.

Planning and planting now is essential to offset expected tree loss in the coming decades.

Council will:

- › Continue to review the age profile of Council managed trees to identify renewal and replacement priorities.
- › Proactively engage the local community about the need to remove trees and the opportunities for renewal planting.
- › Develop a proactive management plan with the local community for streets containing ageing avenues of trees.
- › Renew street tree populations as part of road reconstruction and other civic infrastructure projects, where possible and appropriate.
- › Undertake additional planting in streets with intermittent ageing trees to increase the canopy cover of the area prior to removal of larger, older trees.
- › Identify opportunities to replace groupings of trees to achieve a consistent planting scheme.
- › Monitor and manage risks associated with ageing trees.

04 Grow the urban forest



Objective:

To expand the urban forest across public and private land in order to increase canopy cover and maximise the community, environmental and economic benefits provided by trees.

Given the many community, environmental and economic benefits that trees provide, there is a desire to expand the urban forest across the public and private realm.

Trees on private land

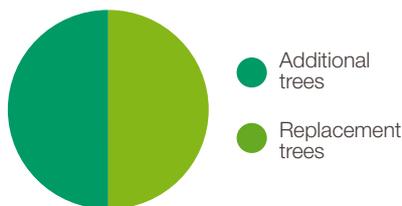
The planning process can help to grow the urban forest, despite increasing densification, by ensuring sufficient space to grow large trees within developments is provided. Space is required for trees both above and below ground to support both a large canopy and a healthy root system. The basement footprint in new developments can often extend beyond the surface footprint of the dwelling. A basement footprint that extends close to the boundary will generally not contain enough soil to support large trees, even if the building is setback.

As the majority of the land area within the City of Stonnington is privately owned, private land owners will play a significant role in the growth of the urban forest. Increasing and maintaining a healthy urban forest requires private landowners to plant and look after private trees.

Tree planting program

Council has an annual tree planting program that occurs in the cooler months of each year. This includes replacing removed trees, infill planting, new park trees, street tree renewal projects and tree planting for road reconstructions and other major civic projects.

The City of Stonnington plants in the order of 2,000 new trees each year of which approximately half are replacement plantings for removed trees. This results in a net gain of approximately 1,000 trees on public land each year.



Targeted planting

Vegetation mapping across Stonnington has shown that activity centres and dense residential areas are the hottest parts of the City and are generally lacking in vegetation cover. Growing large canopy trees in these areas is a clear priority. There are significant challenges to growing trees in areas that experience high competition from the other infrastructure for the limited available space. Traditional planting techniques, involving growing trees in the existing, but highly modified, soil environment in pavement cutouts, have not previously produced large canopy trees.

Design and engineering solutions are available that allow large trees to be grown in high density areas:

Design solutions: redesign the street configuration so that trees can be planted in kerb outstands or along the centre of the carriageway.

Engineering solutions: install permeable pavements, larger open planter systems, tree pits, continuous vaults with modified soil environments, root paths and channels and water sensitive urban design initiatives to improve and increase the growing environment.

While these solutions can be more expensive, difficult and time consuming to install, the additional long-term benefits gained from sustaining larger canopied trees makes these planting treatments worthwhile in dense urban areas. These benefits include:

- › improving the long term health and viability of the tree
- › a greater range of tree species that can be planted, and
- › reduced maintenance costs associated with below ground infrastructure and paving repair.



Park tree planting

The City of Stonnington's parks and open spaces are highly valued community assets that are used for a range of purposes. Trees enhance the quality and usability of these areas and help to provide a connection to nature that can be hard to find in the inner city.

Council is committed to increasing natural shade around playgrounds and to incorporating trees and other vegetation into play areas. Tree planting opportunities in parks are identified through Park Master Plans and through an annual process to identify new planting opportunities in all parks.



Parks as testing grounds

The conditions for growing trees in parks are generally more favourable than in streets as the growing environment beneath grass, mulch or bare ground, as opposed to concrete or asphalt, is more conducive to plant growth. The permeable surfaces of parks allows for greater gas exchange, water infiltration, nutrient uptake and biological activity.

