

Boroondara

Project A: Tree Canopy Replacement Report

This report was prepared in response to planned tree removals associated with construction of the North East Link (NEL) and the requirement of the North East Link Project (NELP) to implement a Tree Canopy Replacement Plan.



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Preamble

GbLA Landscape Consultants were engaged by the City of Boroondara to prepare Canopy Restoration Plans (Project A) and an Arboretum Concept Plan (Project B). These projects were prepared to assist Council with future planning and investment by the North East Link Project (NELP) in canopy tree planting to replace the large number of amenity trees to be removed during construction of the North East Link and associated widening of the Eastern Freeway.

A working group was established comprising key Council personnel, Andrea Lomdahl - Project Manager, Sue Godfrey - Senior Landscape Architect, Phil Jansen - Senior Integrated Asset Planner, Brad Curtis - Coordinator Biodiversity, Sue Murphy - Urban Tree Planner and Andrew McConchie - Integrated Works Planner; GbLA landscape consultants including Ashley Sheldrick - Director, Annette Warner - Senior Landscape Architect and project leader, Barnard McIntyre - Landscape Architect and Ling Wu - Graduate Landscape Architect. Additional sub-consultant expertise was provided by PGA - Surveying, Sportsturf - Soil Testing, and TreeMap Arboriculture - Arboriculture Services.

The Tree Canopy Replacement and Arboretum Concept Plan projects have been developed and informed by a number of strategic documents and reports including :

- Boroondara Community Plan 2017 - 2027.
- Boroondara Open Space Strategy (2013).
- Boroondara Tree Strategy and Tree Strategy Action Plan (2017).
- Boroondara Shade Policy and Implementation Plan (2017).
- Boroondara Canopy Cover Assessment 2006 to 2016 (2017).
- Boroondara Urban Biodiversity Strategy (2013 - 2023).
- Inventory and Assessment of Indigenous Flora and Fauna in Boroondara, Biosphere Pty Ltd, 2006.
- Boroondara Cultural Diversity Plan (2014 - 2018).
- Environmental Effects Statement : Technical Report G - Arboriculture (April 2019).
- North East Link Expert Witness Statement, presented to the Inquiry and Advisory Committee (IAC) at the North East Link panel hearing to assess submissions on the Environment Effects Statement. (12 July, 2019) — Urban Forest Consulting.
- North East Link Environmental Management Framework, January 2020.
- Urban Forest Tree Species Research for the ACT, Environment, Australian Capital Territory Planning and Sustainable Development Directorate — Environment, 2019.
- Urban Forest Diversity Guidelines, 2011 Tree Species Selection Strategy for the City of Melbourne, City of Melbourne (2011).
- Urban Forest Strategy, Making A Great City Greener 2012 -2032, City of Melbourne (2012).
- Advisory list of environmental weeds in Victoria, M. White, D. Cheal, G.W. Carr, R. Adair, K. Blood and D. Meagher, (April 2018).
- Department of Sustainability and Environment (2006) *Native Vegetation Revegetation planting standards - Guidelines for establishing native vegetation for net gain accounting*. Victoria Government, Department of Sustainability and Environment, East Melbourne.

Both projects utilise existing Council data, CAD, PDF or GIS format.



Melaleuca styphelioides - Prickly Paperbark



Site Photographs - Koonung Creek Reserve

Introduction

The North East Link (NEL) is a proposed freeway standard new road linking the Metropolitan Ring Road (M80) to the Eastern Freeway at Bulleen. Technical Report G - Arboriculture estimates that 16,000 trees will be removed for construction of the North East Link and a further 16,000 trees may be potentially impacted from construction activities. A key aim for Project A was to identify opportunities for tree canopy replacement within the City of Boroondara to meet the requirements of the North East Link project Environmental Performance Requirement AR3 (EPR AR3) — Implement a Tree Canopy Replacement Plan, North East Link Environmental Management Framework, (page 29) which states:

‘Develop and implement a Tree Canopy Replacement Plan to replace the loss of canopy cover and achieve a net gain in tree canopy cover by 2045. The plan must show the location, size and species of replacement trees, in consultation with relevant land managers. The plan must specify requirements to support the long-term viability of replacement plantings including appropriate soil requirements, establishment works and ongoing maintenance.’

[North East Link Environmental Management Framework - January 2020](#)

EPR AR3 provides guidelines toward establishing a hierarchy of tree planting locations. These are:

1. Within the North East Link Project boundary - as a first priority, in locations in close proximity to where trees are removed.
2. Outside the Project boundary and within 400m walking catchment from where trees are removed.
3. Within Victorian Government and local Council land within the municipalities of Manningham, Boroondara, Nillumbik, Yarra and Whitehorse and Banyule outside the Project boundary.

Whilst the points above provide broad guidance, additional considerations in order to meet the objectives of EPR AR3 include the following:

4. Tree Canopy Gap Analysis of open space areas.
5. Areas with low tree canopy cover coupled with high heat impacts.
6. Areas where the population is vulnerable to heat impacts.
7. Areas where shade is needed to promote pedestrian and cycling activity, e.g... along shared paths, footpaths and in open space.
8. Areas within open space, waterways and along streets where biodiversity corridors or habitat links can be established.

In addition to identifying key locations for tree planting that addressed the criteria above, an expert witness statement provided by Urban Forest Consulting at the NEL Inquiry and Advisory Committee (IAC) panel hearing, advised that to meet ‘best practice’ targets the following should also be considered. These aims would also inform the outcomes for the Canopy Replacement Strategy:

- a) Growing the next generation of tree canopy : seed collection of the local provenance tree species and procurement from nurseries.
- b) Prioritisation of planting locations (Hierarchy + Planting Considerations as identified above).
- c) Timing of planting : staged implementation to meet targets sooner and mitigate impact of tree loss.

- d) Tree Numbers : Two trees will be planted for every amenity tree removed - numbers to be confirmed.
- e) Appropriate site preparation,.
- f) Appropriate establishment processes.
- g) Species selection should consider potential resilience to potential future climate change scenarios.
- h) Ongoing maintenance beyond establishment period including renewal of trees and pruning.

The above aims, objectives and best practice targets inform the structure and content of the following report on the understanding that all work undertaken should be informed by and consistent with the collective vision of Boroondara.

For the purposes of this report, an amenity tree:

- Contributes to landscape amenity, urban character, biodiversity, shade and safety; and
- Is generally considered to have a ULE of 11 years or more, although this will be species dependent as some fast growing species may provide benefits at a lower ULE.

Vision

‘Boroondara continues to be a place of shady trees, with leafy streets and green parklands.

Our trees enable us to experience the seasons, connect with nature and contribute to our sense of wellbeing.’-

Boroondara Tree Strategy: A Strategy to address the Management of Trees in the Public Realm (2017),



Methodology and results

INTERNAL STAKEHOLDER CONSULTATION

Boroondara will lose approx. 6-7 ha of public open space, and trees ranging in age from juvenile to mature, through the construction of NEL. It will not be feasible to restore all lost trees to the land that is handed back to Council at completion of the project. An Internal Working Group used their knowledge of Boroondara's open space, in conjunction with Council's strategic and policy documents to identify a starting list of open space areas throughout Boroondara that could benefit from additional tree planting to partially offset this loss of tree canopy. The merits and drawbacks of each site were discussed in an internal workshop of landscape management and operational staff; 40 sites were considered likely to meet the required tree replacement target, and were prioritised for further investigation. Discipline areas included:

- Transport Planning.
- Urban Tree Planning.
- Landscape Architecture.
- Arboriculture.
- Sustainability.
- Sports & Events.

DESKTOP ANALYSIS

Desktop studies were undertaken of existing Council park tree surveys conducted between February - May, 2019. Council has GIS polygon features for assets including trees, ovals and buildings. These assets represent 'unavailable open space' within Council Managed Land where no new trees can be planted. Council also has polygon features for Council Managed Land (CML). Council's Integrated Asset's Officer Phil Jansen subtracted the sum of the area of the 'unavailable open space' features from the CML feature that they are located within to provide an indication of the 'available' space for new tree planting. He also drew buffers around high use assets such as seats, tables, BBQ's, and pathways, to determine the available space for tree planting near these assets. The methodology used by Council officers to generate an initial list of Boroondara parks and reserves with the greatest scope for additional tree planting may be found in Appendix 1. Reserves that had a higher number of assets such as playgrounds, paths, seats or biodiversity zones were ranked highly by GbLA.

At this point, Department of Environment, Land, Water and Planning (DELWP) 2018 data covering Urban Heat Index, Vegetation Cover and Heat Vulnerability (refer below) was considered to assist with the prioritisation of sites for tree canopy replacement. To this end, map visualisations of reserves under consideration across Boroondara likely to benefit from increased canopy were developed.

DELWP provided the following for each category:

Figure 2, Urban Heat Index (UHI) — a measure of deviation or difference of urban temperatures relative to a native vegetated site (NVS). The units expressed are in degrees Celsius above the NVS. In essence, the higher the range expressed, the higher the deviation above the NVS.

Figure 3, Vegetation Cover — shows the percentage cover of vegetation (not just trees) of urban areas, where vegetation cover is grouped into five height classes: grass (0-0.5m), shrub (0.5-3m), small tree (3-10m), medium tree (10-15m) and large tree (15m+). The higher the percentage, the greater the amount of vegetation cover of all types.

Figure 4, Heat Vulnerability Index (HVI) — This category is determined by three 'vulnerability' components — heat exposure (gained through satellite thermal infrared imagery) sensitivity to heat effects (measure of land cover, population density and age of population), and adaptive capacity (socioeconomic advantage or disadvantage — the very young, incapacitated, socially disadvantaged, and non-English speaking people are considered vulnerable in this system). This data was integrated by summing the scores from the three vulnerability components just outlined. Each of these have equal weighting. The heat vulnerability rating is on a scale of 1 - 5, where 1 = low vulnerability and 5 = high vulnerability.



Grevillea robusta - Silky Oak

Methodology and results (cont.)

Boroondara has a strong commitment to protecting existing biodiversity values and undertaking habitat restoration at identified biodiversity sites. Some locations identified for canopy restoration included Council-managed biodiversity sites. Two of these sites (Koonung Creek Reserve and Yarra Flats Reserve) are located within or adjacent to the project area. Koonung Creek Reserve, in particular will lose valuable canopy trees and native vegetation during the construction of the NEL.

Land ownership was also considered (Figure 5) and advice sought on the status of the areas under consideration, for example there are multiple land owners along the Outer Circle Linear Path (OCLP) and other shared trails, consistent with the EPR A3 hierarchy, all government and Council managed land was considered for planting opportunities.

Data visualisation included preliminary mapping and aerals for the reserves under consideration, these were also presented at the internal workshop and the feedback also informed locations for tree planting within each of the reserves.

FURTHER ANALYSIS

The 39 reserves shortlisted (Figures 1,2,3 and 4) were re-assessed using criteria established by NELP's, Urban Forest Consulting expert witness statement and the internal workshop discussion outcomes. The DELWP data provided criteria for assessing sites for canopy restoration but added a layer of complexity to the process of prioritising reserves for canopy restoration, that was not necessarily helpful. DELWP's Urban Heat Index (UHI) was deemed the most useful as the category 'Vegetation Cover' was too broad in its consideration and 83% of the priority listed sites on the on the Heat Vulnerability Scale (HVI) were between 0-1; although there were some exceptions in this category such as Markham Reserve, (Ashburton) and Lynden Park (Camberwell) with HVI ratings of between 2 - 3. More usefully, reserves that included facilities or amenities such as playgrounds, paths, shared paths and seating were important considerations when nominating areas for canopy restoration as planting would provide direct benefits to visitors. These sites were ranked again by Council's Urban Tree Planner, Sue Murphy, using a simple matrix to score key criteria that identified the need for further tree planting, and sum these to generate an overall ranking for each park. Criteria were:

- Tree density (lowest tree density attracted highest score).
- % canopy cover (lowest % canopy cover attracted highest score).
- Urban Heat Index (highest urban heat index received highest score).
- Consultant's Initial Ranking (highest initial ranking by consultant received highest score).

