

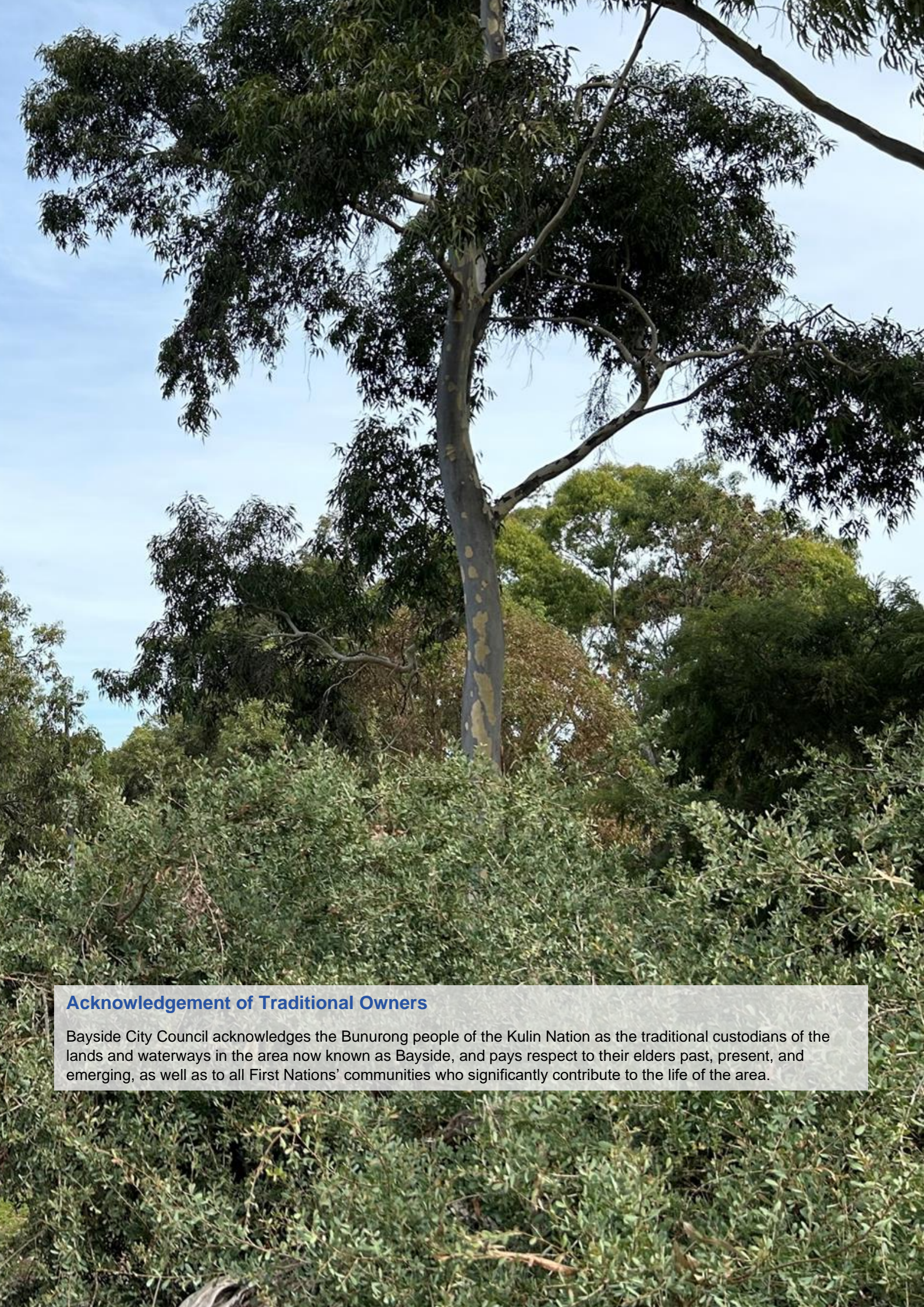


DRAFT Cheltenham (including Pennydale) Urban Forest Precinct Plan 2023



Cover Page: Cheltenham Golf Club

Inside Cover Page: Cheltenham Park Reserve



Acknowledgement of Traditional Owners

Bayside City Council acknowledges the Bunurong people of the Kulin Nation as the traditional custodians of the lands and waterways in the area now known as Bayside, and pays respect to their elders past, present, and emerging, as well as to all First Nations' communities who significantly contribute to the life of the area.

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Introduction to the Precinct Plans

In December 2019, Bayside City Council declared a climate emergency and has since prepared a *Climate Emergency Action Plan 2020 – 2025*. Climate change is real and without respecting our environment or changing the way we behave as a society, there will be even greater impacts than those already experienced. Expanding Bayside’s urban forest is one way that we can help cool the urban environment in which our residents live.

As an action listed in the *Climate Emergency Action Plan*, the development of the *Bayside Urban Forest Strategy* was undertaken and ultimately adopted at its February 2022 Council Meeting. In addition, Bayside City Council has endorsed *Living Melbourne: Our Metropolitan Urban Forest* in 2019, which sets out regional targets for tree and vegetation canopy cover to be reached by 2030, 2040 and 2050.

The Vision of the *Urban Forest Strategy* is

“Bayside’s urban forest will protect and restore ecological systems with special concern for biological diversity and natural processes which will create a cooler and greener Bayside with enhanced amenity and character where people are connected to nature.”

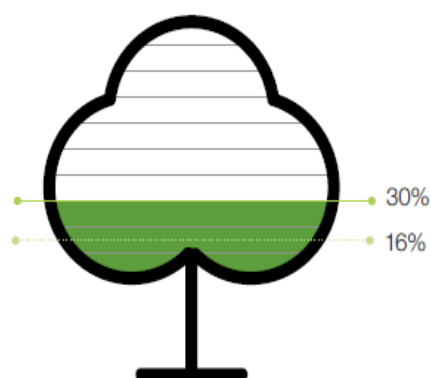
The overarching goal of the *Bayside Urban Forest Strategy* is to increase the urban tree canopy cover from the current 16.01% to 30% by 2040, and to continue this increase into the future.

The *Bayside Urban Forest Strategy* identifies a range of actions to be undertaken over the next four years. A key focus is the preparation of *Precinct Plans* for each suburb in Bayside to guide tree planting and greening at a local level. *Precinct Plans* are subsidiary documents to the *Bayside Urban Forest Strategy* and form a key component of the strategy’s implementation. Bayside is made up of 9 suburbs and the *Urban Forest Precinct Plans* will be prepared for each. They will provide tailored direction for increasing canopy cover and urban forest outcomes into the future.

What is an urban forest?

The urban forest encompasses all the trees, shrubs, grasslands, other vegetation and the soil and water that support them – within Bayside, on both public and private land. The urban forest incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, home gardens, green walls, balconies, and roofs.¹ Fauna is an important component too, with complex interrelations between animals and plants helping to maintain the urban forest.

Bayside’s urban forest is made up of native, indigenous and exotic trees, shrubs, grasslands and other vegetation, growing on public and private land, and the soil and groundwater that support them. This includes vegetation in parks, reserves, private gardens, along railways, waterways, main roads, and local streets, and on other green infrastructure such as green walls and roofs. The urban forest provides habitat to a wide range of fauna.



The overarching goal of the *Urban Forest Strategy* in Bayside is to increase the urban tree canopy cover from the current 16.01% to 30% by 2040, and to continue this increase into the future.

¹ Resilient Melbourne, *Living Melbourne Strategy*, 2018, available at: https://resilientmelbourne.com.au/wp-content/uploads/2019/09/LivingMelbourne_Strategy_online3.pdf

The Urban Forest Strategy

Principles:

1. Increase

Strategies:

1.1 Consider the individual needs of Bayside's suburbs and ensure that the approach to increasing canopy cover and urban forest outcomes is tailored to the conditions of each area.

1.2 Reframe Council's approach to major capital and infrastructure renewal projects as opportunities to increase urban forest outcomes.

1.3 Through the Bayside Planning Scheme, require development to provide increases to the number of canopy trees provided.

2. Healthier ecosystems

2.1 Increase the tree and vegetation canopy cover that is of a diverse range of species across Bayside.

2.2 Ensure humans and wildlife can simultaneously and safely access densely vegetated areas, streets and reserves.

3. Monitor

3.1 Improve, implement and facilitate Council processes and procedures to assist the monitoring of the urban forest

4. Maintain

4.1 Ensure the tree removal process is transparent and equitable

4.2 Reframe our planning and policy framework to give greater priority to existing trees and vegetation when siting new development and ensuring the longevity of any new trees or vegetation by ensuring it is appropriately sited nearby surrounding hard surfaces or infrastructure.

4.3 Enhance Council's ability to retain existing trees on private property through increased regulation of tree removal.

4.4 Support the maintenance and retention of trees on public land.

5. Learn and Celebrate

5.1 Increase Council's capacity to provide advice and build community sentiment to tree planting in Bayside.

5.2 Continue to build upon Council's green image and utilise this platform to advocate and partner with key stakeholders to provide greener outcomes across Bayside, metropolitan Melbourne and Victoria.

5.3 Leverage from the strengths of our network of volunteers, community groups, State Government departments, neighbouring local governments, academics and professionals to support the delivery of community education, information sharing and creating partnerships.

Key Issues

Environmental challenges:

Impact of climate change: All trees, including trees on private property, are being affected by climate change. It is important that Council continues to encourage residents to plant climate-resilient trees and vegetation on their property and nature strips. To support this, the provision of readily accessible information and useful tips on how to best plant these types of trees and vegetation will be of great value. Council will also ensure its species palette for streets and parks include the use of more climate-resilient trees and vegetation.

Tree health, age, Useful Life Expectancy, and species diversity: *The Bayside Urban Forest Strategy* defines key issues across Bayside's urban forest, including climate change, insufficient growth space and natural characteristics (disease, insects, etc.) being significant contributing factors to the health and sustainability of tree coverage across Bayside. This Precinct Plan identifies locations of trees that are in poor health, are reaching senescence and has low useful life expectancy so that appropriate action can be taken in due time.

Tree survival rate: A high proportion of street and park trees that have been planted have struggled to survive either during or after their initial period of maintenance (first 2 years). Expanding the urban forest and increasing tree canopy coverage will be challenging, especially if high tree attrition continues to occur.

Developmental challenges:

Trees on private property: Trees on private property make up a significant proportion of Bayside's urban forest. The removal of trees on private property is a significant and challenging issue to address as the management of private trees, to some extent, falls into the hands of individual property owners. Partnering with the private owners and undertaking a precinct-based approach to the protection, retention and enhancement of the urban forest will allow Council to consider the local opportunities for vegetation and tree plantings, process improvements and other locally specific issues.

Planning permits involving vegetation removal:

There are several mechanisms currently in place within the Bayside Planning Scheme that seek to protect vegetation in certain areas of Bayside and require a planning permit to be granted for tree or vegetation removal. These mechanisms include but are not limited to the Vegetation Protection Overlay (VPO), Significant Landscape Overlay (SLO), Heritage Overlay (HO) and Erosion Management Overlay (EMO).

Surrounding infrastructure: Street trees are located alongside public and private assets that include footpaths, roads, fences, overhead powerlines and underground services. This pressure is similarly felt on private property for medium and high density developments where there are competing uses and infrastructure to be sited. While there are management and design techniques that can mitigate most of these issues, it is not always easy, particularly with established trees. Established trees have larger roots that can impact footpaths and roads, creating potential hazards that need to be fixed.

Social challenges:

Older people, children, and people with disabilities:

More vulnerable members of the community include older people, young children and people with disabilities and their carers. While trees bring many benefits, they can also create challenges. Maintenance of trees can be challenging for older people or people living with disabilities. Particularly large trees that overhang private property or within the property that can become hazardous through

debris that create trip and slip risks. Aging and/or disability can prevent some residents from being able to manage the debris from trees, requiring the use of private gardening services.

Bayside Council's *Disability Action Plan 2021-2025* states that over 14,000 people living in Bayside have a disability and over 4,000 people need assistance in their day-to-day lives. This assistance is required because of disability, long-term health conditions or old age.

Women's safety: There are a number of elements that contribute to women feeling unsafe, including low visibility and lack of passive surveillance from nearby residents and/or other groups. Within streets, Council plants and maintains trees to ensure there is no foliage to block sight lines. Trees can contribute to this problem if not managed correctly as they have the potential to block visibility from the street if planted too closely together.

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What will the Precinct Plans achieve?

A key action from the Bayside *Urban Forest Strategy* is the preparation of Precinct Plans. Each Precinct Plan will be informed by community consultation and will provide set targets to respond to the individual needs, challenges, and aspirations of the locality.

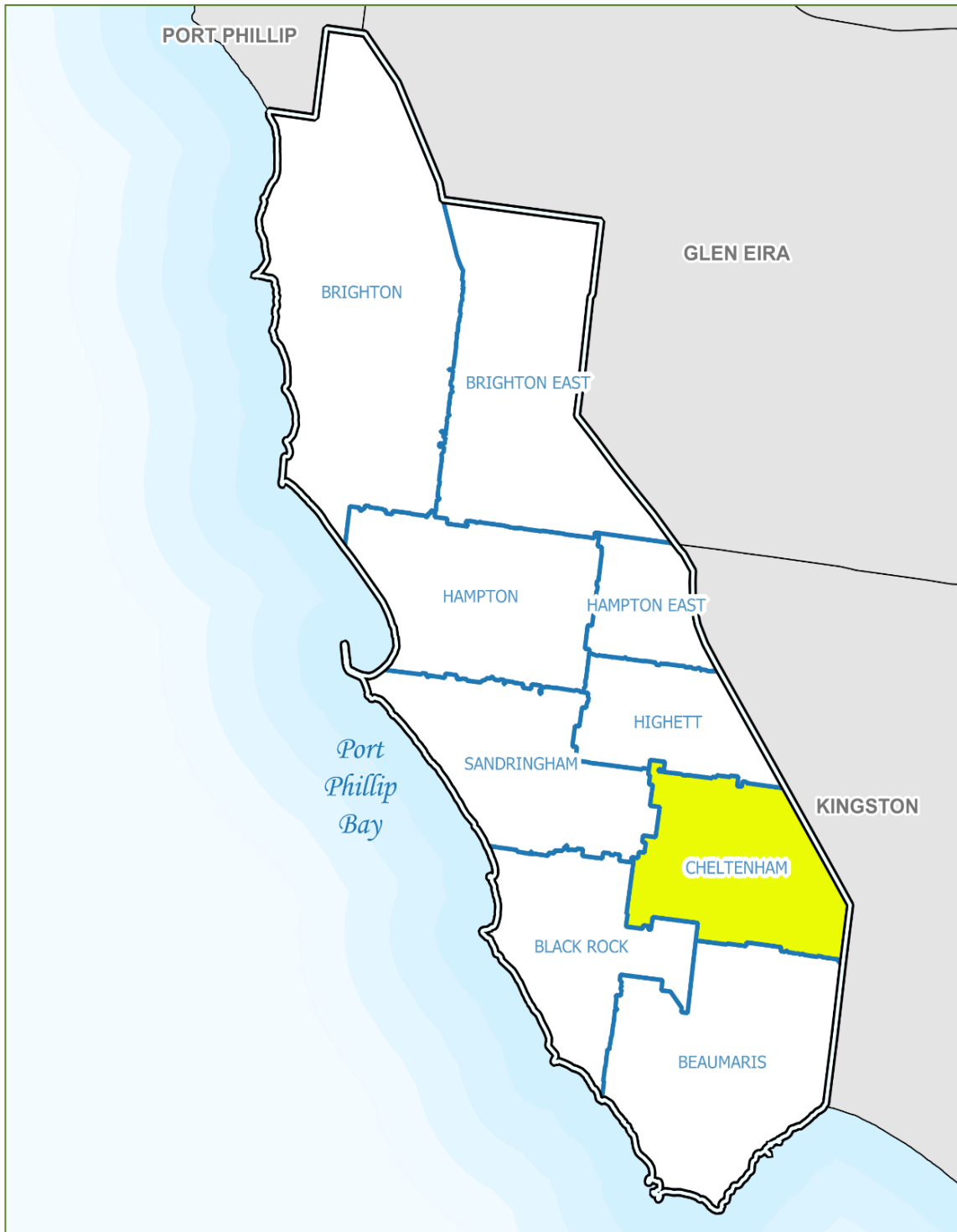
The Precinct Plans will help guide the implementation of the Bayside *Urban Forest Strategy* in Bayside and direct Council's focus to areas with low vegetation, to protect and enhance neighbourhood character and help achieve the objectives of the Bayside *Urban Forest Strategy*.

The prime objective of the Precinct Plan is to prioritise areas of greatest need, including areas with the lowest existing percentage canopy tree cover, as well as areas that are strategically located to mitigate urban heat island effects (including within major activity centres that are experiencing increased density and construction activity), areas of declining canopy or aging trees, highly trafficked pedestrian routes and gaps or vacancies in public planting.

Within this document, specific direction is provided on the selection of appropriate trees for the precinct. The Precinct Plans are performance-based in that they establish the desired outcomes for streets but do not prescribe specific species for each location. A high level landscape character assessment has been undertaken to assist with the species selection.

High-performance guidelines have been developed to support the Precinct Plans with case studies and detailed guidance on how to achieve outcomes in streets, parks and nature strips. Park and significant boulevard trees will be planted using existing master plans and site-specific plans to respond to the individual needs, challenges, and aspirations of the locality. This document focuses on the suburb of Cheltenham (including Pennydale).

Map 1. Cheltenham's location within Bayside



<p>Bayside CITY COUNCIL</p>	<p>Legend</p> <ul style="list-style-type: none"> Suburbs Bayside LGA Boundary 	<p style="text-align: center;">N</p> <p style="text-align: center;">0 0.5 1 1.5 km</p> <p style="text-align: center;">GDA 2020 MGA Zone 55</p>	<p><small>Disclaimer: Copyright 2022 ViaMap Data - DE, WA This material may be of assistance to you but the state of Victoria and Bayside City Council do not guarantee that the publication is without fault of any kind or is not appropriate for your particular purposes and therefore disclaims all liability for any errors, loss or consequences which may arise from your relying on any information contained in this material. Created by Bayside City Council 12 November 2022</small></p>
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Suburb Profile – Cheltenham (including Pennydale)

Information in this Suburb Profile was accessed from Profile.id which utilises 2021 census data from the Australian Bureau of Statistics and population, household and age structure forecasts.

Population:

Cheltenham (including Pennydale) is experiencing a high rate of demographic change as well as population and housing growth. The suburb population increased by 697 people from 3,605 in 2016 to 4,302 in 2021 and forecasted to grow significantly to 5,767 (increasing by 34.06%) by 2041.

With regard to household size, in 2021 the most dominant household type in Cheltenham (including Pennydale) was couple families with dependents, which accounted for 37% of households. By 2041, this household type will continue to be the most dominant (31%), followed by couples without dependents (28.2%) and lone person households (27.8%).

As the household structure suggests, Cheltenham (including Pennydale) also has a higher percentage of parents (24%) compared to Bayside (19%) and residents classified as being in the young workforce (10% compared to 8% in Bayside). Future housing will need to accommodate for this varied population by providing a diverse housing typology by providing dwellings for families, skilled workers and older residents.

Age structure:

By 2041, it is anticipated that 29.3% of Cheltenham (including Pennydale) residents will be above 60 years of age, which is an increase from the current 21% (2021). It is expected that older populations will have greater difficulty maintaining gardens and are susceptible to environmental challenges, such as heatwaves and increasing temperatures.

Senior residents who decide to remain in their family home after their children move out become what is known as 'empty nesters'. Many low density residential dwellings in Cheltenham typically have moderate sized gardens with which empty nesters may have difficulty maintaining and therefore may require assistance now and in the future.

Residential developments:

Cheltenham is undergoing significant commercial and residential growth to accommodate for the growing population. Residential development forecasts assume the number of dwellings in Cheltenham (including Pennydale) will increase by an average of 43 dwellings per annum to 2,561 in 2041. In Cheltenham (including Pennydale), there is a higher percentage of medium density housing (38%) compared to Bayside (30%). This is due to a significant proportion of Cheltenham (including Pennydale) being zoned in the General Residential Zone, which is a moderate growth zone where housing development can be permitted up to three storeys.

As the number of units and apartments across Cheltenham (including Pennydale) increases, housing will diversify, providing ageing residents with the opportunity to downsize to smaller homes, while staying in their local community. Smaller homes for senior residents provide a number of benefits, including a minimal need for garden maintenance.

In addition to residential growth, commercial development will continue to occur in the north-western part of the suburb (the Bayside Business District) which is within the Commercial 2 Zone. This zone encourages commercial areas for offices, appropriate manufacturing and industries, bulky goods retailing, other retail uses, and associated business and commercial services. While increases in residential and commercial development are consequent to population growth, this development in

turn reduces the available permeable surfaces to plant trees, which can impact their ability to grow to maturity and provide large canopies if not planted appropriately. In addition, the facilitation of new residential development will likely see the loss of existing trees and vegetation – a problem that will continue to occur if appropriate processes and planning tools are not put in place.

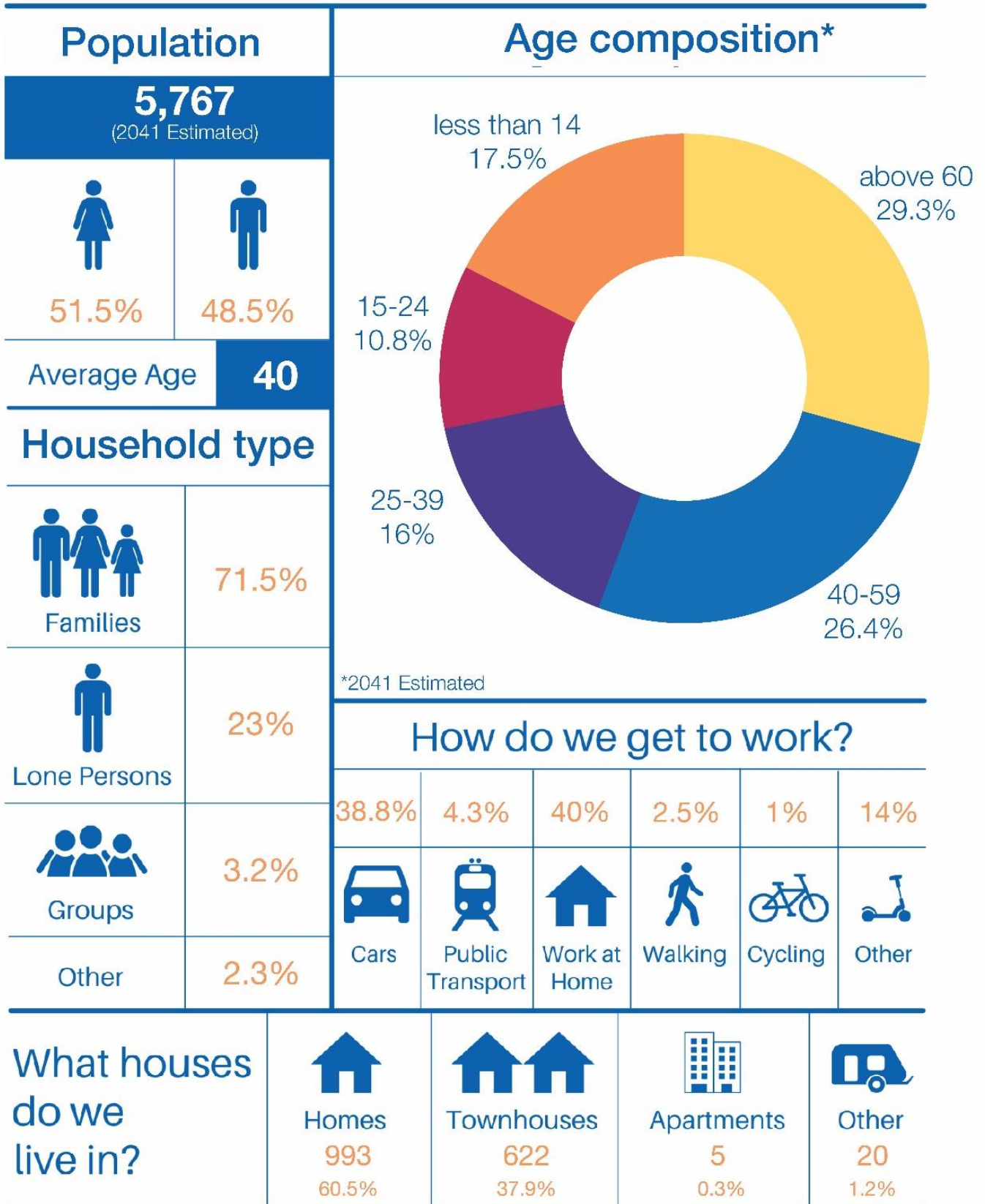
Climate change:

The effects of climate change are anticipated to significantly impact tree canopy and vegetation. Due to climate change, there will be an increase in severe weather events including more intense rainfall over summer, leading to more frequent and severe flooding events. Trees can play an important role in mitigating the impacts of a flooding event. The soil under trees and vegetation absorbs water as opposed to urban impervious surfaces where the water just runs (such as pavement and roofs). The leafy canopy of trees also spreads out the rainfall and slows it down. This gives more time for the soil underneath to absorb the rainfall, resulting in less and slower runoff. As a result, the risk of flooding is reduced. When flooding does still occur, the volume and speed of the flood will be reduced. This will also reduce the need for larger stormwater gutters and pipes.

