Draft Greening Whittlesea City Forest Strategy 2020-2040

Acknowledgement of Traditional Owners

The City of Whittlesea recognises the rich Aboriginal heritage of this country and acknowledges the Wurundjeri Willum Clan as the Traditional Owners of this place.

Definitions

Action – used here to describe a specific set of steps to achieve objectives.

Adapt – a term used to describe animals, plants, or habitats/ecosystems that are able to change or adjust to suit new/altered conditions.

Baseline (also benchmark) – describes the condition of target biodiversity prior to, or in the early stages of, project implementation. It is a standard against which management-induced changes can be identified and measured.

Biodiversity – an umbrella term encompassing all species of plants, animals, and micro-organisms, and the variation in ecosystems and ecological processes of which they are part. It is a multi-dimensional concept, difficult to define in an operational sense and difficult to measure.

Canopy cover – areas that when viewed on an aerial image is considered to be planted with a tree.

Citizen science – scientific research conducted in whole or in part by amateur (i.e. non-professional) scientists and/or community volunteers. Typically conducted in collaboration with professional scientists. A BioBlitz event is an example of citizen science.

Distribution – the spread of something over an area. When used in relation to species (i.e. species distribution) it tends to indicate where areas of suitable environmental and habitat conditions occur for a species.

Diversity – the amount of variation in a given element. When used in relation to biological species the term biodiversity is often used to refer to the number of different species (e.g. to measure species diversity is to quantify the number of different species; to increase species diversity is to increase the number of different species).

Ecosystem – refers to the complex network of living organisms and their interactions with each other and their environment.

Ecosystem services – the various benefits that people gain freely from the natural environment and from properly-functioning ecosystems.

Environment – the natural surroundings or conditions in which an animal or plant lives or operates. Can be used to describe the whole of the natural world, or a particular area.

Focal area – A grouping of suburbs based on their general land use being:
Urban: Bundoora, Doreen, Epping, Lalor, Mernda, Mill Park, South Morang, Thomastown
Rural: Eden Park, Humevale, Kinglake West, Whittlesea, Woodstock, Yan Yean
Growth: Beveridge, Donnybrook, Wollert

Goal – what is trying to be broadly achieved through implementation of the objectives and actions outlined in this Strategy.

Impervious surface – ground surfaces that do not allow water to permeate the soil and so prevents filtering of pollutants and recharging of water tables. These surfaces are often mand-made sealed surfaces (e.g. roads, buildings, footpaths).

Land Cover Type - one of four categorisations used in this strategy to differentiate between areas of: canopy cover; plantable space; unplantable space; and impervious surfaces.

Objective - used in this strategy to describe an output that will help achieve the goals and targets outlined in this Strategy. Objectives will be achieved through implementation of a set of priority actions.

Pervious surface – ground surfaces that allow water to permeate the soil to filter out pollutants and recharge water tables. These surfaces are not covered by mand-made sealed surfaces (e.g. roads, buildings, footpaths).

Plantable space – areas of grass or bare ground that when viewed on an aerial image is considered able to be planted with a tree. Excludes areas such as active portions of sports fields and areas adjacent airport runways.

Resilient – relates here to animal and plant species, habitats, environments and/or ecosystems being able to withstand, recover quickly from, or adapt to threats and difficult conditions.

Strategy – used here to refer to the direction and approach developed to achieve a vision.

Target – used here to describe a quantifiable element that may be measured to gauge progress towards achieving goals.

Tenure – indicates the ownership of land with **non-council** including private ownership, other Government Agencies, and Crown Land.

Urban heat island – an urban area that is significantly hotter than the area that surrounds it.

Administrator's Message

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Pulvinar neque laoreet suspendisse interdum consectetur libero id faucibus. Non blandit massa enim nec. Enim ut sem viverra aliquet eget sit amet tellus. Faucibus pulvinar elementum integer enim neque volutpat ac. Tristique senectus et netus et malesuada fames ac turpis. Orci eu lobortis elementum nibh.

Augue eget arcu dictum varius duis at consectetur lorem. Quam pellentesque nec nam aliquam sem et. Sit amet venenatis urna cursus eget nunc. Nunc sed augue lacus viverra. Arcu ac tortor dignissim convallis aenean et tortor at risus. Commodo elit at imperdiet dui accumsan. Turpis egestas sed tempus urna. Mi eget mauris pharetra et ultrices. Donec massa sapien faucibus et molestie. Risus in hendrerit gravida rutrum quisque non. Pellentesque elit ullamcorper dignissim cras tincidunt lobortis.

Ultrices eros in cursus turpis massa. Tristique magna sit amet purus gravida quis blandit turpis. Pellentesque sit amet porttitor eget dolor morbi non arcu. Tortor pretium viverra suspendisse potenti nullam ac tortor vitae purus. Ac ut consequat semper viverra nam libero justo laoreet. Leo a diam sollicitudin tempor id eu nisl nunc. Felis imperdiet proin fermentum leo.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Pulvinar neque laoreet suspendisse interdum consectetur libero id faucibus. Non blandit

massa enim nec. Enim ut sem viverra aliquet eget sit amet tellus. Faucibus pulvinar elementum integer enim neque volutpat ac. Tristique senectus et netus et malesuada fames ac turpis. Orci eu lobortis elementum nibh.

Augue eget arcu dictum varius duis at consectetur lorem. Quam pellentesque nec nam aliquam sem et. Sit amet venenatis urna cursus eget nunc. Nunc sed augue lacus viverra. Arcu ac tortor dignissim convallis aenean et tortor at risus. Ac turpis egestas integer eget aliquet nibh praesent. Pellentesque elit ullamcorper dignissim cras tincidunt lobortis.

First Name Last Name
 ADMINISTRATOR

Contents

Figures

Overview

In 2018, consultation was undertaken to develop the long-term vision for our community: Whittlesea 2040 – A place for all. As part of this process the community identified the value they place on our natural landscapes and trees. The Greening Whittlesea City Forest Strategy 2020-2040 (GWS) builds on that sentiment with its own strategic vision which sees the City of Whittlesea:

*"creating and managing liveable and resilient places for the benefit of people and the environment through **responsibly** greening diverse landscapes"*

The GWS addresses three key challenges faced by our city; climate change, urban expansion (and population growth), and urban heating – these factors are placing increasing pressure on our city forest and impact the liveability of our city.

The GWS sets responsible goals supported by quantifiable objectives and actions that aim to realise our vision and strategic targets in the desired time frames. The GWS sets the benchmark for land cover and heat mapping across the Council area, and establishes targets for greening our landscapes to benefit our people, environment, and local economy.

To realise our strategic vision, the following goals have been established:

Goal 1. Preserve existing trees and green cover on Council and non-council land.

Goal 2. Grow our tree population and green cover to achieve a 20% canopy increase across the city.

Goal 3. Inspire community support for the Greening Whittlesea Strategy and contribution towards achieving the shared strategic vision.

Goal 4. Construct infrastructure that contributes to the greening of our city.

The GWS recognises the diverse landscape types, uses, and cultural connections that comprise our city; diverse, though complementary, greening approaches will therefore be applied to achieve overall greening targets. Increasing canopy cover across the region will help:

- our landscapes and communities adapt to climate change;
- mitigate the urban heat island effect by bringing temperatures down;
- create healthier ecosystems; and,
- encourage a connected and engaged community.

The GWS has a 20-year lifespan with progression reviews proposed every five years. A detailed Implementation Plan will be developed, guided by the Goals and Priority Actions, and linking back to the City and strategic visions (Figure 1). A Project Steering Group will be established to oversee the Strategy's implementation.
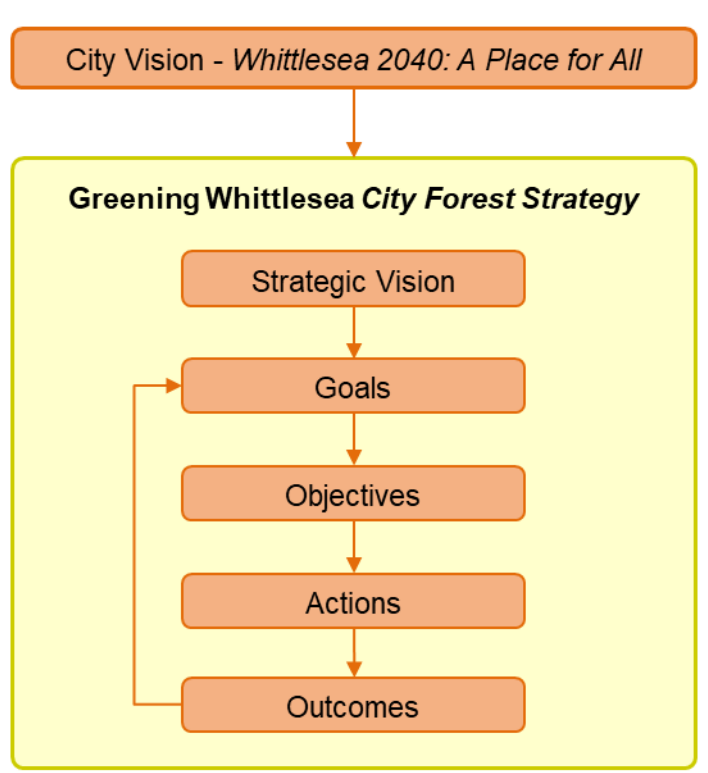
Figure 1. Relationship between targets, themes, goals, objectives, and actions.

1 Policy Context

The key driver for the Greening Whittlesea City Forest Strategy is the City's long-term vision 'Whittlesea 2040: A place for all', which calls for Whittlesea:

'…..to be ready for the challenges and opportunities that the future will bring, ensuring that the City of Whittlesea is a great place to live now and in the future."