With an additional point given for each of the following:

- biodiversity site.
- playground.
- shared path.

The scale of ratings for each criterion are shown in the table headers in Appendix 2; the maximum possible score for any park was 16. This may influence implementation of the Canopy Replacement project. The full matrix is located in Appendix 2.

In summary, the above approach established a broad assessment framework for reserves within Boroondara that might benefit from tree planting through the Canopy Replacement project. This approach considered existing facilities, potential for habitat restoration or connectivity and ability to meet NELP criteria along with some contribution from DELWP information. The need to approach the nominated reserves on a more local level through site visits became apparent at this point.

FURTHER SITE INVESTIGATION AND POTENTIAL CANOPY TREE PLANTING OPPORTUNITIES

Additional site visits of the 30 priority areas were undertaken by GbLA and TreeMap to determine on-site conditions. A visual analysis was carried out for each reserve to identify potential areas for tree planting. This was measured against comments made in the internal workshop to mitigate any possible future areas of conflict with future tree planting; for example, increasing the size of sporting ovals to meet standards, or maintaining areas of open space for informal recreation. The Consultant Arborist, TreeMap was able to provide the Project Working Group with data summaries for each reserve. These provided additional information on the percentage of existing canopy cover, the overall size (ha) of each reserve, further refinement of the available area for tree planting and the Life Expectancy (LE) of trees within each reserve,. The LE was considered important in these



Corymbia citriodora - Lemon - scented Gum

Methodology and results (cont.)

circumstances because of the potential for future tree planting opportunities, that might fall within the NEL project timelines. The LE considered most relevant for the purposes of this work were trees with LE of 0-5Y life expectancy and 6-11Y life expectancy. In addition, weed species were also identified as possible removals to facilitate future tree planting. This is summarised for each reserve in Table 2.

PROPOSED TREE SPECIES

Additional visual analysis work was carried out that considered the qualitative aspects of existing trees in the reserves. No formal rating system was used for this process, but the following was considered:

- Overall tree health under existing site conditions.
- Establishment of ground storey — whether grass or other understorey was established beneath existing canopy.
- Contribution to aesthetic amenity — whether colourful, seasonal or of interesting form.

The potential for a tree species to contribute to future amenity through shading qualities,habitat value and availability within the trade were also considered. This information is summarised in Table 3.

There is a growing awareness of the importance of planning for tree planting in a changing climate. Two main sources of information were considered in the preparation of proposed tree species for the City of Boroondara - *Urban Forest Diversity Guidelines - Tree Species Selection Guidelines for the City of Melbourne* (2011) and *Urban Forest Tree Species Research for the ACT* (2019). Whilst the *Urban Forest Diversity Guidelines* are more directly applicable to Boroondara, the ACT report provides additional useful information regarding possible tree species for urban environments. These reports inform the base criteria to be considered in tree species selection for canopy replacement:

- Withstand effects of heat extremes such as foliage and trunk scorch, canopy dessication, storm damage and frequent extremes in wet and dry periods.
- Drought and Heat tolerance.
- Wind and Pollution tolerance.
- Longevity.
- Pathogen & Pest susceptibility and management. Trees must be able to withstand and recover from pests and diseases.
- Potential as allergen.
- Shade cast.
- Maintenance requirements.
- Tree litter.

Not every tree will satisfy all criteria. It will also be important to address neighborhood character, existing heritage values and site specific conditions.

A suggested tree list for Boroondara incorporates some of these species, where relevant, and further feedback on these was sought from the Consultant Arborist, TreeMap. In general, trees that are performing well under existing

site conditions have been put on the recommended planting list. In some circumstances new cultivars have also been recommended. Biodiversity values have been considered for those reserves identified as important biodiversity sites or corridors — in this instance tree species have been selected using the *Inventory and Assessment of Indigenous Flora and Fauna in Boroondara*.

AVAILABLE SPACE AND PLANTING DENSITY

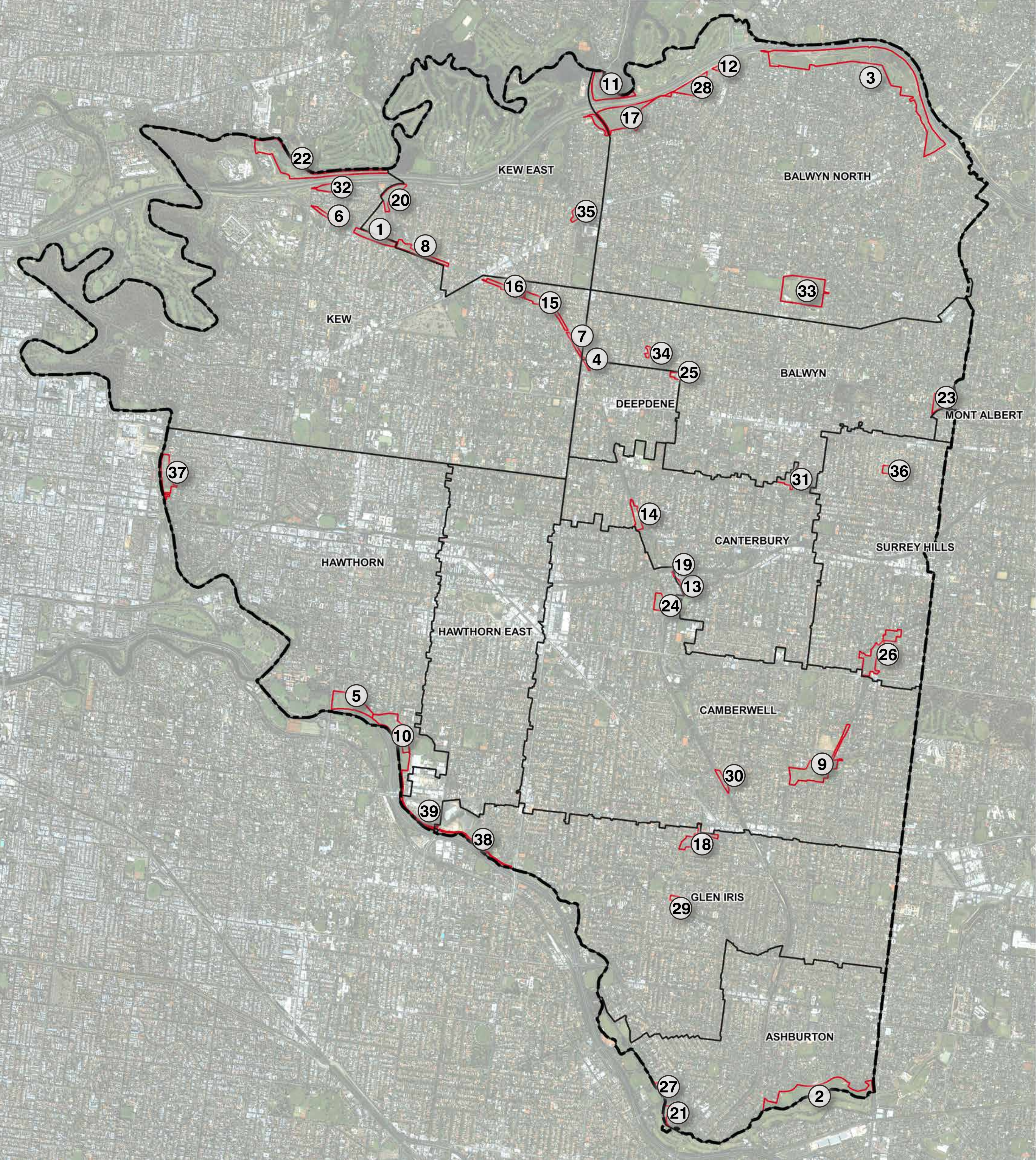
Calculation of possible hectare area for tree planting took into consideration stakeholder comments raised during the internal workshop with respect to any possible future development plans taking a general overview of all parks. The average stocking rate for existing tree planting over the thirty nominated reserves is 105 trees/hectare. Some reserves have been planted at less than half this rate (for example Hartwell Station Reserve is planted at 42 trees/ha) and some reserves are carrying more (Outer Circle Linear Park — OCLP - D 193/ha). The arrangement of trees within each reserve can vary significantly - from scattered trees, to dense planting beds surrounded by large expanses of mown turf. There is no single way to plant trees in parks, which raises the possibility of increasing tree planting density across all the reserves identified on the priority list. Improvement of canopy cover also improves connectivity of habitat for wildlife - this is a stated aim for biodiversity areas, but can be applied to any park landscape. Other criteria influencing tree canopy replacement numbers would be assessed on a reserve by reserve basis, for example, protecting important view lines to the distant Dandenong Ranges, provision of space for current activities, mowing regimes, and the potential for a layered approach to canopy, taking advantage of differences in mature canopy heights.

Soil samples were taken from 11 reserves dispersed throughout the Municipality. Criteria for nominating which reserve would be sampled was based on visual assessment of the existing soil conditions, in conjunction with tree data indicating relatively higher numbers of poor performing trees in 0 - 11Y Life Expectancy (LE) range. Soil sample findings are summarised in Table 4.

OPINION OF PROBABLE COST

An Opinion of Probable Cost (OPC) was calculated for the Tree Canopy Replacement Plan (Project A) to guide Council's funding request for the North East Link (NEL). The OPC is based on the proposed number of trees to be planted. It exclude preliminaries such as insurances, but these should be sought from Contractors prior to the acceptance of any tender for works. Rates have been provided based on current market rates at the time of writing of this report. They have been established through the tender assessment process over a variety of types of landscape projects including new tree plantings in established landscapes and for new parks and reserves.