Mode of transport:

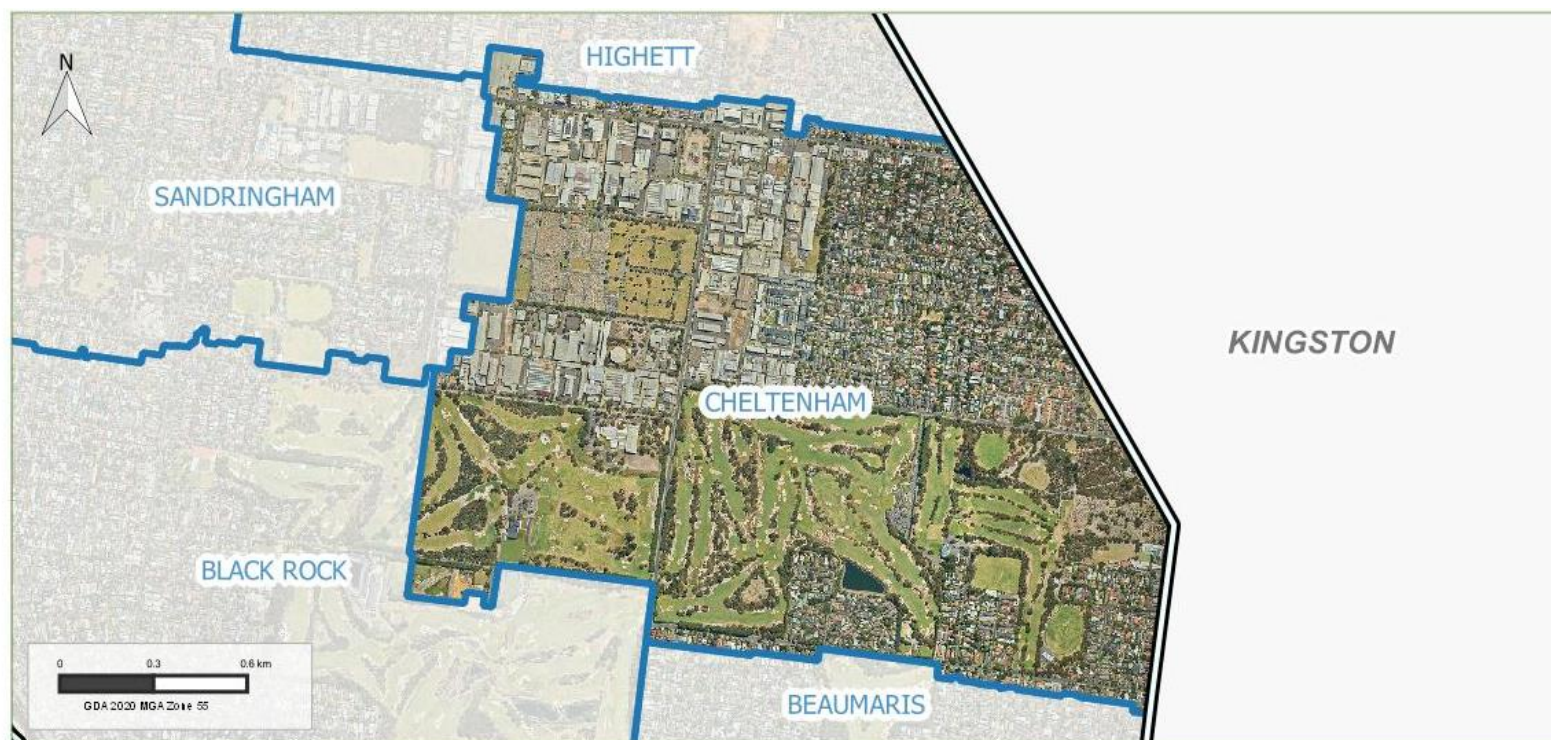
In 2021, 38.8% of Cheltenham (including Pennydale) residents travelled to work by car. Cheltenham (including Pennydale) is serviced by Cheltenham Train Station, Southland Train Station and various bus routes. A new station is proposed for construction at Cheltenham (within the Kingston municipal boundary) as part of the Suburban Rail Loop (SRL) Project. SRL East will connect Cheltenham with Box Hill and Clayton and is to be completed by 2035. The development of the new station and connection to other transport modes within the Bayside municipal boundary will provide a great opportunity to increase street tree and understorey planting.

Cheltenham (including Pennydale) Forecast for 2041





Note: Cheltenham suburb population and age data is a 2023 estimation for 2041, which was retrieved from the Australian Bureau of Statistics. All other data shown was retrieved from profile id (2021).

Aerial of Cheltenham (including Pennydale)



Legend

-  Bayside LGA Boundary
-  Suburb

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14 December 2022

The Vision for Cheltenham's (including Pennydale) Urban Forest:

The Cheltenham (including Pennydale) Urban Forest will be enhanced by connecting private dwellings with public open space. Future planting will complement the different types of uses and development within the suburb.

Planning controls applying to Cheltenham (including Pennydale)

Residential and Commercial zone

The majority of Cheltenham's (including Pennydale) residential land is located within the General Residential Zone (GRZ), which is a planning zone applied to areas where growth and housing diversity is anticipated. The GRZ discretionary maximum building height is 11 metres or 3 storeys.

Much of the current residential growth in Cheltenham (including Pennydale) takes the form of dual occupancy, townhouses, and apartments. As the population increases, it is expected that housing types will continue to change to provide more diverse built forms, in response to the preferred future neighbourhood character.

There are several areas within the suburb that have been identified as areas subject to housing growth and change. Both Pennydale and Cheltenham have centres designated as moderate residential growth areas. There are also 4 small neighbourhood activity centres to support local convenience retailing and employment as well as a significant portion of the Bayside Business District (BBD) which dissects the suburb. Uses within the BBD include offices, commercial businesses, manufacturing and light industrial and retail activity. Commercial and industrial areas generally have lower canopy coverage, which will be targeted and explored further within this Precinct Plan.

Traditional ways of increasing tree and vegetation cover are of course encouraged throughout the suburb, particularly where it is needed most. However, as commercial and residential development continues to occur throughout the suburb, the ways of increasing planting may require more innovative methods in response to the changes in built form, alike green walls and roofs.

VPO controls: permit removals

There are areas within Cheltenham (including Pennydale) that are covered by the Vegetation Protection Overlay Schedule 2 (VPO2) and Schedule 3 (VPO3), which aims to protect areas of significant vegetation.

VPO2 applies specifically to remnant bushland reserves that are discontinuous, landlocked and surrounded by either residential or industrial development, aiming to maintain the quality of the remaining fauna habitat and to create additional habitat in bushland areas. All areas within VPO2 are Council-owned. The vegetation of Bayside's remnant bushland reserves is significant for its diversity and environmental value in providing habitat areas of regional, state, national and worldwide significance. Permits are therefore required to remove, destroy, or lop any native vegetation in areas that are covered by the VPO2 (unless it is undertaken by or on behalf of the public land manager in order to maintain or improve the area as a flora and fauna conservation site).

VPO3 aims to retain the amenity, aesthetic character, and habitat value of vegetation within the area by seeking the protection of a number of indigenous species that are of local significance. Under VPO3, a planning permit is required to remove, destroy, or lop any vegetation native to Australia. This does not apply to:

- The removal, destruction or lopping of vegetation which is less than 2 metres high or has a single trunk circumference of less than 0.5 metre at a height of 1 metre above ground level.
- The pruning of vegetation to remove that part of any branch which overhangs an existing dwelling or is within 2 metres of an existing dwelling.

Benefits of strengthening the VPO3

As identified as an Action of the Bayside *Urban Forest Strategy*, Council is seeking to strengthen the Vegetation Protection Overlays to increase the effectiveness of the policy tool and maximise the retention of protected vegetation.

Any expansion of the VPO would help maintain existing trees and enhance Cheltenham's (including Pennydale) leafy character, provide relief from urban heat island effects, filter air pollutants and better support the community's health and lifestyle.

Community feedback for VPO3

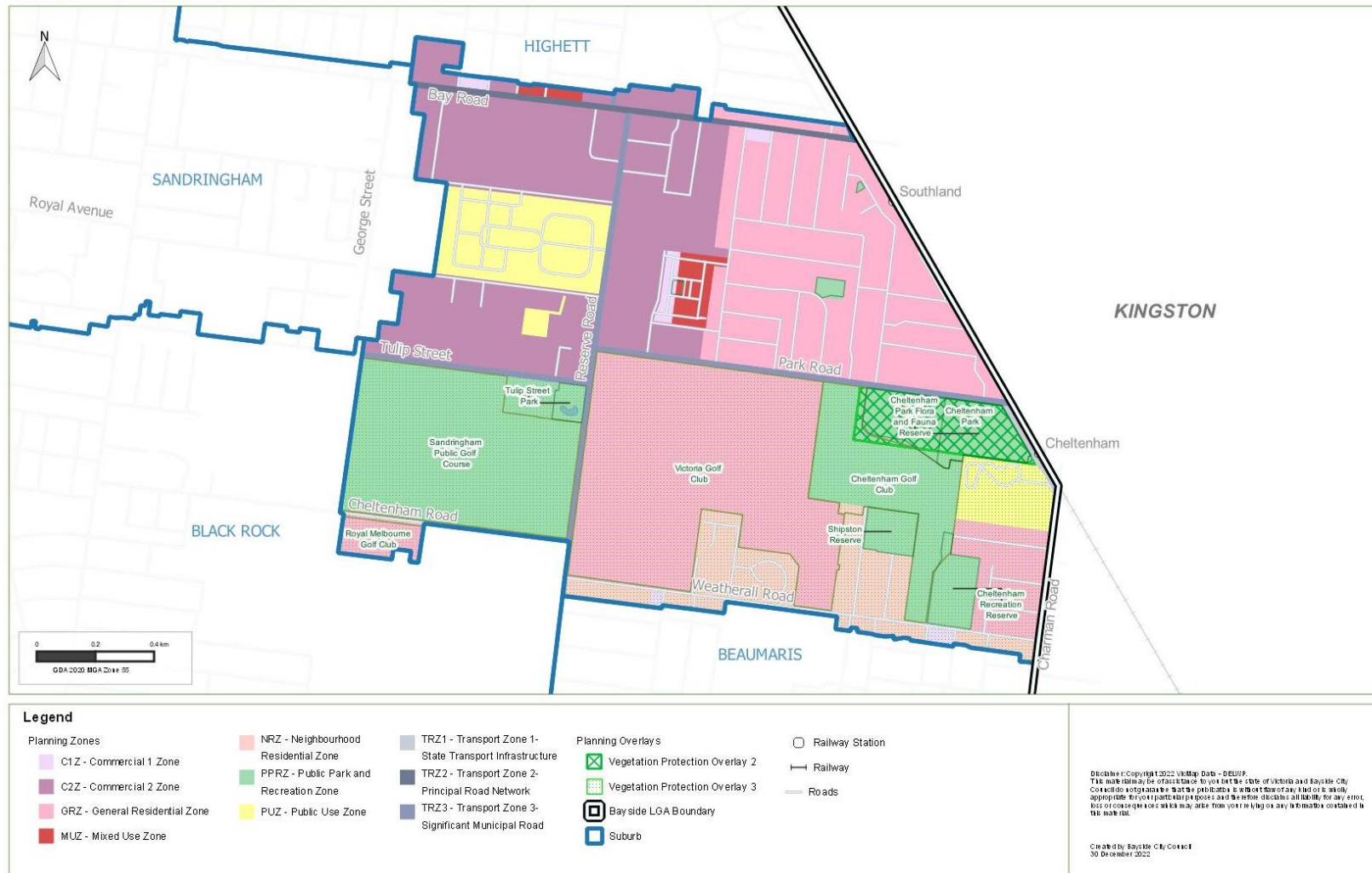
Council's community feedback survey provided an insight into the community's views on VPO controls. The survey captured some VPO related suggestions that have been summarised below:

- VPO protections should be implemented across the whole of Bayside, particularly in Cheltenham, Highett and Hampton East, which already have the least tree canopy coverage in Bayside
- Improve communication and education around VPO protections for residents and potential buyers in VPO affected areas
- Review and strengthen the wording of VPO decision guidelines to prioritise tree retention over replanting
- Undertake habitat studies to support the VPO habitat decision guidelines
- There needs to be stricter enforcement of the VPO controls
- The process of removing a VPO protected tree is time consuming and expensive. This discourages residents from planting native trees in the first place due to the issues it could cause in the future.

Neighbourhood Amenity Local Law 2021

Local Laws are laws utilised by Council to respond to issues and community needs within a local context. The *Neighbourhood Amenity Local Law 2021* applies to the Bayside municipality, including trees on private land. The law determines that any tree on private land is protected if the *"single or combined tree trunk circumference is 155 centimetres or more at one metre above ground level."* If a tree is protected it means that a permit must be acquired from council in order to remove or prune it. The same permit requirements apply to any tree on Council's Significant Tree Register.

Map 2: Planning Controls in Cheltenham (including Pennydale)



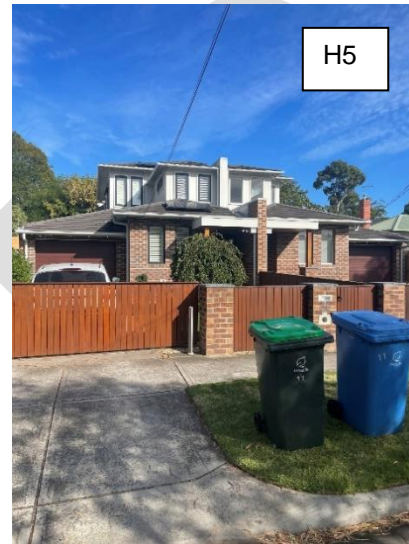
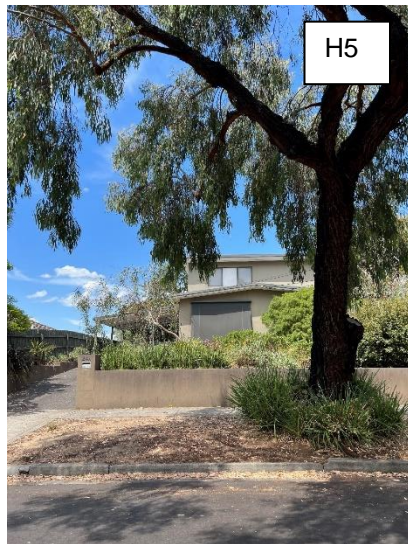
Cheltenham (including Pennydale) Neighbourhood Character

Cheltenham (including Pennydale) is a distinct suburb that is currently undergoing increased residential and commercial growth. It is important that new development respects, supports and enhances the cherished characteristics of their surrounding neighbourhood. Clause 15.01-5L 'Bayside preferred neighbourhood character' in the Bayside Planning Scheme provides general objectives and policy guidelines for neighbourhood character precincts that have been set across the municipality.

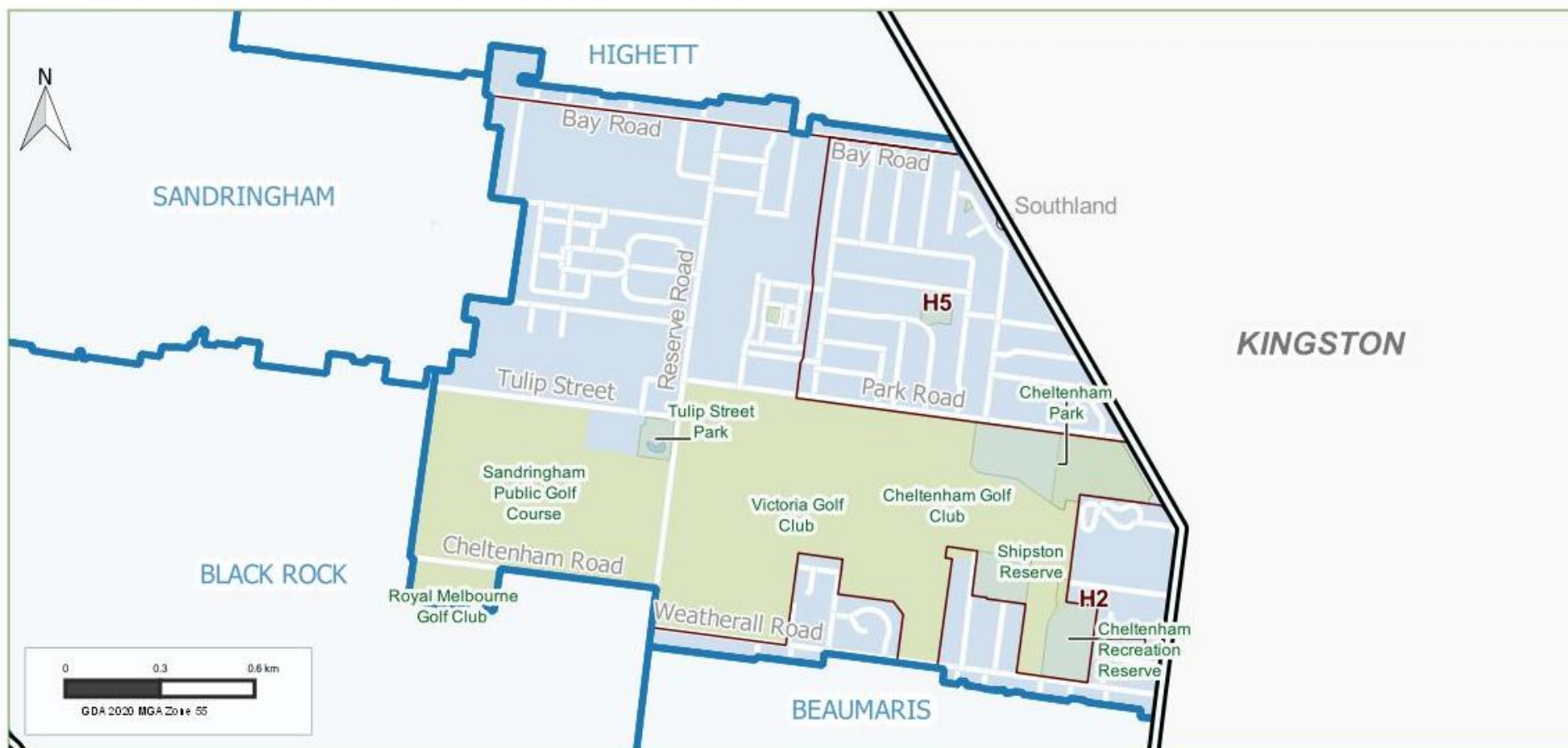
For many of the streets within the suburb, the regular pattern of predominately single storey, bungalow-style homes, with setbacks on all sides, is readily apparent. Front setbacks vary from 6-8 metres and side setbacks are generally 1 metres on one side with 3-4 metres setbacks including garages and driveways to the boundary on the other. While there are many 1950s-60's post war dwellings still intact throughout the suburb, there are also various pockets of infill contemporary development which continues to occur and has allowed for more increased density in more recent times.

While tree planting in various streets in Hampton and Brighton have a purposeful appearance, tree planting style and type within Cheltenham appears more sporadic and this is likely in response to the increases in housing growth. There are many examples of mature trees throughout the suburb, however larger trees tend to occur in small groups across the suburb. Currently, only 10.7% of the street tree population is considered to be 'mature' whilst 24.7% is 'juvenile' and 34.28% 'new.' Gardens are typically well developed with a mixture of low-level shrubs, lawn, and native or exotic canopy trees.

Examples of neighbourhood character across various precincts within Cheltenham (including Pennydale)



Map 3: Cheltenham (including Pennydale) Neighbourhood Character Precincts



Legend

- Bayside LGA Boundary
- Neighbourhood Character Precinct
- Suburb
- Local Road
- Council Land
- Golf Club

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 22 December 2022

The Urban Forest of Cheltenham (including Pennydale)

In Cheltenham, there is approximately 15% of tree canopy cover and 28% of understorey cover (2019), which is an average amount in comparison to all other suburbs within Bayside.

Cheltenham's (including Pennydale) urban forest encompasses a distinct character of native and exotic trees and understorey planting, contributing to a highly biodiverse environment. The contribution of tree and vegetation cover is largely felt within the parks, reserves and golf clubs within Cheltenham (including Pennydale). Outside of these areas, tree canopy coverage is limited, and prioritisation of planting will be required within Cheltenham (including Pennydale) to reach the intended target.

History

Prior to European settlement, the Bunurong people of the Kulin Nation inhabited the land and used the natural springs in the area. Following European settlement, settlers established market gardens and orchards in the area. Cheltenham was one of the earliest suburbs to be settled in the parish of Moorabbin. In 1852, Josiah Morris Holloway purchased 625 acres of land which he subdivided into 370 allotments and then sold in 1853. The community was referred to as the 'Two Acre Village' as many of the blocks sold were two acres in size. Cheltenham Park dates back to 1872 and was previously utilised for cricket and other recreational activities. Significant population growth occurred in the 1880s after the Cheltenham railway station opened in 1881.

Residential development occurred in the second half of the 1940s post World War II with growth continuing into the 1980s. Looking at aerial imagery from 1970, there is notably very little tree canopy cover across the suburb, and along streets in particular. This was likely subject to the fast increases in development and the conversion of land within Hampton East from bare, vacant land (with little vegetation prior existing, having been cleared) into a mostly residential neighbourhood. It appears the majority of planting has occurred since the 1970s and continues to occur to help enhance the urban forest within the suburb. Private gardens have seen a mix of both exotic, native and indigenous vegetation and consisted of shrubs with limited canopy trees. Tree canopy coverage within Cheltenham (including Pennydale) is still limited in comparison to other suburbs, especially throughout within the residential areas of the suburb.

While the overall canopy cover is limited, there are a number of canopy trees and vegetation that have been recognised over time for their local heritage significance within the suburb. This includes remnant vegetation such as *Coast Banksia*, *Sallow Wattle*, *Manna Gum* and *Flower Gum* in Cheltenham Park. Vegetation in the old and new Cheltenham Cemetery also form a part of the heritage overlay. The four golf clubs located within Cheltenham (including Pennydale) consist of older canopy trees and understorey vegetation that contributes to the amenity and ecological importance of the courses.

Contemporary issues impacting Cheltenham's urban forest

There are a number of contemporary issues impacting the urban forest of Cheltenham (including Pennydale) and providing cause to the decrease in canopy cover. Issues associated with climate change, and its flow on effects, such as the urban heat island effect and erratic weather events, are impacting and damaging the health and viability of tree and ground cover vegetation. Increasing tree and vegetation cover will help alleviate rising temperatures and dramatic changes in climatic conditions by providing shade and cooling effects.

For new developments on private and public land, Council considers all possible design solutions and ensures the application has met all criteria provided in the Procedure for *Street and Park Tree Removal for Development 2020*. However, even with these measures in place, the removal of tree and understorey vegetation is an issue facing Cheltenham (including Pennydale) and is likely consequential to the increase in medium density residential development and the limitations on permeable surfaces appropriate for planting.

The removal of established gardens, large trees and understorey plantings is contributing to a loss of the distinct vegetation character and impacting the biodiversity. Other issues impacting the urban forest include:

- Trees nearing the end of their useful lifespan can also create safety issues particularly for more vulnerable residents. As a tree becomes older it loses its strength as is more prone to falling or losing limbs. Council monitors the health of its trees to ensure any hazardous trees are removed.
- The Suburban Rail Loop is a State government commitment and will deliver a 90km rail line linking various major train services from the Frankston Line to the Werribee Line via Melbourne Airport, providing better connection to jobs, retail, education and health services across Melbourne. As part of its development, a new train station will be constructed at Cheltenham and is to be completed by 2035. Council is mindful that the development of the train station may result in the loss of vegetation within Bayside and will work closely with the Suburban Rail Loop Authority to advocate for an increase in planting and ensuring all trees that have been removed are replaced. As new trees are planted and they mature in age, canopy coverage will increase and reduce temperatures within the precinct.
- Vandalism of public and private trees is another issue contributing to tree canopy loss across Bayside. Illegal removal, lopping or poisoning of trees occurs throughout Bayside by members of the public for personal gain. A common example of this is the vandalism of trees due to the build up of leaf debris upon or near private property. Unpermitted removal, destruction, pruning and interference with trees and vegetation is illegal in Bayside. In an effort to deter vandals, Council has adopted a strong stance on vandalism and has installed signs and advertised on social media platforms an offering of rewards for information when an act of vandalism has occurred.



Image 1: Cheltenham Park Reserve



Image 2: Cheltenham Park Playground



Image 3: Cheltenham Recreation Reserve

Tree canopy cover across Cheltenham (including Pennydale) and various land uses

As indicated previously in this document, Cheltenham (including Pennydale) has an average amount of canopy cover in comparison. Of the 15% of tree canopy cover within Cheltenham (including Pennydale):

- 51.84% is located upon open spaces and reserves;
- 29.13% is located upon private residential and mixed-used areas;
- 14.82% is located upon streets;
- 4.19% is located within the public use zone; and
- 0.02% 'other'

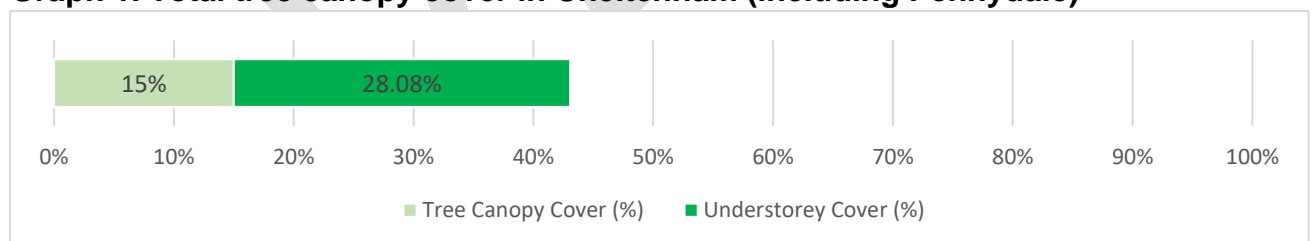
The amount of tree canopy cover upon streets is significantly low in comparison to other suburbs, and as previously mentioned in this Precinct Plan, it is evident that this has occurred due to increases residential and commercial development within the suburb.

In 2022, there were 3,830 trees managed and maintained by Council throughout Cheltenham (including Pennydale), with over 2,705 street trees, 1,119 park trees and 6 other location-specific trees. Monitoring the age, health and useful life expectancy of these trees is important to ensuring that Council understands the local conditions, maintains tree and understorey plant populations, and effectively plans for future planting programs and strategies across Cheltenham (including Pennydale).