The GWS recognises that greening plays a significant role in addressing current and emerging environmental issues, including climate change, and that achieving necessary change will require a wide range of efforts. The GWS does not exist in isolation and will connect to existing local and regional Strategies, providing a link between the strategic direction in *Living Melbourne* and the local vision defined in *Whittlesea 2040* (Figure 2)
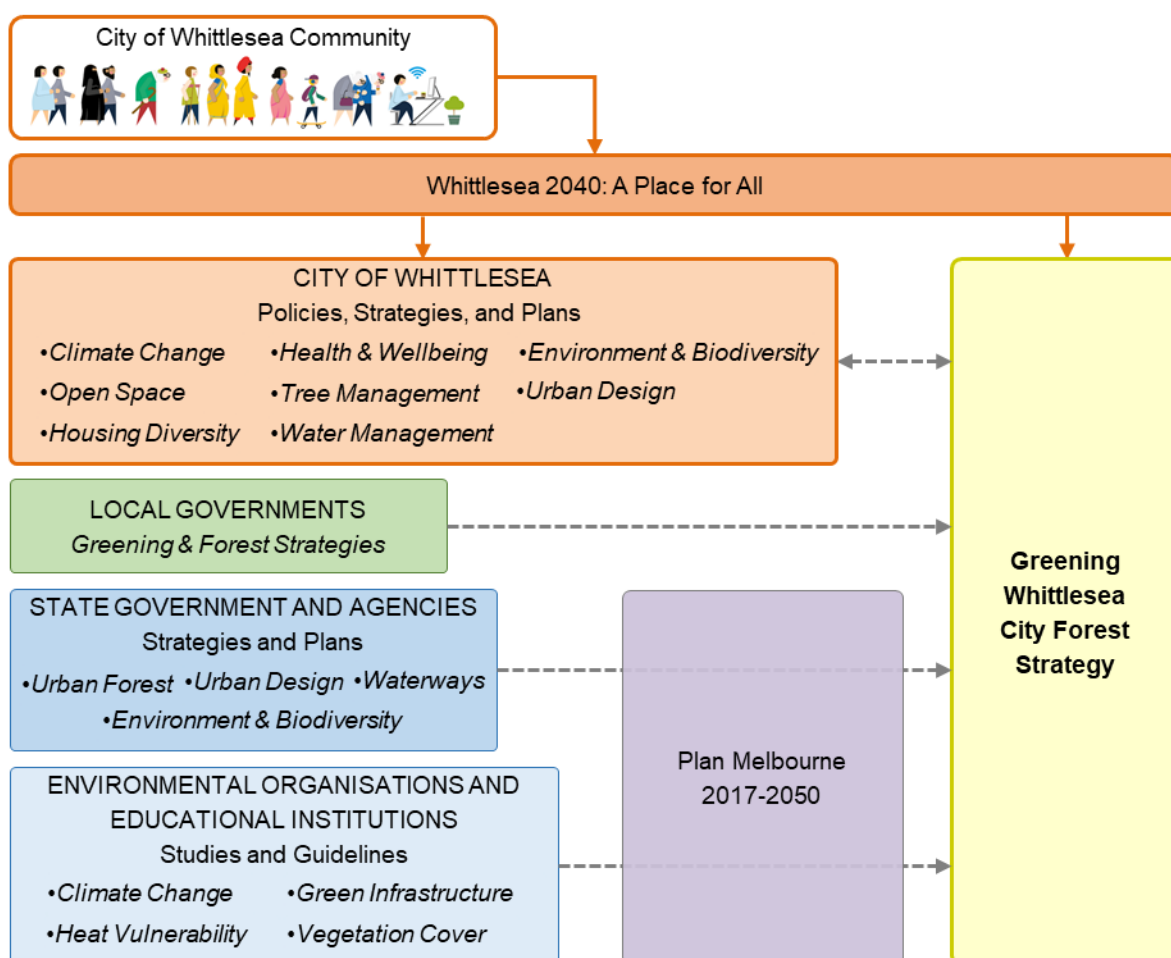
Figure 2. Strategy relationships.

Relationship between the Greening Whittlesea Strategy (yellow) and other State (purple), regional (blue), Whittlesea-specific (orange), and other local Council (green) strategies, plans, policies, and reports.

2   Why Greening Our City Matters

Greening in this Strategy refers to all traditional planted elements, on Council and non-council land, including grass, shrubs, and trees, as well as more novel, constructed elements such as rain gardens, green walls, and green roofs.

Whilst all greening elements provide benefit, trees provide the greatest scope for a lasting impact. Trees are valued by the community for their beauty, shade, and character. They provide a range of benefits (Figure 3) including improved mental and physical health and wellbeing, increased property values, and reduced heating and cooling costs. They also reduce air pollution, store carbon, and provide habitat for wildlife. Trees help the community adapt to climate change by cooling the air on hot summer days.

Trees have an important role to play both in connecting communities in liveable neighbourhoods and in our response to changing climate conditions.
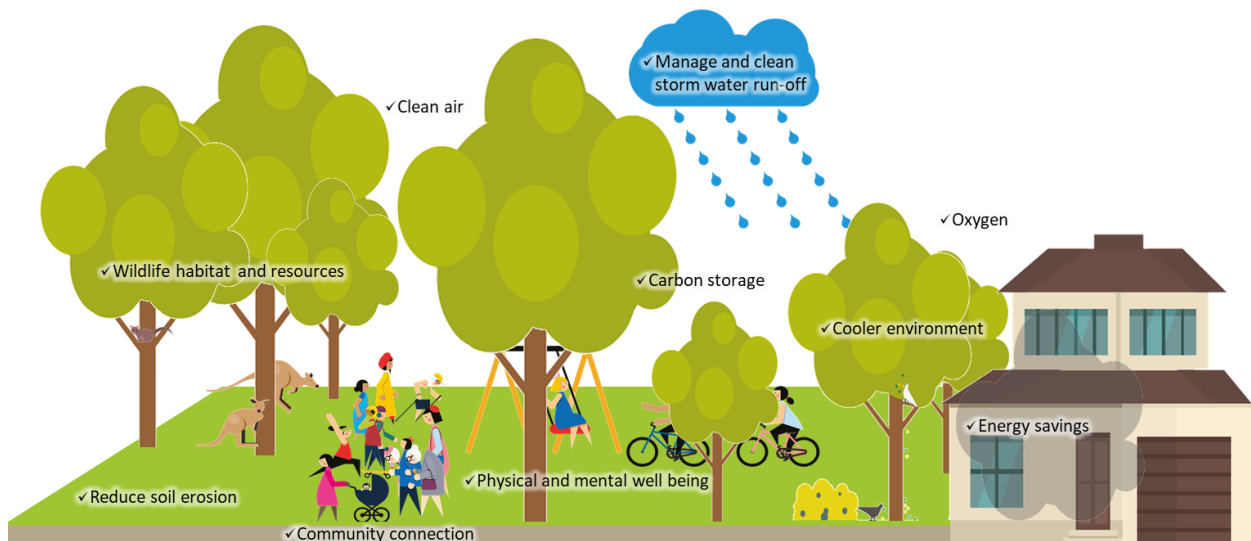
Figure 3. Benefit of trees.

3 About Whittlesea

Much of central Victoria including the City of Whittlesea was covered by a shallow sea 420 million years ago. As Australia collided with other land masses, uplift occurred forming the Great Dividing Range with Mount Disappointment at its southern end. Moving forward 240 million years and Victoria was covered by rainforest with a range of mammals, birds, reptiles and plants calling it home.

By the start of the Quaternary Period (2.6 million years ago) these rainforests were shrinking. The climate was warming and drying, giving way to the more familiar local landscapes dominated by Eucalypts and Wattles. Volcanoes were also active across the western region of Victoria, resulting in the basalt volcanic plains that are found in the west of the city.

Today the City of Whittlesea (Figure 4) is a growth Council on the northern edge of metropolitan Melbourne covering an area of approximately 489km^2, of which around 70 per cent is rural 30 per cent being urban. Our 17 suburbs comprise diverse landscape uses, ranging from established urban centres primarily in the south, through rural pastures, to remnant bushland tracts in the north and north-east. It is bordered by Kinglake National Park and Mt Disappointment State Forest to the north, Merri Creek to the west and Plenty River to the east. The Eden Park Hills to the north-west connect the Victorian Volcanic Plains to the Great Dividing Range and an area of mostly continuous vegetation that stretches up the east coast of Australia. Along with the Merri Creek and Plenty River, the City of Whittlesea also supports Darebin and Edgars Creeks. Across the city there is also a strong recognition of the Wurundjeri connection to culture, with culture being the interconnection of land, water, vegetation, and fire.

Whittlesea's recent agricultural land use history has resulted in natural areas being retained in fragmented pockets within the city. Approximately 35% (17,000 hectares) remains of the original extent of native vegetation within Whittlesea. Of this area, approximately 29% (4,860 hectares) of remnant vegetation is retained under permanent protection on crown land. The Urban Growth Boundary (UGB) separates the well-established and developing suburbs to the south, and designated Green Wedge Land to the north.

All of City: 489.73km²

Council: 13.34% | Non Council: 86.66%

Established urban suburbs: 135.86km²

Council: 23.45% | Non Council: 76.55%

Rural suburbs: 236.73km²

Council: 3.02% | Non Council: 96.98%

Growth suburbs: 117.14km²

Council: 5.49% | Non Council: 94.51%

Urban Growth Boundary

Beveridge: 38.26km²
Council: 2.6%
Non-Council: 97.4%

Eden Park: 24.17km²
Council: 5.73%
Non- Council: 94.27%

Woodstock: 31.25km²
Council: 2.09%
Non-Council: 97.91%

Donnybrook: 24.53km²
Council: 1.31%
Non-Council: 98.69%

Wollert: 54.35km²
Council: 8.49%
Non-Council: 91.51%

Epping: 33.74km²
Council: 20.12%
Non-Council: 79.88%

Lalor: 9.29km²
Council: 26.33%
Non-Council: 73.67%

Thomastown: 14.75km²
Council: 28.9%
Non-Council: 71.1%

Whittlesea: 106.51km²
Council: 3.15%
Non-Council: 96.85%

Humevale: 36.02km²
Council: 3.39%
Non-Council: 96.61%

Kinglake West: 9.32km²
Council: 1.83%
Non-Council: 98.17%

Yan Yean: 29.46km²
Council: 4.72%
Non-Council: 95.28%

Mernda: 22.5km²
Council: 13.65%
Non-Council: 86.35%

Doreen: 14.46km²
Council: 30.4%
Non-Council: 69.6%

South Morang: 21.02km²
Council: 25.65%
Non-Council: 74.35%

Mill Park: 12.82km²
Council: 27.47%
Non-Council: 72.53%

Bundoora: 7.28km²
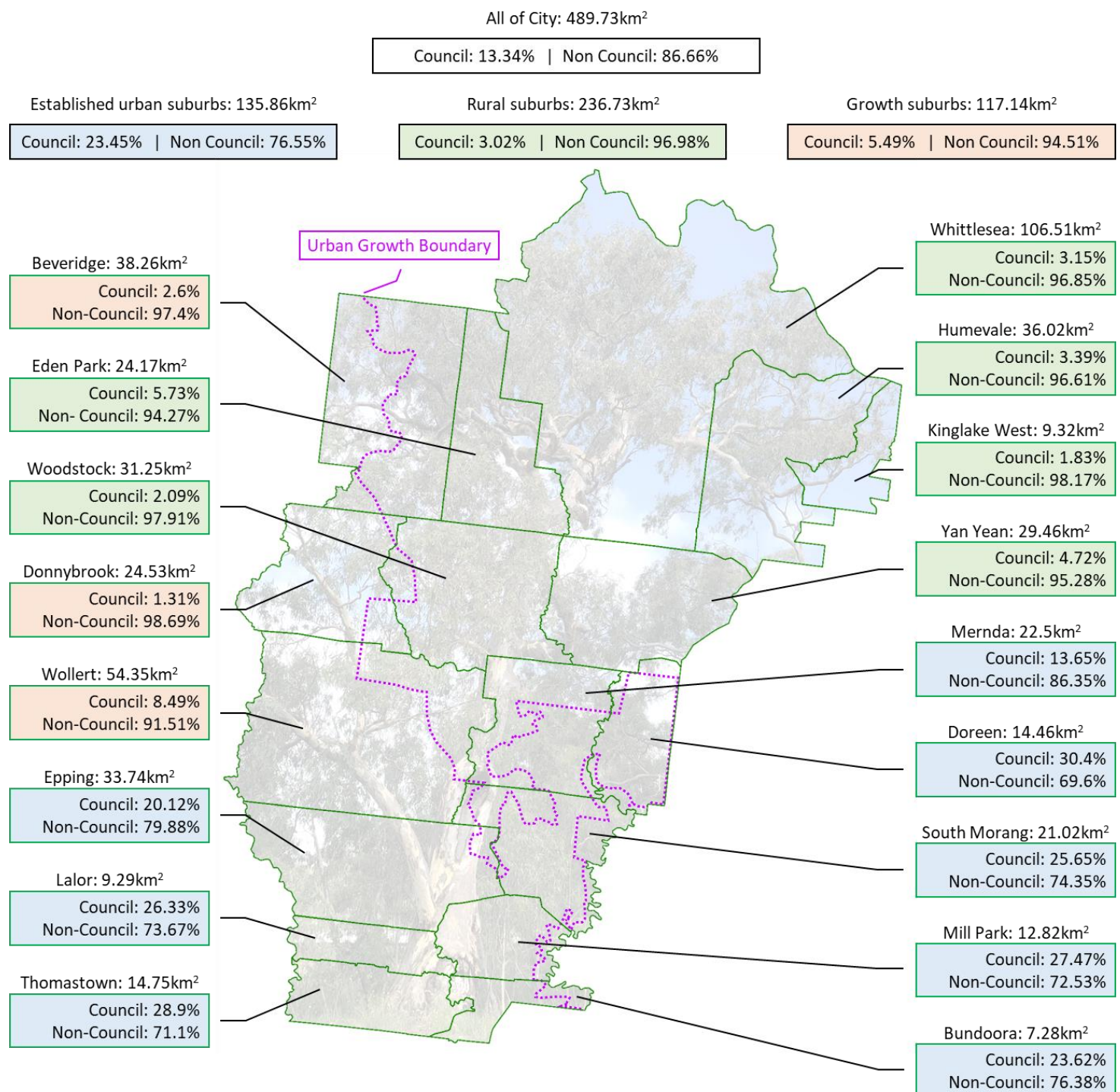Council: 23.62%
Non-Council: 76.38%