Figure 1 Reserves for preliminary consideration



KEY

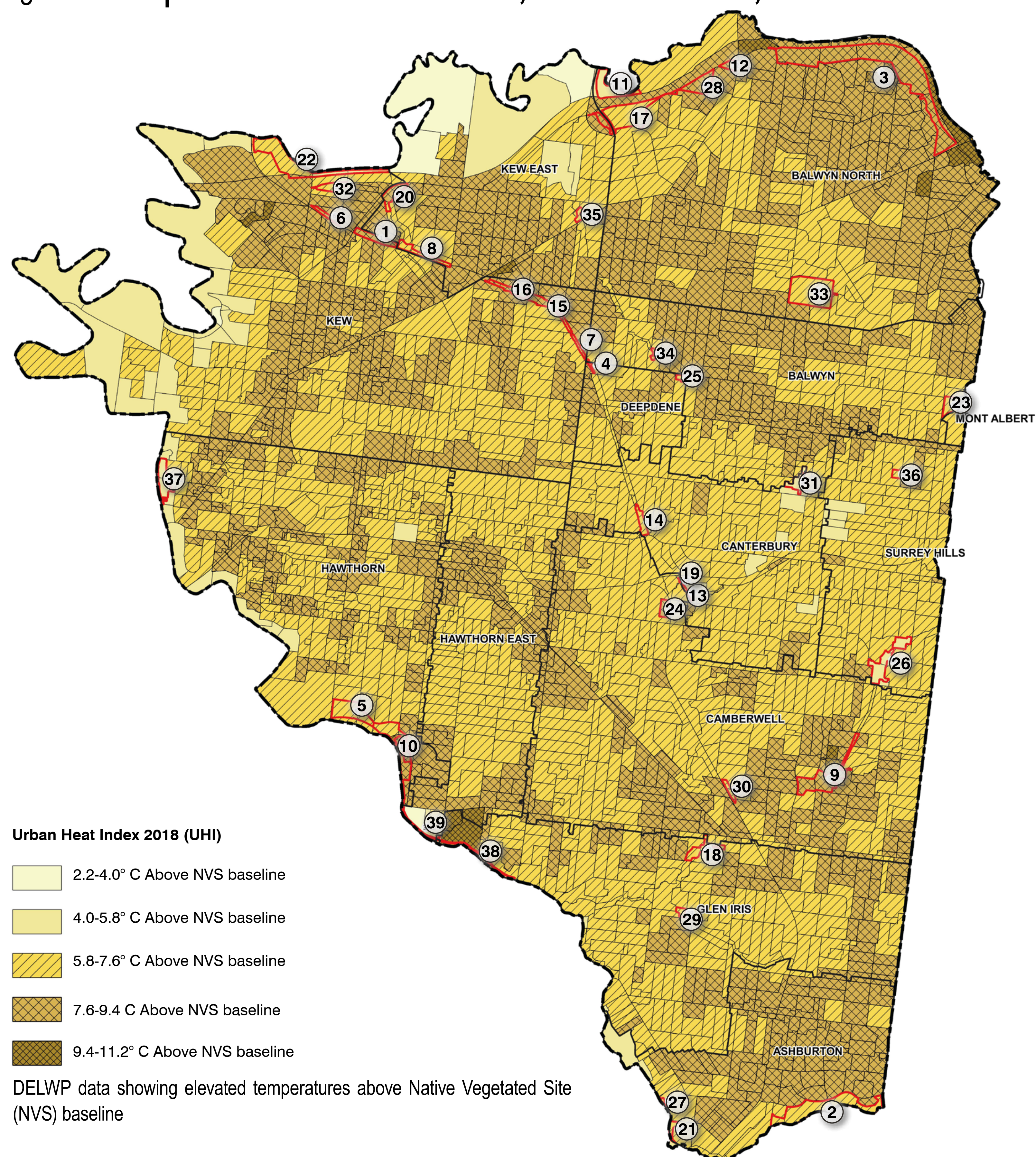
- ① OCLP C - Willesmere Road to Spruzen Avenue
- ② Markham Reserve
- ③ Koonung Creek Reserve
- ④ OCLP I - Burke Road to Abercrombie Street
- ⑤ H.A. Smith Reserve
- ⑥ OCLP A - Princess Street to Peel Street
- ⑦ OCLP H - Argyle Road to Burke Road
- ⑧ OCLP D - Spruzen Avenue to Belford Road
- ⑨ Lynden Park
- ⑩ Patterson Reserve
- ⑪ Yarra Flats Reserve
- ⑫ Leonis Avenue Reserve
- ⑬ OCLP 02 - Myrtle Road South
- ⑭ OCLP N - Shenley Ground
- ⑮ OCLP G - Normanby Road to Argyle Road
- ⑯ OCLP F - High Street to Normanby Road
- ⑰ Musca Street Reserve
- ⑱ Back Creek Reserve
- ⑲ OCLP 01 - Myrtle Road North
- ⑳ Hyde Park
- ㉑ Winton Road Reserve
- ㉒ Chandler Park
- ㉓ Mont Albert Park
- ㉔ Brinsley Road Reserve
- ㉕ Gordon Street Reserve
- ㉖ South Surrey Park
- ㉗ Pitt Street South Reserve
- ㉘ Columba Street Reserve
- ㉙ Ferndale Reserve
- ㉚ Hartwell Station Reserve
- ㉛ John August Reserve
- ㉜ Kate Campbell Reserve
- ㉝ Gordon Barnard Reserve
- ㉞ Kings Street Chain - Naroo Street Reserve
- ㉟ Harrison Reserve South
- ㊱ Grovedale Park
- ㊲ Pridmore Park Connect to Yarra Bank Reserve
- ㊳ Gardiners Creek Linear Park - Burke Road - Tooronga Road
- ㊴ Gardiners Creek Linear Park - Tooronga Road - Toorak Road

LEGEND

- Municipal Boundary
- Suburb Boundary
- Potential Canopy Replacement Site

Plan showing location of reserves within Boroondara initially considered for tree canopy replacement.

Figure 2 Map Urban Heat Index, Boroondara, 2018



Urban Heat Index 2018 (UHI)

- 2.2-4.0° C Above NVS baseline
- 4.0-5.8° C Above NVS baseline
- 5.8-7.6° C Above NVS baseline
- 7.6-9.4 C Above NVS baseline
- 9.4-11.2° C Above NVS baseline

DELWP data showing elevated temperatures above Native Vegetated Site (NVS) baseline

KEY

- 1 OCLP C - Willemsmere Road to Spruzen Avenue
- 2 Markham Reserve
- 3 Koonung Creek Reserve
- 4 OCLP I - Burke Road to Abercrombie Street
- 5 H.A. Smith Reserve
- 6 OCLP A - Princess Street to Peel Street
- 7 OCLP H - Argyle Road to Burke Road
- 8 OCLP D - Spruzen Avenue to Belford Road
- 9 Lynden Park
- 10 Patterson Reserve
- 11 Yarra Flats Reserve
- 12 Leonis Avenue Reserve
- 13 OCLP 02 - Myrtle Road South
- 14 OCLP N - Shenley Ground
- 15 OCLP G - Normanby Road to Argyle Road
- 16 OCLP F - High Street to Normanby Road
- 17 Musca Street Reserve
- 18 Back Creek Reserve
- 19 OCLP 01 - Myrtle Road North
- 20 Hyde Park
- 21 Winton Road Reserve
- 22 Chandler Park
- 23 Mont Albert Park
- 24 Brinsley Road Reserve
- 25 Gordon Street Reserve
- 26 South Surrey Park
- 27 Pitt Street South Reserve
- 28 Columba Street Reserve
- 29 Ferndale Reserve
- 30 Hartwell Station Reserve
- 31 John August Reserve
- 32 Kate Campbell Reserve
- 33 Gordon Barnard Reserve
- 34 Kings Street Chain - Naroo Street Reserve
- 35 Harrison Reserve South
- 36 Grovedale Park
- 37 Pridmore Park Connect to Yarra Bank Reserve
- 38 Gardiners Creek Linear Park - Burke Road - Tooronga Road
- 39 Gardiners Creek Linear Park - Tooronga Road - Toorak Road