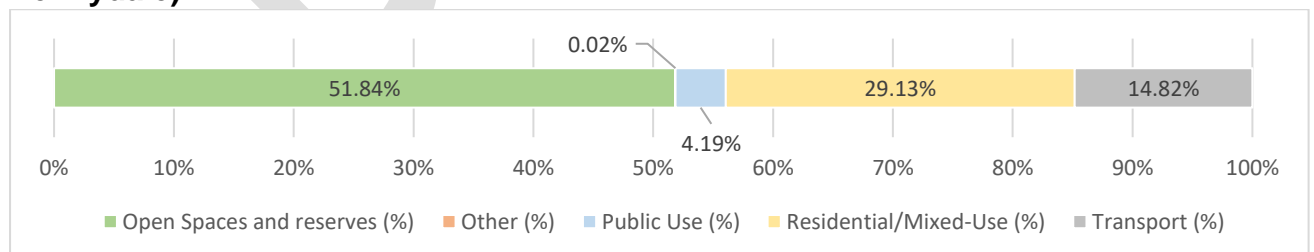
Map 4 identifies locations of tree canopy cover across Cheltenham (including Pennydale). It is evident upon observations of this map that there is a significantly limited amount of tree canopy cover within the Bayside Business District (Commercial Zoned 2) as well as land within the Public Use Zone.

In Cheltenham (including Pennydale), there is approximately 15% tree canopy cover and 28% understorey cover. Through increased and prioritized planting, Cheltenham (including Pennydale) will be a major contributor towards achieving the council’s goal of 30% tree canopy cover by 2040, and the enhancement of understorey cover within the public and private realm.

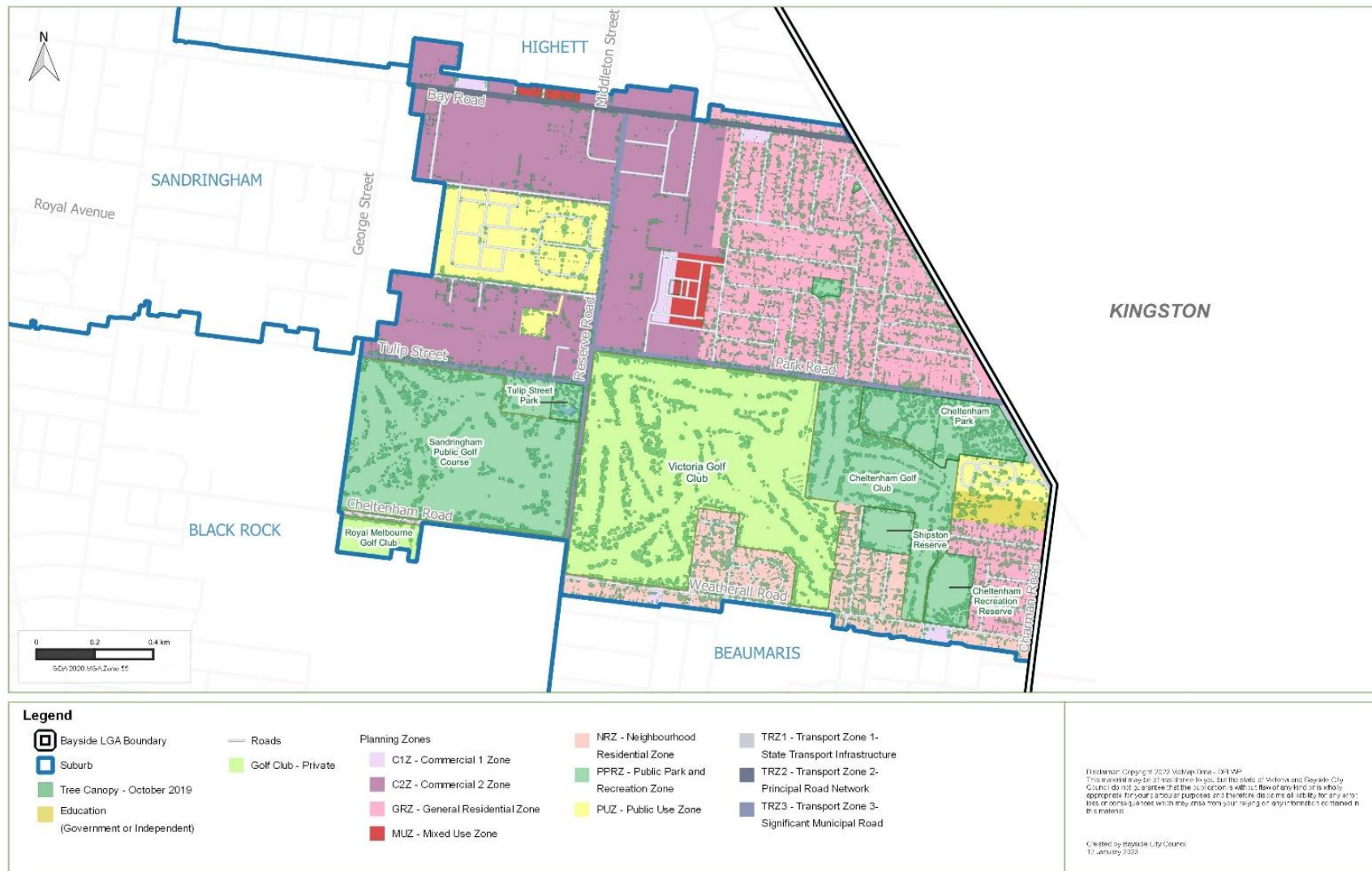
Graph 1. Total tree canopy cover in Cheltenham (including Pennydale)



Graph 2. Tree canopy cover over various land uses in Cheltenham (including Pennydale)



Map 4: Tree canopy cover in Cheltenham (including Pennydale)



Council-managed Tree Population

Useful Life Expectancy (ULE)

Estimating the useful life expectancy of the council-managed tree population is regularly undertaken and can inform the future management options for trees that have limited useful life left. The assessment of a tree's useful life expectancy provides an indication of health and tree appropriateness and involves an estimate of how long a tree is likely to remain in the landscape based on species, stage of life (cycle), health, amenity, environmental services contribution, conflicts with adjacent infrastructure and risk to the community.² It is not a measure of the biological life of the tree within the natural range of the species, but more a measure of the health status and the tree's positive contribution to the urban landscape.²

There are approximately 208 (3%) council-managed trees that may not survive in Cheltenham (including Pennydale) after the next 10 years (Graph 3). By 2040, a total of 3,481 (91%) council-managed trees will have reached the end of their useful life expectancy and may need to be replaced.

Where trees reaching the end of their useful life expectancy have been assessed and are no longer providing a benefit to the surrounding habitat, removal may be required. Where it has been found that trees reaching the end of their useful life still provide benefit and habitat, it should be retained as habitat tree as per the Tree Risk Assessment Tool (TRAQ).

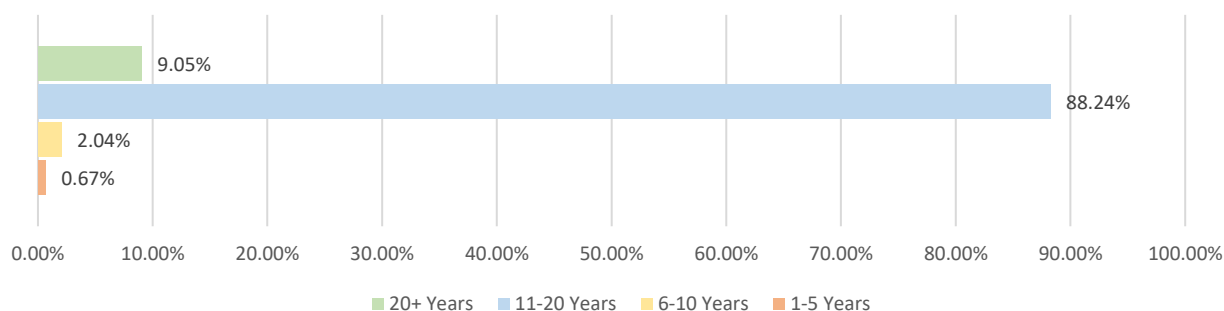
Where replacement of trees is required, new trees should be selected based on the existing surrounding vegetation, landscape character and ability to enhance habitat. Where there is a large concentration of trees required for replacement, this should be undertaken intermittently to enable varying ages and maturity.

The locations where there is a high concentration of trees that will need to be replaced in the next 10 years include Tulip Grove, Cheltenham Road, Shipston Reserve, Cheltenham Recreation Reserve, Cheltenham Park Reserve and Park Road.

In Cheltenham (including Pennydale), approximately 3% of council-managed trees will not survive after the next 10 years (Graph 3). Map 5 shows the location of trees with low ULE and the locations where the concentration of these trees is high.

Where it has been found that trees reaching the end of their useful life still provide benefit and habitat, it should be retained as habitat tree as per the Tree Risk Assessment Tool (TRAQ).

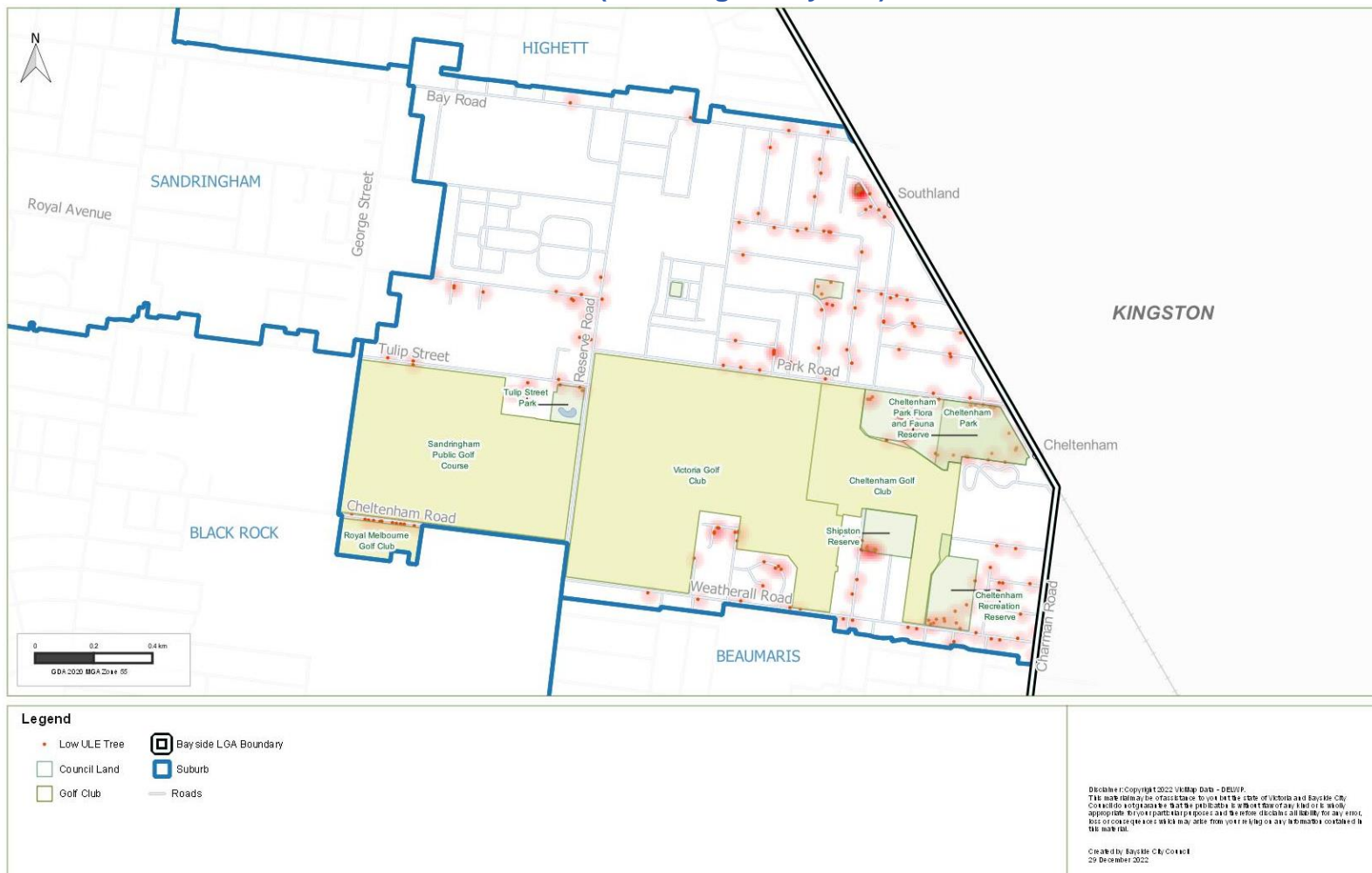
Graph 3. Useful life expectancy of council owned trees in Cheltenham (including Pennydale)



² Department of Health and Human Services, 'Arboricultural Assessment Holland Court, Flemington– 3.7 Useful Life Expectancy(ULE)', 2017, Available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0011/105500/SHRP-SH1-15.a.-Tree-Logic-Rpt_Holland-Court-Flemington.pdf

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Map 5: Location of trees with low ULE in Cheltenham (including Pennydale)



Tree health and age

Approximately 88% of council-managed street and park trees in Cheltenham (including Pennydale) were classified as being in good health, while 5% were classified as excellent. Trees that are classified as poor, dangerous or dead make up for 2% of street and park trees.

There is a reasonable level of diversity in the age of trees within the suburb. As seen in Graph 5, the highest proportions are new and semi-mature trees, making up 34% and 30% respectively.

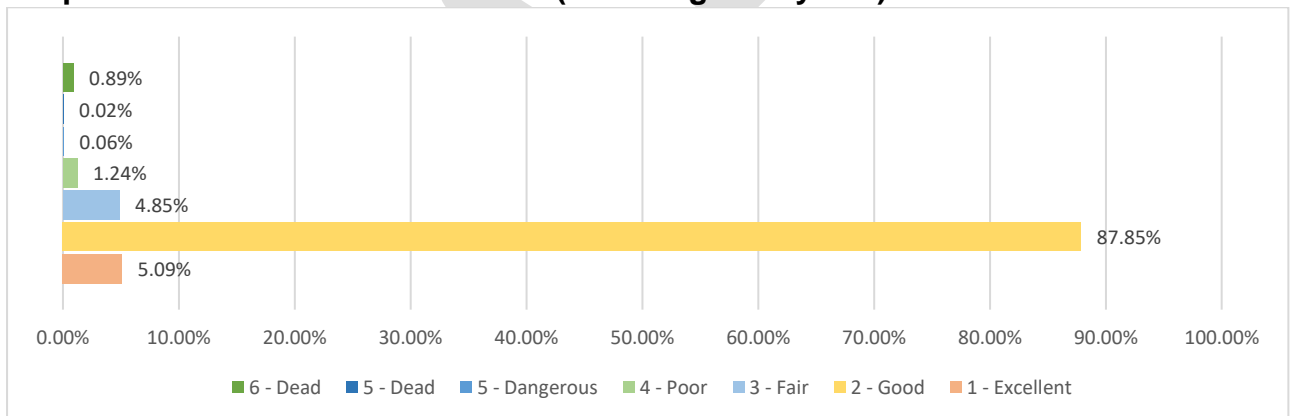
Map 6 provides the location of those trees that are in poor health or dead. Where tree health is poor, dangerous, and dead. Trees that have been identified as poor or dead are concentrated within reserves and in parks such as Tulip Street Park, Cheltenham Park and Shipston Reserve. Street trees that are dead should be removed but dead trees in parks can provide habitat for fauna. The map shows concentration of dead trees on foreshore that are providing habitat. Through the continued use of the Tree Risk Assessment Tool, Council will retain those trees and vegetation that provide a

In 2022, 88% of the council-owned street and park trees in Cheltenham (including Pennydale), were classified as being in good health. Trees that are classified as poor, dangerous or dead make up for 2%.

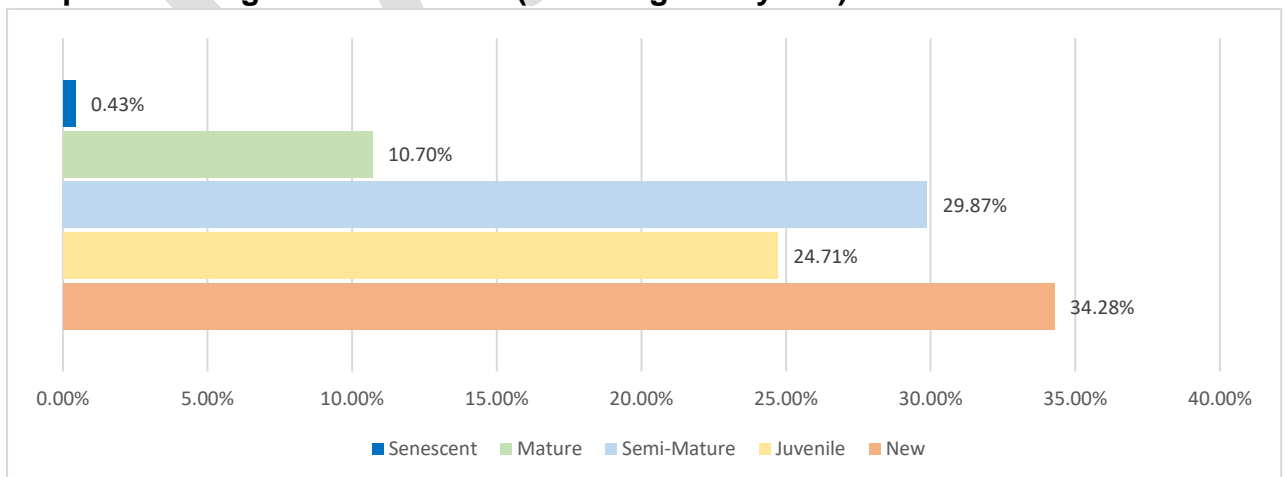
Through the continued use of the Tree Risk Assessment Tool, the council will retain the trees and vegetation that provide a service to the ecosystem.

service to the ecosystem.

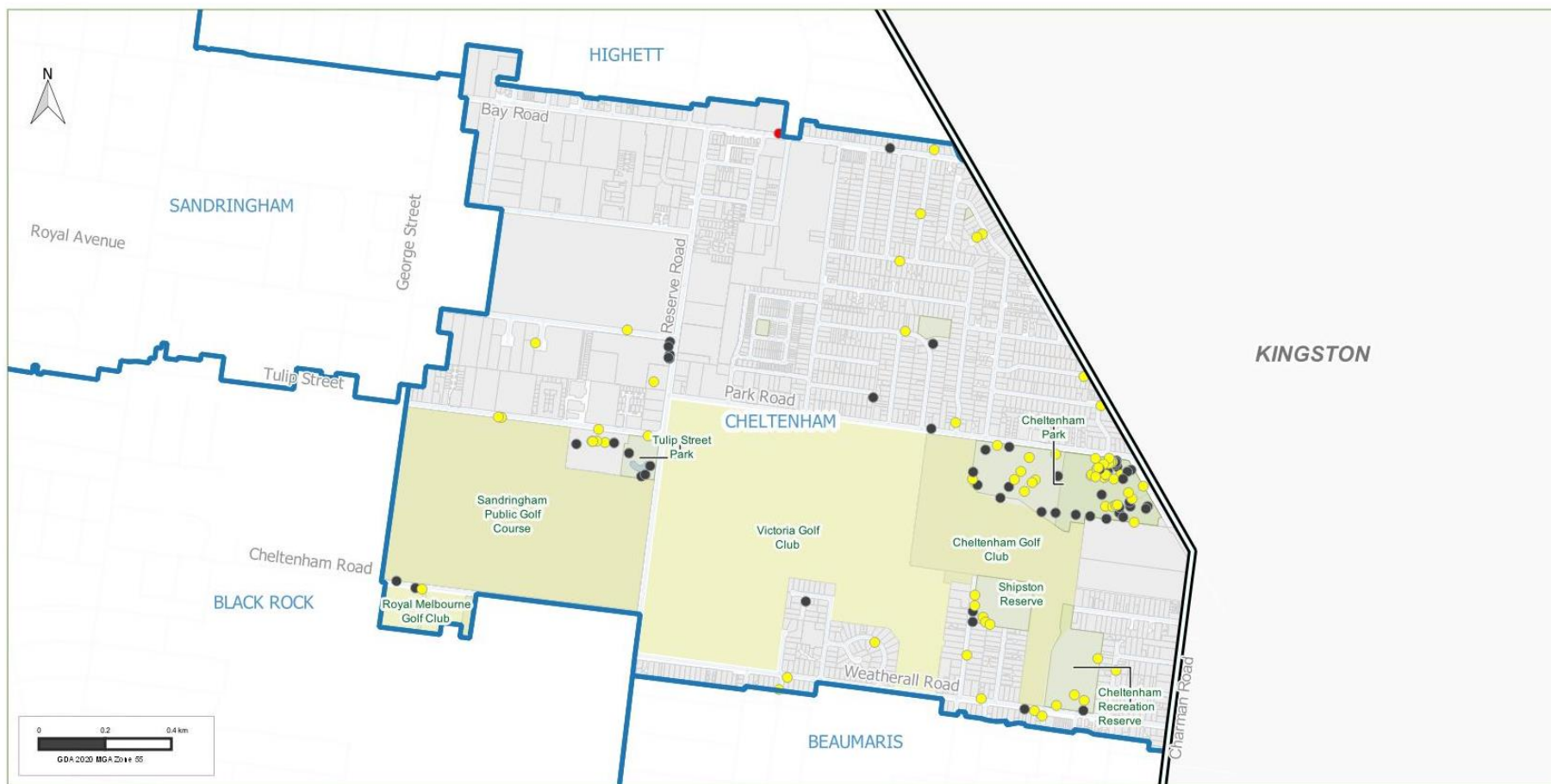
Graph 4. Tree health in Cheltenham (including Pennydale)



Graph 5. Tree age in Cheltenham (including Pennydale)



Map 6: Tree Health in Cheltenham (including Pennydale)

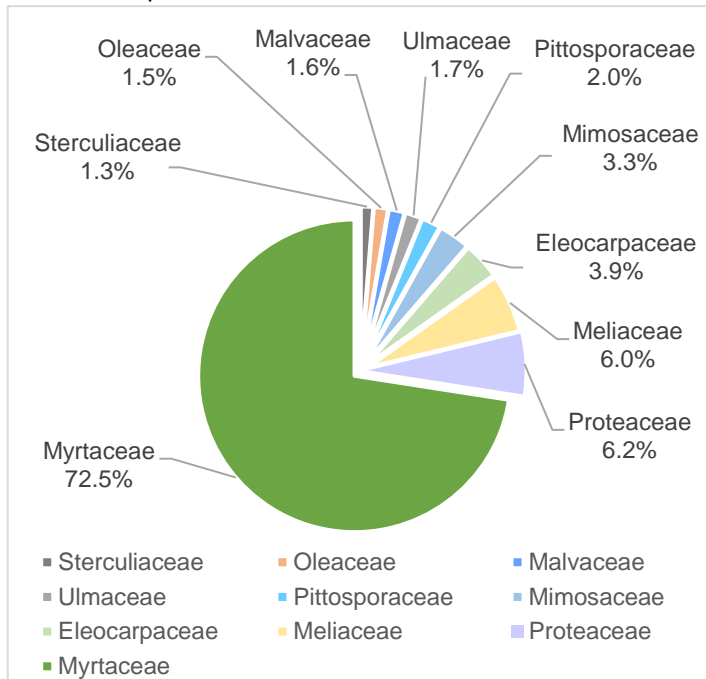


- Legend**
- Tree health
 - Poor
 - Dangerous
 - Dead
 - Bay side LGA Boundary
 - Suburb
 - Property Boundary
 - Council Land
 - Golf Club

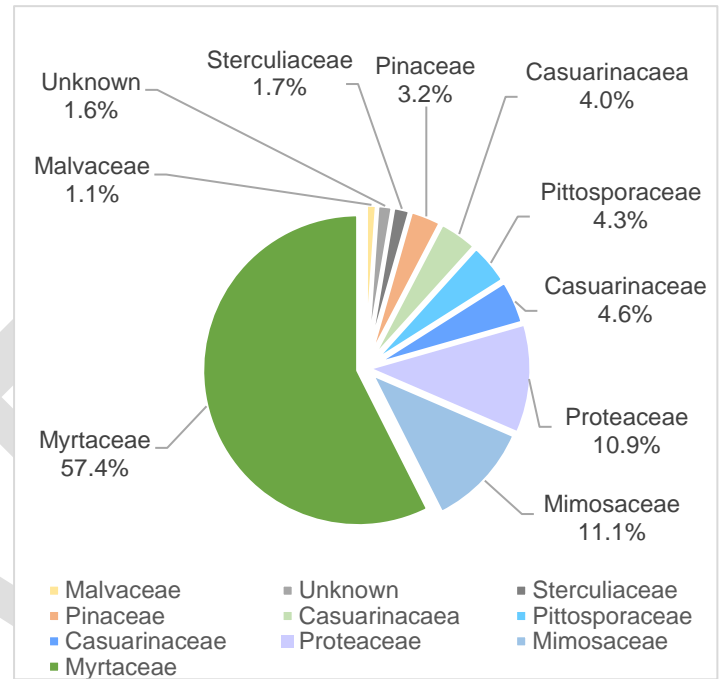
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 29 December 2022

Species diversity

A resilient urban forest has a diverse range of species from different families. As seen in graphs 6 and 7 below, Council-managed street and park trees are predominantly within the *Myrtaceae* family, making up to 73% of all street trees and 57% of all park trees. This is then followed by the *Mimosaceae* family (11% of all park trees), and the *Proteaceae* family (6% of all street trees). Other families make up about 21% of street trees and 32% of park trees, with a small percentage (2%) of council-managed trees in Cheltenham (including Pennydale) that are listed as unknown species.



Graph 6. Diversity of street tree species in Cheltenham (including Pennydale)



Graph 7. Diversity of park tree species in Cheltenham (including Pennydale)

The reliance of a small number of species, and a lack of spatial diversity in species distribution leaves the urban forest vulnerable to threats from pests and disease. Diversification of the family composition of the urban forest was a key challenge that was previously identified in the *Bayside Street and Park Tree Guide* and reiterated within the *Bayside Urban Forest Strategy*.