Figure 4. Land area and ownership.

Land area for the City, suburbs, and focal areas showing percentage of Council and non-council owned properties (non-council includes private ownership, other Government Agencies, and Crown Land). Also indicated is the urban growth boundary which sets the extent of urban development.

3.1 City of Whittlesea's key landscapes types

Victorian Volcanic Plain

Victorian Volcanic Plain covers 51% of Whittlesea, including the majority of the southern section of the city and including most of the land within the Urban Growth Boundary. The extensive flat to undulating basaltic plain contains stony rises, old lava flows, and a volcanic scoria cone (Hayes Hill, Donnybrook). The fertile soils are dominated by Plains Grassland, Plains Grassy Woodland, and Plains Grassy Wetland.

Highlands – Southern Fall

Highlands – Southern Fall is found in the northern section of Whittlesea, covering 46% of the city. It is a diverse bioregion; vegetation at higher elevations is dominated by Wet Forest, Damp Forest, Herb-rich Foothill Forest and Heathy Dry Forest, with Cool Temperate Rainforest occurring in the most protected gullies. At lower elevations, Shrubby Foothill Forest, Grassy Dry Forest and Grassy Riverine Forest ecosystems are present.

Central Victorian Uplands

Central Victorian Uplands extends east-west through central Victoria, covering 5.2% of the State. However, an isolated pocket can be found in South Morang and Mernda. Central Victorian Uplands can support a variety of ecosystems; less fertile hills support Grassy Dry Forest vegetation; granitic and sedimentary terrain is dominated by Grassy Woodland vegetation; and lower lying valleys and plains are dominated by Valley Grassy Forest and Plains Grassy Woodland ecosystems.

Urban landscape

Urban areas are highly modified with 'hard' surfaces like bricks and asphalt dominating the landscape. Conservation reserves and waterways act as critical refuge for the remaining native flora and fauna. Parks, roadsides (particularly street trees) and residential backyards provide essential modified habitat and linkages through this fragmented landscape. In this setting many native species cannot thrive so the biodiversity is made up in a large part through introduced species and some native species that have adapted well to the new landscape.
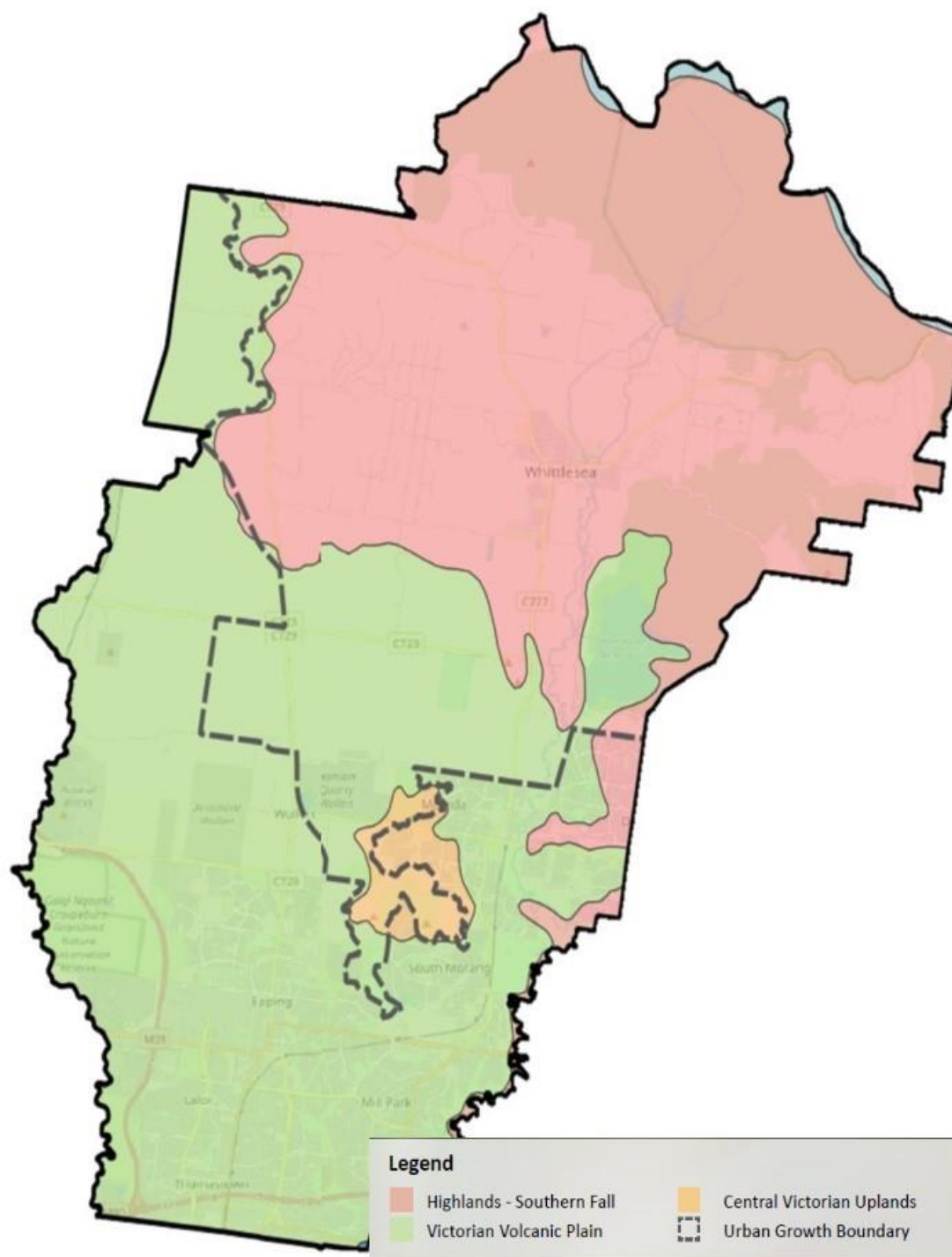
Figure 5. Key landscape types.

Key landscape types with the area north of the Urban Growth Boundary being the Green Wedge Zone.

3.2 City of Whittlesea's key landscape features

King Lake

The King Lake area contains a large expanse of forest within the King Lake National Park and its immediate surrounds. Running through this area is the King Lake Ranges which form part of the Great Dividing Range.

Yan Yean and Toorourrong Reservoirs

Yan Yean reservoir, located on the Plenty River, was completed in 1857 and was Melbourne's first water supply. When completed it was the largest man-made reservoir in the world. During 1883-85 Toorourrong Reservoir, located at the base of Mount Disappointment in the Kinglake Ranges, was constructed to provide additional water supply to Yan Yean Reservoir.

City Parks and Gardens

The city contains many areas of passive and active open space among which are:

Whittlesea Public Gardens - first opened in 1994 this 14.78 Ha reserve in Lalor that provides passive recreation opportunities as well as playground, outdoor exercise station, basketball, barbeque, public toilet, and an enclosed dog off-leash area.

Norris Bank Reserve - a 10.3 Ha open space area in Bundoora that provides passive recreation opportunities as well as playground, outdoor exercise station, basketball, barbeque, public toilet, skate ramp and a dog off-leash area.

Growling Frog Golf Course - An 18-hole course set on 280 acres of bush and wetland, and is traversed by Barbers Creek. The site features ancient River Red Gums, kangaroos, historic buildings, and views of the southern edge of the Great Dividing Range, as well as a club house and driving range.

Natural Landscapes

There are several significant conservation sites across the city including:

Quarry Hills Regional Parklands - A conservation area currently covering 220 Ha

Plenty Gorge Parklands - An extensive area of parklands following the Plenty River from just the Metropolitan Ring Road in Greensborough to Bridge Inn Road in the north. The parklands provide walking trails, barbeques, and playgrounds. The parklands also contain the Nokia Bush Camp and the historical Carome Homestead, as well as the Tanunda and Morang Wetlands.