LEGEND

- Municipal Boundary
- Suburb Boundary
- Potential Canopy Replacement Site

Figure 3. Map of Vegetation Cover, Boroondara, 2018

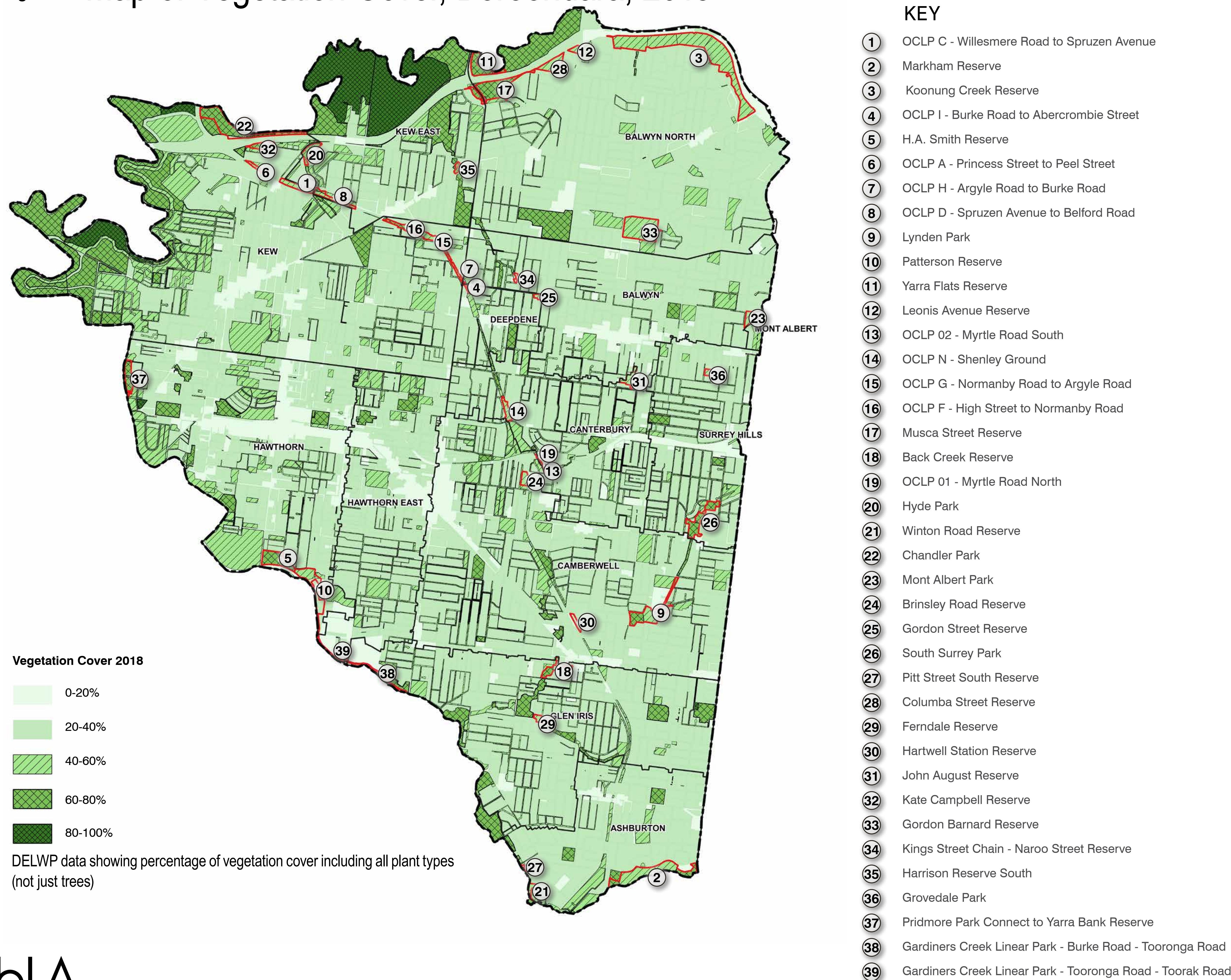


Figure 4. Map Heat Vulnerability Index, Boroondara, 2018

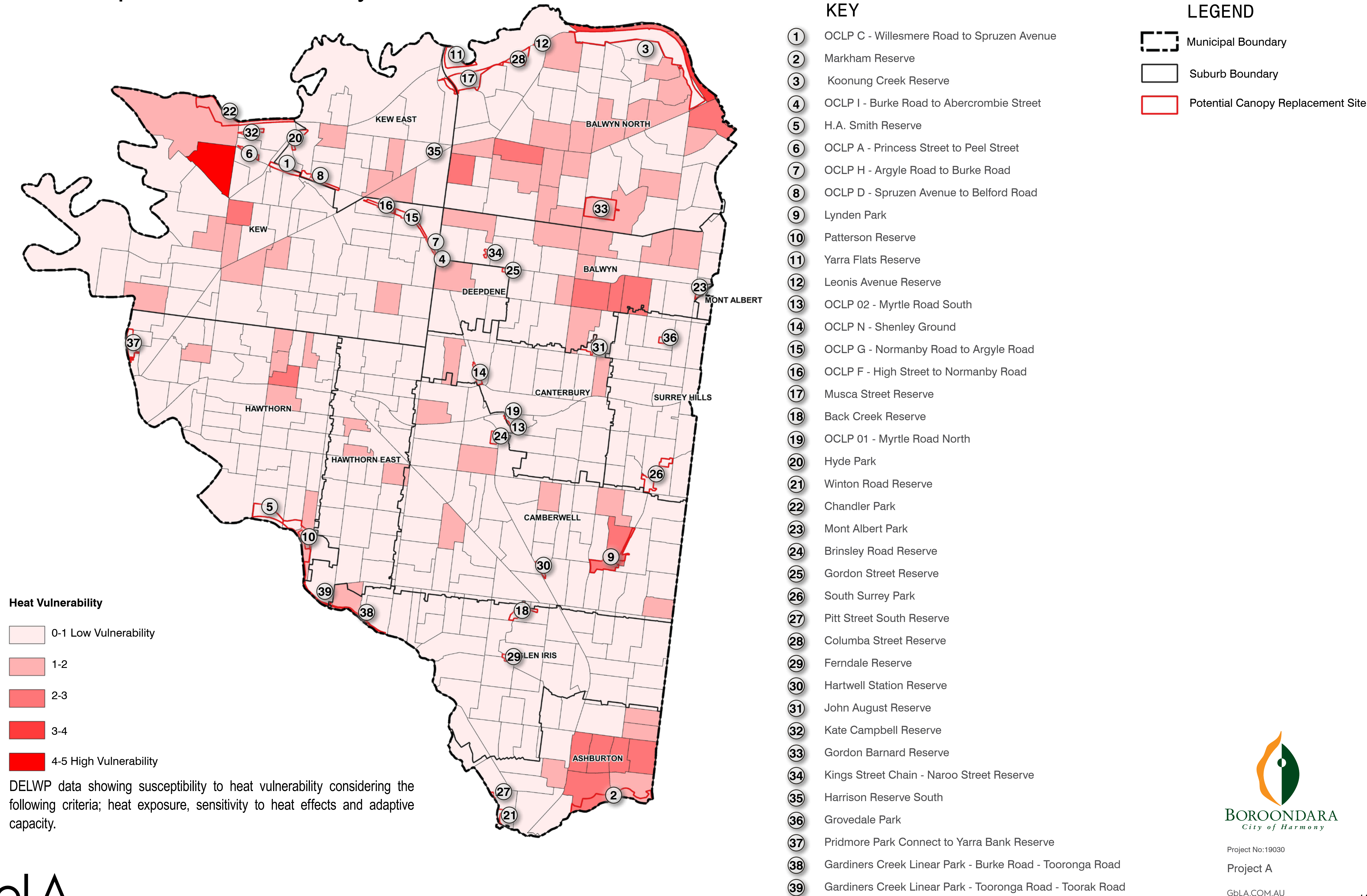


Figure 5. Map land ownership, Boroondara

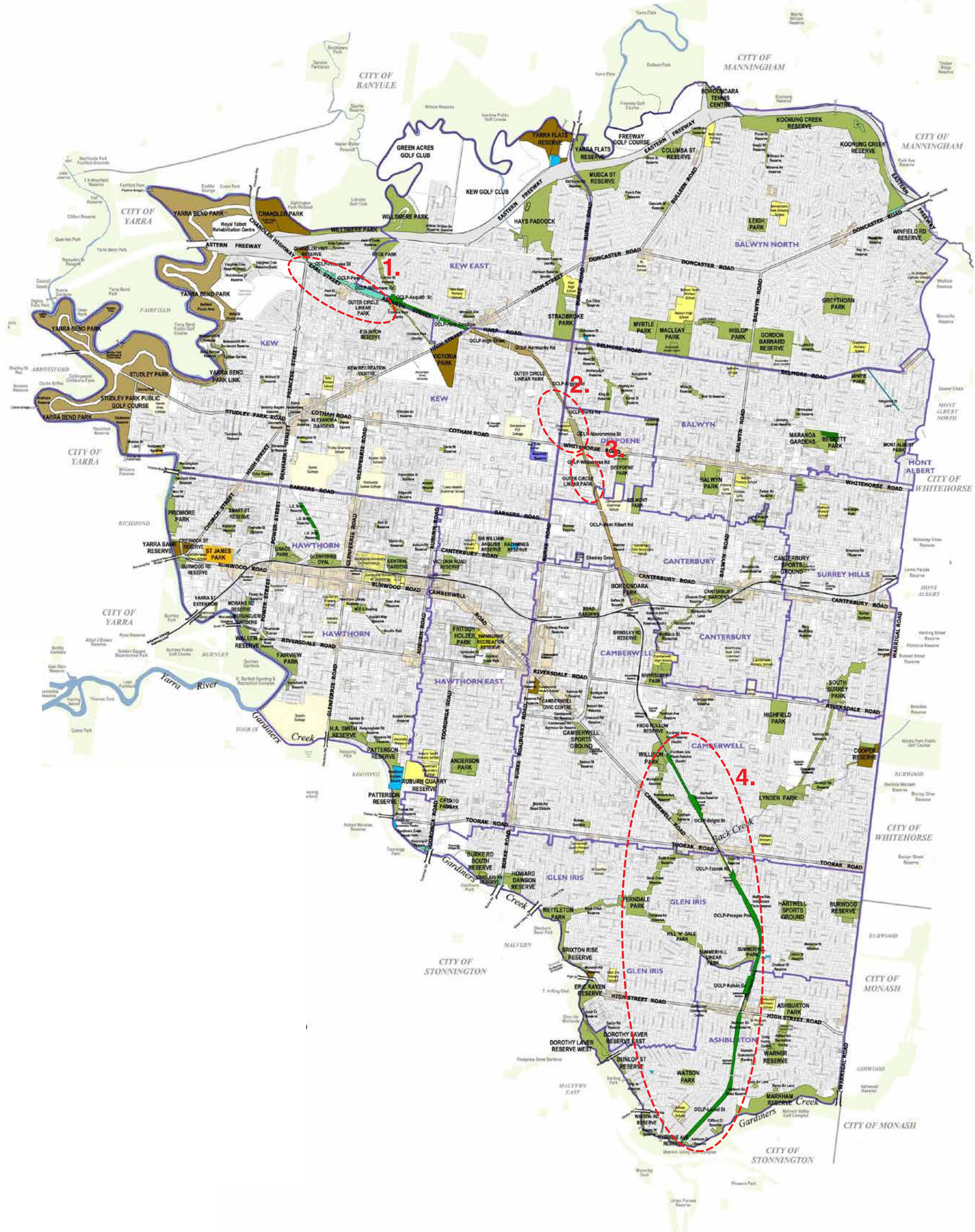


Table 1 Prioritised sites for canopy replacement

| Site Count | Reserve Name | Suburb | DELWP % Vegetation Cover | DELWP Urban Heat Index | DELWP Heat Vulnerability Index | Biodiversity Site or Corridor | Playground | Shared Paths |
|------------|---|---------------|--------------------------|------------------------|--------------------------------|-------------------------------|------------|--------------|
| 1 | OCLP C - Willesmere Road to Spruzen Avenue | Kew East | 40 - 60 | 7.6 - 9.4 | 0 -1 | | | ● |
| 2 | Markham Reserve | Ashburton | 40 - 60 | 5.8 - 7.6 | 2 -3 | ● | ● | ● |
| 3 | Yarra Flats Reserve | Balwyn North | 60-80 | 4.0 - 5.8 | 0 -1 | ● | | ● |
| 4 | Lynden Park | Camberwell | 60 - 80 | 7.6 - 9.4 | 2 -3 | ● | ● | |
| 5 | OCLP N - Shenley Ground | Canterbury | 40 - 60 | 5.8 - 7.6 | 0 -1 | | | |
| 6 | Koonung Creek Reserve | Balwyn North | 40 - 60 | 7.6 - 9.4 | 0 -1 | ● | ● | ● |
| 7 | Leonis Avenue Reserve | Balwyn North | 40 - 60 | 7.6 - 9.4 | 0 -1 | | | |
| 8 | Gardiners Creek Linear Park - Burke Rd - Tooronga Road | Glen Iris | 60 - 80 | 5.8 - 7.6 | 0 - 1/ 1 - 2 | ● | | ● |
| 9 | Back Creek Reserve - Denman Avenue - Somerset Road | Glen Iris | 40 - 60 | 5.8 - 7.6 | 0 -1 | ● | | ● |
| 10 | Mont Albert Park | Balwyn | 40 - 60 | 5.8 - 7.6 | 0 -1 | | ● | |
| 11 | Brinsley Road Reserve | Camberwell | 40 - 60 | 7.6 - 9.4 | 0 -1 | | | |
| 12 | Hartwell Station Reserve | Camberwell | 20 - 40 | 5.8 - 7.6 | 0 - 1 | | ● | ● |
| 13 | Grovedale Park | Surrey Hills | 40 - 60 | 5.8 - 7.6 | 0 -1 | | ● | |
| 14 | Patterson Reserve | Hawthorn | 20 - 40 | 7.6 - 9.4 | 1 - 2 | | ● | ● |
| 15 | Chandler Park | Kew | 60-80 | 7.6 - 9.4 | 2 -3 | ● | | ● |
| 16 | Hyde Park | Kew East | 60 - 80 | 7.6 - 9.4 | 0 -1 | | ● | ● |
| 17 | Pridmore Park Connect to Yarra Bank Reserve | Hawthorn | 60 - 80 | 2.2 - 4.0 | 0 -1 | ● | ● | ● |
| 18 | Ferndale Road Reserve (Central Zone) | Glen Iris | 40 - 60 | 5.8 - 7.6 | 0 - 1 | | | ● |
| 19 | Harrison Reserve (High Street) | Kew | 60 - 80 | 5.8 - 7.6 | 0 - 1 | ● | ● | |
| 20 | Winton Road Reserve | Ashburton | 40 - 60 | 5.8 - 7.6 | 0 - 1 | | ● | ● |
| 21 | Columba Street Reserve | Balwyn North | 60 - 80 | 7.6 - 9.4 | 0 - 1 | | | ● |
| 22 | Gardiners Creek Linear Park - Tooronga Rd - Toorak Road | Hawthorn East | 60 - 80 | 5.8 - 7.6 | 0 - 1 | ● | | ● |
| 23 | OCLP G - Normanby Road to Argyle Road | Kew | 40 - 60 | 5.8 - 7.6 | 0 -1 | | | ● |
| 24 | John August Reserve | Balwyn | 20 - 40 | 2.2 - 4.0 | 0 -1 | | ● | |
| 25 | OCLP D - Spruzen Avenue to Belford Road | Kew East | 40 - 60 | 5.8 - 7.6 | 0 -1 | | | ● |
| 26 | OCLP A - Princess Street to Peel Street | Kew | 40 - 60 | 7.6-9.4 | 0 -1 | | | ● |
| 27 | OCLP F - High Street to Normanby Road | Kew East | 60 - 80 | 7.6 - 9.4 | 0 -1 | | | ● |
| 28 | King Street Chain - Naroo Street Reserve | Balwyn North | 20-40 | 7.6-9.4 | 0 -1 | | | |
| 29 | Kate Campbell Reserve | Kew | 60 - 80 | 5.8 - 7.6 | 0 -1 | | ● | |
| 30 | South Surrey Park | Surrey Hills | 60 - 80 | 2.2 - 4.0 | 0 -1 | ● | ● | |

Table 1 sets out the list of 30 priority sites according to key criteria such as the DELWP data, facilities, amenity or biodiversity site information. Refer to Appendix 2 for the full matrix showing ranking for each site.