The following families currently form part of the overall tree population in Cheltenham's (including Pennydale) streets and parks at a significantly lower percentage than the *Myrtaceae* family. The inclusion and increase of these families should be targeted through the actions and implementation of this Precinct Plan, ensuring that different types of trees align with the neighbourhood character of the surrounding locality:

- *Malvaceae*
- *Sterculiaceae*
- *Pinaceae*
- *Oleaceae*
- *Ulmaceae*
- *Pittosporaceae*
- *Mimosaceae*
- *Eleocarpaceae*.

In order to improve species diversity, Bayside City Council is undertaking investigations through its *Park Improvement and Habitat Linkage Plan* to understand which species (trees and vegetation) would best support specific locations in Bayside and encourage the rebuilding of the ecological foundations in Bayside.

Currently, Cheltenham’s (including Pennydale) street and park tree population is largely dominated by the *Myrtaceae* family (*eucalyptus* etc.), making up 73% of all street trees and 57% of park trees.

Understorey planting in Cheltenham (including Pennydale)

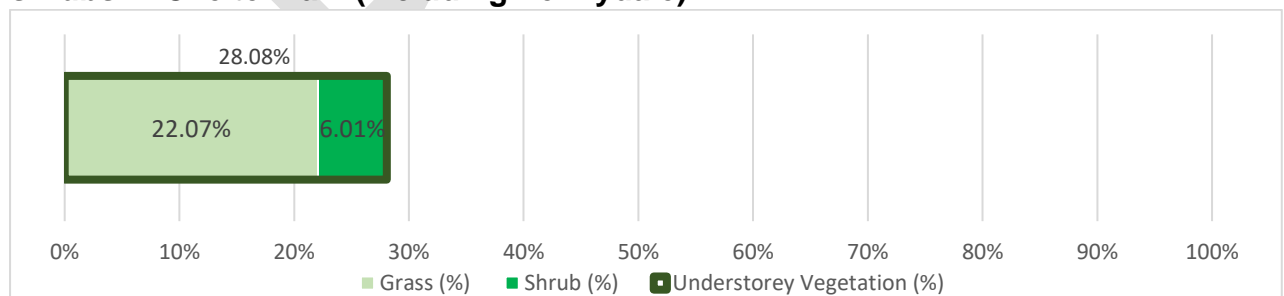
This section investigates the potential habitat and biodiversity corridors in Cheltenham (including Pennydale) across public and private land to understand where further opportunities are to increase habitat connectivity and improve biodiversity.

Understorey vegetation includes small trees, shrubs, herbs, grasses, mosses and lichens that occupy the vegetation layers below the canopy of taller trees.³ Bayside’s *Urban Forest Strategy* has three major goals to ensure the increase and improvement of the urban forest and the functions it serves. Two of these goals recognise the importance of understorey plantings. In addition, one of the strategic objectives of the Bayside *Urban Forest Strategy* is to support and enhance our local biodiversity and protect locally endangered and native species. This will be achieved by improving habitat connectivity and the protection and planting of Ecological Vegetation Classes (EVCs) through the implementation of the *Park Improvement and Habitat Linkage Plan 2022* which involves identifying the suitable locations to prioritise understorey planting.

There is currently 28.08% of understorey vegetation coverage in Cheltenham (including Pennydale), with a majority of this being located on the golf courses and recreational reserves within the suburb, as depicted in graph 8 & 9 and Map 7.

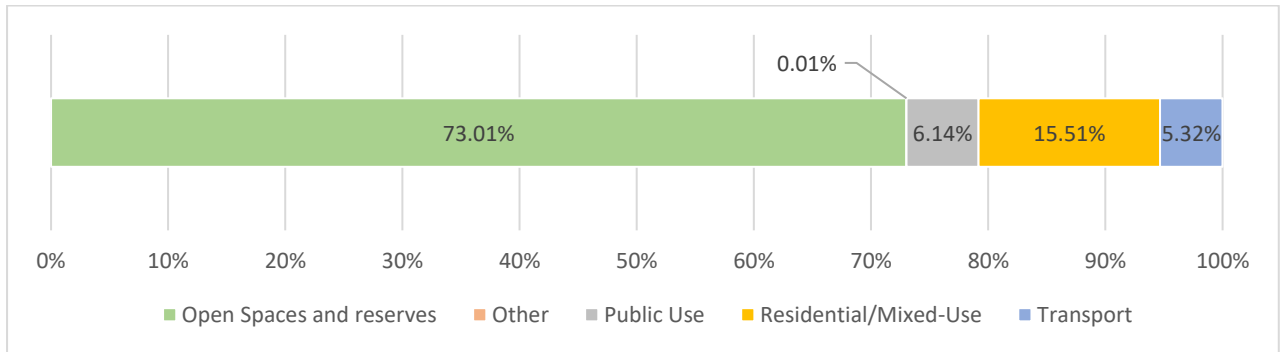
Council’s priority will be to increase understorey planting in a range of ways and specifically within areas that significantly lower coverage – including residential, commercial and mixed-use areas and streets, locations where core habitat patches exists and habitat improvement is recommended (Maps 10-11), and also by encouraging residents to have biodiverse gardens with indigenous and native plants. Streets that have a very low percentage of understorey planting (0-10%) have been identified in Map 7 and include Tulip Street, Reserve Road and Wangara Road.

Graph 8. Percentage distribution of understorey vegetation as grass and shrubs in Cheltenham (including Pennydale)



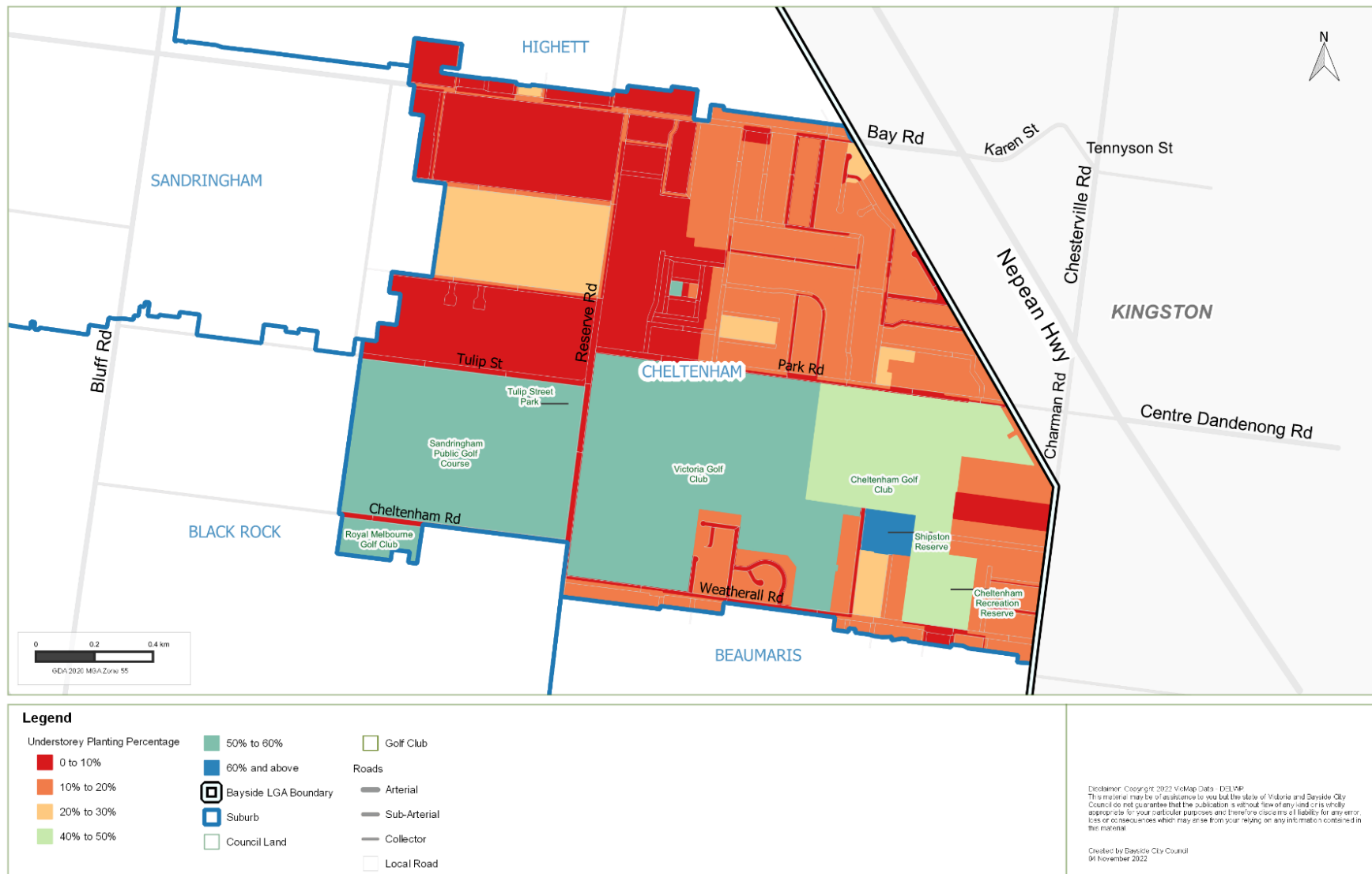
³ Land for Wildlife Queensland, ‘The Value of Understorey Vegetation’ Note V6, available at: <https://www.lfwseq.org.au/wp-content/uploads/2016/11/The-Value-of-Understorey-Vegetation.pdf>

Graph 9. Percentage distribution of understorey vegetation in different land uses



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Map 7: Understorey planting in Cheltenham (including Pennydale)



Urban Heat Island

Urban heat island effect in Cheltenham (including Pennydale)

Urban heat island effect is the phenomenon of dense urban areas having significantly warmer air and land surface temperatures than surrounding areas.⁴ It is primarily a result of impervious hard surfaces that generate heat and low vegetation cover that fails to provide adequate shade and natural cooling.

Urban heat data was captured in 2018 and provided in Map 8 below. It is evident from this map that there are various areas of Cheltenham (including Pennydale), particularly in the north, east and centre of the suburb, which are undergoing increased temperatures and are subject to urban heat island effects.

Increased greening and enhancement of the urban forest has been identified as one of the most cost-effective means of mitigating the potential impacts of climate change and urban heat island effects. Planting will be prioritised on streets in Cheltenham (including Pennydale) impacted by urban heat island effects including:

- Weatherall Road, MacKenzie Street, Sydney Street
- Glebe Avenue, Coape Street, Llewellyn Street
- Cheltenham Park Reserve (eastern section)
- Park Road, Churchill Avenue, Tulip Grove
- Gilford Avenue, Heather Grove, Bay Road
- Cheltenham Memorial Park
- Cloyne Street, Reserve Road, Beaumaris Parade
- Tibrockney Street, Arnold Street, Phillip Street
- Ambrose Avenue, Pallisades Bvd, Amberley Drive
- Fairview Drive, Monterey Drive, Bellevue Road
- Charlton Avenue, Jack Road, Luxmoore Street
- Paul Street, Stuart Avenue, Olympic Avenue
- Davie Avenue, Munro Avenue.

Anticipated population growth means that more people will be at risk during extreme weather events. The council's efforts in increasing the suburb's urban forest will provide an array of environmental benefits that will contribute to creating resilient and sustainable places for people to live and work safely from such extreme weather events. Some of the significant benefits that our tree canopy and understorey planting can provide to mitigate climate change impacts are shade, cooling, and rainwater interception.

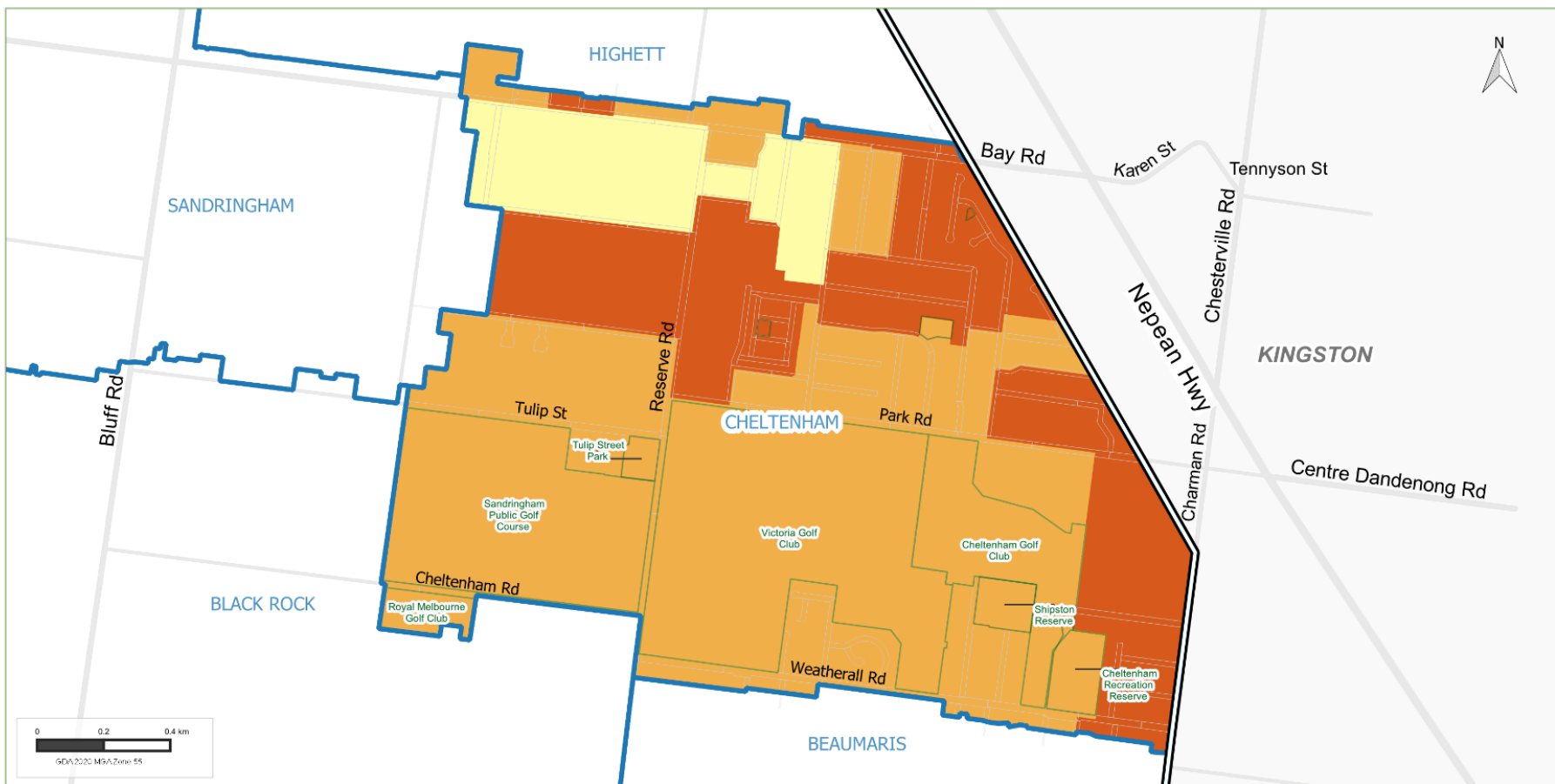
The urban forest and its associated benefits have been identified as one of the most cost-effective means of mitigating the potential impacts of climate change and heat on our area.

Council will prioritise planting on council land in the northern, central and eastern areas of Cheltenham (including Pennydale) through a tree planting program. In Activity Centres that are facing high temperatures innovative techniques such as green roofs and walls will be explored and encouraged to increase vegetation.

Due to larger areas that have impervious hard surfaces, that generate heat, and low understorey planting, the northern, central and eastern areas of Cheltenham (including Pennydale) will reach threshold temperatures for heat-related illness in vulnerable populations more often and for longer than surrounding areas.

⁴ Resilient Melbourne and The Nature Conservancy, 'Living Melbourne – Our metropolitan Urban Forest', 2019, Available at https://livingmelbourne.org.au/wp-content/uploads/2022/10/Strategy_online.pdf

Map 8 - Urban Heat – Increased temperatures in Cheltenham (including Pennydale)



Legend		
Urban Heat (°C)	Council Land	Sub-Arterial
4.5 - 6.5	Golf Club	Collector
6.5 - 8.5	Roads	Local Road
8.5 and above	Arterial	Bayside LGA Boundary
		Suburb

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 04 November 2022

Biodiversity Assessment

To help inform the Bayside *Urban Forest Strategy*, Council undertook a desktop biodiversity assessment across the entire municipality. The purpose of the desktop biodiversity assessment was to assess and identify the existing ecological values present within the municipality and identify key areas where biodiversity could be improved. This section of the Precinct Plan will focus on the findings of this assessment within the suburb of Cheltenham (including Pennydale).

Strategic Biodiversity Value Score

The Strategic Biodiversity Value (SBV) is a ranking system developed by the Department of Transport & Planning (DTP) that ranks the biodiversity contribution that a location has to Victoria's overall biodiversity. The SBV is presented as a score ranging between 0 - 1 and is mapped across all areas of Victoria.⁵

56 areas with SBV scores were identified within Bayside, all of which exist on public land and are provided in Map 9. There was only one location within Cheltenham which presented a SBV score. The location is the Sandringham Golf Links, with a score between 0.2 and 0.4.

To ensure SBV scores modelled within these areas do not decrease over time, native restoration and plantings in these areas must continue when required. It is important that these areas remain as much in their current condition as possible to preserve the ecological values present within these areas.

Ecological Vegetation Classes (EVCs)

As a part of this study a review of Ecological Vegetation Classes (EVCs) model was undertaken. A total of 10 EVCs were modelled within the Bayside area and provided in Map 10. However, these have largely been cleared and do not represent what they once were, due to human settlement and the extensive residential development that has occurred, and the associated road, rail and commercial development. While it's not possible to restore our environment to what it was like pre-settlement, we can improve how we restore native vegetation and ensure what we are planting is complimentary and in replica to what was historically within these EVC areas.

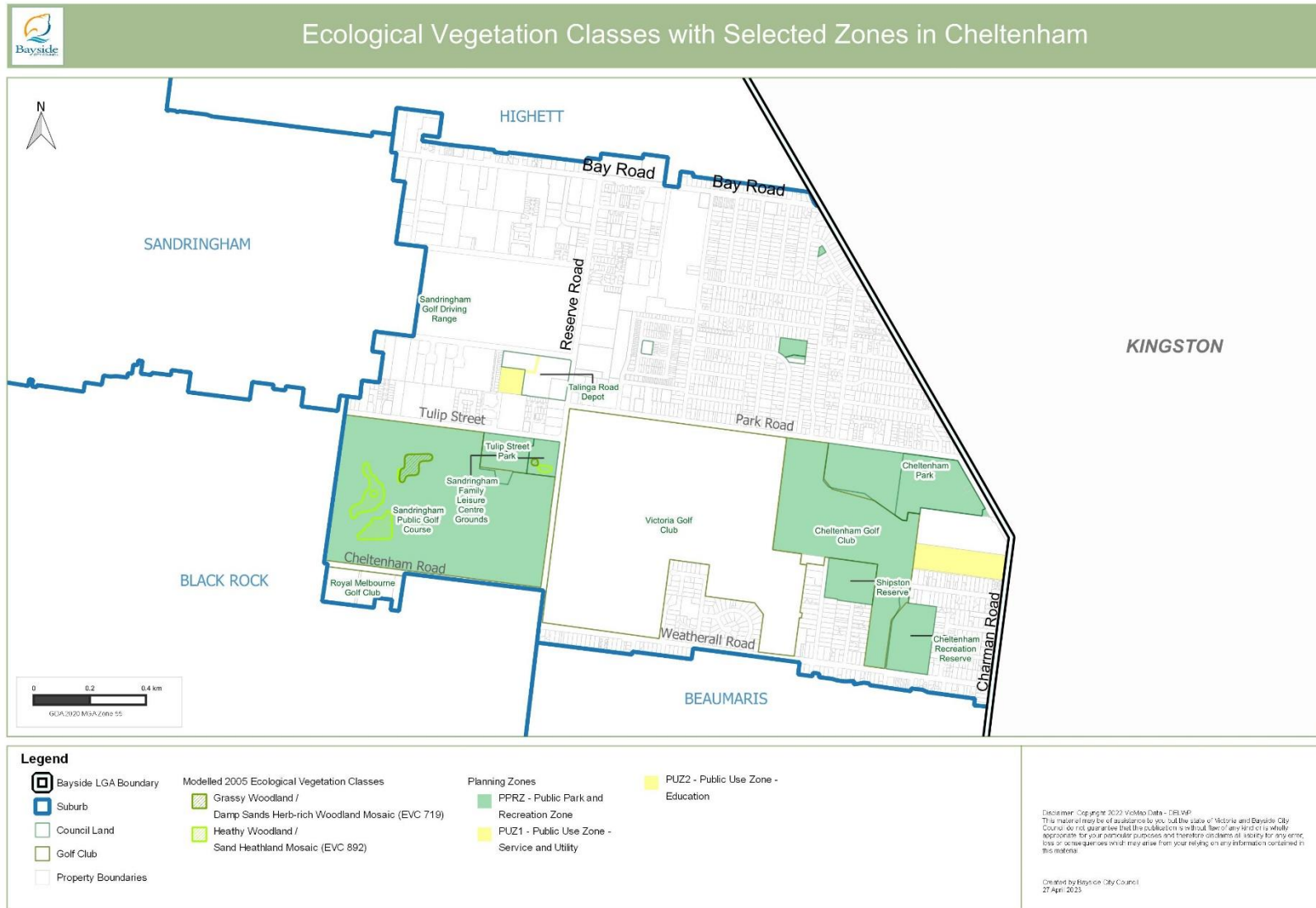
Of the 10 EVCs modelled within Bayside, two have been identified within Cheltenham (including Pennydale). These EVCs are the grassy woodland / damp sands herb-rich woodland and the heathy woodland / sand heathland (locations of EVCs are identified in Map 10). This identified EVC has informed the species palette in Appendix 3 to this Precinct Plan. The species palette provides guidance on species of trees and vegetation that should be planted in order to enhance the character and enhance the ecological values of the urban forest.

⁵ Desktop Biodiversity Assessment for the Urban Forest Strategy, Bayside City Council (2022)

Map 9 - Biodiversity Value Score



Map 10 – Ecological Vegetation Classes



Park Improvement and Habitat Linkage Plan 2022

The *Park Improvement and Habitat Linkage Plan 2022* was undertaken by Council as a way to improve species diversity within Bayside and understand what species (trees and vegetation) would best support specific locations in Bayside and encourage the rebuilding of ecological foundations. The objective of the plan is to assist in increasing the diversity of indigenous and native plantings in council-owned open spaces outside the conservation reserve system and strengthen the connections between natural areas.

Two major actions identified in the *Park Improvement and Habitat Linkage Plan* that correspond to the Cheltenham (including Pennydale) Precinct Plan are:

1. Streetscapes – Wherever possible, increase the extent of indigenous understorey vegetation in verges, nature strips, roundabouts, traffic islands and edges of carparks or other less frequented or unused areas.
2. Parklands – Expand on areas of existing native vegetation (both patches and individual trees) with dense understorey plantings, or identify locations for additional native plantings, to create structurally diverse ‘habitat planting zones’.

Conservation reserves in Cheltenham (including Pennydale)

- Cheltenham Park Flora and Fauna Reserve.

Core habitat patches

Eight core habitat patches have been identified within Cheltenham (including Pennydale) as areas where planting should occur to implement new or improve existing links to areas of open space and provide habitat corridors:

1. Victoria Golf Club
2. Wangara Road
3. Sandringham Golf Links
4. Cheltenham Golf Club
5. Cheltenham Pioneer Cemetery
6. Cheltenham Park
7. Cheltenham Recreation Reserve
8. Jack Road.

Map 11 – Core Habitat Patches



Priority Habitat Improvement Areas

Priority habitat locations are primarily associated with parks or reserves that support high-quality habitat values (such as bushland or foreshore reserves) or have the potential to provide core habitat with further investment through on-ground plantings and complimentary habitat structures.⁶

Priority Habitat Improvement Areas identified in Cheltenham (including Pennydale) are:

- Cheltenham Park Flora and Fauna Reserve
- Cheltenham Park
- Cheltenham Golf Course.

Priority Linkage Improvement Areas

Linkage Improvement Areas are primarily associated with public road reserves with the objective being to increase the functional diversity of vegetation within these areas to improve connectivity for a broader range of species.⁶ Locations of priority linkages identified across the municipality have been restricted to public land, except for limited instances within privately owned golf courses.

- Tulip Street/ Park Road
- Victoria Golf Club/ Weatherall Road.

⁶ Park Improvement and Habitat Linkage Plan, Bayside City Council (2022)

Map 12: Habitat Linkage and Improvements



Trees on Private Land

While we encourage and support the increase of tree canopy cover on private land, it is recognised that the uptake of tree planting on private land can only be enforced through better planning mechanisms, education, advocacy and commitment from the community.

The objectives of the Bayside *Urban Forest Strategy* is to prioritise and strengthen the support for retaining existing trees on public and private land and to strengthen Council's ability to retain and monitor trees on both public and private land.

Regulations involving trees on private land

Under the *Neighbourhood Amenities Local Law 2021*, a permit is required for the removal of a tree that is on the Significant Tree Register or a canopy tree that has a single or combined trunk greater than 155 centimetres measured at 1 metre above ground level. There are currently nine trees in Cheltenham that are on the Significant Tree Register.

There are several mechanisms currently in place within the Bayside Planning Scheme that require a planning permit to be granted for tree removal. These mechanisms include but are not limited to the Vegetation Protection Overlay (VPO), Significant Landscape Overlay (SLO) and the Heritage Overlay (HO). The HO is however the only overlay that applies to selective private properties in Cheltenham (including Pennydale).