Craigieburn Grassland Conservation Reserve - A 340 Ha site located east of Merri Creek and established in 1999 as a Flora and Fauna reserve under the National Parks Act. The Grasslands are home to unique and rare animals and plants, and provide protection to a large number of grassland plants and animals considered to be rare or threatened in Victoria. The Craigieburn Grassland Reserve is listed on the Register of the National Estate and represents the most significant and largest remaining example of the Western Plains Basalt Grassland.
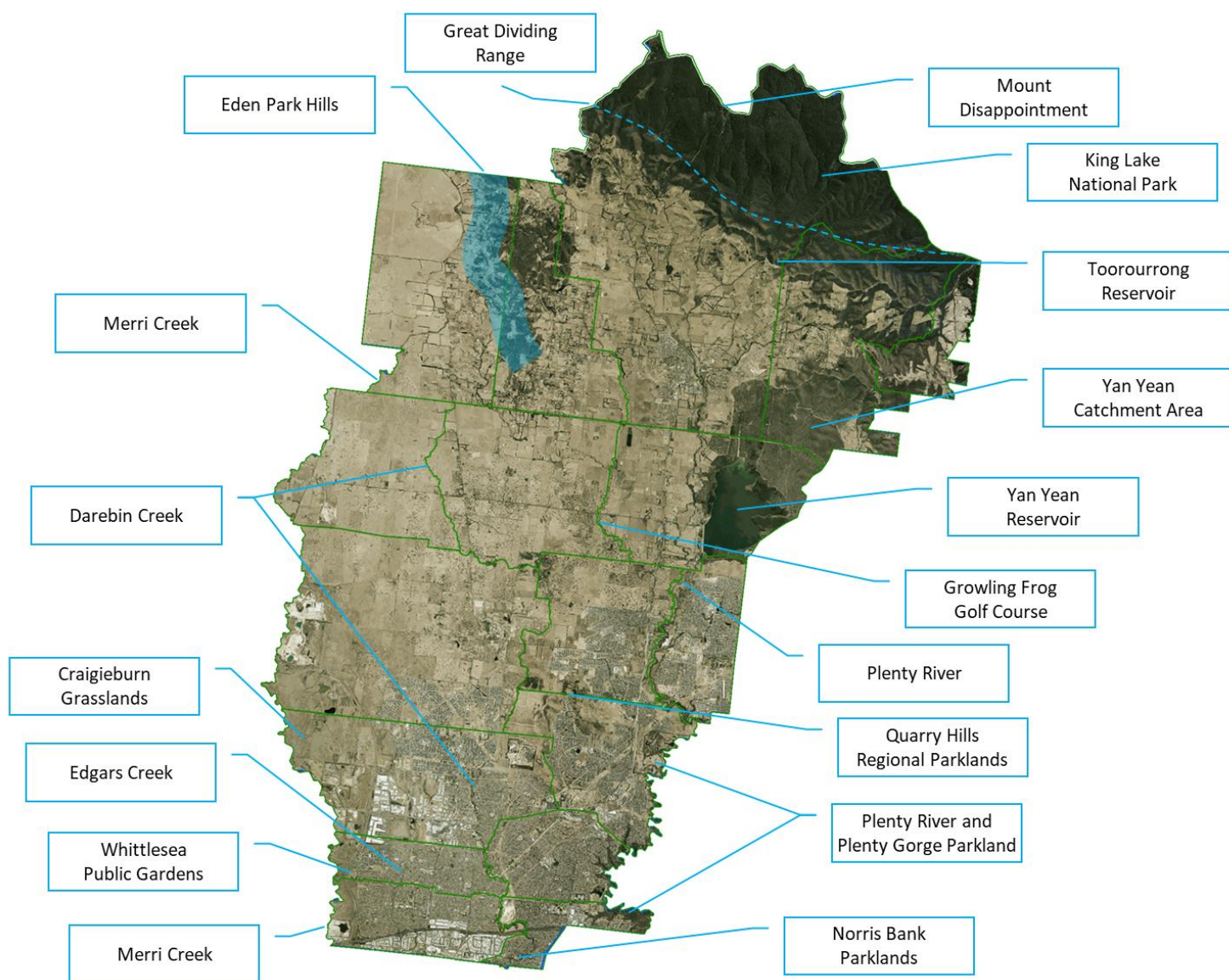
Figure 6. Key landscape features.

Location of existing open space, conservation, and forest features.

3.3 Significant flora and fauna

Whittlesea is home to a number of rare, endangered, and iconic species. Within the last 30 years, 52 threatened flora and fauna species have been recorded within Whittlesea. This includes 17 flora species and 35 fauna species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or State *Flora and Fauna Guarantee Act 1988* (FFG Act) Act. Additionally, six ecological communities of National or State significance are considered to potentially occur within the city. The full lists of these species can be found in Appendix 1.

River Red Gum *Eucalyptus camaldulensis*
Mature River Red Gums in an open plains grassland environment are generally recognised as the most important visual and environmental feature of this city. Many of the River Red Gums within the urban areas have been estimated to be between 200-800 years of age.

Areas such as Mill Park, South Morang and Mernda/Doreen contain significant River Red Gum habitat. Council recognised that very few of the original River Red Gums would survive the encroachment of urban development unless careful site assessment and planning occurred. In response, the Whittlesea Planning Scheme was amended to provide existing River Red Gums protection by ensuring they are properly assessed and treated as an integral part of development design. Today River Red Gums are incorporated into design activities, providing them with the spaces they need in order to thrive, and they are generally not removed unless they have been independently assessed and found to present a danger to people and property. It is Council policy to recognise the intrinsic value of River Red Gums in establishing character and identity in urban and rural areas.

Matted Flax Lily *Dianella amoena*

The Matted Flax-lily is a small native lily that is restricted to Victoria where it occurs in grassland and grassy woodland environments. It is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Threatened under the Victorian *Flora and Fauna Guarantee Act 1988*. As most of this type of vegetation has been cleared, the remaining populations of Matted Flax-lily are small and fragmented. Many of the remaining populations are on roadsides, railway lines, private land or small urban reserves. The current threats to the species survival are land clearing and weed invasion. The City of Whittlesea manages a number of reserves that contain remnant populations, as well as plants translocated from development sites for the long-term protection of the species.

Brush-tailed Phascogale (Tuan) *Phascogale tapoatafa*

The Tuan is a nocturnal carnivorous marsupial. It has a large 'bottle-brush' tail and some people mistake it for a squirrel. This species is listed as Threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.. The main threats to this species are loss of habitat and introduced predators (cats, dogs and foxes). Habitat loss for this species includes the removal of hollow bearing trees and fallen logs. In the City of Whittlesea, these animals have been recorded in the northern forested environments of Eden Park, Humevale and Kinglake West.

Growling Grass Frog *Littoria raniformis*

The Growling Grass Frog was once a common frog in south-eastern Australia but it is now listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Threatened under the Victoria *Flora and Fauna Guarantee Act 1988*. The frog is active during the day and night and is highly mobile.

Loss of habitat, feral animals and change to hydrological regimes are the main threats to the species. Populations still exist within the City of Whittlesea and require ongoing management to ensure this species continues to persist in the area.

3.4　Land cover

3.4.1　Where are we today?

An assessment of each suburb and focal area identified the estimated extent of four general land cover types, with the suburb-level results being collated to provide a whole of City result[1] (Figure 7). With more than 85% of the city's land *not* owned by Council, property ownership (Council or non-council) for each land cover type was also considered.
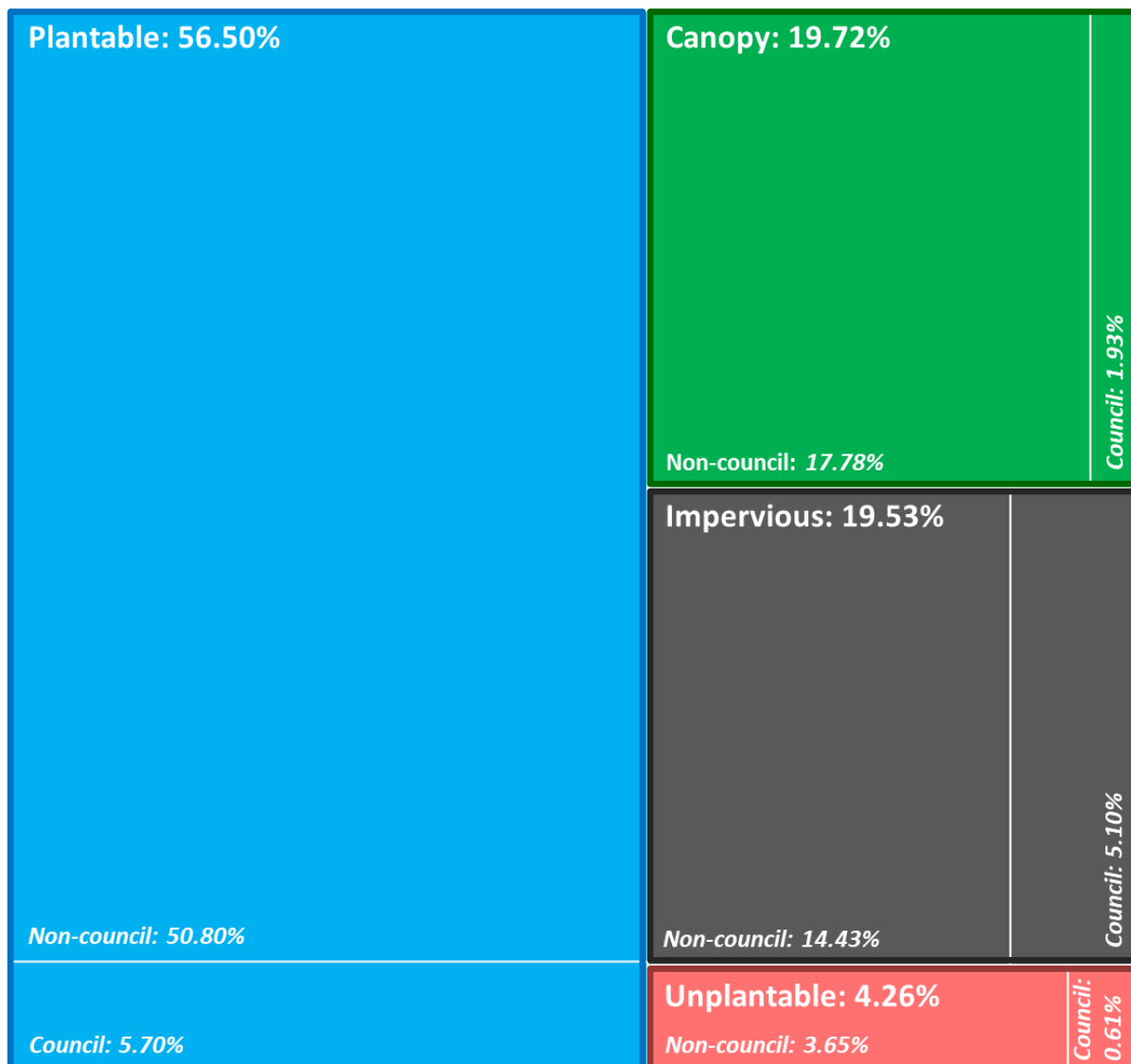

Figure 7. Percentage of land cover types across the City of Whittlesea.

Estimated values[1] showing the percentage per cover type across the whole of city, and the split across Council and non-council owned land.

---

[1] ± 0.97% at the 95% confidence level

3.4.1.1 Tree canopy cover

Tree canopy is estimated to cover 19.72% of the city (Figure 8), or 96.57 km^2, which is roughly equivalent in area to the combined suburbs of Wollert, Epping, and Lalor.

Much of the City's canopy falls on non-council land (17.78% or 87.02 km^2).