A wider range of tree species can be planted in parks, including larger trees and trees that have a more spreading form.

As the growing conditions in parks are generally more favorable than in streets, parks can be used to test whether tree species not previously planted in the City will grow in local soil and environmental conditions.

Council will:



- › Develop and implement a street tree planting program for infill planting and whole street renewal.
- › Target identified hot spots and areas of low canopy cover for tree planting.
- › Identify opportunities to increase the number of trees in parks.
- › Implement annual tree planting programs in key biodiversity sites.
- › Continue to hold school, community and staff tree planting days.
- › Respond to opportunities for new and renewal street tree plantings as part of road resurfacing and other civic projects.
- › Work with residents and owners in relation to proposed new planting initiatives.
- › Explore innovative solutions to plant canopy trees in dense urban environments.
- › Increase the species diversity of trees in the public realm.
- › Plant tree species that will provide the maximum benefits to the community and the environment.
- › Encourage and support the planting of trees and other vegetation on private property.
- › Explore potential opportunities for diversifying the urban forest to include productive trees.



05 Create feature boulevard plantings



Objective:

To develop unique, attractive and distinguishing avenues of feature trees along high profile streets to increase canopy cover, enhance public amenity and liveability and provide a unique sense of place for the community to enjoy.

A key feature of urban landscapes is their planned, intentional and uniform boulevards of trees. Boulevards are important major thoroughfares for walking, cycling and vehicle traffic and they also provide linkages to activity centres and open spaces, encouraging active and passive exercise.

Annual funding has been allocated over coming years to create and enhance a number of significant boulevards in the municipality by establishing signature avenues of trees. Council recognises

that these boulevards contain existing trees and therefore the design of each area will respond to the landscape character as well as accommodate and enhance mature and significant plantings.

The implementation of each boulevard will be phased over a number of years, with tree removal and replacement occurring in stages. This allows the long term vision of a signature boulevard to be realised over time without a sudden reduction in canopy cover over a short period.

Council will:

- › Develop and implement the Boulevard Planting Program.
- › Progressively scope, design and document new boulevard planting projects.
- › Engage the community on all boulevard planting projects.
- › Implement each project over a number of years so that concurrent planting projects occur across the municipality.



06 Create habitat



Objective:

To maximise the biodiversity values of the urban forest.

The vast majority of the land area in inner city municipalities has been developed for residential housing, business precincts, transport corridors and public open spaces. The remaining natural environment is highly modified and, in most cases, has been preserved by accident rather than design. Most areas of remnant vegetation found within Stonnington are along rail corridors. These areas have been preserved from development since the installation of the railways in the late 19th century.

The urban forest can help to enhance biodiversity values throughout the municipality. The network of parks, reserves, private gardens and street trees can act as natural corridors or islands for native fauna. Urban areas also provide new and diverse habitat types to help support a range of species. For example, green roofs and walls, private gardens and the indigenous planting along the Yarra River all provide different resources that can help support a range of fauna throughout the year.



Despite the highly modified and urbanised landscape, the urban forest as a whole provides important habitat and food resources to help increase the City's biodiversity outcomes and support native ecosystems.

Council will:

- › Continue to establish and enhance key biodiversity sites and vegetation corridors including along waterways.
- › Maintain a diversity of tree species throughout the City of Stonnington's streets, parks, gardens and reserves, including both native and exotic species.
- › Plant a mixture of grasses, herbs, shrubs, and trees of different forms, sizes and densities to increase the complexity of planting within parks, reserves and gardens to provide greater habitat and food resources.
- › Identify opportunities to create habitat corridors between key biodiversity sites.
- › Promote and support enhanced biodiversity outcomes across private land through Council's environmental education programs and events.
- › Investigate the development of a program to encourage, assist and reward residents who provide habitat for local wildlife in their gardens.
- › Develop and implement a biodiversity monitoring framework to track biodiversity improvements across the city.

07 Manage the interface between trees and infrastructure



Objective:

To minimise and manage the conflict that often occurs between growing trees and the surrounding static infrastructure.