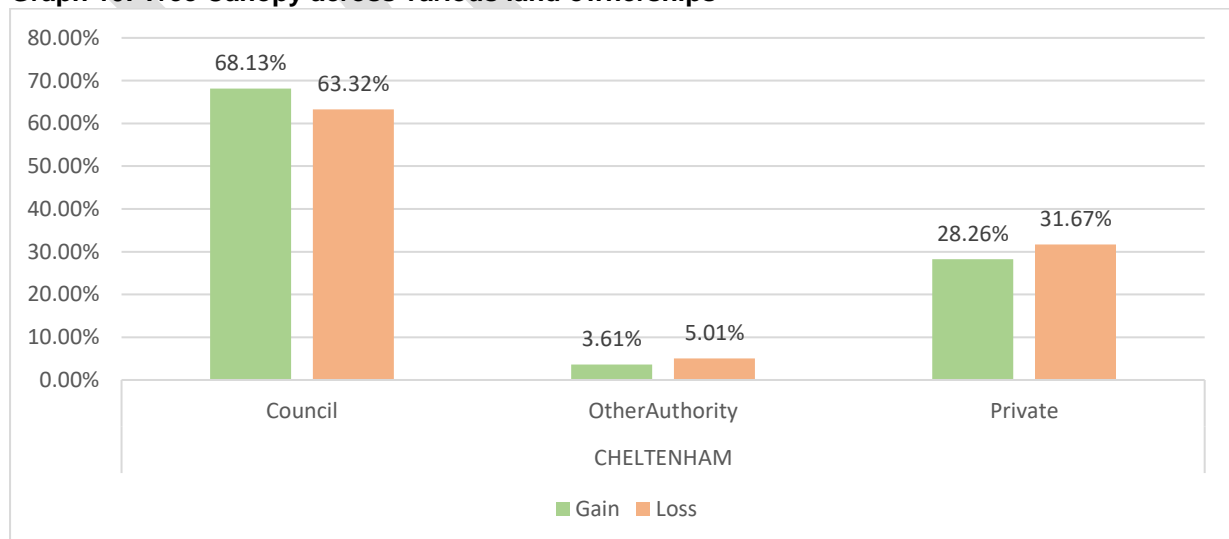
It is difficult to approximate the number of trees removed from private land each year under a planning permit as this is not separately recorded (and one application can be for multiple tree removals), let alone the extent of tree removal that is legal or illegal.

As indicated in Graph 10, while private land contributed to 19% of tree canopy gains in Cheltenham (including Pennydale), it also contributed to 25% of tree canopy losses. Council-owned land contributed 45% to tree canopy gain versus 50% of tree canopy loss. Losses and gains were calculated by comparing 2015 and 2019 canopy cover data.

Tree loss and gain in Cheltenham (including Pennydale) on private land

Map 13 shows tree canopy lost and gained in Cheltenham (including Pennydale) from 2015 to 2019. The source aerial photography datasets were obtained from the State Government's Coordinated Imagery Program (CIP). The datasets from 2015 and 2019 were further compared by council's GIS team to identify changed areas of vegetation.

Graph 10: Tree Canopy across various land ownerships



Encouragement of trees on private land

As mentioned in the *Bayside Urban Forest Strategy*, community engagement will be essential in growing the urban forest on private land and Council will continue to be proactive in communicating the benefits of trees and vegetation on private land.

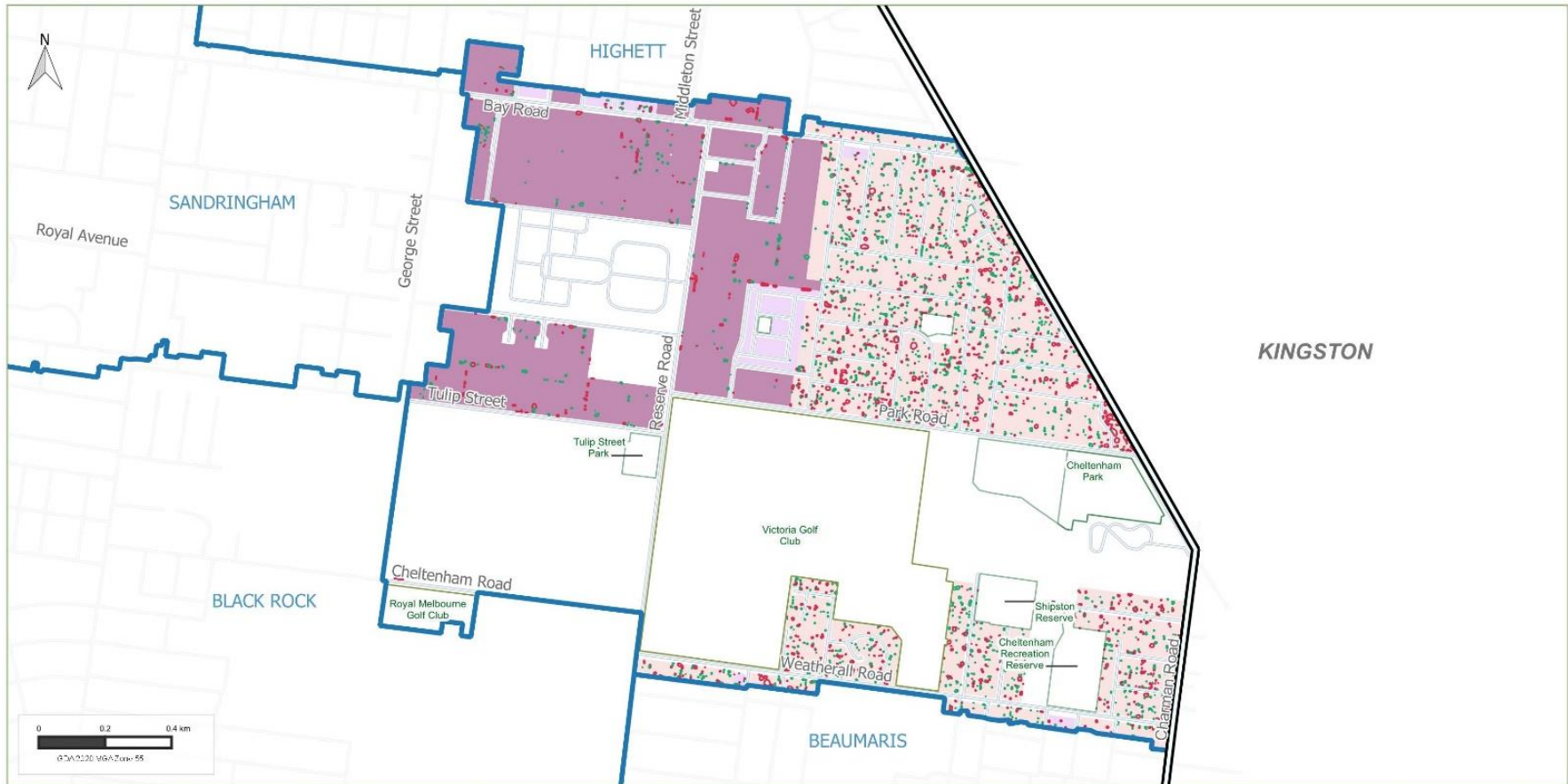
Council will also investigate opportunities to provide free tree and vegetation giveaways to residents. This will provide Council with a pathway to influence the tree and vegetation cover that exists on private land and help residents maintain the health of their trees and gardens. Bayside already has a strong network of 'Friends of' groups and community volunteers who carry out tree and vegetation plantings and would be great allies in this work.

Council will encourage landowner participation in greening, particularly for areas identified as having less canopy cover. This is being undertaken through communications and engagement actions that has a focus on education, awareness on the benefits of vegetation, and participation in increased tree planting through various education programs.

There has been a greater interest from the younger population of Bayside to participate in increasing vegetation cover. Council will continue to run educational programs within schools and work alongside the community to reach the *Bayside Urban Forest Strategy* target of 30% canopy cover across Bayside by 2040.

As part of the *Bayside Urban Forest Strategy* Implementation Plan, Council is exploring opportunities to include further policies and planning mechanisms within the Bayside Planning Scheme with an aim to maintain and increase tree canopy and vegetation on private land.

Map 13 - Vegetation loss and gain on private land



Legend

- | | | |
|----------------------|---|--|
| Bayside LGA Boundary | Tree Canopy Change
- February 2015 to October 2019
- Private Land | UFS Reporting Areas
Private-Residential |
| Suburb | Gain | Private-Commercial |
| Council Land | Loss | Private-Commercial-Residential Mixed |
| Roads | | |

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12 January 2023

Cheltenham (including Pennydale) in images

The following images show examples of low, medium, and high tree canopy coverage in Cheltenham (including Pennydale).



Image 5. Charman Road, an example of a road with low tree canopy coverage

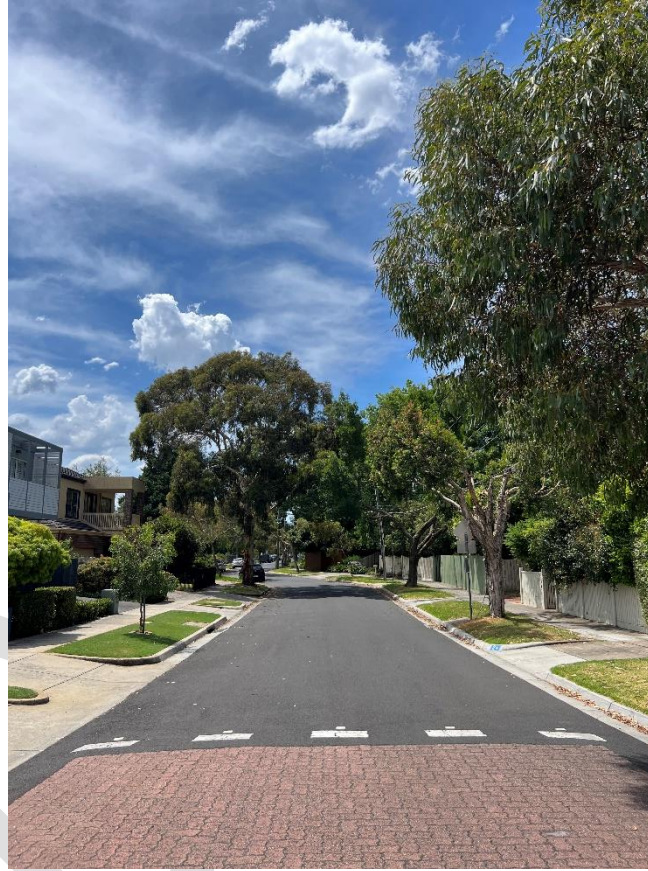


Image 6. Paul Street, an example of a street with medium tree canopy coverage

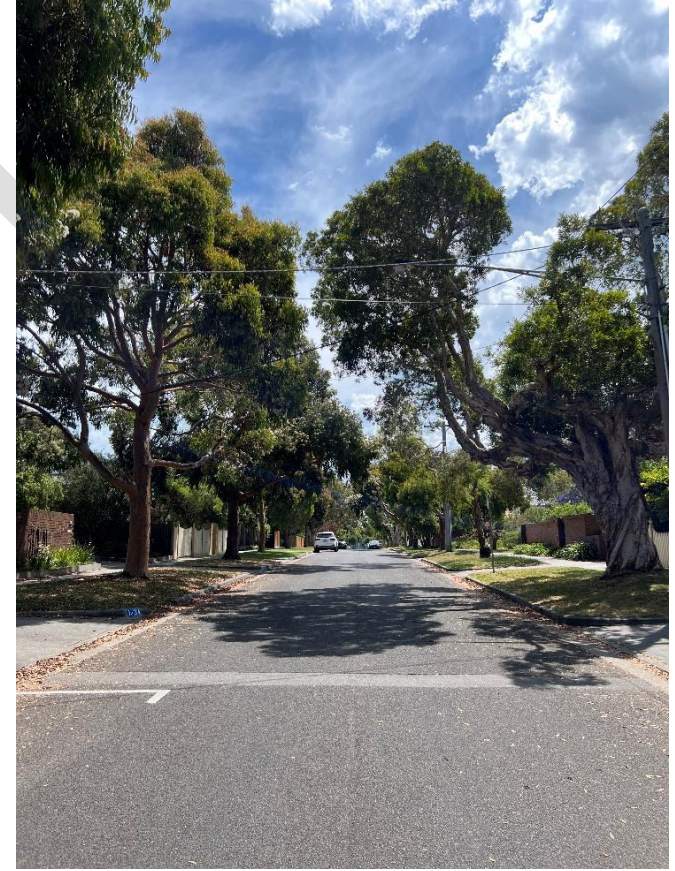


Image 7. Glebe Avenue, an example of a street with high tree canopy coverage

Key Constraints – Infrastructure

Finding locations for street and park tree planting can be challenging as it is important to ensure trees do not compromise the existing above and below infrastructure, as well as the existing uses and accessibility of the space.



Small tree under

Tree trimmed under

Certain pieces of infrastructure introduce constraints that impact the ability to plant trees. Street and park tree selection for trees growing under powerlines needs to consider a particular species' tolerance for pruning. For example, a tree that has a natural branching habit and a good wound response to mechanical damage would be considered an appropriate tree species for growing under powerlines.

In streets that have small or narrow nature strips, a smaller tree species will be considered for the powerline side of the street. In those circumstances, the trees on both sides of the street should have similar foliage and form to provide a consistent vegetation character for the street.

As a phase 1 action of this plan, Council will facilitate the negotiations between the residents and relevant authorities to support the undergrounding of powerlines (and other services) if there is sufficient interest in a street. Council will also advocate to VicRoads and other authorities for undergrounding the powerlines and plant vegetation on the Principal Transport Network. Other infrastructure that must be considered when undertaking tree and vegetation planting includes:

- Footpaths
- Kerb and channel
- Roadways
- Playgrounds
- Pathways
- Private infrastructure
- Public infrastructure.

When selecting tree species for planting, Council officers consider which species will be the least destructive to underground infrastructure. Potential opportunities to install root barrier systems and other protection mechanisms are also investigated at the locations of key underground infrastructure. This will ensure that Council can increase vegetation cover whilst protecting existing infrastructure and reducing demand for maintenance.

It is also important to note that infrastructure can also be constrained due to weather events. The *Climate Emergency Action Plan 2020* requires that new infrastructure be designed to higher environmental standards and is located with consideration to future flood and storm surge risk. Existing infrastructure has to be retrofitted to reduce environmental impact and to improve resilience. It is critical to consider how each piece of new infrastructure can contribute to a more resilient built environment. Adapting to climate change requires taking actions to lessen its adverse consequences and increase capacity to withstand the stresses and shocks associated with natural hazards and extreme weather events. Investing in climate change adaption helps to embed economic, social, and environmental resilience to protect the most vulnerable to the consequences of climate change.

Map 14 – Infrastructure servicing across Cheltenham (including Pennydale)



Legend

- Bayside LGA Boundary
- Suburb
- Council Land
- Golf Club
- Overhead Powerlines
- Drainage Pipe
- Drainage Pit
- Roads

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 21 December 2022

Key Opportunities

Key Directions

<p>Greening Cheltenham (including Pennydale)</p> <p>Increasing tree canopy cover to reach 30% and vegetation cover to reach 30% across Cheltenham (including Pennydale) by 2040.</p>	<p>Biodiverse suburb</p> <p>Create a diverse and healthy urban forest that reinforces greater outcomes for biodiversity.</p>	<p>Improve monitoring and maintain</p> <p>Improve the ability to monitor and track along with maintaining our existing canopy cover and avoid further decline.</p>	<p>Encourage residents and private owners</p> <p>Learn together, educate each other, encourage and celebrate greater care and protection.</p>
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Open spaces

Cheltenham (including Pennydale) has approximately 75 hectares of open space which includes parks, reserves and three golf clubs.

An opportunity exists to increase the number of canopy trees and vegetation planted in council-owned open spaces and where appropriate, increased planting should occur in Stanley Avenue Reserve, Booker Street Reserve, Page Street Reserve, Cheltenham Recreation Reserve, Shipston Reserve and Cheltenham Park Reserve.

Commercial (including industrial) areas

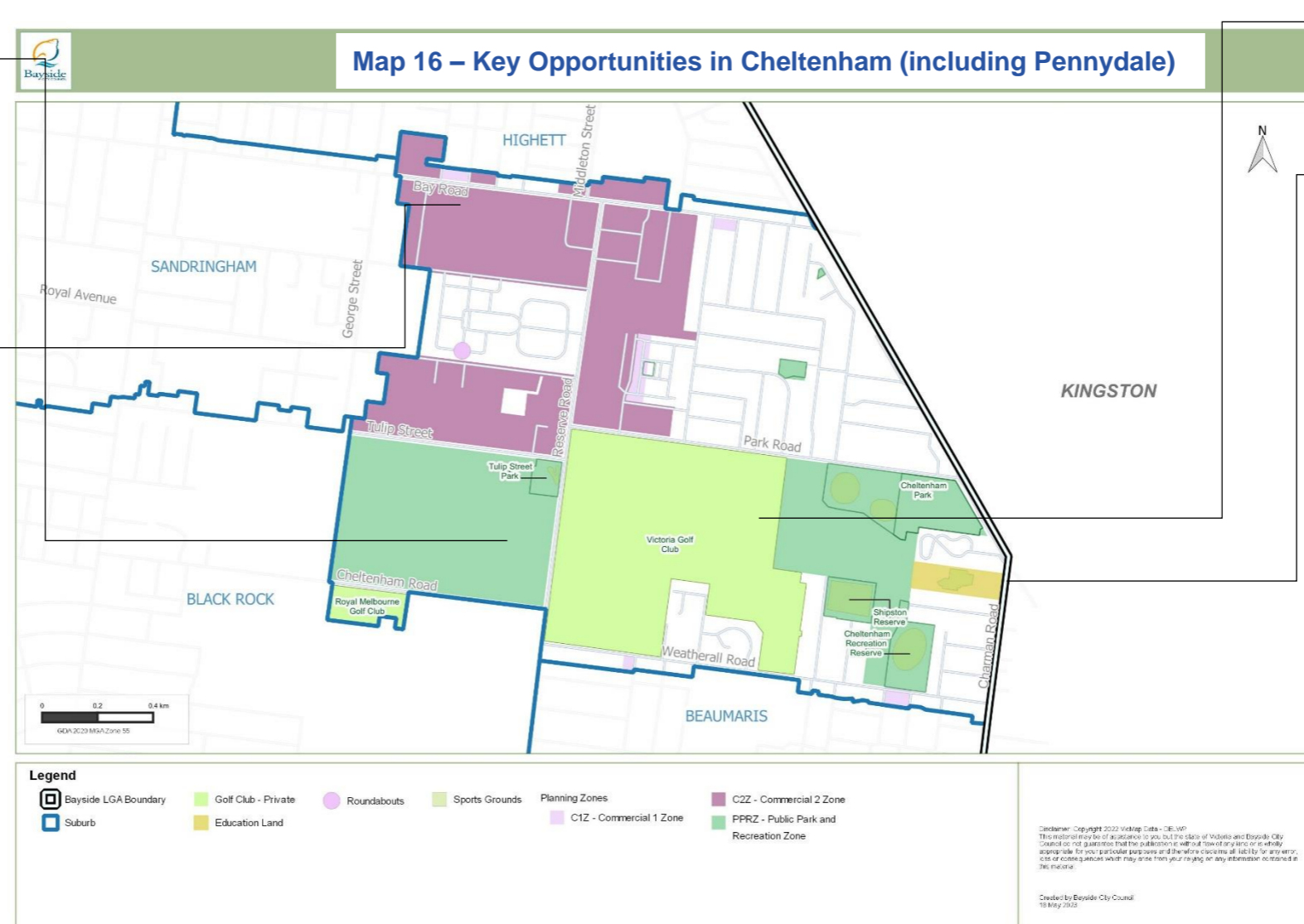
Across Cheltenham (including Pennydale) there are three areas that are zoned for commercial use. These include:

- Weatherall Road and Morey Road Small Commercial Activity Centre;
- Bay Road and Jack Road Small Neighbourhood Activity Centre
- Bay Road and Avoca Street Small Neighbourhood Activity Centre

In addition, the suburb also encompasses the majority of the **Bayside Business District** (along Bay Road). The enhancement of the amenity and appearance of this employment area is a key strategic direction outlined within the Bayside Planning Scheme.

The character and appearance of these commercial and employment centres can be improved by increasing the amount of trees and vegetation cover, where appropriate. This will create more appealing centres that will attract a greater number of visitors and therefore increase business for local traders.

When planting trees in commercial and industrial areas conflicting priorities such as the demand for car parking, footpath activation, shop awnings, street lighting and road signage must be considered. Innovative techniques such as green roofs and walls should be explored and encouraged to increase vegetation.



Private golf course – Royal Melbourne Golf Club and Victoria Golf Club
Council will encourage the increased greening of private golf courses where possible.

Educational land
Council will work with other State government and non-State government Schools to increase tree and vegetation cover on educational land. Cheltenham Primary School is the only school within the suburb.

Nature strips
In terms of tree planting, the Street and Park Tree Management Policy states that: 'Council aims to have 100% of suitable sites within Bayside planted with a tree to contribute to the municipality's leafy character. Most property frontages in Bayside can accommodate at least one tree within the nature strip.'

Council-owned projects
There is a significant opportunity to increase and diversify tree and vegetation cover through council-owned projects like the renewal or development of community buildings and sports clubs. Each Council project has site-specific issues and opportunities that need to be considered as a part of the project scope. Examples of this include having a buffer around Council buildings and sporting ovals to ensure new plantings do not hinder future projects. When planting near sporting ovals maintenance of future trees must be considered to ensure sporting events can still run.

Prioritising Trees and Vegetation in streets

Streets make up approximately 12% of the total area of Cheltenham (including Pennydale). When prioritising where to plant, it is important to focus resources in the locations that need it most. This includes consideration of where we have opportunities to plant understorey, improvement of habitat, where the highest density of people reside, and where very low canopy cover exists.

Tree replacements are only identified for streets where the useful life expectancy of multiple trees is rated at less than 10 years.

Planting priorities

The Implementation Plan later in this document identifies phase 1 actions that are to be delivered within the next 5 years. These actions along with the *Park Improvements and Habitat Linkages Plan 2022* will identify priority areas and inform the Annual Tree Planting Program.

As a response to the Bayside *Urban Forest Strategy*, Council is committed to increasing tree planting every year. Maps 17 to 20 identify priority locations to be targeted in Council's Annual Tree Planting Program.

The Annual Tree Planting Program provides a great opportunity to increase species diversity, habitat and local character. A general rule of thumb that should be applied is the 10:20:30 rule, where the urban tree population includes no more than 10% of any one species, 20% of any one genus, or 30% of any family.