All of City: 19.71%

Council: 1.93% | Non Council: 17.78%

Established urban suburbs: 10.49%

Council: 3.26% | Non Council: 7.23%

Rural suburbs: 39.99%

Council: 0.54% | Non Council: 39.45%

Growth suburbs: 6.46%

Council: 0.50% | Non Council: 5.96%

Beveridge: 13.02%
Council: 0.78%
Non-Council: 12.24%

Eden Park: 27.60%
Council: 1.82%
Non- Council: 25.78%

Woodstock: 9.11%
Council: 0.00%
Non-Council: 9.11%

Donnybrook: 1.3%
Council: 0.00%
Non-Council: 1.3%

Wollert: 4.17%
Council: 0.52%
Non-Council: 3.65%

Epping: 6.78%
Council: 3.65%
Non-Council: 3.13%

Lalor: 6.51%
Council: 2.60%
Non-Council: 3.91%

Thomastown: 7.02%
Council: 3.13%
Non-Council: 3.91%

Whittlesea: 47.92%
Council: 0.00%
Non-Council: 47.92%

Humevale: 58.85%
Council: 1.56%
Non-Council: 57.29%

Kinglake West: 55.73%
Council: 0.52%
Non-Council: 55.21%

Yan Yean: 26.30%
Council: 0.78%
Non-Council: 25.52%

Mernda: 8.59%
Council: 1.30%
Non-Council: 7.29%

Doreen: 11.2%
Council: 4.43%
Non-Council: 6.77%

South Morang: 15.63%
Council: 3.13%
Non-Council: 12.50%

Mill Park: 16.41%
Council: 4.95%
Non-Council: 11.46%

Bundoora: 19.01%
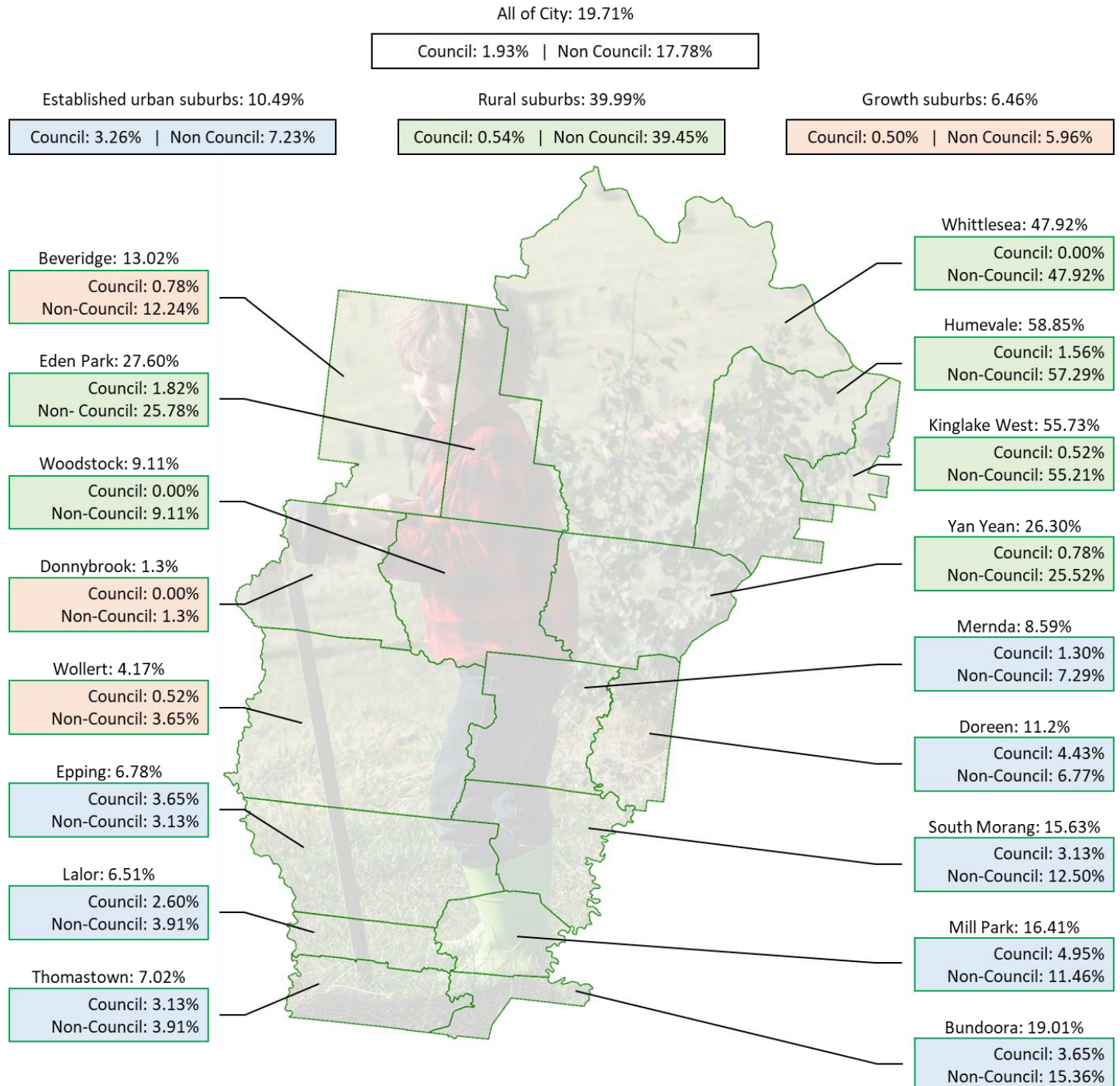Council: 3.65%
Non-Council: 15.36%

Figure 8. Existing canopy cover.

Existing canopy cover for the City, suburbs, and focal areas showing percentage overall percentage and the split of that percentage across Council and non-council owned properties (non-council includes private ownership, other Government Agencies, and Crown Land).

3.4.1.2 Plantable area cover

Plantable areas are estimated to cover 56.5% of the city (Figure 9), which is equivalent to an area of 276.53 km^2. Many of these plantable areas fall on non-council land (50.8% or 248.63 km^2)

All of City: 56.50%

| Council: 5.70% | Non Council: 50.80% |

Established urban suburbs: 50.09%

| Council: 10.32% | Non Council: 39.77% |

Rural suburbs: 53.58%

| Council: 1.49% | Non Council: 52.09% |

Growth suburbs: 83.75%

| Council: 2.68% | Non Council: 81.07% |

Beveridge: 84.11%
| Council: 1.04% |
| Non-Council: 83.07% |

Eden Park: 66.41%
| Council: 1.82% |
| Non- Council: 64.58% |

Woodstock: 88.28%
| Council: 1.30% |
| Non-Council: 86.98% |

Donnybrook: 94.53%
| Council: 0.78% |
| Non-Council: 93.75% |

Wollert: 78.65%
| Council: 4.69% |
| Non-Council: 73.96% |

Epping: 54.69%
| Council: 9.11% |
| Non-Council: 45.57% |

Lalor: 35.42%
| Council: 9.64% |
| Non-Council: 25.78% |

Thomastown: 31.52%
| Council: 9.64% |
| Non-Council: 21.88% |

Whittlesea: 46.35%
| Council: 2.08% |
| Non-Council: 44.27% |

Humevale: 36.46%
| Council: 0.78% |
| Non-Council: 35.68% |

Kinglake West: 41.67%
| Council: 1.04% |
| Non-Council: 40.63% |

Yan Yean: 57.03%
| Council: 0.26% |
| Non-Council: 56.77% |

Mernda: 69.27%
| Council: 7.03% |
| Non-Council: 62.24% |

Doreen: 48.96%
| Council: 13.54% |
| Non-Council: 35.42% |

South Morang: 55.73%
| Council: 14.58% |
| Non-Council: 41.15% |

Mill Park: 37.76%
| Council: 10.94% |
| Non-Council: 26.82% |

Bundoora: 33.59%
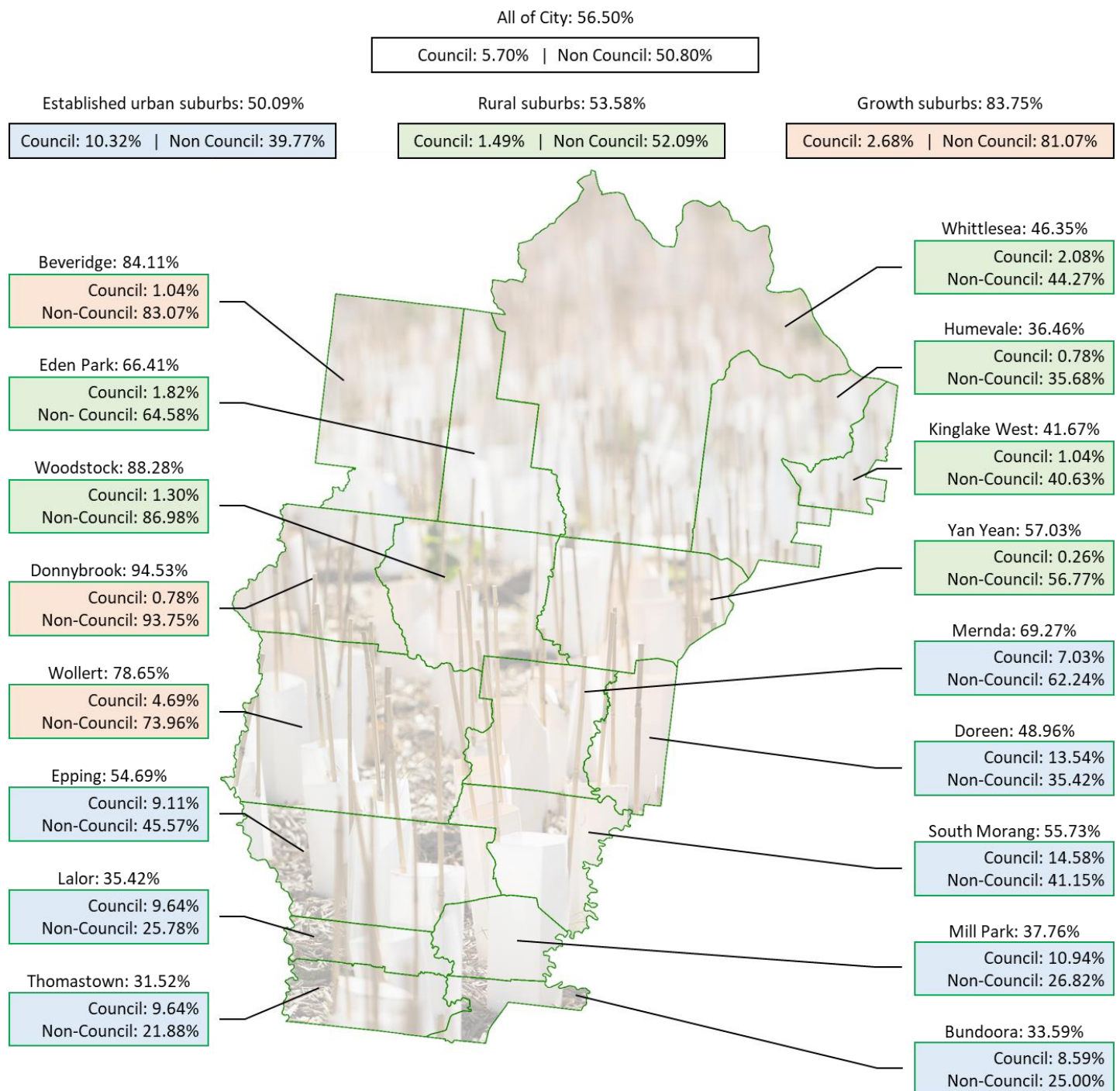| Council: 8.59% |
| Non-Council: 25.00% |

Figure 9. Available plantable areas.

Available planting areas for the City, suburbs, and focal areas showing percentage overall percentage and the split of that percentage across Council and non-council owned properties (non-council includes private ownership, other Government Agencies, and Crown Land).

3.4.1.3   Impervious and unplantable cover

Impervious (built) surfaces such as buildings and roads, cover 19.53% (95.59 km^2) of the city and like canopy cover this impervious cover occurs mainly on private land (14.43%, 70.62 km^2). Buildings are the primary driver of impervious surfaces across the city, followed by other built surfaces (e.g. footpaths and car parks), and roads (9.36%, 6.36%, and 3.81%, respectively). On private land buildings are the dominant built surface type (9.33%) followed by other impervious surfaces (4.73%), whereas buildings comprise the lowest proportion of impervious cover on Council land (0.03%). Instead, roads are the dominant type on Council land followed by other impervious cover (3.45% and 1.62%, respectively).