Canopy tree gap analysis

AREA AVAILABLE FOR TREE PLANTING

Areas available for tree planting have been calculated for each of the priority reserves. Table 2 summarises the total tree planting area for each reserve in meters squared (m²). The areas nominated for tree planting have been considered with regard to maintaining existing open space, existing masterplans, location of facilities that may benefit from additional tree planting (such as playgrounds), where tree planting may supplement or enhance canopy quality for shade purposes or where biodiversity areas may benefit from additional canopy to reinforce habitat or connectivity. If staged planting is an option, then existing trees that could be replaced over time are also indicated in Table 2. This includes species currently identified as weeds in the *Advisory list of environmental weeds in Victoria*, (2018), trees that have been assessed through tree survey work as having a life expectancy of between 0 - 5Y and 6 - 11Y, or have been identified as dead and could be removed. Overall, there are just 19 hectares within the priority reserves available for additional tree planting.

CURRENT TREE PLANTING DENSITIES

The average tree planting density within the prioritised reserves is 105 trees/ha. This was calculated using primary data from existing tree survey work on trees per hectare for each of the reserves under consideration divided by the number of reserves. Exceptions to this include Hartwell Station Reserve with a planting density of only 42 trees/ha, Gardiners Creek Reserve with a current planting density of 42.4 trees/ha and Leonis Avenue Reserve with a planting density of 38 trees/ha. Reserves such as Koonung Creek Reserve in North Balwyn, located adjacent to the Eastern Freeway will require a masterplanning process to determine the final numbers, configuration and location of tree planting in consultation with Council and the community.

PROPOSED PLANTING DENSITIES IN BIODIVERSITY SITES

Tree planting species and density for reserves that include biodiversity sites or corridors has been informed by internal Council expertise and Department of Sustainability and Environment (2006) *Native Vegetation Revegetation planting standards - Guidelines for establishing native vegetation for net gain accounting*. It was determined that tree planting in these sites should be at the 100/ha rate.

- Possible tree planting total in biodiversity areas.
- (including low LE and weed species replacement of 917 trees) @ 100 trees / ha = 2,110 trees.

PROPOSED PLANTING DENSITIES IN OTHER RESERVES

Additional scenarios for canopy replacement, excluding biodiversity areas, are presented below:

- Possible trees for replacement (including low LE and weed species replacement) = 987 trees.
 - Possible area / ha for new tree planting 19.40 hectares @ 105 trees per hectare = 784trees.
- Total = 1,771 trees.

A further possible option is that the tree planting rate be increased from 105/ha to 150/ha, given some reserves such as those within the Outer Circle Linear Park (OCLP) demonstrate this up to at least 150 trees /ha. The revised total is summarised below :

- Possible trees for replacement (including low LE and Weed species replacement) = 987 trees.
 - Possible area / ha for new tree planting 19.40 hectares @ 150 trees per hectare = 1,120 trees.
- Total = 2,107 trees.

SUMMARY AND BREAKDOWN OF TREE PLANTING NUMBERS FOR BIODIVERSITY SITES AND OTHER RESERVES (150/ha rate)

| Summary | Within NELP Project Area (5.9ha) | Between the NELP boundary and 400metre offset (5.2ha) | Other parks and reserves in the municipality (8.27ha) | Subtotal | Existing plants that could be replaced (dead, weeds, LE 0-11Y) | Total |
|--|----------------------------------|---|---|----------|--|-------|
| Tree planting in biodiversity sites (planting rate 100 trees/ha) | 568 | 250 | 375 | 1,193 | 917 | 2,110 |
| Tree planting in other parks and reserves (planting rate 150 trees/ha) | 42 | 405 | 673 | 1,120 | 987 | 2,107 |
| TOTAL | 610 | 655 | 1,048 | 2,313 | 1,904 | 4,217 |



Cedrus deodara - Himalayan Cedar

Table 2 Canopy gap analysis (cont.)

| Site Count | Reserve Name | Suburb | Total Tree Planting Area (m2) | Trees that could be Replaced (Dead, Weeds, LE 0-11yrs) | Existing Trees that could be Replaced (Dead, Weeds, LE 0-11yrs) (Biodiversity Area) | No of Trees for Planting (100/ha) Biodiversity Area | No of Trees for Planting (105/ha) | No of Trees for Planting (150/ha) |
|--------------------|---|---------------|-------------------------------|--|---|---|-----------------------------------|-----------------------------------|
| 1 | OCLP C - Willesmere Road to Spruzen Avenue | Kew East | 5,886 | 57 | | | 62 | 88 |
| 2 | Markham Reserve | Ashburton | 16,114 | | 282 | 161 | | |
| 3 | Yarra Flats Reserve | Balwyn North | 2,185 | | 29 | 22 | | |
| 4 | Lynden Park | Camberwell | 5,432 | | 130 | 54 | | |
| 5 | OCLP N - Shenley Ground | Canterbury | 2,344 | 21 | | | 25 | 35 |
| 6 | Koonung Creek Reserve | Balwyn North | 67,581 | | 0 | 676 | | |
| 7 | Leonis Avenue Reserve | Balwyn North | 2,796 | 17 | | | 29 | 42 |
| 8 | Gardiners Creek Linear Park - Burke Rd - Tooronga Road | Glen Iris | 1,788 | | 24 | 18 | | |
| 9 | Back Creek Reserve - Denman Avenue - Somerset Road | Glen Iris | 4,053 | | 51 | 41 | | |
| 10 | Mont Albert Park | Balwyn | 2,572 | 5 | | | 27 | 39 |
| 11 | Brinsley Road Reserve | Camberwell | 3,908 | 10 | | | 41 | 59 |
| 12 | Hartwell Station Reserve | Camberwell | 1,957 | 4 | | | 21 | 29 |
| 13 | Grovedale Park | Surrey Hills | 1,258 | 5 | | | 13 | 19 |
| 14 | Patterson Reserve | Hawthorn | 4,291 | 144 | | | 45 | 64 |
| 15 | Chandler Park | Kew | 12,063 | | 215 | 121 | | |
| 16 | Hyde Park | Kew East | 6,001 | 58 | | | 63 | 90 |
| 17 | Pridmore Park Connect to Yarra Bank Reserve | Hawthorn | 4,928 | | 47 | 49 | | |
| 18 | Ferndale road Reserve (Central Zone) | Glen Iris | 3,120 | 21 | | | 33 | 47 |
| 19 | Harrison Reserve (High Street) | Kew | 426 | | 2 | 4 | | |
| 20 | Winton Road Reserve | Ashburton | 1,006 | 23 | | | 11 | 15 |
| 21 | Columba Street Reserve | Balwyn North | 7,894 | 52 | | | 83 | 118 |
| 22 | Gardiners Creek Linear Park - Tooronga Rd - Toorak Road | Hawthorn East | 576 | 37 | | 6 | | |
| 23 | OCLP G - Normanby Road to Argyle Road | Kew | 5,901 | 69 | | | 62 | 89 |
| 24 | John August Reserve | Balwyn | 5,325 | 19 | | | 56 | 80 |
| 25 | OCLP D - Spruzen Avenue to Belford Road | Kew East | 3,145 | 45 | | | 33 | 47 |
| 26 | OCLP A - Princess Street to Peel Street | Kew | 4,753 | 83 | | | 50 | 71 |
| 27 | OCLP F - High Street to Normanby Road | Kew East | 3,463 | 177 | | | 36 | 52 |
| 28 | King Street Chain - Naroo Street Reserve | Balwyn North | 761 | 22 | | | 8 | 11 |
| 29 | Kate Campbell Reserve | Kew | 8,281 | 118 | | | 87 | 124 |
| 30 | South Surrey Park | Surrey Hills | 4,108 | | 137 | 41 | | |
| | | | 193,916 | 987 | 917 | 1,193 | 784 | 1,121 |
| TOTAL No. of Trees | | | | | | | 3,880 | 4,217 |

Table 2 sets out the list of 30 priority sites, identifies the total tree planting area available, trees that could be replaced and planting density. (10,000m² = 1 hectare)

Table 3 Tree visual quality assessment outcomes and proposed tree species

To understand which tree species are performing well and contributing to local amenity under current site conditions a visual tree quality assessment was carried out for each reserve. The selected species form the basis for a proposed tree planting list for the Canopy Replacement project. Additional tree species from *Urban Forest Diversity Guidelines - Tree Species Selection Guidelines for the City of Melbourne* (2011) and *Urban Forest Tree Species Research for the ACT* (2019) were also included. The outcomes of these investigations are presented in Table 3.

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|--|--------------|--------------------------------------|---------------------------------|--|
| 1 | OCLP C - Willesmere Road to Spruzen Avenue | Kew East | | | |
| | | | <i>Angophora costata</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Eucalyptus mannifera</i> | <i>Eucalyptus camaldulensis</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus viminalis</i> | |
| | | | <i>Eucalyptus cinerea</i> | | |
| | | | <i>Corymbia maculata</i> | | |
| | | | <i>Ulmus x hollandica</i> | | |
| 2 | Markham Reserve | Ashburton | | | |
| | EVC 55, 56, 895 | | <i>Grevillea robusta</i> | | <i>Acacia implexa</i> |
| | | | <i>Melaleuca styphelioides</i> | | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus camaldulensis</i> | | <i>Allocasuarina verticillata</i> |
| | | | <i>Eucalyptus sideroxylon</i> | | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus melliodora</i> | | <i>Eucalyptus radiata</i> s.l. |
| | | | <i>Allocasuarina cunninghamiana</i> | | |
| | | | <i>Corymbia maculata</i> | | |
| 3 | Yarra Flats Reserve | Balwyn North | | | |
| | EVC 56, 895 | | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus camaldulensis</i> | <i>Acacia implexa</i> |
| | | | <i>Eucalyptus melliodora</i> | <i>Eucalyptus viminalis</i> | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus sideroxylon</i> | | <i>Allocasuarina verticillata</i> |
| | | | | | <i>Eucalyptus camaldulensis</i> |
| | | | | | <i>Eucalyptus leucoxylon</i> ssp <i>connata</i> |
| | | | | | <i>Eucalyptus melliodora</i> |
| | | | | | <i>Eucalyptus melliodora</i> |
| | | | | | <i>Eucalyptus ovata</i> |
| | | | | | <i>Eucalyptus radiata</i> s.l. |
| 4 | Lynden Park | Camberwell | | | |
| | EVC 55, 56, 895 | | <i>Allocasuarina cunninghamiana</i> | <i>Angophora costata</i> | <i>Acacia implexa</i> |
| | | | <i>Corymbia ficifolia</i> | <i>Corymbia ficifolia</i> | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus cladocalyx</i> | <i>Eucalyptus camaldulensis</i> | <i>Allocasuarina verticillata</i> |
| | | | <i>Eucalyptus spathulata</i> | <i>Eucalyptus spathulata</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Grevillea robusta</i> | | <i>Eucalyptus radiata</i> s.l. |
| | | | <i>Melaleuca linariifolia</i> | | |
| | | | <i>Melaleuca styphelioides</i> | | |
| | | | <i>Prunus cerasifera</i> | | |
| | | | <i>Tilia cordata</i> | | |