How the Precinct Plan guides planting

Set planting program



Planting Priorities from Precinct plan
Streets or Activity Centres undergoing Change
Annual Budget



Design Objectives for Streetscape

Review guiding principles and considerations for tree planting



Undertake further investigation to assist planting strategy

On-site analysis and assessment



Select Species

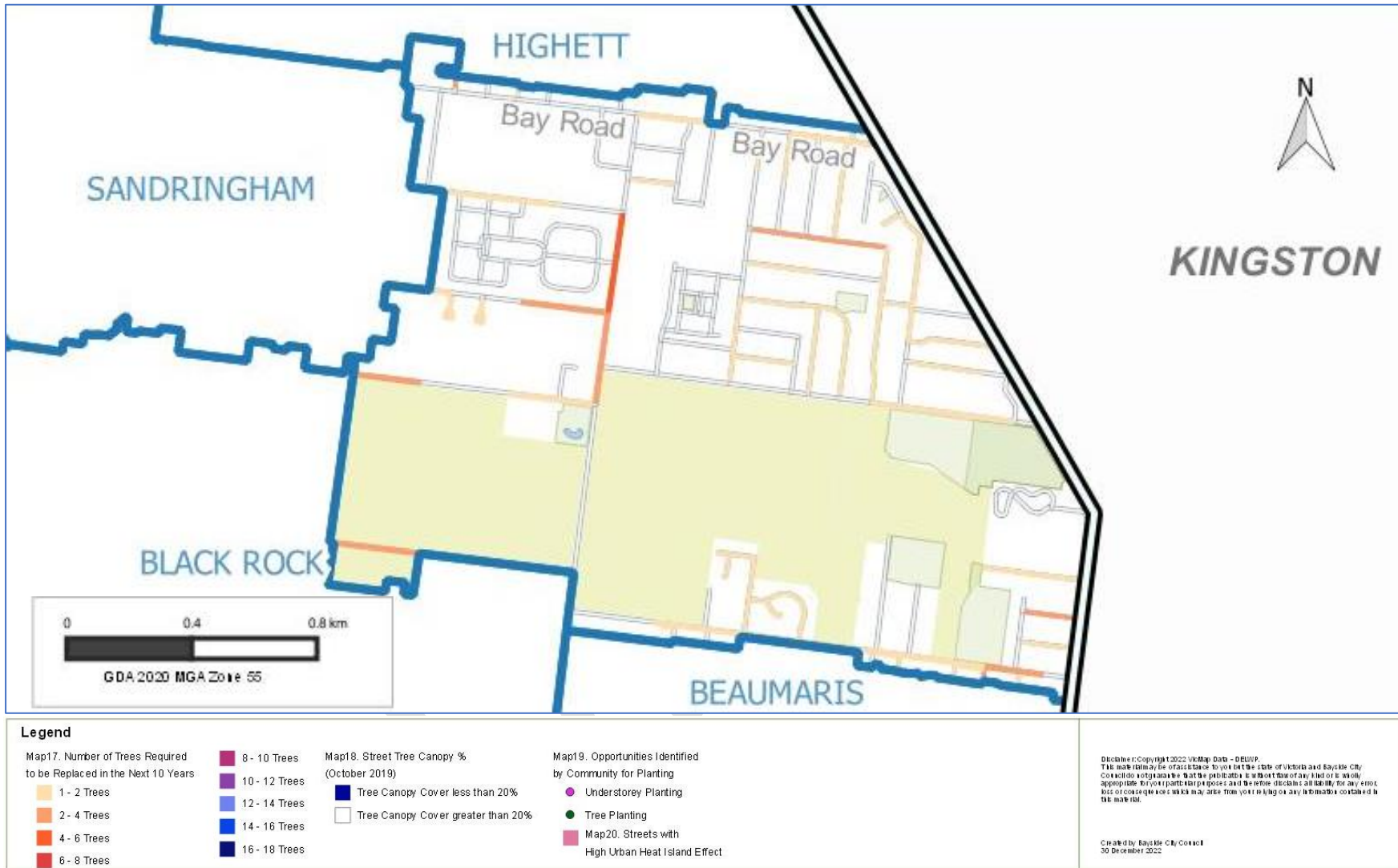
Review Species Palette



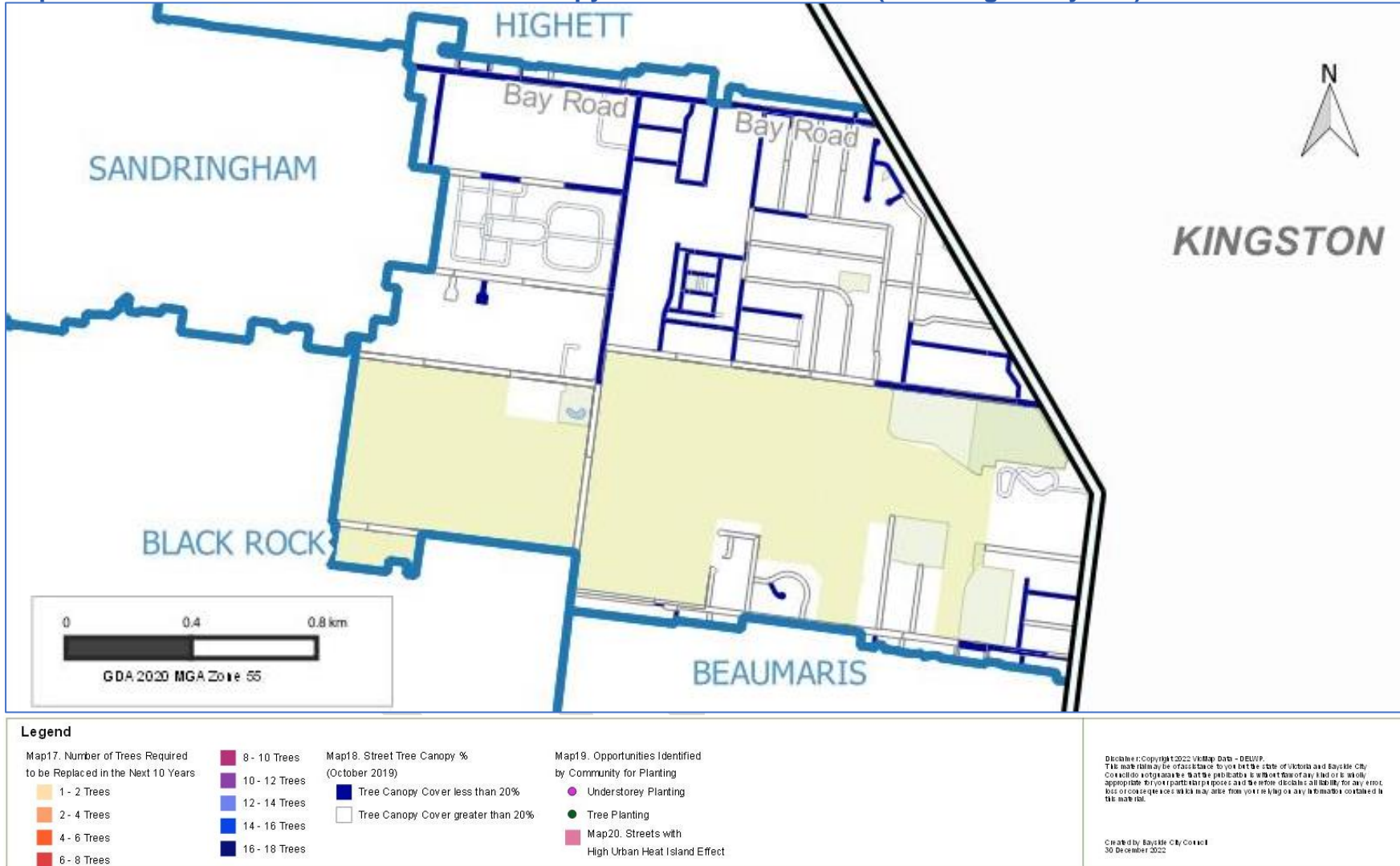
Implement Planting

Produce streetscape design options
Consult with residents and business owners

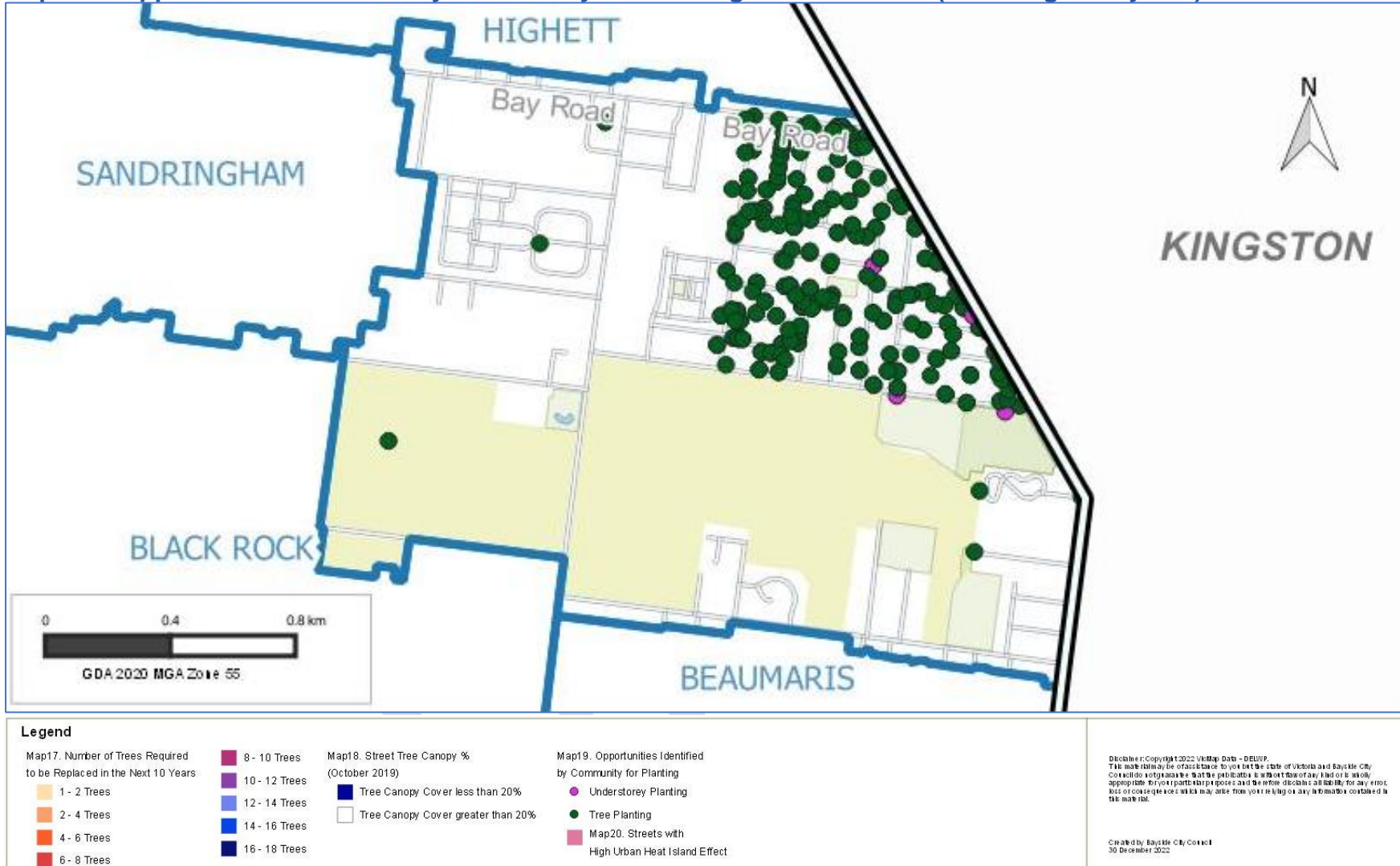
Map 17 – Number of Tree Replacements required in next 10 years in Cheltenham (including Pennydale)



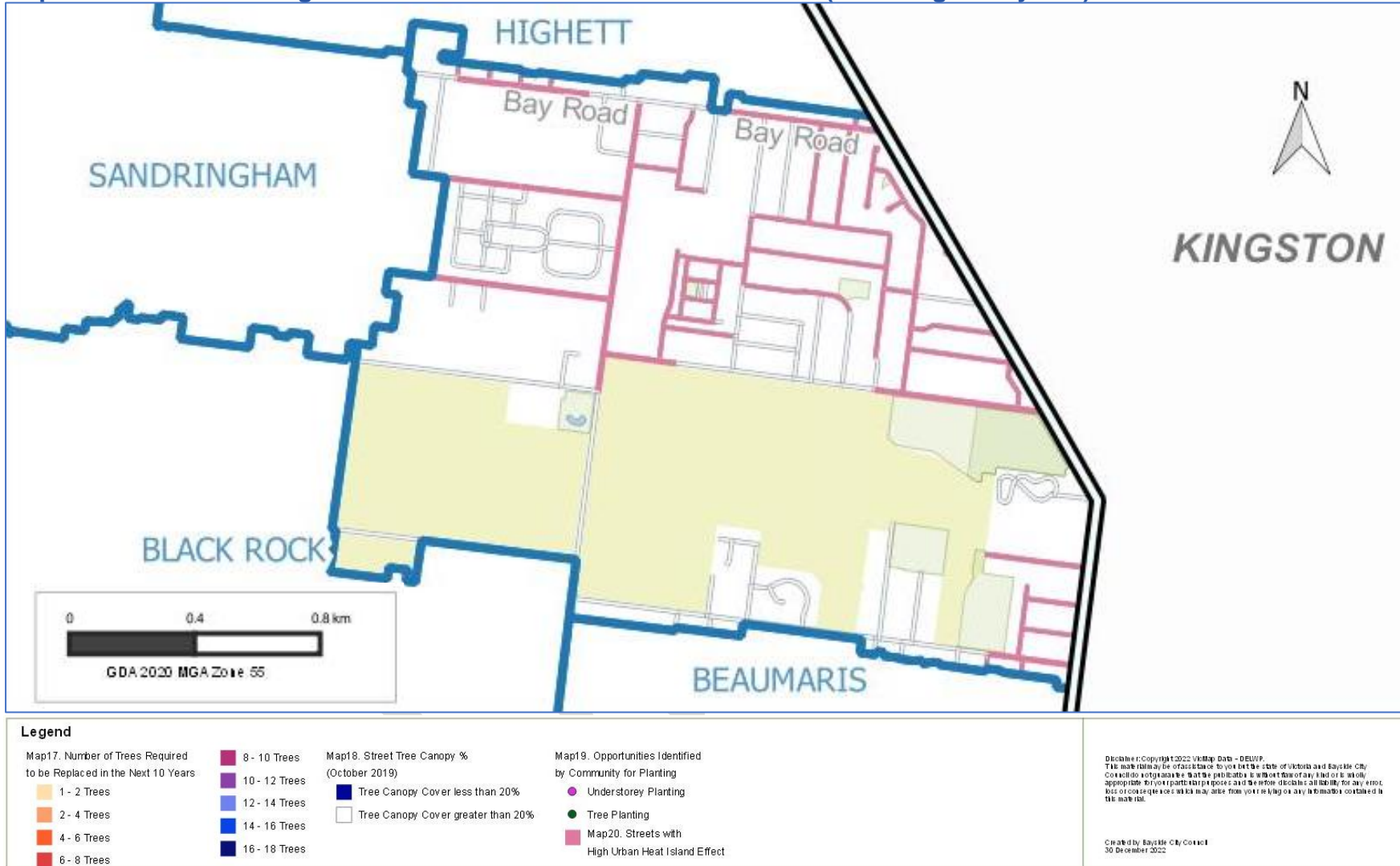
Map 18 – Streets with less than 20% Tree Canopy Cover in Cheltenham (including Pennydale)



Map 19 – Opportunities Identified by Community for Planting in Cheltenham (including Pennydale)



Map 20 – Streets with High Urban Heat Island Effect in Cheltenham (including Pennydale)



Implementation Plan

The following set of actions specifically identifies outcomes for trees and vegetation planting. They provide the framework for change within Cheltenham (including Pennydale) with outcomes informed by all of the other factors outlined in previous sections of this Precinct Plan.

Phase	Objective	Action	Responsibility	Timeframe	Resources required	Measure
Urban Forest Strategy Action: Opportunities for boulevard plantings and the creation of improved streetscape outcomes						
Phase 1	Prioritise and increase planting on identified habitat and biodiversity corridors across public land to enhance habitat linkages.	Investigate opportunities to provide increased understorey planting in areas identified as part of Council's <i>Park Improvement and Habitat Linkage Plan</i> (Map 10 - 11), including: Priority Habitat Improvement Areas: <ul style="list-style-type: none"> Cheltenham Park Flora and Fauna Reserve Cheltenham Park Cheltenham Golf Course. Priority Linkage Improvement Areas: <ul style="list-style-type: none"> Tulip Street/ Park Road Victoria Golf Club/ Weatherall Road. Core habitat patches: <ul style="list-style-type: none"> Victoria Golf Club Wangara Road Sandringham Golf Links Cheltenham Golf Club Cheltenham Pioneer Cemetery Cheltenham Park Cheltenham Recreation Reserve Jack Road. 	Open Space	Year 1 & 2	Budget allocated for 2022/23 and 2023/24 financial years.	<i>Park Improvement Habitat Linkage Plan</i> and the <i>Urban Forest Strategy Annual Reporting Program</i> .
Phase 1	Enhance biodiversity outcomes on private land.	Encourage private landowners to plant vegetation on nature strips within their street and provide support and tools to assist. To ensure new plants enhance habitat and biodiversity, Council officers should recommend appropriate plants listed in Appendix 3 Species Palette of this document.	Urban Strategy, Communication and Engagement	Ongoing	Budget may be required to create and implement specific engagement plans.	Utilise engagement evaluation matrix to measure success. Increased number of community members involved in activities. Increased demand from residents for vegetation outside their house.
Phase 2	Create new open space, pocket parks, micro-forests in the suburb seeking new biodiversity or habitat corridors.	Investigate opportunities to seek funds to support the acquisition of land for new open spaces to connect core habitat patches.	Open Space	Ongoing	Resources required for advocacy	Number of grants / opportunities applied for.
Phase 1	Ensure humans and wildlife can simultaneously and safely access densely vegetated areas, streets and reserves	Support the undergrounding of powerlines where it is at the request of the community and at their full cost. Facilitate the negotiations between the residents and relevant authorities to support the undergrounding of powerlines (and other services) if there is sufficient interest in a street.	Asset Protection, Urban Strategy	Ongoing	No budget required	Number of streets where undergrounding of powerlines has been implemented
Enhance landscape outcomes and increase tree and vegetation cover to reach 30% across Brighton by prioritising areas in greatest need						
Phase 1	Increase tree and understorey cover at areas with greatest need to	Investigate opportunities to increase canopy tree and understorey planting at the following streets which have been identified as having low canopy cover (less than 20%):	Open Space	Year 1 to 5	Budget and resources will be required to increase the number of trees and understorey plants to be planted.	Number of plants planted

Phase	Objective	Action	Responsibility	Timeframe	Resources required	Measure
	enhance landscape outcomes, provide for heating and cooling benefits and combat climate change.	<ul style="list-style-type: none"> Tulip Street Reserve Road Park Road Chesterville Road <p>In addition, investigate opportunities to increase tree and understorey cover at the following streets which have been identified as hot spots due to potential impacts from Urban Heat Island effects:</p> <ul style="list-style-type: none"> Tulip Grove Cheltenham Road (along Royal Melbourne Golf Club) Shipton Reserve Cheltenham Recreation Reserve Cheltenham Park Reserve Park Road 				<i>Urban Forest Strategy Annual Reporting Program.</i>
Phase 2	Increase utilisation of green walls and green roofs in Activity Centres.	<p>Encourage innovative greening in Pennydale and Cheltenham moderate residential growth areas, the Bayside Business District (BBD) as well as the following small neighbourhood activity centres by promoting and piloting different greening initiatives:</p> <ul style="list-style-type: none"> Bay Road and Avoca Street Centre, Cheltenham Bay Road and Jack Road Centre, Cheltenham Weatherall Road Shopping Centre, Cheltenham <p>Investigate opportunities to introduce mechanisms to increase green roofs and walls within these areas.</p>	Development Services, Economic Development, Strategic Planning	Year 5 to 10	Economic Development team may require budget to run pilot programs.	<p>Number of plants planted.</p> <p><i>Urban Forest Strategy Annual Reporting Program</i></p>
Phase 1 and 2	Reframe Council's approach to major council-owned projects, capital infrastructure renewal projects as opportunity to increase urban forestry outcomes.	Explore opportunities within road reconstruction projects to provide new tree plots as boulevard planting or in between car parking bays to enhance tree and vegetation cover upon local streets.	Project Services	Ongoing	Budget will be considered as part of the project scope.	<p>Number of plants planted.</p> <p>Urban Forest Strategy Annual Reporting Program.</p>
Phase 1	Increase tree canopy cover by prioritising vacant tree sites.	As part of the Annual Tree Planting Program, continue to identify the current vacant sites and prioritise planting at these sites.	Open Space	Ongoing	Budget and resources will be required to increase the number of trees and understorey plants to be planted.	<p>Number of plants planted</p> <p><i>Urban Forest Strategy Annual Reporting Program.</i></p>
Learn together, educate each other, encourage and celebrate greater care and protection of the Bayside Urban Forest						
Phase 1	Increase planting on VicRoads that have less than 20% of tree canopy cover.	Advocate to the VicRoads and other authorities for increased planting on Nepean Highway, Edward Street, Park Road.	Open Space, Urban Strategy, Integrated Transport	Ongoing	No budget required.	A commitment made to plant trees on the streets maintained by VicRoads
Phase 1	Increase awareness amongst the community around the importance of vegetation through various programs and communication material.	Continue to run student and community educational programs to increase awareness around vegetation planting and protection.	Urban Strategy, Communication & Engagement	Ongoing	Budget may be required to create and implement educational programs.	Number of educational programs undertaken every year.
Phase 1 and 2	Ensure humans and wildlife can simultaneously and safely access densely vegetated areas, streets and reserves.	Advocate to VicRoads and other authorities for the undergrounding of powerlines.	Urban Strategy	Ongoing	No budget required.	Funding received and/or partnerships created.

Phase	Objective	Action	Responsibility	Timeframe	Resources required	Measure
Maintain our existing canopy cover across Brighton and avoid any further decline where possible						
Phase 1	Increase tree canopy cover by prioritising plantation in vacant tree sites.	As part of the Annual Tree Planting Program, identify the current vacant sites and prioritise planting at these sites.	Open Space	Year 1 to 5	Budget and resources will be required to increase the number of trees and understorey plants to be planted.	Number of plants planted Urban Forest Strategy Annual Reporting Program
Phase 2	Ensure our urban forest is healthy and resilient.	<p>Where trees reaching the end of their useful life expectancy have been assessed and are no longer providing a benefit to the surrounding habitat, removal may be required.</p> <p>Replacement trees should be selected based on the surrounding environment, neighbourhood character (where relevant) and above and below ground infrastructure. It is noted that there are various trees potentially reaching the end of their useful life expectancy at the following locations (Map 5):</p> <ul style="list-style-type: none"> • Weatherall Road, MacKenzie Street, Sydney Street • Glebe Avenue, Coape Street, Llewellyn Street • Cheltenham Park Reserve (eastern section) • Park Road, Churchill Avenue, Tulip Grove • Gilford Avenue, Heather Grove, Bay Road • Cheltenham Memorial Park • Cloyne Street, Reserve Road, Beaumaris Parade • Tibrockney Street, Arnold Street, Phillip Street • Ambrose Avenue, Pallisades Bvd, Amberley Drive • Fairview Drive, Monterey Drive, Bellevue Road • Charlton Avenue, Jack Road, Luxmoore Street • Paul Street, Stuart Avenue, Olympic Avenue • Davie Avenue, Munro Avenue. <p>Where it has been found that trees reaching the end of their useful life still provide benefit and habitat, it should be retained as a habitat tree as per the Tree Risk Assessment Tool (TRAQ).</p>	Open Space	Year 5 to 10	Budget and resources will be required to increase the number of trees and understorey plants to be planted.	Number of replacement plants planted, and number of those trees retained for habitat. <i>Urban Forest Strategy Annual Reporting Program.</i>
Phase 1 and 2	Increase Council's ability to protect trees from vandalism.	<p>Explore additional opportunities to minimise vandalism:</p> <ul style="list-style-type: none"> • Consider the preparation of a communications and engagement strategy targeted to private property owners and the wider community. 	Local Laws, Open Space	Year 1 to 3	Budget and resources will be required to explore opportunities.	Utilise engagement evaluation matrix to measure success.
Phase 2	Provide safer and cleaner streets for our residents and visitors	As tree and vegetation cover increases with time, ensure future maintenance contracts appropriately funds the clean-up of tree leaves and debris on streets and public land.	City Asset, Open Space	Year 5 to 10	Additional budget may be required for maintenance contract.	The number of requests for additional service.
Phase 1	Strengthen requirements and advocacy to maintain and increase vegetation on private land.	Prepare Planning Scheme Amendments to strengthen the protection of vegetation on private land.	Development Services, Urban Strategy	Year 1 to 5	<p>Planning Scheme Amendment process to be funded via operation budget.</p> <p>Budget may be required to prepare detailed background information.</p>	Preparation of Planning Scheme Amendments

Appendix 1: Guiding Principles and Considerations

Council is responsible for the management of road reserves, parks, public spaces, and foreshore reserves and has an active tree planting and maintenance program, which is guided by the *Park and Street Tree Management Policy*. As such, Council has a greater degree of control and influence over the tree population on council-owned and managed land.

Planting in streets and parks presents a variety of challenges, and there are important principles to be utilised to overcome these challenges and increase and enhance Bayside's tree and vegetation cover. A complete and expanded set of these principles is included in the *Street and Park Tree Selection Guide 2016* and should be referred to when designing or planting any streetscape. Examples of the below principles being utilised in street and neighbourhood settings are also provided within this Section of the Precinct Plans.

Cheltenham (including Pennydale) has a distinctive character dominated by natives and local indigenous species, as a significant portion of the suburb is within the VPO3, which requires 80% of new plants to be indigenous species. Future plantings should continue to focus on increasing the presence of indigenous species where suitable and appropriate.

Planting types and locations in streets

1. 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. Prioritise the use of large canopy trees, with larger trees planted preferentially in centre medians or tree islands, then in the roadway and then the footpath.

We recognise that there are restrictions where medium or small size trees would be more appropriate due to competing infrastructure. Understorey planting in these locations is also encouraged.

2. Constrained planting spaces

- a.) *Cut-outs*. Planting in cut-outs in the road or footpaths provides a useful alternative where there may be insufficient space on the nature strip. Suitability for planting in the road or footpath will depend on road or footpath width and other factors such as traffic volume and impact to on-street parking.
- b.) *Planting in Road Reserve*. Designing in-road tree pits where there is opportunity to plant trees in between on-street parking spaces, traffic islands and buffer areas like street corners.
- c.) *Narrow Streets*. Narrow streets, including narrow footpaths and no nature strips, are best landscaped via tree planting within the parking lanes to either side, although this is partly limited by the need to maintain car parking spaces.

3. Roundabouts

Roundabouts will be considered as opportunities to plant canopy trees and understorey planting where appropriate. New plantings must not affect sight lines, safety or accessibility for larger vehicles. To ensure future planting is appropriate a Road Safety Audit will be completed before and after installation.

4. Boulevards

For boulevards, consider inter-planting with large canopy trees and shrubs to enhance the existing canopy cover.

5. Streets and powerlines

- a.) *Residential streets.* Low voltage overhead wires are present on one side of most residential streets. Where medians exist for large canopy tree planting, small to medium trees on the side with overhead constraints should be selected, always prioritising understorey planting.
- b.) *Streets with small nature strip and powerlines:* In streets that have small or very small nature strips, a smaller growing tree will be considered for the powerline side of the street. In those circumstances, the trees on both sides of the street should have similar foliage and form to provide a consistent theme for the street.
- c.) *Tree pruning:* In streets where footpath trees provide the only canopy, medium to large trees that can be effectively pruned around powerlines should be selected.

Street and park tree selection for trees growing under powerlines will consider the species' tolerance for pruning. For example, a tree that has a natural branching habit and a good wound response to mechanical damage would be considered an appropriate tree for growing under powerlines.

- d.) *Underground powerlines:* Although overhead powerlines are typically more economical, they are susceptible to damage from windborne tree branches, debris, and high wind conditions from extreme weather.

Council will facilitate the negotiations between the residents and relevant authorities to support the undergrounding of powerlines (and other services) if there is sufficient interest in a street.

6. Planting patterns and species choice

Cheltenham's urban forest character is strongly connected to gum trees, and there will continue to be a higher population of gum trees in Cheltenham. In terms of opportunities to increase diversity in streets, kerb out stands, roundabouts and road ends should be considered as opportunities to plant species drawn from a wider palette that are unique to the location or intersection and provide visual interest. These areas should also be considered as opportunities to create landmark feature landscapes and to support understorey planting.

7. Important Facades

In streets with important public buildings or building that have heritage importance, deciduous trees should be given preference so that building façades are exposed over winter.

The convention of planting avenues, or consistent lines of a single species, can limit species diversity. However, avenue plantings are important to local character in many streets and open spaces. To balance these two conflicting pressures, it is important to identify ways to minimise the extent of homogeneous avenue planting while maintaining a strong design outcome.