Unplantable space comprises the balance of land cover in the city (4.26%, 20.85 km^2), comprised primarily of bare ground (e.g. earthworks) followed by water, grassy areas (e.g. sporting fields), and wetland vegetation. Most unplantable space on non-council land is due to bare ground, which may be partly indicative of active urban infill activities on private land.

3.4.2   Land cover conclusions

Tree canopy cover:

- Of our estimated 96.47 km^2 of canopy cover, 87.02 km^2 falls on non-council land. This means that tree canopy across the city may be at risk of being lost, particularly to processes such as urban development expansion and infill, which commonly occur on private land. This said, non-council land in suburbs with the highest canopy cover include significant areas of crown land being the King Lake National Park and Surrounds which covers an area of approximately 60 km^2 in the city's north east, and the Yan Yean Reservoir catchment which covers an area of approximately 13 km^2 in the east of the city extending across the Humevale and Yan Yean suburb boundaries.

  Our city has some significant areas of canopy cover which contribute to our city forest but are outside of our direct control. Minimising canopy loss on non-council land will be critical to realising our strategic vision.

Plantable space:

- Of our estimated 276.53 km^2 of potential plantable space, 248.63 km^2 falls on non-council land, leaving limited opportunities for tree plantings on Council land (27.90 km^2). Much of our plantable space currently consists of grassy areas, which is likely due to the large expanse of rural pastures in the city. Large portions of grassy land within the growth areas are likely to be converted to other land cover types during development.

  In broad terms over half of our city can be considered plantable space but is not under Council's direct control. Collaborative planting efforts with non-council landowners is required if we are to realise our strategic vision.

Impervious cover:

- 95.59 km^2 of our city is covered by buildings, roads, pavements, and other constructed assets with the majority of that occurring in our established urban areas, and falling on non-council land

  Beneficial levels of greening in our established areas will most likely be reliant on innovative use of constructed assets to support planting or other approaches and will require close collaboration with non-council landowners.

3.5   City heat profile

Understanding how 'hot' our city is means identifying urban heat islands and hotspots which, together with an understanding of future land use changes, can underpin priority locations for tree plantings.

Much of our city is hotter than average due to the large areas of unirrigated dry grass in the rural and growth areas, and the impervious surfaces in the established urban areas. The coolest locations in the city coincided with the heavily forested Kinglake National Park which covers portions of Whittlesea, Kinglake West, and Humevale, as well as the large water body of Yan Yean Reservoir (Figure 10).

Of importance to the GWS, is the distinction between hotter than average areas and heat islands occurring in largely uninhabited areas, and those occurring in urbanised areas. Due to the severe heat influence of dry unirrigated grass and bare ground when compared to impervious surfaces, the city's highest temperatures coincide with the growth areas (Figure 10). Clearly these largely uninhabited areas have a significant impact on the overall city result, but given the importance of achieving tangible liveability improvements for our residents, we need to understand the distribution of heat within the urban areas and at the local level (Figure 11).

Hotspots and heat islands in urban areas can have significant detrimental impacts on individual and community wellbeing, economic productivity (e.g. people working outdoors), and the health and wellbeing of plants and animals. Hotspots and heat islands in urban areas are driven by land cover materials that absorb heat, meaning that the selection of materials in development can have a significant influence on how hot an area is.
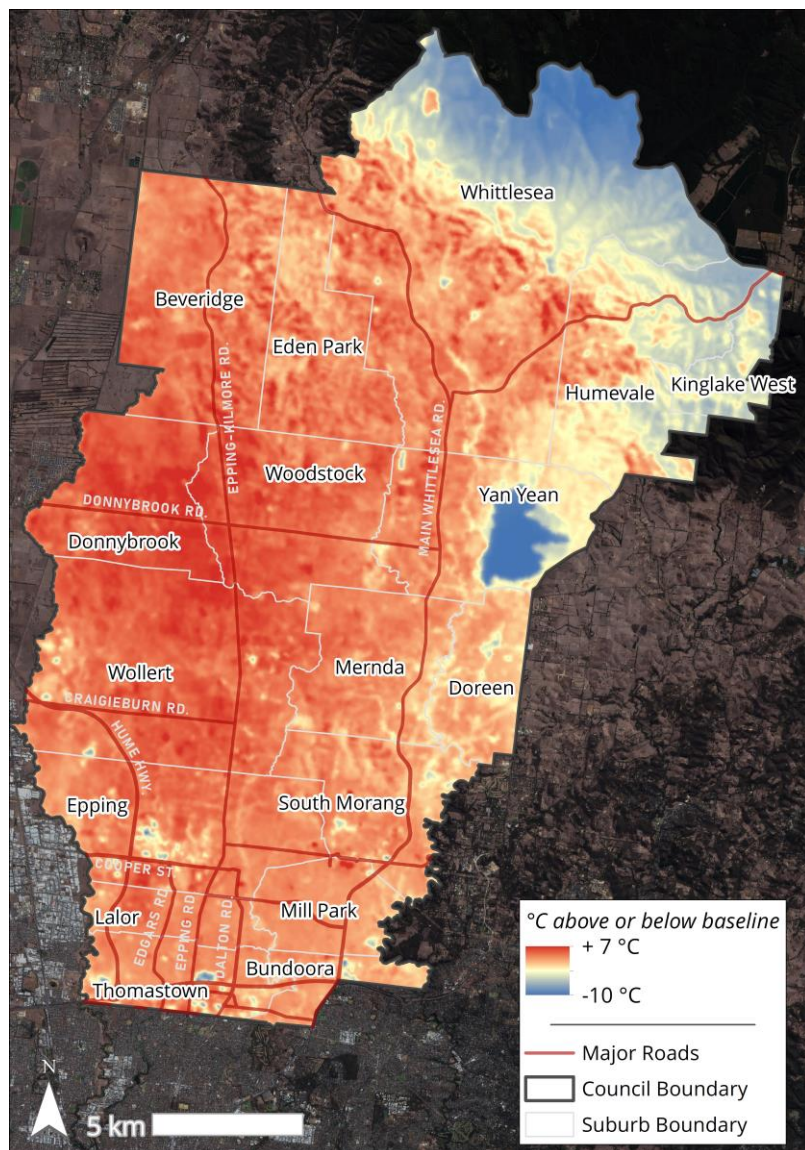
Figure 10. The heat effect across the City of Whittlesea.

Redder areas are warmer than average and bluer areas are cooler than average.

Figure 11. Urban heat islands in the City of Whittlesea. Orange areas are 2-4 °C warmer than average and are considered Heat Islands. Red areas are more than 4 °C warmer than average and are considered Severe Heat Islands.

3.6   Urban growth

Considerable growth over the last decade has seen the City of Whittlesea's population increase from 154,063 to 229,791 - a change of around 49%. This growth is forecast to continue with the population expected to increase to 382,439 by 2040 - a 66.4% change from 2019 to 2040 (Figure 12). This growth will take two general forms, urban expansion and infill.
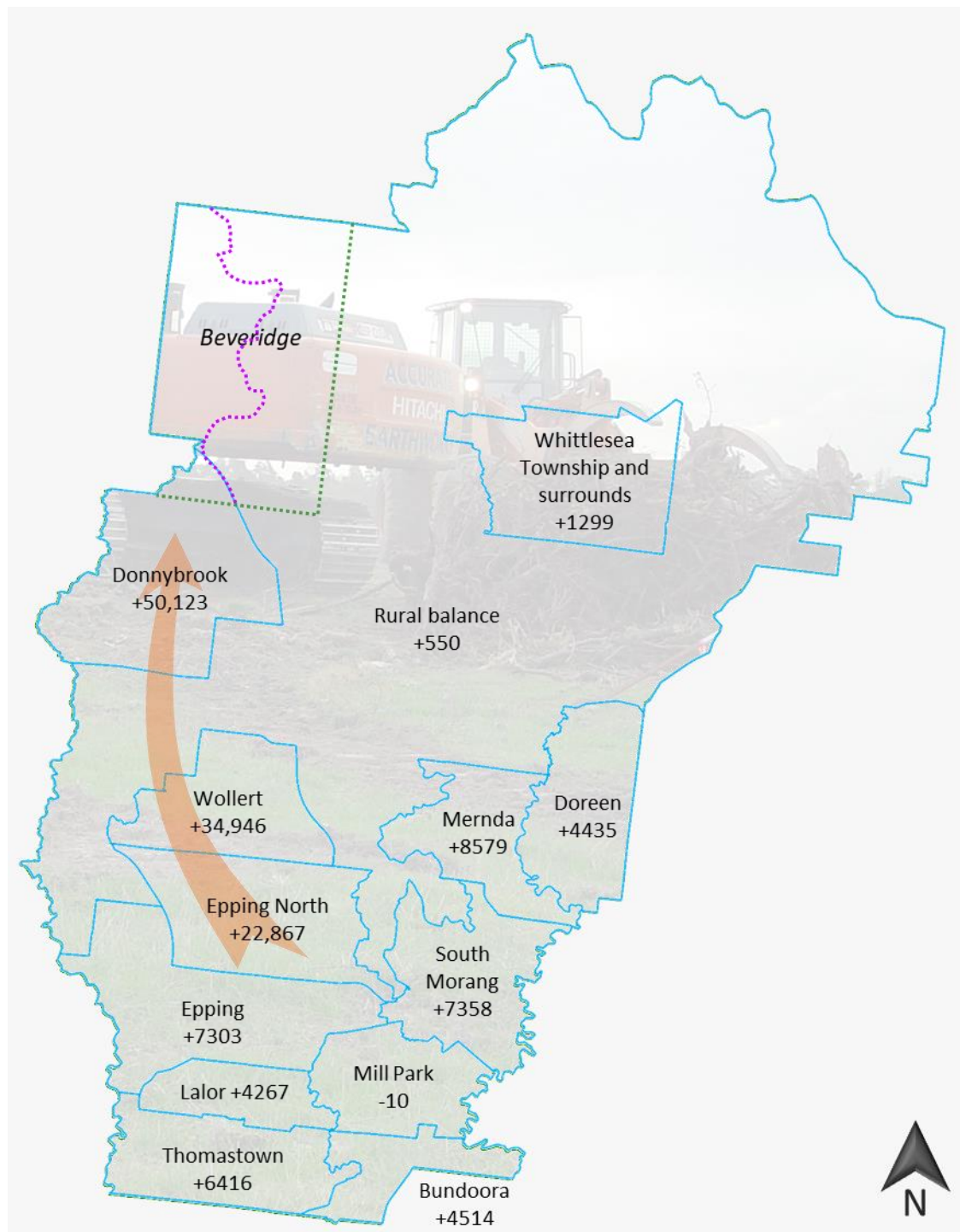

Figure 12 Population growth

Shows the distribution of population growth across the city's forecast precincts to 2041

Our city's urban expansion-based growth will occur mainly through the north west corridor of the urban growth boundary, with the sub-precincts of Donnybrook, Wollert, and Epping North accounting for around 60% of the city's projected population growth to 2041 (+105,215 residents). While the suburb of Beveridge is not expected to experience high levels of population growth, significant investment in transport infrastructure and related industry is expected to drive development within the urban growth boundary.