The Council managed tree population is primarily composed of trees that have been planted over the past 100 years or more. The urban environment surrounding these trees has changed significantly over this time. The knowledge of tree characteristics and management practices has grown and a much wider range of cultivars, some of which have been developed specifically for urban areas, are now available. The trees that were planted decades ago are not necessarily the same species that would be planted today. As a whole, they offer substantial benefits to the wider community and provide much of the canopy cover

across the City. The City of Stonnington will look to minimise or remove the conflict between these trees and surrounding infrastructure without removing the trees. This is necessary to provide the best environmental and community outcomes.

Council's ongoing public infrastructure maintenance program ensures that footpaths and roads are proactively inspected and any damaged or hazardous infrastructure can be replaced or repaired in a timely manner. If tree roots are identified as contributing to the issue, the repair or replacement of the asset aims to reduce the impact of tree roots in the future and

to minimise the effect of the works on the tree's health and stability. The City of Stonnington will not remove a healthy, established tree unless there is a compelling arboricultural, community safety or public value reason to do so.



Large, established trees are not able to be quickly replaced, and the benefits they provide to the community cannot be satisfactorily replaced by any other infrastructure.

For new plantings Council will:

- › Select species with consideration of potential future conflict with surrounding infrastructure.
- › Optimise planting locations to maximise the growing space.
- › Explore the installation of containerised growing environments to direct root spread.
- › Seek innovative solutions for surrounding infrastructure (e.g. flexible and permeable paving).
- › Select appropriate species for growing beneath powerlines.
- › Undertake formative pruning of trees beneath powerlines so they form an appropriate shape as they grow.

For established plantings Council will:

- › Consider the suitability of the type of paving treatment around established trees.
- › Seek innovative solutions for surrounding infrastructure (e.g. flexible and permeable paving).
- › Undertake targeted and select root pruning when not detrimental to tree health and stability.
- › Consider the use of tree root barriers only where effective and appropriate.
- › Implement Council's Electric Line Clearance Plan.
- › Identify opportunities and priorities to remove conflict with powerlines through undergrounding and installing Aerial Bundle Cabling.

08 Increase the cover of alternative green infrastructure



Objective:

To green the City by growing vegetation to complement the urban tree population.

While this Strategy has focused on trees, the urban forest includes all vegetation within Stonnington, including vegetation in parks, reserves, private gardens, along railways and waterways, and green infrastructure such as green walls, facades and roofs. In addition to maintaining and expanding the urban tree population, the inclusion of other green infrastructure across the City is important to achieve the wider objectives of this Strategy, particularly in places where trees cannot be planted.



Green roofs, walls and facades

The higher density precincts within the City of Stonnington are dominated by roofs, roads, footpaths and public and private carparks. While street tree planting can reduce the vegetation cover and urban heat island effect in these areas, other green infrastructure, such as green roofs, walls and facades, present an opportunity to grow vegetation where trees cannot be planted. Green infrastructure transforms a surface that is typically devoid of vegetation into a green area that can offer many benefits to residents and the wider community. Green roofs, walls and facades can be designed into new buildings or retrofitted to many existing buildings, provided that engineering and structural requirements are taken into account.

The benefits provided by green roofs and walls include:

- › providing additional insulation
- › reducing stormwater runoff
- › protecting roof or wall surfaces by decreasing uv damage
- › decreasing internal building temperatures and associated energy costs
- › providing habitat
- › providing outdoor areas for apartment residents
- › improving the appearance of an area, and
- › improving property value.

Green infrastructure includes all of the natural assets in a city, including the street trees, open space, Water Sensitive Urban Design infrastructure (such as tree pits, raingardens and biofiltration wetlands) and green roofs, walls and facades.

Council will:

- › Seek to install green roofs, facades and walls where appropriate.
- › Seek to install raingardens as part of road reconstruction projects.
- › Promote the installation of green walls, roofs and facades in the private realm.

Glossary



Evapotranspiration is the evaporation of water from the soil or bodies of water and transpiration through vegetation to the surrounding air, contributing to the cooling of an area.

Green façades are created by growing a climbing plant up a wall.

Green infrastructure includes all of the natural assets in a city, including the street trees, naturestrips, open space, raingardens and green roofs, walls and facades.