8. Selection criteria for street trees:

The following factors can be considered for selection of suitable street tree species:

- Relationship with local landscape character
 - garden character, surrounding streetscape
 - vegetation protection overlays, heritage values
 - maintain existing landscape character by selection of low fruiting cultivators where possible
 - Replacing difficult to replace existing species with species demonstrating similar characteristics, e.g. growth habit, foliage colour and size.
- Ability to tolerate and thrive in a site's environmental conditions. Species that have or can adapt to local conditions like climate, soil, coastal and salt tolerances, pests and diseases.
- Possible future damage to infrastructure as assessed against identified current issues with footpaths, kerb and channel, roadways, private infrastructure and powerlines.

9. Permeable surfaces

Impermeable surfaces such as pavements, roofing and building coverage increase the risk of flooding in urban areas. Comparatively, permeable surfaces are made of porous materials that allow stormwater to flow through, which reduces the volume of stormwater runoff that enters the drainage system. This helps improve water quality as it reduces the number of pollutants that enter waterways and habitats.

For new private residential development, at least 20% of the site should have surfaces that can absorb water such as lawns, garden beds or permeable paving. Council has developed the *Integrated Water Management Plan 2019 – 2039*, called 'Water for Bayside', to provide clear direction to deliver high priority integrated water management and water sensitive urban design (WSUD) activities. A key technique to improve water management is to increase permeability and incorporate WSUD into new developments and council projects.

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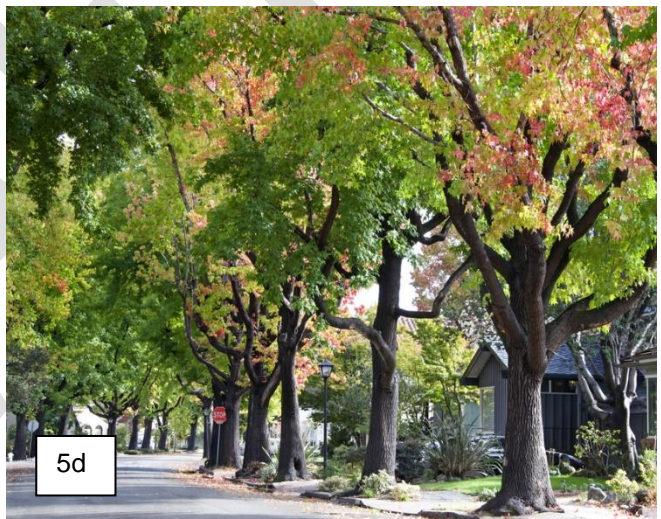
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Appendix 2: Case Studies

Importance of high-quality landscaping to contribute to the urban forest

The following case studies showcase the use of indigenous and native vegetation and high-quality design to create an attractive streetscape. A precinct's landscape helps define its character in much the same way as architecture or urban design because trees and other vegetation physically define a place. Landscapes are the setting for many everyday recreational and leisure activities and help forge a sense of connection to place.

1. Ambrose Avenue

Ambrose Avenue in Cheltenham (including Pennydale) incorporates different types of understorey planting to provide a distinct and unique streetscape. Understorey planting helps to improve soil health and provide habitat for insects, birds, and small mammals. This also helps to create ecological corridors for the local biodiversity. The case study can be used as an example of how new developments can integrate understorey planting within the streetscape to increase planting and create visual interest.



2. City of Melbourne Streetscape Biodiversity Program

The City of Melbourne's Streetscape Biodiversity Case Study provides an example of high-quality landscaping that focuses on utilising native species to create attractive streetscapes and biodiversity corridors. The City of Melbourne collaborated with the University of Melbourne to develop and test an understorey plant palette designed to increase streetscape biodiversity in the urban environment. In 2018, the plant palette was integrated into four streetscapes within the City of Melbourne, Clowes Street, Docklands Drive, Park Street and Arden Street. The understorey plant palette focused on predominantly native species, comprising perennial herbs, grasses and shrubs that were aesthetically attractive, low maintenance and tolerant to environmental challenges like drought. The species were also selected based on what resources they could provide to birds, bees and butterflies such as pollen and nectar. Increasing understorey planting along streets is a successful and cost-effective way to improve biodiversity, amenity and function whilst creating a more ecologically connected urban landscape. The examples provided can be replicated within Bayside by council and residents to increase vegetation and provide habitat for local fauna.

2

Construction and growth of the Clowes Street biodiversity planting site



Original condition as a bitumen footpath (April 2017).



Plant installation (April 2018).



Post-plant installation (November 2018).



Post-plant installation (November 2019). Photo: David Hannah.

Appendix 3: Cheltenham (including Pennydale) Species Planting Targets and Palette

Species Targets

A broad target for Council's future planting has been set for native, indigenous and exotic species based on the vegetation character of each precinct. These targets should only be utilised as a guide to Council's Capital Works and Open Space teams for new and replacement planting in each suburb. While it is important to strive towards these targets and diversify the urban forest, species should also be picked based on their ability to survive in certain locations, their contribution to neighbourhood character and the community's safety as well as their ability to provide improvement of habitat.

Suburb	EVCs	Target % of new Exotic Species plants	Target % of new Native Species plants	Target % of new Indigenous Species plants
Cheltenham/ Pennydale	719, 892	30	30	40

Species Palette

The following species provided are of guidance only, and has been informed by various academic and technical resources. The Ecological Vegetation Classes (EVC) that exist in Cheltenham (including Pennydale) have informed the species palette as they focus on retaining and increasing native vegetation. In the suburb of Cheltenham (including Pennydale), the EVCs found include the Grassy Woodland / Damp sands Herb-rich woodland (EVC 719) and the Healthy Woodland / Sand heathland (EVC 892).⁵ The key species associated with this EVC is provided in the tables below. By prioritising the planting of the listed species, the emphasis will be given on restoring native vegetation, to replicate the original vegetation of the area.

Eucalyptus species are another key genera across Cheltenham (including Pennydale), forming an important part of the character of the suburb's urban forest. Species from many other genera will also be planted to increase the diversity of tree species, with the aim to reduce the vulnerability of Cheltenham's (including Pennydale) urban forest. A high diversity of plant species improves the chance of local ecosystems to survive destructive events or processes such as weed and pest animal invasion and climate change. Planting of specific species will depend on the geographic and environmental conditions, as well as the surrounding neighbourhood character.

Bayside City Council has developed *Live Bayside Plant Bayside 2022* as a guide to inform all future planting on public and private land. Residents are encouraged to use the guide when undertaking planting on their private properties. The *Live Bayside Plant Bayside Guide* features a selection of plants including:

- Herbs and groundcovers
- Creepers and climbers
- Lilies, grasses and tussocks
- Small shrubs
- Large shrubs
- Trees.

Council promotes the use of indigenous plants as they occur naturally within Bayside and have adapted to the conditions within the local environment (soil and climate) whilst also providing habitat and food for local birds, insects, and other native animals.

General Planting List for Cheltenham

The following species are provided as guidance only and should be considered for planting on private and public land where the following doesn't apply:

- One of the EVC species list identified in this Appendix;
- An existing approved landscape plan
- Endorsed Master plan for a Park or Reserve.

The list uses letter to denote the type of environment the species are suited to:

- A plants are adaptable, growing well in most soil types and aspects
- C plants are for the coast – dune scrub and and woodland
- D plants prefer dry, well-drained soils and can tolerate dryness once established
- S plants prefer or tolerate full shade
- H plants prefer heath or woodland
- W plants prefer or tolerate moist soils, wetness and periodic inundation.

Climbing Plants		
Species Name	Common Name	Key
<i>Billardiera mutabilis</i>	Common Apple-berry	HA
<i>Clematis microphylla</i>	Small-leaved Clematis	HCA
<i>Comesperma volubile</i>	Love Creeper	HDS
<i>Hardenbergia violacea</i>	Purple Coral Pea	HD
<i>Muehlenbeckia australis</i>	Climbing Lignum	HCDS
Grasses and Tussocks		
Species Name	Common Name	Key
<i>Austrostipa flavescens</i>	Coast Spear-grass	CA
<i>Austrostipa mollis</i>	Soft Spear-grass	HA
<i>Austrostipa stipoides</i>	Prickly Spear-grass	CD
<i>Deyeuxia quadriseta</i>	Reed Bent-grass	HD
<i>Dianella admixta</i>	Spreading Flax-lily	HCSA
<i>Dianella brevicaulis</i>	Small-flower Flax-lily	HCDSA
<i>Dianella laevis</i> var. <i>laevis</i>	Pale Flax-lily	HA
<i>Dianella</i> sp. aff. <i>revoluta</i>	Coastal Flax-lily	C
<i>Dichelachne crinita</i>	Long-hair Plume-grass	HD
<i>Distichlis distichophylla</i>	Australian Salt-grass	CA
<i>Eragrostis brownii</i>	Common Love-grass	HA
<i>Ficinia nodosa</i>	Knobby Club-sedge	HCA
<i>Juncus pallidus</i>	Pale Rush	A
<i>Lomandra filiformis</i>	Wattle Mat-rush	HDSA
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	HCDSA
<i>Lomandra multiflora</i>	Many-flowered Mat-rush	HAD
<i>Microlaena stipoides</i>	Weeping Grass	HCA

<i>Patersonia fragilis</i>	Short Purple-flag	HW
<i>Patersonia occidentalis</i>	Long Purple-flag	HDW
<i>Poa labillardieri</i>	Common Tussock-grass	HA
<i>Poa poiformis</i>	Coast or Blue Tussock-grass	CA
<i>Poa sieberana</i>	Tussock-grass	HA
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass	HCA
<i>Rytidosperma geniculatum</i>	Kneed Wallaby-grass	HCA
<i>Rytidosperma racemosum</i>	Clustered Wallaby-grass	HCDW
<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass	HA
<i>Sporobolus virginicus</i>	Salt or Sand Couch	CA
<i>Themeda triandra</i>	Kangaroo Grass	HA
<i>Triglochin striatum</i>	Streaked Arrowgrass	CW
<i>Xanthorrhoea minor</i>	Small Grass-tree	HD

Ground Covers and Wildflowers

Species name	Common name	Key
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	CSA
<i>Actites megalocarpus</i>	Dune Thistle	C
<i>Acrotriche serrulata</i>	Honey-pots	HD
<i>Amperea xiphoclada</i>	Broom Spurge	HD
<i>Apium prostratum ssp prostratum</i>	Sea Celery	CW
<i>Arthropodium strictum</i>	Chocolate Lily	HA
<i>Bossiaea prostrata</i>	Creeping Bossiaea	HD
<i>Brachyscome parvula</i>	Coast Daisy	CW
<i>Burchardia umbellata</i>	Milkmaids	HDW
<i>Carpobrotus rossii</i>	Karkalla	CD
<i>Chrysocephalum apiculatum</i>	Common Everlasting	HD
<i>Coronidium scorpioides</i>	Button Everlasting	HD
<i>Dichondra repens</i>	Kidney-weed	HCA
<i>Disphyma crassifolium</i>	Rounded Noon-flower	CA
<i>Einadia nutans</i>	Nodding Saltbush	HCDA
<i>Frankenia pauciflora</i>	Southern Sea-heath	CD
<i>Geranium solanderi</i>	Austral Cranesbill	HA
<i>Gonocarpus tetragynus</i>	Poverty Raspwort	HA
<i>Goodenia geniculata</i>	Bent Goodenia	HA
<i>Hibbertia acicularis</i>	Prickly Guinea-flower	HD
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	W

<i>Isotoma fluviatilis ssp australis</i>	Swamp Isotome	W
<i>Kennedia prostrata</i>	Running Postman	HCD
<i>Lagenophora stipitata</i>	Common Bottle-daisy	HCA
<i>Laxmannia orientalis</i>	Dwarf Wire Lily	HD
<i>Lobelia anceps</i>	Angled Lobelia	HW
<i>Lobelia pratioides</i>	Poison Lobelia	HW
<i>Opercularia ovata</i>	Broad-leaf Stinkweed	HA
<i>Opercularia varia</i>	Variable Stinkweed	HDS
<i>Pelargonium australe</i>	Austral Stork's-bill	CA
<i>Pelargonium inodorum</i>	Kopata	HA
<i>Pimelea humilis</i>	Common Rice-flower	HA
<i>Platylobium obtusangulum</i>	Common Flat-pea	HD
<i>Platysace heterophylla</i>	Slender Platysace	HDW
<i>Sarcocornia quinqueflora ssp. quinqueflora</i>	Beaded Glasswort or Samphire	CW
<i>Selliera radicans</i>	Shiny Swamp-mat	CW
<i>Stylidium graminifolium</i>	Grass Trigger-plant	HDW
<i>Tetragonia implexicoma</i>	Bower Spinach	CA
<i>Tetragonia tetragonioides</i>	New Zealand Spinach	CA
<i>Viola hederacea</i>	Ivy-leaf or Native violet	HCWS

Small to Medium Trees (5m - 10m)

Species name	Common name	Key
<i>Acacia implexa</i>	Lightwood	HSA
<i>Acacia mearnsii</i>	Black Wattle	HCD
<i>Acacia melanoxylon</i>	Blackwood	HWA
<i>Allocasuarina littoralis</i>	Black She-oak	HDS
<i>Allocasuarina verticillata</i>	Drooping She-oak	CD
<i>Bursaria spinosa</i>	Sweet Bursaria	HCA
<i>Leptospermum laevigatum</i>	Coast Tea-tree	CDA
<i>Melaleuca ericifolia</i>	Swamp Paperbark	HCDWA
Species Name	Common Name	Key
<i>Banksia integrifolia</i>	Coast Banksia	CD
<i>Eucalyptus camaldulensis</i>	River Red Gum	HA
<i>Eucalyptus melliodora</i>	Yellow Box	HA
<i>Eucalyptus ovata</i>	Swamp Gum	HW
<i>Eucalyptus pauciflora</i>	Snow Gum or White Sallee	HA
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint	HD

<i>Eucalyptus viminalis</i> ssp. <i>pyroriana</i>	Coast Manna-gum	HCD
Small Shrubs (50cm - 2m)		
Species name	Common name	Key
<i>Acacia brownii</i>	Heath Wattle	H
<i>Acacia suaveolens</i>	Sweet Wattle	HD
<i>Acacia ulicifolia</i>	Juniper Wattle	HW
<i>Allocasuarina paradoxa</i>	Green She-oak	HDS
<i>Aotus ericoides</i>	Common Aotus	HWD
<i>Atriplex cinerea</i>	Coast or Grey Saltbush	CD
<i>Bossiaea cinerea</i>	Showy Bossiaea	HCD
<i>Correa alba</i>	White Correa	CA
<i>Correa reflexa</i>	Common Correa	HSA
<i>Daviesia ulicifolia</i>	Gorse Bitter-pea	HA
<i>Dillwynia cinerascens</i>	Grey Parrot-pea	HDS
<i>Dillwynia glaberrima</i>	Heath Parrot-pea	HDS
<i>Epacris impressa</i>	Common Heath	HA
<i>Goodenia ovata</i>	Hop Goodenia	HCA
<i>Hibbertia fasciculata</i> var. <i>prostrata</i>	Bundled Guinea-flower	HD
<i>Hibbertia sericea</i>	Silky Guinea-flower	HD
<i>Hibbertia riparia</i>	Erect Guinea-flower	HA
<i>Lasiopetalum baueri</i>	Slender Velvet-bush	CDA
<i>Leptospermum myrsinoides</i>	Heath or Silky Tea-tree	HA
<i>Leucophyta brownii</i>	Cushion Bush	CD
<i>Leucopogon virgatus</i>	Common Beard-heath	HD
<i>Monotoca scoparia</i>	Prickly Broom-heath	HDW
<i>Myoporum petiolatum</i>	Sticky Boobiolla	CA
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	HD
<i>Rhagodia candolleana</i>	Seaberry Saltbush	CA
<i>Suaeda australis</i>	Austral Seablite	CW

Medium to Large Shrubs

Species Name	Common Name	Key
<i>Acacia sophorae</i>	Coast Wattle	CA
<i>Acacia oxycedrus</i>	Spike Wattle	HWA
<i>Acacia paradoxa</i>	Hedge Wattle	HCA
<i>Acacia stricta</i>	Hop Wattle	HCSA
<i>Alyxia buxifolia</i>	Sea Box	CD
<i>Banksia marginata</i>	Silver Banksia	HDA

<i>Cassinia arcuata</i>	Drooping Cassinia	HA
<i>Cassinia aculeata</i>	Common Cassinia	HDS
<i>Indigofera australis</i>	Austral Indigo	HA
<i>Kunzea leptospermoides</i>	Yarra Burgan	HA
<i>Leptospermum continentale</i>	Prickly Tea-tree	HWA
<i>Melaleuca squarrosa</i>	Scented Paperbark	HW
<i>Myoporum insulare</i>	Common Boobialla	CA
<i>Olearia axillaris</i>	Coast Daisy-bush	CD
<i>Olearia glutinosa</i>	Sticky Daisy-bush	CD
<i>Ozothamnus ferrugineus</i>	Tree Everlasting	HWA
<i>Pomaderris paniculosa</i>	Shining Coast Pomaderris	CDA
<i>Ricinocarpos pinifolius</i>	Wedding Bush	HW
<i>Solanum laciniatum</i>	Large Kangaroo Apple	HCA
<i>Viminaria juncea</i>	Golden Spray	HA

EVC Specific Lists

Of the 10 EVCs modelled within Bayside, two have been identified within Cheltenham (including Pennydale). The Damp Sands Herb-rich Woodland / Grassy Woodland and the Sand heathland / heathy woodland. The below species should be planted within the locations where these EVCs were historically present (as per Map 10).

Damp Sands Herb-rich Woodland / Grassy Woodland (EVC 719)

Reference Location: Donald Macdonald Reserve

Species typical of at least part of EVC range	Common Name	Lifeform	Location
<i>Acacia mearnsii</i>	Black Wattle	Middlestorey Tree	Throughout
<i>Acacia melanoxylon</i>	Blackwood	Middlestorey Tree	Inland Areas
<i>Epacris impressa</i>	Common Heath	Middlestorey Shrub	Heathlands
<i>Leptospermum continentale</i>	Prickly Tea-tree	Middlestorey Shrub	Throughout
<i>Banksia marginata</i>	Silver Banksia	Middlestorey Tree	Heathlands
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	Middlestorey Shrub	Heathlands
<i>Leucopogon virgatus</i>	Common Beard-heath	Middlestorey Shrub	Heathlands
<i>Dillwynia glaberrima</i>	Smooth Parrot-pea	Middlestorey Shrub	Heathlands
<i>Amperea xiphoclada</i> var. <i>xiphoclada</i>	Broom Spurge	Understorey Shrub	Heathlands
<i>Astroloma humifusum</i>	Cranberry Heath	Understorey Shrub	Heathlands
<i>Gonocarpus tetragynus</i>	Common Raspwort	Understorey Herb	Heathlands

<i>Drosera peltata</i> subsp. <i>auriculata</i>	Tall Sundew	Understorey Herb	Inland Damp Areas
<i>Viola hederacea</i> sensu <i>Willis</i> (1972)	Ivy-leaf Violet	Understorey Herb	Inland sheltered sites
<i>Geranium solanderi</i> s.l.	Austral Cranesbill	Understorey Herb	Not local to BCC
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	Understorey Herb	Throughout
<i>Opercularia varia</i>	Variable Stinkweed	Understorey Herb	Heathlands
<i>Dichondra repens</i>	Kidney-weed	Understorey Herb	Sheltered Damp Areas
<i>Poranthera microphylla</i>	Small Poranthera	Understorey Herb	Inland Areas
<i>Austrostipa mollis</i>	Supple Spear-grass	Understorey Graminoid	Heathland and Woodland Areas
<i>Tetrarrhena juncea</i>	Forest Wire-grass	Understorey Graminoid	Not local to BCC
<i>Lepidosperma concavum</i>	Sandhill Sword-sedge	Understorey Graminoid	Heathlands and wetlands
<i>Dianella revoluta</i> s.l.	Black-anther Flax-lily	Understorey Graminoid	Coastal and Heathland Areas
<i>Poa sieberiana</i>	Grey Tussock-grass	Understorey Graminoid	Coastal and Heathland Areas
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	Understorey Graminoid	Inland and Heathland Areas
<i>Allocasuarina littoralis</i>	Black Sheoak	Middlestorey Tree	Throughout
<i>Exocarpos cupressiformis</i>	Cherry Ballart	Understorey Shrub	Heathlands
<i>Cassinia aculeata</i>	Common Cassinia	Understorey Shrub	Heathland and Woodland Areas
<i>Acacia paradoxa</i>	Hedge Wattle	Understorey Shrub	Throughout
<i>Pimelea humilis</i>	Common Rice-flower	Understorey Shrub	Coastal and Heathland Areas
<i>Hibbertia riparia</i>	Erect Guinea-flower	Understorey Shrub	Heathlands
<i>Bossiaea prostrata</i>	Creeping Bossiaea	Understorey Shrub	Coastal and Heathland Areas
<i>Acrotriche serrulata</i>	Honey-pots	Understorey Herb	Dry Sandy Areas
<i>Pterostylis longifolia</i> s.l.	Tall Greenhood	Understorey Herb	Inland sheltered sites
<i>Drosera whittakeri</i> subsp. <i>aberrans</i>	Scented Sundew	Understorey Graminoid	Heathlands
<i>Deyeuxia quadriseta</i>	Reed Bent-grass	Understorey Graminoid	Woodland Areas
<i>Xanthorrhoea minor</i> subsp. <i>lutea</i>	Small Grass-tree	Understorey Graminoid	Heathland and Woodland Areas
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Understorey Graminoid	Coastal and Inland Damp Areas
<i>Gahnia radula</i>	Thatch Saw-sedge	Understorey Graminoid	Inland Damp Areas
<i>Lomandra filiformis</i>	Wattle Mat-rush	Understorey Graminoid	Inland Damp Areas

<i>Themeda triandra</i>	Kangaroo Grass	Understorey Graminoid	Inland Areas
<i>Lepidosperma laterale</i>	Variable Sword-sedge	Understorey Graminoid	Coastal and Woodland Areas
<i>Pteridium esculentum</i>	Austral Bracken	Understorey Fern	Heathland and Woodland Areas
<i>Comesperma volubile</i>	Love Creeper	Understorey Climber	Heathland and Woodland Areas
<i>Billardiera scandens</i>	Common Apple-berry	Middlestorey Tree	Coastal and Heathland Areas
<i>Eucalyptus viminalis</i> <i>subsp. pryoriana</i>	Rough-barked Manna Gum	Canopy Tree	Woodland Areas

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Spiny-headed Mat-rush



Cherry Ballart



Tall Sundew



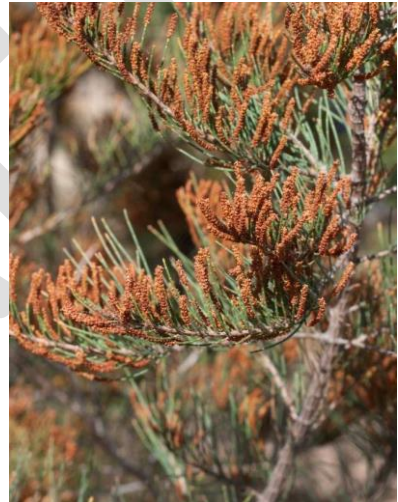
Creeping Bossiaea



Common Apple-berry



Black Sheoak



Love Creeper



Honey-pots



Common Rice-flower



Sand heathland / heathy woodland (EVC 892)

Reference Location: Bay Road Heathland Sanctuary

Species typical of at least part of EVC range	Common Name	Lifeform	Location
<i>Epacris impressa</i>	Common Heath	Middlestorey Shrub	Heathlands
<i>Banksia marginata</i>	Silver Banksia	Middlestorey Tree	Heathlands
<i>Leptospermum continentale</i>	Prickly Tea-tree	Middlestorey Shrub	Throughout
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	Middlestorey Shrub	Heathlands
<i>Dillwynia glaberrima</i>	Smooth Parrot-pea	Middlestorey Shrub	Heathlands
<i>Platylobium obtusangulum</i>	Common Flat-pea	Understorey Shrub	Heathlands
<i>Hibbertia fasciculata</i> var. <i>prostrata</i>	Bundled Guinea-flower	Understorey Shrub	Heathlands
<i>Leucopogon virgatus</i>	Common Beard-heath	Middlestorey Shrub	Heathlands
<i>Gonocarpus humilis</i>	Shade Raspwort	Understorey Herb	Inland sheltered sites
<i>Drosera peltata</i> subsp. <i>auriculata</i>	Tall Sundew	Understorey Herb	Inland Damp Areas
<i>Gahnia radula</i>	Thatch Saw-sedge	Understorey Graminoid	Inland Damp Areas
<i>Xanthorrhoea minor</i> subsp. <i>lutea</i>	Small Grass-tree	Understorey Graminoid	Heathland and Woodland Areas
<i>Lepidosperma concavum</i>	Sandhill Sword-sedge	Understorey Graminoid	Heathlands and wetlands
<i>Hypolaena fastigiata</i>	Tassel Rope-rush	Understorey Graminoid	Coastal and Sandy Areas
<i>Schoenus brevifolius</i>	Zig-zag Bog-sedge	Understorey Graminoid	Heathlands and Wetlands
<i>Pteridium esculentum</i>	Austral Bracken	Understorey Fern	Coastal and Heathland Areas
<i>Monotoca scoparia</i>	Prickly Broom-heath	Middlestorey Shrub	Heathlands and Wooded Areas
<i>Amperea xiphoclada</i> var. <i>xiphoclada</i>	Broom Spurge	Understorey Shrub	Heathlands and Wooded Areas
<i>Gahnia sieberiana</i>	Red-fruit Saw-sedge	Understorey Graminoid	Damp Inland Areas
<i>Cassytha glabella</i>	Slender Dodder-laurel	Climber	Heathlands
<i>Eucalyptus radiata</i> subsp. <i>radiata</i>	Narrow-leaf Peppermint	Canopy Tree	Wooded Areas
<i>Eucalyptus viminalis</i> subsp. <i>pryoriana</i>	Rough-barked Manna Gum	Canopy Tree	Woodland Areas

Bundled Guinea-flower



Heath Tea-tree



Common Flat-pea



Zig-zag Bog-sedge



Tassel Rope-rush



Shade Raspwort



Small Grass-tree



Red-fruit Saw-sedge



Broom Spurge



Additional native species observed that are not included in the EVCs

Scientific Name	Common Name	Lifeform	Location
<i>Olearia axillaris</i>	Coast Daisy-bush	Middlestorey Shrub	Coastal Areas
<i>Correa alba</i>	White Correa	Middlestorey Shrub	Coastal Areas
<i>Myoporum insulare</i>	Common Boobialla	Middlestorey Shrub	Coastal Areas
<i>Alyxia buxifolia</i>	Sea-box	Middlestorey Shrub	Coastal Areas
<i>Muehlenbeckia adpressa</i>	Climbing Lignum	Climber	Coastal Areas
<i>Atriplex cineria</i>	Coast Saltbush	Middlestorey Shrub	Coastal Areas
<i>Austrostipa stiptodes</i>	Prickly Spear-grass	Understorey Graminoid	Coastal Areas
<i>Goodenia ovata</i>	Hop Goodenia	Understorey Shrub	Inland Areas
<i>Juncus pallidus</i>	Pale Rush	Understorey Graminoid	Wetlands/low-lying areas
<i>Acacia paradoxa</i>	Prickly Wattle	Middlestorey Shrub	Inland Areas
<i>Correa reflexa</i>	Common Correa	Understorey Shrub	
<i>Solanum aviculare</i>	Kangaroo Apple	Middlestorey Herb	Woodlands
<i>Bolboschoenus</i>			
<i>Indigofera australis</i>	Austral Indigo	Middlestorey Shrub	Inland Areas
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	Understorey Shrub	Coastal Areas
<i>Bursaria spinosa</i>	Sweet Bursaria	Middlestorey Shrub	Inland Areas
<i>Einadia nutans</i>	Nodding Saltbush	Understorey Herb	Inland Areas
<i>Allocasuarina paludosa</i>	Scrub Sheoak	Middlestorey Shrub	Inland Areas
<i>Acacia suaveolens</i>	Sweet Wattle	Middlestorey Shrub	Inland Areas
<i>Acacia ulicifolia</i>		Middlestorey Shrub	Inland Areas
<i>Stylidium graminifolium</i>	Grass Trigger-plant	Understorey Graminoid	Heathlands
<i>Aotus ericoides</i>	Common Aotus	Understorey Shrub	Heathlands
<i>Ricinocarpos pinifolius</i>	Wedding Bush	Middlestorey Shrub	Heathlands
<i>Gompholobium huegelii</i>	Common Wedge-pea	Understorey Shrub	Heathlands
<i>Hibbertia fasciculata</i> <i>var. prostrata</i>	Bundled Guinea-flower	Understorey Shrub	Heathlands
<i>Allocasuarina paradoxa</i>	Green She-oak	Understorey Shrub	Heathlands

Exotic Species list

As reiterated in this Precinct Plan, focus will be placed on increasing the use of native and indigenous species. In certain areas of Bayside, the historic use of exotic plants makes part of the character of the area and has provided species diversity. The use of exotic plants is encouraged where appropriate and where considered to have a positive impact on the surrounding environment and neighbourhood.