Infill growth (Figure 13) impacts our existing urban areas and generally takes the form of dual occupancy developments, multi-unit developments, commercial/industrial developments, and special purpose developments such as retirement villages.

This growth places increasing stress on our existing canopy and impacts the volume of plantable areas, but it also provides an opportunity to work with developers to maximise greening outcomes in areas of urban expansion.

Figure 13. Examples of urban infill
Providing examples of the impact of urban infill on existing canopy and plantable areas.

4 Current greening efforts

Historically, Council has placed a high level of importance on providing high quality open space, conservation areas, and streetscapes. A range of past and current actions and programs have provided focus on our natural environment, and while currently independent of the GWS some of these actions and programs may be included under the general banner of its implementation.

The list below provides an example of some of the outcomes these actions and programs have delivered:

- 3000 new street trees planted per year.
- 275 protected street trees.
- 2600 River Red Gum trees formally protected through specific planning controls.
- More than 17,400 plants provided over the last four years for rural re-vegetation.
- Establishment of Landcare and Blackberry Action Groups in rural areas tackling weed control and resulting in land owners planting approximately 500 trees per year.
- Over 540 hectares of conservation land *and* over 1000 hectares of public open space (combined, that's more space than the suburb of Thomastown).

5   Engagement

An underlying driver for developing the Greening Whittlesea City Forest Strategy was our community's connection to the natural environment. Throughout the Whittlesea 2040 consultation process our community told us what they liked about our City now and what their future aspirations were. Of particular relevance to the GWS were the following comments:

Now: "We love that our neighbourhoods are beautiful, clean and tidy and many of the services and facilities we need are in easy reach of our homes"

2040: "The City of Whittlesea is well-planned and beautiful. Our neighbourhoods and town centres are convenient and vibrant places to live, work and play"

Now: 'We highly value our natural spaces; our trees, landscapes, waterways and the wildlife around us'.

2040: The City of Whittlesea's superb landscapes and natural environment are an enduring source of pride

5.1   Consultation

To aid in the development of the GWS we consulted with the community and stakeholders to understand how the strategy might best contribute to these outcomes (Figure 14).
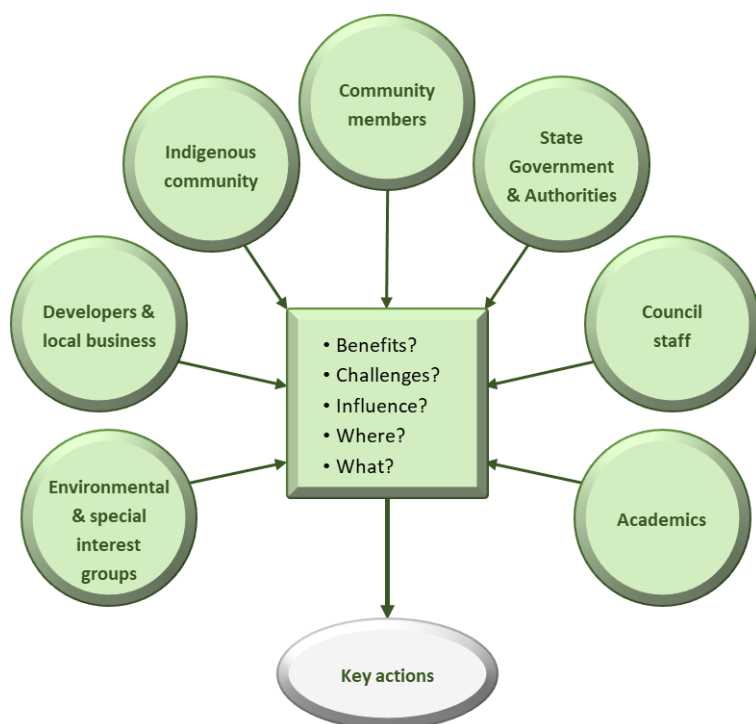

Figure 14. Engagement participants
Shows the range of participants consulted during the GWS engagement activities.

Using the overarching theme of 'protecting the existing city forest while finding ways to extend our forest cover', we asked the community and stakeholders to tell us:

1. What likely benefits are most important to them/their organisation.
2. What the likely challenges are and how difficult they might be to overcome.
3. What could influence decisions to increase greening.
4. Where we could plant, or encourage the planting of, trees.
5. What greening initiatives they would like to see in the City.

The results were positive with 87% of option responses and 96% of verbatim comments[2] being supportive of the concept of greening.

There are 9 key findings based on the results of the consultation.

That the Greening Whittlesea - City Forest Strategy should prioritise:

1. Education around the value and benefit of greening and green assets.
2. Environmental outcomes including climate change response, ongoing resilience, biodiversity, and habitat.
3. Community/Government/Business/Council partnerships.

That the Greening Whittlesea - City Forest Strategy action plan includes actions that will:

4. Provide access to a broad range of informational and instructional resources to build a better understanding of greening and green assets, and support the public's efforts to increase greening on private property.
5. Protect existing green assets in both the Council and non-council realm.
6. Increase the amount of green assets in both the Council and non-council realm.
7. Improve liveability by providing shade, reducing heat, and increasing visual and functional amenity.
8. Mitigates as far as possible the impact of barriers to protecting existing green assets and increasing green assets in both the Council and non-council realm.
9. Explore economic opportunities such as productive plantings.

5.2 Education

While GWS actions will initially be carried out over the coming 20 years, successful and ongoing greening of our city requires a long term / multi-generational focus - fostering an interest in and support for the GWS among school aged children and youth will be critical.

School visits and youth workshops help to generate awareness around the development of the GWS and what it is aiming to achieve, but these initial efforts will need to be ongoing in order to maintain interest over the long term.

---

[2] Positive verbatim comments may include negative aspects [e.g. "no gum trees" or "no trees next to roads"] but are considered positive as they conditionally support the implementation of greening.

6 Greening Targets

6.1 What level of change are we aiming for?

Through implementation of the GWS, Council will aim to achieve a 20% canopy cover increase across the City by 2040. This would see our total canopy cover increase from around 19.7% to 23.6%. The following focal area *increases* will contribute to our overall target.

- Established urban suburbs: 57.45% (includes 37.5% on non-council land)
- Growth suburbs: 39.86% (includes 30% on non-council land)
- Rural: 3.09% (includes 1.5% on non-council land)

6.2 Where should greening be prioritised?

Multiple factors can influence where we focus our greening efforts (Figure 15), however when prioritising the implementation of actions such as tree planting, Council will apply the follow hierarchy of principles.

1. Our first priority is to provide benefit at the *local* level.

We will prioritise making people's lives better, improving liveability within connected communities across our city.

2. Our second priority is to provide benefit at the *suburb* level.

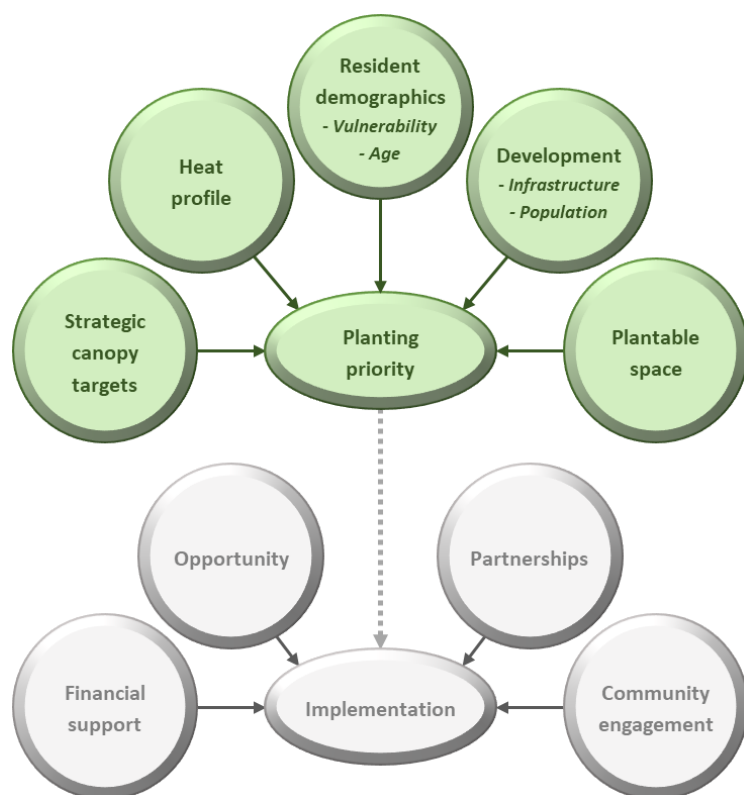3. Our third priority is to provide benefit at the *regional* level.

Figure 15. Setting priorities

The major factors influencing planting priorities, and the subsequent issues that may impact implementation efforts.

7   Greening Challenges

When aiming to increase green cover, particularly tree cover, it is important to recognise the range of challenges that may arise, so these may be specifically considered in planning and decision-making. The source of challenges will vary, and may include those that are:

- environmental in nature;
- planning and development related;
- due to management or resourcing decisions; or
- stemming from public perception

The following section outlines the key challenges identified from engagement activities.

7.1   Environmental

Climate change

Global climate change affects local conditions across Australia by increasing average temperatures, altering rainfall patterns, and generating more frequent and intense natural disasters. *Climate Change Whittlesea* outlines the local impacts, opportunities, and challenges of global climate change on the city, and the actions to be taken to protect services and assets and increase resilience across the organisation.

Within Whittlesea, climate change is creating warmer and drier conditions. By 2050, it is projected that: annual average temperatures will increase by 2-3 degrees; the number of extreme heat days and number and duration of heatwaves will increase; droughts will be longer and harsher; the fire season will last longer and bushfires will be more frequent and intense; winter spring and autumn seasons will be drier and summers wetter; and flooding and storm events will be more severe.

Water availability

Limited water availability was considered by the community to be one of the most substantial challenges facing greening objectives in the city. Supporting healthy growing trees relies on ensuring access to sufficient water. Failing to do so as they grow can influence whether they reach maturity, how structurally sound they are as mature trees, and may also create conflicts with infrastructure as tree roots seek water from all available sources.

7.2   Planning and development

Urban expansion and infill

Urban development and development planning allowances (small lot sizes and street design) were considered by the Whittlesea community as two of the most substantial challenges to greening the city. The process of urban infill is a leading driver of tree canopy and green cover loss, with such processes occurring primarily on private land. This presents a significant challenge when aiming to protect and increase our green cover across the city.

7.3 Tree management

Maintaining existing trees

Achieving increased canopy cover targets will require not only new trees to be planted, but existing trees to be protected wherever possible. However, it is not feasible to expect all trees will be able to be protected. For example, as trees age they require additional maintenance and eventually removal and replacement. Further, in an urbanised environment, diseased or structurally compromised trees will likely need to be removed to ensure public safety.

Right tree, right place, right way, right time

Competition for space between trees and built infrastructure and facilities in urban environments , often creates conflicts which need to be resolved to ensure the safety of people, minimise infrastructure damage, and allow for uninterrupted utility services. Often, the conflict experienced today is a legacy of past decisions which may not have considered the long-term growth and nature of a tree (e.g. 100+ year old river red gums). However, conflict can also arise from planting a tree in: an unsuitable location (e.g. for pure aesthetic reasons or due to a lack of understanding of tree requirements and local conditions); an unsuitable way (e.g. planting hole too small, inadequate availability of soil for deep root growth); or at an unsuitable time (e.g. seasonal and weather considerations).