Green roofs are composed of a specially designed substrate that sits on top of a roof surface and supports plant growth.

Green walls are generally composed of a modular system where a growing medium is affixed to the wall surface, providing an opportunity to grow many plants together.

Indigenous vegetation refers to plants that are naturally found in a particular region.

Native vegetation refers to plants that have originated in Australia.

Road reconstruction projects involve the removal and replacement of the road surface and occasionally the footpath. They provide an opportunity to redesign layout and improve the growing environment.

Significant tree refers to a large private tree of a certain trunk circumference, as defined in the City of Stonnington's Local Law for the Protection of Trees, or a tree listed on the Significant Tree Register.

Street tree renewal projects occur in streets where the current tree stock as a whole have reduced health and vigour and will not enhance the appearance of the street in the short or long term. Existing trees are removed, amendments to the growing area are made as required and new stock, of the same or different species, are planted.

Streetscape refers to the view or scene of all of the elements that make up a street, including the footpath, road, naturestrip, trees, buildings and street furniture.

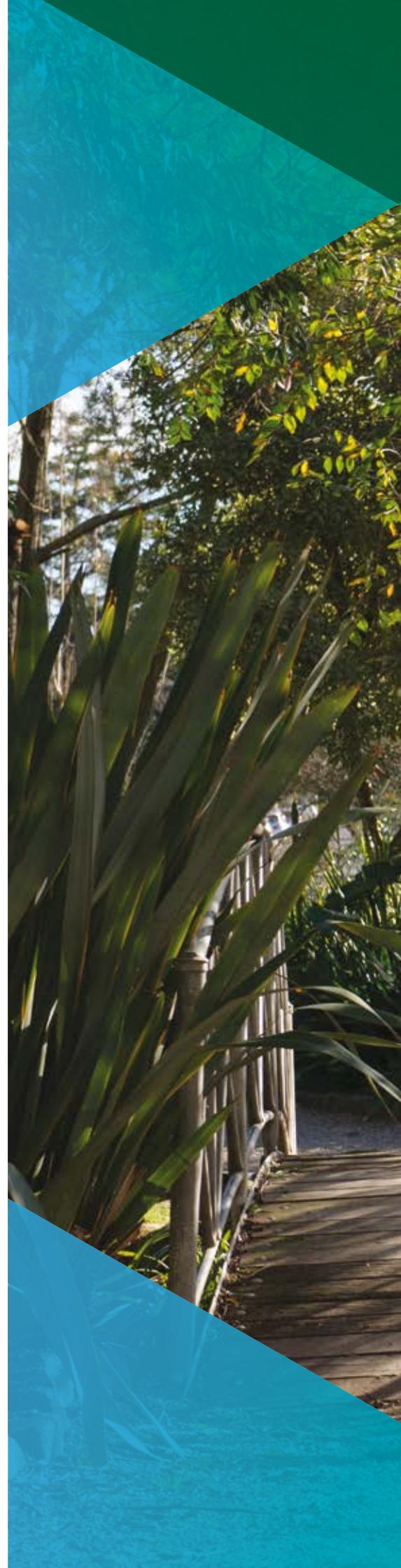
Transpiration is the transfer of water from the soil and through vegetation to the surrounding air, contributing to the cooling of an area.

Urban forest comprises all trees, shrubs and other vegetation growing across public and private land. This includes vegetation within parks, reserves, private gardens, along railways and waterways, street trees and alternate green infrastructure such as green walls and roofs.

Urban heat island effect is a phenomenon where urban centres are hotter than their surrounding rural areas. This can be caused by many factors but most notably the large amounts of surfaces that absorb heat and re-radiate it at night. This can have serious consequences for human and animal health. Vegetation, especially large trees can help to reduce this effect.

Useful life expectancy is the estimated lifespan of a tree until it reaches a point where it has declined to a point where it contributes few benefits to the community, the environment and the appearance of the streetscape.

Water Sensitive Urban Design (WSUD) is an approach that uses engineering, design and urban planning to improve the quality and quantity of stormwater entering waterways. This stormwater is often used to increase water availability to trees and other vegetation.







City of
STONNINGTON

2017 – 2022

Urban Forest Strategy

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