Ground cover & Grasses <1m

Scientific Name	Common Name	Location	Origin
<i>Abelia 'Kaleidoscope'</i>	'Kaleidoscope'	Private gardens, reserve, parkland, street	North Carolina
<i>Aponogeton distachyos</i>	Water Hawthorn	Waterways	South Africa
<i>Azalea</i>	Azalea	Private gardens, reserve, parkland, street	China
<i>Blechnum fern</i>	Silver Lady	Private gardens, reserve, parkland, street	Pacific Islands
<i>Bromeliad</i>	Bromeliad	Private gardens, reserve, parkland, street	North and South America
<i>Buxus sempervirens suffruticosa</i>	Dutch box	Private gardens, reserve, parkland, street	Europe
<i>Cistus x argenteus</i>	Silver Pink'	Private gardens, reserve, parkland, street	Mediterranean and Canary Island
<i>Clivia x cyrtanthiflora</i>	Belgium Hybrid	Private gardens, reserve, parkland, street	Southern Africa
<i>Convolvulus cneorum</i>	Silver Bush	Private gardens, reserve, parkland, street	Coastal Spain
<i>Coprosma repens</i>	Pacific Sunrise	Private gardens, reserve, parkland, street	New Zealand
<i>Daphne odora</i>	Perfume Princess	Private gardens, reserve, parkland, street	China
<i>Dichondra</i>	Silver Falls	Private gardens, reserve, parkland, street	America*** Under review in Australia
<i>Echinodorus uruguayensis</i>	Uruguay Sword Plant	Waterway	South America
<i>Escallonia laevis</i>	Pink Elle	Private gardens, reserve, parkland, street	North and South America
<i>Hebe</i>	Emerald Green Hebe	Private gardens, reserve, parkland, street	New Zealand
<i>Hemerocallis hybrida</i>	Stella Bella	Private gardens, reserve, parkland, street	China
<i>Liriope muscari</i>	Elmarco	Private gardens, reserve, parkland, street	East Asia
<i>Liriope muscari</i>	Evergreen Giant	Private gardens, reserve, parkland, street	East Asia
<i>Lithodora diffusa</i>	Grace Ward	Private gardens, reserve, parkland, street	Southern and Western Europe
<i>Nuphar japonica</i>	Japanese Pond Lily	Waterway	Japan
<i>Nymphoides indica</i>	Water Snowflake	Waterway	South Asia
<i>Orontium aquaticum</i>	Golden Club	Waterway	Eastern America
<i>Phlebodium</i>	'Davana'	Private gardens, reserve, parkland, street	Central, South America
<i>Rhaphiolepis indica</i>	Oriental Pearl	Private gardens, reserve, parkland, street	Asia
<i>Sagittaria subulata var. subulata</i>	Awl-Leaf Arrowhead	Waterway	America
<i>Salvia farinacea</i>	Blue Sage	Private gardens, reserve, parkland, street	Mexico

Aponogeton distachyos



Buxus sempervirens suffruticosa



Convolvulus cneorum



Daphne odora



Liriope muscari



Hemerocallis hybrida



Lithodora diffusa



Rhaphiolepis indica



Sagittaria subulata var. subulata



Midstory Canopy 1m – 5m

Scientific Name	Common Name	Location	Origin
Aeonium arboreum	Irish Rose	Coastal	Atlantic Islands
Aloe plicatilis	Aloe Fan	Coastal	South Africa
Camellia japonica	Debbie'	Private gardens, reserve, parkland, street	New Zealand
Cotyledon orbiculata	Pigs ear	Coastal	South Africa
Dracaena warneckii	Janet Craig	Private gardens, reserve, parkland, street	China
Echium fastuosum	Pride of Madeira	Coastal	Madeira
Euphorbia characias	'Silver Swan'	Coastal	Mediterranean
Gardenia augusta	'Radicans'	Private gardens, reserve, parkland, street	China, Japan, Korea
Nandina domestica	Heavenly Bamboo	Coastal	Japan
Phormium tenax	Flax	Coastal	New Zealand
Pinus heldreichii 'COMPACT GEM'	Heldreich's pine	Coastal	Southern Italy
Rosemary officinalis	Rosemary	Private gardens, reserve, parkland, street	Mediterranean

Aloe plicatilis



Cotyledon orbiculata



Echium fastuosum



Gardenia augusta



Nandina domestica



Pinus heldreichii 'COMPACT GEM'



Aeonium arboreum



Phormium tenax



Dracaena warneckii



Canopy Tree >5m

Scientific Name	Common Name	Location	Origin
<i>Acer buergerianum</i>	Three toothed Maple	Private Garden, street, reserve, parkland	China
<i>Acer campestre</i> 'Elsrijk'	Field Maple	Private Garden, street, reserve, parkland	West Europe
<i>Acer platanoides</i>	Norway Maple	Private Garden, reserve, parkland	Eastern Europe
<i>Acer rubrum</i>	'October Glory'	Private Garden, street, reserve, parkland	North East America
<i>Acer truncatum</i>	Shangtung maple	Private Garden, reserve, parkland	China
<i>Acer x freemanii</i>	'Autumn Blaze'	Private Garden, street, reserve, parkland	North East America
<i>Afrocarpus Falcatus</i>	Common Yellow	Private Garden, street, reserve, parkland	Southern Africa
<i>Catalpa bignonioides</i> 'Nana'	Southern Catalpa	Private Garden, street, reserve, parkland	America
<i>Cedrus atlantica</i>	Atlas Cedar	Private Garden, street, reserve, parkland	North Africa
<i>Cedrus deodara</i>	Himalayan Cedar	Private Garden, street, reserve, parkland	Himalayas
<i>Celtis australis</i>	European nettle tree	Private Garden, street, reserve, parkland	Southern Europe, North Africa
<i>Celtis occidentalis</i>	Common Hackberry	Private Garden, street, reserve, parkland	North America
<i>Cercis siliquastrum</i>	Judas Tree	Private Garden, street, reserve, parkland	Mediterranean
<i>Cupressus glabra</i> (syn. <i>C. arizonica</i>)	Arizona smooth bark cypress	Private Garden, street, reserve, parkland	South western America
<i>Cupressus sempervirens</i>	Mediterranean cypress	Private Garden, reserve, parkland	Mediterranean
<i>Cupressus torulosa</i>	Himalayan cypress	Private Garden, street, reserve, parkland	India, Himalayas
<i>Fraxinus excelsior</i>	Golden Ash	Private Garden, street, reserve, parkland	Europe
<i>Fraxinus ornus</i>	Manna Ash	Private Garden, street, reserve, parkland	Southern Europe and West Asia
<i>Fraxinus pennsylvanica</i>	Cimmaron Green Ash	Private Garden, street, reserve, parkland	North America

<i>Fraxinus velutina</i>	Velvet Ash	Private Garden, street, reserve, parkland	South western North America
<i>Ginkgo biloba</i>	Ginkgo	Private Garden, street, reserve, parkland	China
<i>Gleditsia triacanthos</i> var.inermis Varieties	Honey locust	Private Garden, street, reserve, parkland	North America
<i>Jacaranda mimosifolia</i>	Jacaranda	Private Garden, street, reserve, parkland	South America
<i>Lagerstroemia indica</i> x <i>L. fauriei</i> varieties	Crepe Myrtle	Private Garden, reserve, parkland	Japan
<i>Liquidambar formosana</i>	Chinese sweet gum	Private Garden, street, reserve, parkland	Southern China and Taiwan
<i>Liquidambar styraciflua</i>	Fruitless sweet gum	Private Garden, street, reserve, parkland	North and Central America
<i>Maclura pomifera</i>	Osange Orange	Private Garden, street, reserve, parkland	South central America
<i>Magnolia grandiflora</i>	Exmouth	Private Garden, street, reserve, parkland	America
<i>Metasequoia glyptostroboides</i>	Dawn Redwood	Private Garden, street, reserve, parkland	China
<i>Olea europaea</i>	Olive	Private Garden, street, reserve, parkland	Southern Europe, northern Africa and western Asia
<i>Paulownia tomentosa</i>	Canary Pine	Private Garden, street, reserve, parkland	Canary Island
<i>Phoenix canariensis</i>	Canary Date Palm	Private Garden, street, reserve, parkland, coastal	Morocco
<i>Pinus halepensis</i>	Jerusalem Pine	Private Garden, street, reserve, parkland	Mediterranean
<i>Pinus patula</i>	Mexican weeping pine	Private Garden, street, reserve, parkland	Mexico
<i>Pinus pinaster</i>	Maritime pine	Private Garden, street, reserve, parkland	Western Mediterranean
<i>Pinus pinea</i>	Italian Stone Pine	Private Garden, street, reserve, parkland	Southern Europe
<i>Pistacia chinensis</i>	Chinese pistacia	Private Garden, street, reserve, parkland	China
<i>Platanus orientalis</i>	Oriental Plane	Private Garden, street, reserve, parkland	Asia, Cypress
<i>Platanus X acerifolia</i>	London Plane	Street, reserve, parkland	Britain
<i>Pyrus calleryana</i> varieties	Celery pear	Private Garden, street, reserve, parkland	China, Vietnam

<i>Pyrus nivalis</i>	Snowy pear	Private Garden, street, reserve, parkland	South east Europe to western Asia
<i>Quercus acutissima</i>	Sawtooth Oak	Private Garden, street, reserve, parkland	Asia
<i>Quercus agrifolia</i>	Coast live oak	Private Garden, street, reserve, parkland, coastal	California
<i>Quercus bicolor</i>	Swamp white Oak	Private Garden, street, reserve, parkland	Eastern and Central Midwest America
<i>Quercus canariensis</i>	Algerian Oak	Private Garden, street, reserve, parkland	Spain, Morocco
<i>Quercus cerris</i>	Austrian Oak	Private Garden, street, reserve, parkland	South-eastern Europe
<i>Quercus coccinea</i>	Scarlett Oak	Private Garden, reserve, parkland	America
<i>Quercus ilex</i>	Holly Oak	Private Garden, street, reserve, parkland	Mediterranean
<i>Quercus macrocarpa</i>	Burr Oak	Private Garden, street, reserve, parkland	North America
<i>Quercus phellos</i>	Willow Oak	Private Garden, reserve, parkland	America
<i>Sapium sebiferum</i>	Chinese Tallow	Private Garden, street, reserve, parkland	China
<i>Sophora japonica</i>	Princeton Upright	Private Garden, street, reserve, parkland	China
<i>Taxodium distichum</i>	Bold Cypress	Private Garden, street, reserve, parkland	South-eastern America
<i>Tilia cordata</i>	Greenspire	Private Garden, street, reserve, parkland	Europe
<i>Trachycarpus fortunei</i>	Windmill Palm	Private Garden, street, reserve, parkland	China
<i>Ulmus glabra</i>	Golden Wych Elm	Private Garden, street, reserve, parkland	Britain
<i>Ulmus parvifolia</i>	Chinese Elm	Private Garden, street, reserve, parkland	Eastern Asia
<i>Washingtonia filifera</i>	Dessert fan palm	Private Garden, street, reserve, parkland, coastal	Southwest America
<i>Washingtonia robusta</i>	Mexican Fan Palm	Private Garden, reserve, parkland	North west Mexico
<i>Zelkova serrata</i>	Green Vase	Private Garden, street, reserve, parkland	Japan

Acer rubrum



Catalpa bignonioides 'Nana'



Cupressus torulosa



Fraxinus ornus



Ginkgo biloba



Maclura pomifera



Magnolia grandiflora



Pinus patula



Pistacia chinensis



Platanus orientalis



Quercus acutissima



Tilia cordata



Zelkova serrata



Lagerstroemia indica x *L. fauriei*
varieties



Paulownia tomentosa



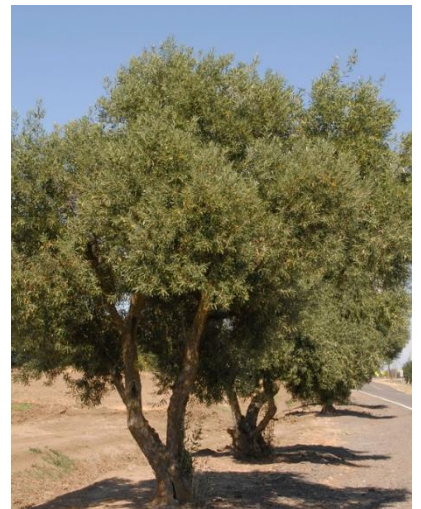
Platanus X acerifolia



Quercus macrocarpa



Olea europaea



Glossary

Biodiversity: 'All components of the living world: the number and variety of plants, animals, and other living things (including fungi and micro-organisms) across our land, rivers, coast, and ocean. It includes the diversity of their genetic information, the habitats and ecosystems within which they live, and their connections with other life forms and the natural world'.⁷

Canopy cover is the layer formed by the branches and crowns of plants or trees. The cover can be continuous, as in primary forests, or discontinuous - with gaps as in an urban area. Canopy is defined in Living Melbourne as vegetation above three metres in height.⁸

Canopy tree: A tree which has, or at maturity is likely to have, sufficient height and canopy characteristics to make a positive contribution to local amenity, sense of place, micro climate and/or biodiversity. Minimum 8 x 4 metres.⁹

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.¹⁰

Climate change adaptation is the process of adjustment to actual or expected climate and its effects.¹¹

Climate change mitigation is the human intervention to reduce the sources or enhance the sinks of greenhouse gases.¹¹

Climate Emergency refers to the catastrophic changes to the climate brought about by human activity that poses a dangerous threat to all life on the planet.¹¹

Environmentally Sustainable Development refers to development that is designed, constructed, and managed to optimise climate resilience, energy efficiency, integrated water management, indoor environment quality, the circular economy, low carbon transport and urban ecology.¹²

General Residential Zone (GRZ) is applied to land in areas where growth and housing diversity is anticipated. It is expected that the type of housing provided will evolve over time to provide more diverse forms of housing, but not at the expense of existing open garden character.¹³

Greenways are a form of landscape planning. They are linear open space corridors in the built or natural environment, which preserve biodiversity or other aspects of a sustainable environment, and generally engage the community in recreational use.¹⁴

⁷ The State of Victoria Department of Environment, Land, Water and Planning, 'Protecting Victoria's Environment – Biodiversity 2037', 2017, Available at <https://www.environment.vic.gov.au/biodiversity/biodiversity-plan>

⁸ CID Bio-Science, 'Forest and Plant Canopy Analysis – Tools and Methods', 2019, Available at <https://cid-inc.com/blog/forest-plant-canopy-analysis-tools-methods/>

⁹ Bayside City Council, 'Local Law Guidelines, Neighbourhood Amenity Local Law 2021', 2021, Available at <https://www.bayside.vic.gov.au/sites/default/files/2022-05/Neighbourhood%20Amenity%20Local%20Law%202021%20Guidelines%20-%20Final.pdf>

¹⁰ Definition has been sourced from 'Bayside's Climate Emergency Action Plan 2020-2025 – Glossary', 2019, Available at https://www.bayside.vic.gov.au/sites/default/files/sustainability_and_environment/climate_emergency_action_plan_v1.2_140920_for_web.pdf

¹¹ Department of Health and Human Services, 'Arboricultural Assessment Holland Court, Flemington– 3.7 Useful Life Expectancy(ULE)', 2017, available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0011/105500/SHRP-SH1-15.a.-Tree-Logic-Rpt_Holland-Court.-Flemington.pdf

¹² Bayside Sustainable Building and Infrastructure Policy (updated 2021)

¹³ Victorian Planning Authority, 'Reformed Residential Zones – General Residential Zone', 2017, Available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0023/103865/General-Residential-Zone.pdf

¹⁴ University of New South Wales, 'The future of greenways in Sydney,' by P. Crawshaw, 2009, available at: https://www.be.unsw.edu.au/sites/default/files/upload/pdf/schools_and_engagement/resources/_notes/5A2_41.pdf

Habitat: All the physical and biological things that collectively make up the place where a plant or animal lives.¹⁵

Habitat Corridor: A habitat corridor is a linear two-dimensional landscape element that differs from the surrounding vegetation, in both vegetation structure and form, and connects two or more patches, of otherwise isolated, habitat that have been connected in historical time, this is meant to function as a conduit for both plants and animals.¹⁶

Heat Vulnerability Index: The heat vulnerability index (HVI) is represented by a scale of 1 to 5 based on quintiles, with 1 representing low exposure, low sensitivity, or high adaptive capacity and 5 representing high exposure, high sensitivity or low adaptive capacity. We integrated indicators of heat vulnerability to calculate a Heat Vulnerability Index (HVI) at SA1 level. The index consists of three component layers: heat exposure, sensitivity to heat, and adaptive capability. Integration was accomplished by summing the scores from the three vulnerability components, dividing the SA1s into quintiles, and attributing SA1s with a Heat Vulnerability Rating scaled from 1 to 5.¹⁷

Neighbourhood Residential Zone (NRZ) is applied to land that has been identified as having specific neighbourhood, heritage, environmental or landscape character values that distinguish the land from other parts of the municipality or surrounding area.¹⁸

Permeability: The readiness with which a surface, whether man-made (such as a paved road) or natural (such as soil or rock) allows water, air or plant roots to penetrate or pass through.¹⁹

Residential Growth Zone (RGZ) is considered a substantial change area where medium density housing growth and diversity of housing types is encouraged for example town houses and apartments around activity centres and close to train stations.²⁰

Resilience: The capacity of individuals, institutions, businesses and systems within a city to adapt, survive and thrive no matter what kind of chronic stresses and acute shocks they experience.¹¹

SEIFA: Socio-Economic Indexes for Areas (SEIFA) measures the relative level of socio-economic disadvantage and/or advantage based on a range of Census characteristics.²¹

Senescence is the process by which cells irreversibly stop dividing and enter a state of permanent growth arrest without undergoing cell death.²²

Significant Landscape Overlay (SLO): The Significant Landscape Overlay (SLO) is a planning overlay and tool for protecting and managing significant landscapes. Its purpose is to identify significant landscapes, and conserve and enhance their character. The SLO can require a permit to

¹⁵ Resilient Melbourne and The Nature Conservancy, 'Living Melbourne – Our metropolitan Urban Forest', 2019, Available at https://resilientmelbourne.com.au/wp-content/uploads/2019/05/LivingMelbourne_Strategy_online.pdf

¹⁶ Definition as used in 'Corridors for Habitat and Biodiversity Conservation in the Act with Links to the Region' from 'The theory of wildlife corridor capability – in Nature Conservation 2: The role of corridors', 1991 by Soulé, M. E. and M. E. Gilpin, Available at https://www.parliament.act.gov.au/_data/assets/pdf_file/0008/381077/PE_06_Environment_attach.pdf

¹⁷ Department of Environment, Land, Water and Planning, Victorian Government 'Urban Vegetation, Urban Heat Islands and Heat Vulnerability Assessment in Melbourne, 2018', Available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0018/440181/UHI-and-HVI2018_Report_v1.pdf

¹⁸ Victorian Planning Authority, 'Using the residential zones – Planning Practice Note 91, Clause 32.09', 2019, Available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0033/445389/PPN91-Using-the-residential-zones.pdf

¹⁹ DELWP, 'Land for Wildlife' available at: <https://www.wildlife.vic.gov.au/protecting-wildlife/land-for-wildlife>

²⁰ Victorian Planning Authority website, 'Frequently Asked Questions – What is a Residential Growth Zone (RGZ)', 2017, Available at <https://vpa.vic.gov.au/faq/berwick-residential-growth-zone-rgz/>

²¹ Id community, 'Demographic Resources', Available at <https://profile.id.com.au/bayside/seifa-disadvantage-small-area?WebID=10>

²² CSIRO Linked Data Registry, 'Definition of Senescence', Available at <http://registry.it.csiro.au/def/keyword/nature/subjects/senescence>

construct a building or construct or carry out works, construct a fence, and remove, destroy or lop any vegetation.²³

Significant Tree: Some trees, through age, size, and rarity of planting or association with historical events achieve a higher level of importance on private or public land. Identifies the following the categories used to define significant trees as scientific, social, historic, and aesthetic.²⁴

Tree Canopy: The uppermost trees or branches of trees in a forest, forming an almost continuous layer of foliage. The topmost layer of bioactivity in a forest setting.⁴

Urban Forest encompasses all of the Trees, Shrubs and Grasslands – and the Soil and Water that support them. An Urban Forest incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, coastal foreshores, wetlands, railway corridors, community gardens, green walls, balconies, and roofs.⁴

Urban Heat Island Effect: The phenomenon of dense urban areas having significantly warmer air and land surface temperatures than surrounding areas.⁴

Useful Life Expectancy (ULE): Assessment of useful life expectancy provides an indication of health and tree appropriateness and involves an estimate of how long a tree is likely to remain in the landscape based on species, stage of life (cycle), health, amenity, environmental services contribution, conflicts with adjacent infrastructure and risk to the community. It is not a measure of the biological life of the tree within the natural range of the species. It is more a measure of the health status and the tree's positive contribution to the urban landscape.²

Vegetation Protection Overlay (VPO): The VPO focuses on the protection of significant vegetation, including native and introduced vegetation in urban environments. The overlay can be applied to individual trees, groups of trees or areas of significant vegetation. It requires a landowner to obtain a permit to remove, destroy or lop any vegetation specified in a schedule to the overlay subject to a list of exemptions. Some of those exemptions apply to particular types of vegetation and others apply to specific situations, for example, to clear vegetation from electricity lines and to ensure emergency access.²⁵

Vulnerability: Exposure to contingencies and stress, and the difficulty in coping with them. This can apply to ecosystems, trees, people, and places.²⁶

Water Sensitive Urban Design (WSUD) is a more sustainable approach to urban planning and design to make use of stormwater and reduce the harm it causes to our natural waterways.²⁷

²³ Victorian Planning Authority, 'DPCD South West Victoria Landscape Assessment Study – Regional Overview Report', 2013, Available at https://www.planning.vic.gov.au/_data/assets/pdf_file/0023/94820/ROR-Chapter-5-Implementation-Part-2.pdf

²⁴ Bayside City Council, 'Significant Tree Management Policy 2020', 2020, Available at https://www.bayside.vic.gov.au/sites/default/files/trees_parks_and_beaches/significant_tree_management_policy_2020.pdf

²⁵ Victorian Law Reform Commission, '4. Planning law and regulation affecting trees on private land - Vegetation Protection Overlay, Available at <https://lawreform.vic.gov.au/content/introduction-34>

²⁶ GreenFacts, 'Vulnerability (in ecosystems), available at: <https://www.greenfacts.org/glossary/tuv/vulnerability-ecosystems.htm>

²⁷ Melbourne Water, 'Introduction to WSUD', available at: <https://www.melbournewater.com.au/building-and-works/stormwater-management/introduction-wsud>



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