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|--|--------------|--------------------------------------|---------------------------------|--|
| 5 | OCLP N - Shenley Ground | Canterbury | | | |
| | | | <i>Eucalyptus radiata</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Eucalyptus nicholii</i> | <i>Callitris endlicheri</i> | |
| | | | <i>Angophora costata</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Corymbia maculata</i> | <i>Eucalyptus camaldulensis</i> | |
| | | | <i>Allocasuarina littoralis</i> | <i>Eucalyptus radiata</i> | |
| | | | <i>Melia azedarach</i> | <i>Eucalyptus viminalis</i> | |
| | | | <i>Grevillea robusta</i> | | |
| | | | <i>Eucalyptus cladocalyx</i> | | |
| 6 | Koonung Creek Reserve | Balwyn North | | | |
| | EVC 55, 932, 56, 175, 47 | | <i>Quercus</i> sp. | | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus sideroxylon</i> | | <i>Acacia melanoxylon</i> |
| | | | <i>Corymbia citriodora</i> | | <i>Allocasuarina littoralis</i> |
| | | | <i>Eucalyptus viminalis</i> | | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Quercus palustris</i> | | <i>Eucalyptus leucoxylon</i> ssp <i>connata</i> |
| | | | <i>Pyrus</i> sp. | | <i>Eucalyptus melliodora</i> |
| | | | <i>Eucalyptus saligna</i> | | <i>Eucalyptus obliqua</i> |
| | | | <i>Corymbia maculata</i> | | <i>Eucalyptus radiata</i> s.l. |
| | | | <i>Eucalyptus cinerea</i> | | <i>Eucalyptus rubida</i> |
| | | | | | <i>Eucalyptus viminalis</i> |
| 7 | Leonis Avenue Reserve | Balwyn North | | | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Melaleuca styphelioides</i> | <i>Eucalyptus camaldulensis</i> | |
| | | | <i>Corymbia maculata</i> | <i>Eucalyptus viminalis</i> | |
| | | | <i>Eucalyptus sideroxylon</i> | | |
| | | | <i>Eucalyptus spathulata</i> | | |
| | | | <i>Grevillea robusta</i> | | |
| 8 | Gardiners Creek Linear Park - Burke Rd - Tooronga Road | Glen Iris | | | |
| | EVC 56, 895 | | <i>Eucalyptus botryoides</i> | <i>Allocasuarina littoralis</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Callitris glaucophylla</i> | <i>Eucalyptus melliodora</i> |
| | | | <i>Quercus robur</i> | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus ovata</i> |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Eucalyptus viminalis</i> | |
| | | | <i>Fraxinus</i> sp. | <i>Grevillea robusta</i> | |
| | | | <i>Grevillea robusta</i> | | |

Ecological Vegetation Class or EVC are native plant communities found in biodiversity sites.

Table 3 Tree visual quality assessment outcomes and proposed tree species (cont)

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|--|--------------|--------------------------------------|----------------------------------|--|
| 9 | Back Creek Reserve - Denman Avenue - Somerset Road | Glen Iris | | | |
| | EVC 55, 56, 68 | | <i>Calodendron capense</i> | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Eucalyptus cinerea</i> | <i>Eucalyptus ovata</i> |
| | | | <i>Eucalyptus nicholii</i> | <i>Eucalyptus viminalis</i> | |
| | | | <i>Melaleuca styphelioides</i> | | |
| 10 | Mont Albert Park | Balwyn | | | |
| | | | <i>Corymbia maculata</i> | <i>Cedrus atlantica</i> 'Glauca' | |
| | | | <i>Angophora costata</i> | <i>Fraxinus</i> 'Cimmzam' | |
| | | | <i>Corymbia citriodora</i> | <i>Fraxinus griffithii</i> | |
| | | | <i>Eucalyptus botryoides</i> | <i>Fraxinus</i> 'Raywood' | |
| | | | <i>Syzygium smithii</i> | <i>Quercus robur</i> | |
| | | | <i>Fraxinus angustifolia</i> | <i>Quercus suber</i> | |
| | | | <i>Cupressus macrocarpa</i> | | |
| 11 | Brinsley Road Reserve | Camberwell | | | |
| | | | <i>Calodendron capense</i> | <i>Cedrus atlantica</i> 'Glauca' | |
| | | | <i>Cupressus macrocarpa</i> | <i>Ficus macrophylla</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Fraxinus</i> 'Cimmzam' | |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Fraxinus griffithii</i> | |
| | | | <i>Ficus macrophylla</i> | <i>Fraxinus</i> 'Raywood' | |
| | | | <i>Pinus canariensis</i> | <i>Quercus robur</i> | |
| | | | <i>Quercus canariensis</i> | <i>Quercus suber</i> | |
| | | | <i>Schinus molle</i> | | |
| | | | <i>Syzygium floribundum</i> | | |
| | | | <i>Ulmus procera</i> | | |
| 12 | Hartwell Station Reserve | Camberwell | | | |
| | | | <i>Quercus ilex</i> | <i>Angophora costata</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Cedrus atlantica</i> 'Glauca' | |
| | | | <i>Quercus palustris</i> | <i>Fraxinus</i> 'Cimmzam' | |
| | | | <i>Corymbia maculata</i> | <i>Fraxinus</i> 'Raywood' | |
| | | | <i>Eucalyptus melliodora</i> | <i>Quercus ilex</i> | |
| | | | <i>Melaleuca styphelioides</i> | <i>Quercus robur</i> | |
| | | | <i>Angophora costata</i> | | |
| 13 | Grovedale Park | Surrey Hills | | | |
| | | | <i>Cedrus deodara</i> | <i>Brachychiton acerifolius</i> | |
| | | | <i>Melia azederach</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Corymbia maculata</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Phoenix canariensis</i> | <i>Cedrus atlantica</i> 'Glauca' | |
| | | | <i>Quercus robur</i> | <i>Fraxinus</i> 'Cimmzam' | |
| | | | <i>Ulmus parvifolia</i> | <i>Fraxinus</i> 'Raywood' | |
| | | | <i>Lophostemon confertus</i> | <i>Quercus robur</i> | |

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|---|----------|--------------------------------------|---------------------------------|---|
| 14 | Patterson Reserve | Hawthorn | | | |
| | | | <i>Platanus x acerifolia</i> | <i>Angophora costata</i> | |
| | | | <i>Ulmus x hollandica</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Melaleuca styphelioides</i> | <i>Callitris endlicheri</i> | |
| | | | <i>Cuppressus macrocarpa</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Corymbia maculata</i> | <i>Corymbia citriodora</i> | |
| | | | <i>Eucalyptus viminalis</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Corymbia citriodora</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Allocasuarina littoralis</i> | | |
| | | | <i>Brachychiton populneus</i> | | |
| 15 | Chandler Park | Kew | | | |
| | EVC 56,895 | | <i>Eucalyptus camaldulensis</i> | <i>Allocasuarina littoralis</i> | <i>Acacia mearnsii</i> |
| | | | <i>Acacia dealbata</i> | <i>Callitris glaucophylla</i> | <i>Allocasuarina verticillata</i> |
| | | | <i>Melaleuca armillaris</i> | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus ovata</i> |
| | | | <i>Eucalyptus melliodora</i> | <i>Eucalyptus viminalis</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus ovata</i> | | <i>Eucalyptus radiata</i> |
| | | | <i>Eucalyptus leucoxylon</i> | | |
| 16 | Hyde Park | Kew East | | | |
| | | | <i>Corymbia maculata</i> | <i>Fraxinus griffithii</i> | |
| | | | <i>Agonis flexuosa</i> | <i>Quercus robur</i> | |
| | | | <i>Melaleuca linariifolia</i> | <i>Quercus suber</i> | |
| | | | <i>Eucalyptus sideroxylon</i> | | |
| | | | <i>Quercus robur</i> | | |
| | | | <i>Eucalyptus camaldulensis</i> | | |
| 17 | Pridmore Park Connect to Yarra Bank Reserve | Hawthorn | | | |
| | EVC 641 | | <i>Ulmus x hollandica</i> | <i>Brachychiton populneus</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus nicholii</i> | <i>Callitris endlicheri</i> | <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> |
| | | | <i>Populus deltoides</i> | <i>Callitris glaucophylla</i> | <i>Eucalyptus melliodora</i> |
| | | | <i>Eucalyptus melliodora</i> | <i>Corymbia ficifolia</i> | <i>Eucalyptus radiata</i> |
| | | | <i>Corymbia citriodora</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Quercus canariensis</i> | | |
| | | | <i>Grevillea robusta</i> | | |
| | | | <i>Corymbia maculata</i> | | |
| | | | <i>Eucalyptus botryoides</i> | | |



Project No:19030

Project A

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Table 3 Tree visual quality assessment outcomes and proposed tree species (cont)

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|---|---------------|--------------------------------------|---------------------------------|--|
| 18 | Ferndale Road Reserve (Central Zone) | Glen Iris | | | |
| | | | <i>Lophostemon confertus</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Melaleuca styphelioides</i> | <i>Angophora costata</i> | |
| | | | <i>Eucalyptus melliodora</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Eucalyptus nicholii</i> | <i>Eucalyptus cinerea</i> | |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Eucalyptus nicholii</i> | |
| 19 | Harrison Reserve (High Street) | Kew | | | |
| | EVC 55, 68 | | <i>Grevillea robusta</i> | <i>Brachychiton acerifolius</i> | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Brachychiton populneus</i> | <i>Acacia melanoxylon</i> |
| | | | <i>Platanus x acerifolia</i> | <i>Callitris glaucophylla</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Quercus palustris</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Lophostemon confertus</i> | <i>Fraxinus 'Cimmzam'</i> | |
| | | | <i>Pinus radiata</i> | <i>Fraxinus 'Raywood'</i> | |
| | | | <i>Populus x canadensis</i> | <i>Quercus ilex</i> | |
| | | | <i>Fraxinus 'Raywood'</i> | <i>Quercus robur</i> | |
| | | | <i>Quercus robur</i> | | |
| 20 | Winton Road Reserve | Ashburton | | | |
| | | | <i>Quercus robur</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Celtis sp.</i> | <i>Callitris endlicheri</i> | |
| | | | <i>Grevillea robusta</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Eucalyptus melliodora</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | | |
| | | | <i>Eucalyptus saligna</i> | | |
| 21 | Columba Street Reserve | Balwyn North | | | |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Angophora costata</i> | |
| | | | <i>Melaleuca linariifolia</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Corymbia citriodora</i> | <i>Callitris endlicheri</i> | |
| | | | <i>Eucalyptus viminalis</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Melaleuca styphelioides</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Corymbia maculata</i> | | |
| | | | <i>Eucalyptus polyanthemos</i> | | |
| | | | <i>Eucalyptus cladocalyx</i> | | |
| 22 | Gardiners Creek Linear Park - Tooronga Rd - Toorak Road | Hawthorn East | | | |
| | EVC 56 | | <i>Quercus sp.</i> | <i>Allocasuarina littoralis</i> | <i>Eucalyptus camaldulensis</i> |
| | | | <i>Eucalyptus maculata</i> | <i>Callitris glaucophylla</i> | <i>Eucalyptus melliodora</i> |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus ovata</i> |
| | | | | <i>Eucalyptus viminalis</i> | |

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|---|----------|--------------------------------------|--|--|
| 23 | OCLP G - Normanby Road to Argyle Road | Kew | | | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Liquidambar styraciflua</i> | <i>Eucalyptus camaldulensis</i> | |
| | | | <i>Quercus canariensis</i> | <i>Liquidamber styraciflua 'Palo Alto'</i> | - |
| | | | <i>Eucalyptus saligna</i> | <i>Quercus suber</i> | - |
| | | | <i>Eucalyptus maculata</i> | <i>Quercus ilex</i> | - |
| | | | <i>Corymbia maculata</i> | | - |
| 24 | John August Reserve | Balwyn | | | |
| | | | <i>Syzigium smithii</i> | <i>Angophora costata</i> | |
| | | | <i>Quercus canariensis</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Quercus palustris</i> | <i>Fraxinus 'Cimmzam'</i> | |
| | | | <i>Melaleuca linariifolia</i> | <i>Fraxinus 'Raywood'</i> | |
| | | | <i>Quercus robur</i> | <i>Quercus ilex</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Quercus robur</i> | |
| | | | <i>Eucalyptus melliodora</i> | | |
| 25 | OCLP D - Spruzen Avenue to Belford Road | Kew East | | | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Angophora costata</i> | |
| | | | <i>Eucalyptus botryoides</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Eucalyptus nicholii</i> | <i>Eucalyptus camaldulensis</i> | |
| | | | <i>Acacia implexa</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Eucalyptus leucoxylon</i> | | |
| | | | <i>Acacia baileyana</i> | | |
| | | | <i>Acacia mearnsii</i> | | |
| 26 | OCLP A - Princess Street to Peel Street | Kew | | | |
| | | | <i>Callistemon viminalis</i> | <i>Angophora costata</i> | |
| | | | <i>Eucalyptus melliodora</i> | <i>Eucalyptus polyanthemos</i> | |
| | | | <i>Angophora costata</i> | <i>Grevillea robusta</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | | |
| | | | <i>Eucalyptus saligna</i> | | |
| | | | <i>Grevillea robusta</i> | | |