8   Our Strategy

8.1   Vision, goals, objectives and actions

The GWS will guide our city's future greening actions, driving the realisation of our shared strategic vision which sees the City of Whittlesea:

"creating and managing liveable and resilient places for the benefit of people and the environment through responsibly greening diverse landscapes"

A key mechanism for achieving our strategic vision will be to increase the level of tree canopy cover across the city. We have set an ambitious, though realistic, target of 20% canopy cover increase by 2040. We acknowledge that achieving this target will require a collaborative effort on Council and non-council land. We further acknowledge that actions will need to vary across the city to suit different land uses, opportunities, and barriers, presented by our diverse landscapes and communities.

Recognising our landscape diversity, the following canopy cover increases are proposed for each focal area within the city:
- Established urban suburbs: 57.45% (includes 37.5% on non-council land)
- Growth suburbs: 39.86% (includes 30% on non-council land)
- Rural: 3.09% (includes 1.5% on non-council land)

This Strategy is based on four goals for city greening. Each goal will be realised through a series of objectives, which will in turn be achieved through implementation of a set of priority actions. Identification and implementation of actions will form part of the annual business plan and budget process and will be informed by existing Council plans and policies such as the *Street Tree Management Plan*.

8.1.1   Goal 1. "PROTECT and MANAGE": Preserve existing trees and green cover on Council and non-council land.

Objective 1. Ensure a legislative framework for the protection of trees during planning and development processes.
Priority Actions:
- Undertake a review of relevant planning and development legislation to identify where tree protection measures can be strengthened at all development stages.
- Encourage the protection of trees on Council and non-council land during development.

Objective 2. Advocate, incentivise, and encourage the retention and protection of trees on private land.

Priority Actions:

- Assess community behaviours and perceptions in each focal area to identify barriers and incentives to tree retention and protection on private property.
- Examine the suitability of previous incentives schemes in the context of community survey feedback and re-instate or develop new incentives as relevant.
- Implement incentives for encouraging tree retention and protection on private land.
- Advocate for the protection and conservation of high value biodiversity assets.

Objective 3. Right tree, right place, right way, right time

Priority Actions:

- Incorporate consideration of tree growth rate, form and requirements together with existing and future infrastructure into Landscape Approval and Council planting processes.
- Develop a database of tree species showing growth characteristics and climate change resilience to guide approval planting decisions, and lifecycle management.

Objective 4. Infrastructure is part of the solution not the problem

Priority Actions:

- Integrate best-practice design to support healthy tree growth.
- Implement innovative retrofitting solutions for addressing infrastructure and community conflicts with existing mature trees.

Objective 5. Establish reliable water supplies for trees on Council land.

Priority Actions:

- Review global best-practice water sensitive urban design (WSUD) approaches for supporting urban trees, including complementary landscaping/vegetation plantings and built infrastructure.
- Update local tree planting and development guidelines and with regard to WSUD integration.

Objective 6. Landscape vegetation management is informed by traditional and ecological knowledge and burning methods.

Priority Actions:

- Manage the city forest on Council land in a sustainable way to ensure overall good health is maintained and promoted
- Identify traditional and ecological burning methods and knowledge relevant to the city.
- Engage with Wurundjeri Council and relevant fire ecology experts to advise on landscape fire management practices that will help to protect trees and other vegetation from severe bushfire impacts and improve overall vegetation and landscape condition.

8.1.2 Goal 2. "ENHANCE": Grow our tree population and green cover to achieve a 20% canopy increase for the city.

Objective 1. Increase tree plantings on Council land.

Priority Actions:

- Identify and quantify Council plantable opportunities across the city.
- Develop a planting program.

Objective 2. Advocate, incentivise, and encourage the planting of trees on non-council land.

Priority Actions:

- Assess community behaviours and perceptions in each focal area to identify barriers and incentives to tree planting on private property.
- Examine the suitability of previous incentives schemes in the context of community survey feedback and re-instate or develop new incentives as relevant.
- Implement incentives for encouraging tree planting on private land.
- Advocate for the establishment of high value biodiversity asset.

Objective 3. Maximise tree planting opportunities in development areas.

Priority Actions:

- Review and update planning scheme revisions and amendments to allow for tree planting opportunities (e.g. set-backs that allow for size and type of trees).
- Review street design principles and guidelines to allow for planting and watering of larger and healthier street trees.
- Work with developers to achieve better than legislated outcomes where practical.

Objective 4. Develop Council tree database to guide strategic planning and tree management.

Priority Actions:

- Undertake a baseline audit of all Council trees in each focal area, including species, size, canopy spread, and health/condition.
- Develop a database of all Council trees based on the baseline audit.

Objective 5. Improve diversity, resilience, and wildlife habitat.

Priority Actions:

- Apply asset lifecycle principles to the management of Council trees, incorporating successional and in-fill plantings on Council land to ensure that at least 90% of the city forest on Council land is maintained at a useful life expectancy of more than 20 years.
- Review Council tree planting lists in the context of:
  - improving species diversity.
  - increasing fire resistance.
  - native wildlife requirements.
  - climate change resilience and adaptability.
- Integrate best-practice elements of biodiversity sensitive urban design (BSUD) in tree planting plans, particularly along waterways.
- Incorporate complementary vegetation plantings around trees in planting plans.

Objective 6. Prioritise greening in locations that will best mitigate heat islands and hot spots.
Priority Actions:

- Strategically prioritise tree plantings in each focal area based on the location of local hot spots and heat islands, and in consideration of social and physical vulnerability.
- Apply alternative options for greening and cooling where tree plantings are not feasible (e.g. green walls, green roofs, impervious surface treatments, pop-up gardens/parks).
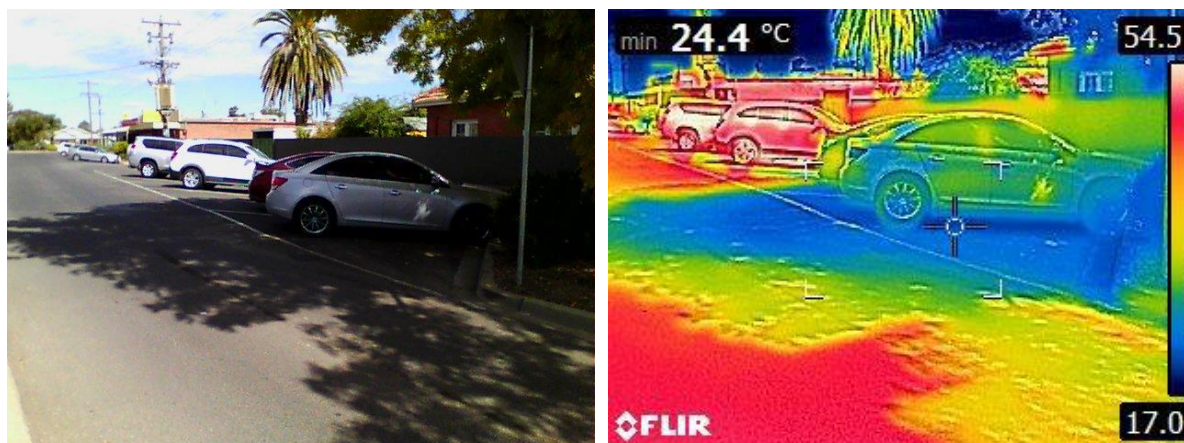

Figure 16. Impact of trees on heat.

One of the many benefits of trees is their effectiveness in reducing heat. These two images demonstrate the cooling capacity of broad canopied trees in the urban environment. The unshaded asphalt and cars reach surface temperatures of 50 degrees Celsius while the shaded cars and road are a much cooler 25 degrees Celsius. This is a difference of 25 degrees Celsius. The greatest cooling performance is provided by trees, which use a combination of shade and evapotranspiration to cool the environment. Irrigated green cover and open water also provide cooling benefits, though less so than canopy cover. Developing and prioritising greening objectives and activities in this Strategy therefore focus on tree plantings first, and will consider where heat islands occur, rather than simply using land cover types as heat surrogates.

8.1.3 Goal 3. "ENGAGE": Inspire community support for the Greening Whittlesea Strategy and contribution towards achieving the shared strategic vision.

Objective 1. Improve community engagement and education around tree benefits
Priority Actions:

- Develop social media campaigns about the importance of trees and greening to the city's community well-being, environmental resilience, and economic health.
- Develop online interactive mapping platform that provides information about mapped and assessed Council trees.
- Investigate other opportunities for community engagement around trees as part of existing community events or citizen science projects.
- Invite and encourage community and business involvement in planning and implementation of planting programs.
- Actively seek to communicate the Wurundjeri connection with landscape to the broader community (e.g. "sense of place").

Objective 2. Maximise opportunities to deliver Vision through partnerships with stakeholder and aligned organisations

Priority Actions:

- Work with major non-council landowners (private and public) to develop a portfolio of greening projects.
- Participate in local and regional greening projects to develop and implement greening initiatives.
- Identify and target current and emerging offset programs to encourage mass planting opportunities within the city.

Objective 3 Gain additional funding to support greening actions

Priority Actions:

- Develop funding opportunities to promote planting and tree retention on private land.
- Understand the value of ecosystem services provided by trees.
- Calculate the business-case for trees based on ecosystem services values provided by trees and annual expenditure on managing and maintaining trees
- Advocate for additional external funding to support tree planting and management actions
- Target available government and private grant opportunities.
- Commit to more internal funding to support greening actions.

8.1.4 Goal 4. 'BUILT ENVIRONMENT": Construct infrastructure that contributes to the greening of our city

Objective 1. Providers of physical infrastructure prioritise and incorporate greening

Priority Actions:

- Develop guidelines for the use of materials and practices that support the intent of the GWS.
- Incorporate the guidelines into Council's infrastructure planning and delivery processes.
- Explore advocacy and incentive-based methods of incorporating the guidelines into private infrastructure planning and delivery processes.

9 Implementation and Evaluation

This Strategy will inform the development of a Greening Whittlesea Action Plan. The Action Plan will provide the details of how the actions in the Strategy will be implemented, including specific tasks, timeframes, responsible departments, required resources, and the monitoring and evaluation plan. In developing the Action Plan, tasks should be quantifiable, and the monitoring and evaluation program should be able to assess action implementation and relative success of actions in achieving the Strategy objectives.

The **Monitoring and Evaluation plan** (MEP) is a strategic mechanism for assessing whether the Strategy is meeting its goals and objectives and allowing for actions to be adapted if found to be counteractive to the goals and objectives (Figure 17). The MEP should be developed to operate over the lifetime of the Strategy. Specifically, the MEP will define indicators of action success, define data collection methods and timeframes, allocate roles and responsibilities, and create an analysis and reporting template. In this way, the MEP assumes the Strategy is adaptive in nature to allow, if necessary, changes to objectives and actions to ensure greater on-going success of the Strategy's goals.

Figure 17. Overview of the adaptive management cycle

"Plan" relates to the Strategy, "do" relates to the Action Plan, and "evaluate and learn" relates to the Monitoring and Evaluation Plan (taken from DPIPWE 2014, adapted from Jones 2005).