Table 3 Tree visual quality assessment outcomes and proposed tree species (cont)

| Site Count | Reserve Name | Suburb | Quality Assessment Existing Trees | Proposed Tree Species | Proposed Tree Species for Biodiversity |
|------------|--|--------------|--------------------------------------|----------------------------------|--|
| 27 | OCLP F - High Street to Normanby Road | Kew East | | | |
| | | | <i>Eucalyptus cladocalyx</i> | <i>Allocasuarina littoralis</i> | |
| | | | <i>Allocasuarina littoralis</i> | <i>Angophora costata</i> | |
| | | | <i>Ulmus X hollandica</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Eucalyptus melliodora</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Eucalyptus leucoxylon</i> | | |
| 28 | King Street Chain - Naroo Street Reserve | Balwyn North | | | |
| | | | <i>Cupressus torulosa</i> | <i>Brachychiton populneus</i> | |
| | | | <i>Quercus robur</i> | <i>Callitris endlicheri</i> | |
| | | | <i>Eucalyptus sideroxylon</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Melaleuca sp.</i> | <i>Corymbia ficifolia</i> | |
| | | | <i>Cedrus deodara</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Lophostemon confertus</i> | | |
| 29 | Kate Campbell Reserve | Kew | | | |
| | | | <i>Eucalyptus nicholii</i> | <i>Callitris glaucophylla</i> | |
| | | | <i>Allocasuarina torulosa</i> | <i>Eucalyptus spathulata</i> | |
| | | | <i>Eucalyptus camaldulensis</i> | <i>Fraxinus 'Cimmzam'</i> | |
| | | | <i>Eucalyptus botryoides</i> | <i>Fraxinus 'Raywood'</i> | |
| | | | <i>Fraxinus sp.</i> | <i>Quercus ilex</i> | |
| | | | <i>Cupressus torulosa</i> | <i>Quercus robur</i> | |
| 30 | South Surrey Park EVC 447 164,465 | Surrey Hills | | | |
| | | | <i>Eucalyptus melliodora</i> | <i>Allocasuarina littoralis</i> | <i>Acacia mearnsii</i> |
| | | | <i>Eucalyptus tricarpa</i> | <i>Angophora costata</i> | <i>Acacia melanoxylon</i> |
| | | | <i>Acacia melanoxylon</i> | <i>Brachychiton populneus</i> | <i>Banksia marginata</i> |
| | | | <i>Angophora costata</i> | <i>Cedrus atlantica 'Glauca'</i> | <i>Eucalyptus leucoxylon ssp connata</i> |
| | | | <i>Cinnamomum camphora</i> | <i>Corymbia ficifolia</i> | <i>Eucalyptus melliodora</i> |
| | | | <i>Cedrus deodara</i> | <i>Eucalyptus spathulata</i> | <i>Eucalyptus melliodora</i> |
| | | | <i>Melaleuca styphelioides</i> | | <i>Eucalyptus obliqua</i> |
| 30 | | | <i>Eucalyptus camaldulensis</i> | | <i>Eucalyptus radiata s.l.</i> |
| | | | <i>Eucalyptus cladocalyx</i> | | <i>Eucalyptus rubida</i> |

CANOPY DIVERSITY, COMPOSITION AND FORM

The Tree Canopy Replacement Project is a unique opportunity to develop a more diverse tree canopy for the City of Boroondara to address a broad range of concerns. These include a consideration of the mix of evergreen and deciduous species, along with their location, to provide seasonal interest and thermal benefits of cooling and shade in summer, with access to light winter. The potential for tree canopy to contribute to design outcomes for the selected reserves through strategic selection and focus on compositional aspects such as continuity of form, juxtaposition of contrasting canopy density and massing of individual or group plantings should not be under estimated as trees form a critical part of the future structure of such spaces.

Melbourne’s design history is reflected in the diverse plantings within the City of Boroondara This legacy has the potential to inspire future plantings that carry forward the best aspects of the gardenesque approach to design and its emphasis on the horticultural specimen to a more responsive and aesthetic outcome for the City.



Sample of tree canopy diversity within the City of Boroondara

Soil test results and recommendations

Soil testing was undertaken by Sportsturf Consultants (Aust) Pty Ltd for 11 sites in total. Two major contributors toward the inclusion of reserves for soil testing were:

- Desktop assessment of existing tree survey data within reserves that indicated higher number of trees in the ULE 0-11 category.
- Visual assessment of soil conditions on surface in conjunction with visual assessment of existing tree canopy health.

The soil test results are generally consistent across all the reserves. Some localised exceptions include Hyde Park with sandy-clay texture, which should not impact on tree canopy establishment.

Reserves where soil amelioration should be considered include:

- Chandler Park, Kate Campbell, OCLP-F, and Columba Street reserves where low pH in the range 4.8-5.9 may impact on tree canopy establishment.
- The following rates have been recommended for ameliorating acidic soils. Chandler Park, Kate Campbell Reserve and OCLP-F 20kg/100m² and Columba Street Reserve 30kg/100m².

The following recommendations have also been provided for Lynden Park and South Surrey Park:

- Application of Potassium Sulphate at the rate 10kg/100m² to correct deficiency in these elements.

A general recommendation across all reserves is for application of NPK 20:0:16 fertiliser or similar for plant establishment, including biodiversity sites. All fertilisers applied must be phosphorous free.

The soil test results also point to a concern with the physical properties of the reserve soils tested. Without exception each the soil test results highlight a concern with waterlogging and compaction. This was such a common occurrence that further soil testing in the remainder of the sites yet to be tested should be considered. Soil cultivation, to reduce compaction will be required in conjunction with the amelioration recommendations outlined in the report for successful tree establishment.

Table 4 Soil test result summary

| Reserve Name | Suburb | Soil Test Result Summary |
|------------------------|--------------|---|
| Markham Reserve | Ashburton | Texture - clay loam pH - 6.6 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Lynden Park | Camberwell | Texture - clay loam pH - 6.1 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Koonung Creek Reserve | North Balwyn | Texture - clay loam pH - 6.1 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Chandler Park | Kew | Texture - clay loam pH - 5.9 Total Salts - adequate and of no concern Notes - moderately acidic pH level which needs to be ameliorated. Soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Hyde Park | Kew East | Texture - sandy clay pH - 6.2 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| OCLP G | Kew | Texture - clay loam pH - 6.7 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| OCLP F | Kew East | Texture - clay loam pH - 5.9 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Pridmore Park | Hawthorn | Texture - clay loam pH - 6.2 Total Salts - adequate and of no concern Notes - phosphorous levels quite high, avoid adding phosphorous fertilisers and ameliorants. Soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Columba Street Reserve | Balwyn North | Texture - clay loam pH - 4.8 Total Salts - adequate and of no concern Notes - very strongly acidic pH level which needs to be ameliorated. Soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| Kate Campbell Reserve | Kew | Texture - clay loam pH - 5.9 Total Salts - adequate and of no concern Notes - moderatley acidic pH level which needs to be ameliorated. Soil may be prone to waterlogging and compaction, no issue with nutrient retention. |
| South Surrey Park | Surrey Hills | Texture - clay loam pH - 6.5 Total Salts - adequate and of no concern Notes - soil may be prone to waterlogging and compaction, no issue with nutrient retention. |

Tree planting and management

Tree planting, maintenance and management should be carried out by qualified contractors. The detail provided is typical, but indicates desired outcomes, therefore site conditions should be understood prior to carrying out tree planting works.

Tree supply should be from reputable growers and suppliers. Format for supply may range from forestry tubes or tubestock to semi-advanced depending on species and best practice, for example preferred format for tree planting in biodiversity sites may be tubestock.

The following Australian Standards need to be considered for any tree-related works :

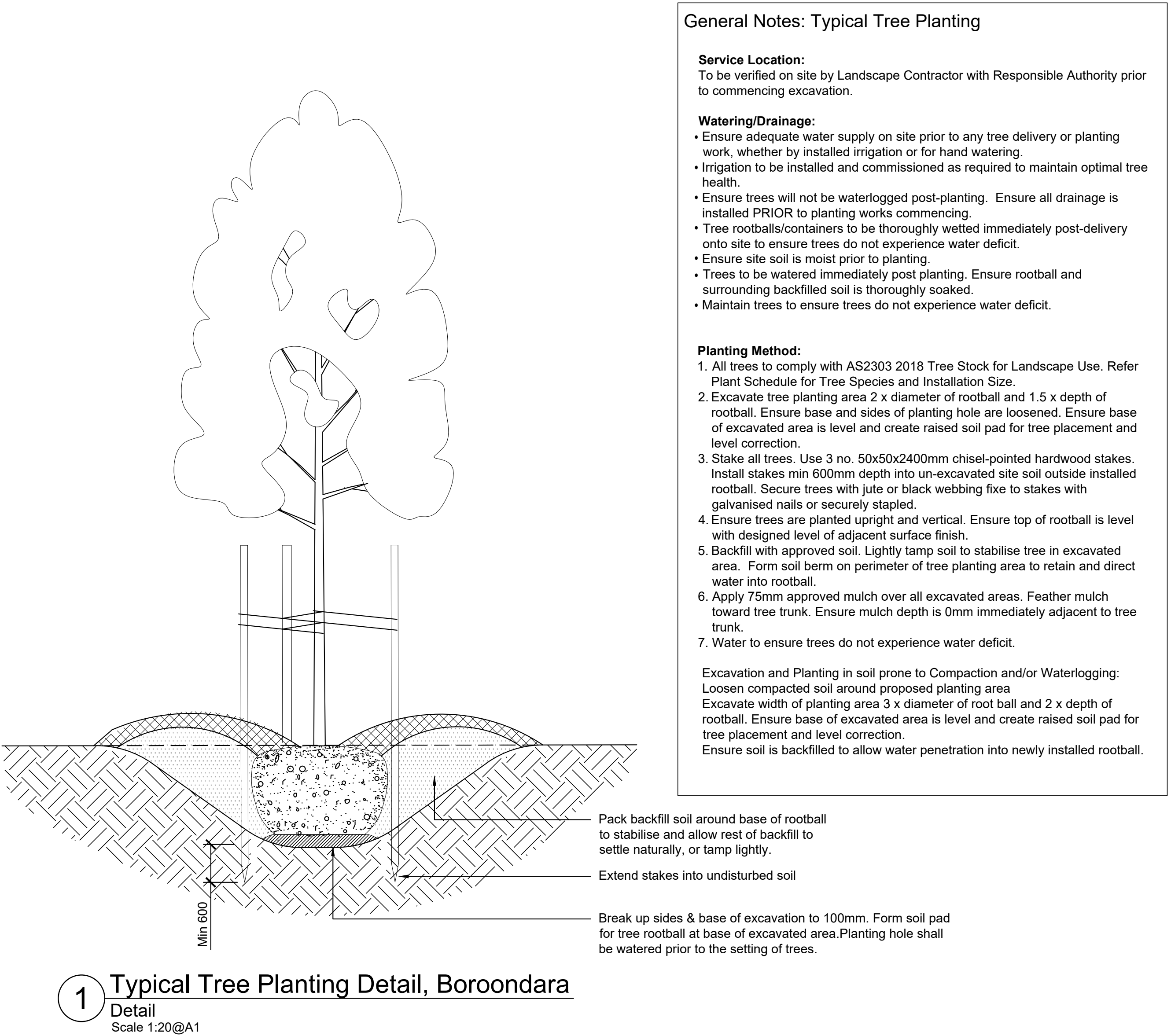
AS4970:2009 (Amendment 1-2010) - Protection of Trees on Development Sites.
AS2303:2018 - Tree Stock for Landscape Use.
AS4419:2018 - Soils for Landscaping and Garden Use
AS4454:2012 (Amendment 2-2018) - Composts, Soil Conditioners and Mulches.
AS4373:2007 - Pruning of Amenity Trees.

The detail provided is for information. It defines the process of tree planting and the works that need to be undertaken. The edge between existing turf and mulch should be maintained such that competition from adjacent grass species and weeds do not impede successful tree establishment. Two approaches are the most commonly utilised here. Spraying of herbicide at the turf/mulch edge and maintaining a spade edge. Spraying with systemic, broad spectrum herbicide such as 'Roundup®' is effective and cost efficient but must be carried out on a regular basis before any encroachment of turf into the mulch bowl. A spade edge has a higher initial cost but provides a neater edge which also forms a legible defined extent for herbicide application. An indicative, probable cost for spade edging has been included in Table 5 - Opinion of Probable Cost schedule as a provisional item.

Where tree planting has been indicated in areas such as Koonung Creek Reserve or Markham Reserve, that may contain landfill or have capping layers in place, contractors need to refer to Council geotechnical reports and to dispose of any soil not retained for planting in an appropriate manner.

In addition, Contractors should refer to *Tree Management Guidelines* 2010, City of Boroondara.

Figure 6 Typical Tree Planting Detail



Opinion of Probable Cost

The Opinion of Probable Cost (OPC) - Table 5 - is prepared on the basis that all works are tendered and completed as a single, unstaged project, not for a staged implementation where such works might be spread over a number of years. Alternative procurement methods such as advanced procurement of trees which may not be as readily available could be considered. Suppliers may charge holding costs for tree stock if planting is delayed.

Costs provided have been informed by current market rates for landscape installation, irrespective of the type of project. In addition 45L trees have been specified, but this may not be suitable for some types of planting, for example in areas nominated for biodiversity, therefore forestry tubes have also been costed equal to the number of trees calculated for planting biodiversity sites.

Watering for tree establishment is particularly critical over the warmer months between December and March. Provision for hand-watering has been included as part of the maintenance and establishment cost. This is, based on 2019-2020 rates. Additional water costs should be considered if local weather conditions differ from that recently experienced.

SCHEDULE NOTES

Site Preparation and Earthworks: Preliminary works to prepare the site for planting. This typically involves weed control prior to any excavation. Success in weed control should be approved prior to further works taking place. An allowance for Trimming and Grading has also been included to ensure the site is prepared for tree planting and that grades are suitable. Where trees are planted on a slope, these works will minimise water runoff in the establishment phase. Trees may have been identified to be replaced and an allowance equal to the number of trees identified with low life expectancy (LE).

Cultivation and Soils: Soil test results inform this component of tree planting work. An allowance has been provided for soil amelioration and cultivation as part of amelioration works to remedy or 'ameliorate' any deficiencies in soil chemical or physical characteristics to ensure successful tree establishment.

Planting: A typical tree planting detail has been included for reference. Trees planted should follow this detail whilst being mindful of the relevant standards for tree supply and care. An allowance has been provided for semi-advance trees in line with typical Council tree planting sizes and also for Forestry tubes for biodiversity sites. Mulch should be used to reduce weed competition and minimise surface water loss during tree establishment. Mulch should conform to Australian standards listed for these products. Tree protection during establishment includes the use of staking and tying using hardwood stakes and black webbing attached in a 'figure' 8 configuration. Trees planted under the NEL canopy replacement program will have their tops painted yellow for easier identification.

Maintenance and Establishment: Tasks covered under this item are listed in Table 6 - Tree Maintenance Matrix with indications on timing and frequency of tasks. Reporting back to the Superintendent of the tree planting works should also occur.

Project Management: This provisional sum provides for further documentation, community engagement and Council resourcing to manage the project and contractors.

Table 5 Opinion of Probable Cost schedule

| | | | | | |
|--|---|-------|------------|------------|----------------|
| Schedule : Issue D DRAFT | | | GbLA | | |
| Project: 19030_Boroondara Project A | | | | | |
| Costs currently based on 4217 trees to be planted | | | 31.05.20 | | |
| No. | Item | Unit | Qty | Rate | Amount |
| A | Site Preparation and Earthworks | | | | |
| | A.01 Weed control program (based on 1m²/tree) | m² | 4,217 | \$0.52 | \$2,192.84 |
| | A.02 Trimming & Grading of existing site where required to facilitate tree planting. (150mm depth) | m³ | 499 | \$26.13 | \$13,038.87 |
| | A.03 Removal of existing trees inclusive of stump grinding | No. | 1,904 | \$600.00 | \$1,142,400.00 |
| K | Cultivation and Soils | | | | |
| | K.01 Cultivation & Amelioration | m² | 4,217 | \$1.83 | \$7,717.11 |
| | K.02 Supply & install Stockpiled topsoil | m³ | 499 | \$22.14 | \$11,047.86 |
| L | Planting | | | | |
| | L. 01 Plant material (Supply & Installation) | | | | |
| | Container & plant sizes | | | | |
| | ~ Evergreen & Deciduous Trees 45L | No. | 2,107 | \$232.87 | \$490,657.09 |
| | ~ Evergreen Trees (Forestry Tubes) | No. | 2,110 | \$2.90 | \$6,119.00 |
| | L. 02 Supply & spread organic mulch (75mm depth) | m³ | 250 | \$100.00 | \$25,000.00 |
| | L. 03 Supply & install 3 x 50x50x2400mm hardwood chisel-pointed stakes, tops painted yellow and black webbing (2,107 trees) | No. | 12,801 | \$6.90 | \$88,326.90 |
| | L. 04 Supply & Install Corflute 450 x 200mm protective guarding to Forestry Tubes (2,110trees) | No. | 2,110 | \$7.09 | \$14,959.90 |
| O | Maintenance and Establishment | | | | |
| | OO.01 - OO.18 Establishment & maintenance (water, mulch, replacement if fail) | weeks | 156 | \$8,107.00 | \$1,264,692.00 |
| P | Project Management | weeks | 364 | \$2,115.38 | \$769,998.32 |
| | | | | | |
| | Sub Total | | | | \$3,836,149.89 |
| | Contingency 10% | | | | \$383,614.99 |
| Q | Provisional Items | | | | |
| | Spade edging (2,107 trees) | lin.m | 6,615 | \$6.17 | \$40,814.55 |
| | Supply & install imported topsoil | m³ | 499 | \$30.00 | \$14,970.00 |
| | Additional Soil Testing (inclusive of testing for nutrients, organic content and drainage) | Item | 1 | \$650.00 | \$650.00 |
| | Overall Sub Total | | | | \$4,276,199.43 |
| | Plus GST | | | | \$427,619.94 |
| | Total | | | | \$4,703,819.37 |
| | | | | | |
| | | | © May 2020 | | |
| Assumptions and Exclusions Preliminaries, set out, insurances have been excluded. Erosion control is site specific and has not been included. Assumption is site topsoil is used. Provisional rate for imported topsoil is provided if required as part of amelioration strategy. Provisional rate for spade edging has been included. Irrigation has been excluded, watering has been included as part of maintenance and establishment. Rates for tree removal will vary according to the size of the tree being removed. Rates will need to be confirmed with the Contractor. Tree removal rate provided in the OPC is for tree size 6-12m. Other indicative rates for tree removal for tree size -6m ≈ \$400.00 and tree removal rate for tree size 12m+ ≈ \$800.00. Tree removal rates may also vary due to ease of access and diameter at breast height (DBH) of individual trees. | | | | | |
| Copyright and Disclaimer The information regarding cost estimates contained in this Opinion of Probable Cost (OPC) is copyright and is intended for the use of (Boroondara) only, the party to whom it is addressed by GbLA. The estimates of cost are based on information available to GbLA at the time of preparing the OPC, and there are various factors that may change subsequently that could significantly affect the cost estimates. GbLA disclaims all liability in any area of the law for any claims made by any third party for loss or damage or loss (including consequential damage or loss) arising out of the use of the information contained in this OPC. GbLA accepts no responsibility whatsoever to any third party who may use or rely on the whole or any part of the information. | | | | | |



Project No:19030

Project A

GbLA.COM.AU

Table 6 Tree maintenance matrix

| Podiums, Reserves & Streets | | | | | | | | | | |
|----------------------------------|---|--|--------|-------------|---------|-----------|----------------|----------|-----------|--|
| Item | Outcome/Minimum Performance Standard | Actions | Timing | | | | | | | Notes |
| | | | Weekly | Fortnightly | Monthly | Quarterly | Twice per year | Annually | As needed | |
| 1. Trees | | | | | | | | | | |
| 1a Watering | Adequate soil moisture retained around tree bowls without soil saturation to promote optimal tree growth. | Irrigation by water truck | | | | | | | | Water application amounts and application intervals to be adjusted according to seasonal and weather variances |
| 1b Formative pruning | Trees maintained to have a single leader and good form, free of pests and diseases to allow optimal growth. | Works undertaken by a qualified arborist to remove co-dominant leaders, crossing branches, dead, damaged or diseased growth, pests and diseases controlled, suckers removed, crown lifting undertaken as required | | | | | | | | Typically Autumn + Spring, consider species requirements. |
| 1c Removal of dead/damaged trees | Trees removed as soon as identified. | Planting hole filled, mulch bowl and stakes to remain. | | | | | | | | Photographic record taken, then tree removed. |
| 1d Tree Replacement | Undertaken in a proactive, systematic way. | Arborist report undertaken at the nursery issued to Superintendent and Council, Council approval of tree stock at delivery, planting undertaken as per details and specification | | | | | | | | No replacement planting in summer. |
| 1e Stakes and Ties | Stakes and ties maintained to allow movement of trunk to promote development of strong trunk and branch structure and root system | Stakes straightened. Damaged stakes replaced. Tension and connections of ties maintained to allow some trunk movement while providing support during strong winds. Ties removed at a point agreed between Council and Superintendent | | | | | | | | |
| 1f Fertiliser + nutrients | Fertiliser applied to promote optimal tree growth | Slow release fertiliser and other nutrients/trace elements applied to tree bowls to promote optimal tree growth. A qualified arborist to assess the requirements and application rates for fertilisers and other nutrients. | | | | | | | | Application at the end of winter and mid-summer or as required |
| 1g Mulch Bowls | Mulch bowls maintained weed-free and to retain soil moisture to root zone | Mulch topped up to maintain a minimum of 50mm depth to the mulch bowl. Weeding undertaken as required. | | | | | | | | Mulch topped up in spring and summer. Weeds controlled monthly |
| 1h Builders Damage/Vandalism | Trees maintained or replaced as required | Proactively manage trees damaged by builders or vandalised. Trees that require replacement to be removed as soon as identified and replanted quarterly. Pruning to remove damaged branches to be done as soon as identified. Stakes and ties and proprietary repaired/straightened at the same time. | | | | | | | | |
| 1i Management of existing Trees | Trees managed as per Council requirements | Undertake quarterly inspections by a suitably qualified arborist and complete tree works as per arborist recommendations | | | | | | | | |

Table 6 identifies the typical tasks associated with a tree maintenance contract, their timing and frequency.