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Urban Forest Diversity Guidelines – Tree Species Selection Guidelines for the City of Melbourne 3
Executive Summary

The Urban Forest Diversity Guidelines is a subsidiary document to the City of Melbourne Urban Forest Strategy. The guidelines are intended to inform the Tree Precinct Plans that in turn will determine locations for street tree plantings. Park trees will be planted using existing Masterplans and site specific plans.

The urban forest is a significant asset for the City of Melbourne and to protect that asset it is necessary to diversify its content. Urban forest diversity will make a more resilient and robust forest, help protect the forest as a whole from pests and pathogens, streamline maintenance programs, and even out annual budgetary requirements. Without diversity, the urban forest is at greater risk from extreme events such as drought and climate change, and from the urban heat island effect.

The urban Forest Diversity Guidelines recommend that by 2040 no more than 5 percent of the forest is to be of any single species, no more than 10 percent is to be of any one genus, and no more than 20 percent is to be of any one Family.

The current profile of the urban forest contains an overproportion of the Family Myrtaceae, as well as the genus Eucalyptus. Regular annual tree planting to 2040 is proposed to reduce this predominance, and to create a forest with greater age spread.

This document also recommends a full review of the City’s Elm and Plane Tree populations, to determine best locations to grow these species.

The Urban Forest Diversity Guidelines provide a non-subjective, scientifically based set of criteria for establishing what tree species are suitable for the urban conditions found in the City of Melbourne.

The Master List of Street and Park Trees provides a broad selection of trees that can meet all of the needs of the City in terms of adaptability, heritage and character.

Trees that are suitable for one location may not be suitable to another location. In order to find the right tree for the right place, a typology of street and park tree locations has been developed, with each Location Type accompanied by minimum criteria necessary for successful tree growth in that location.

By crossreferencing The Master List of Street and Park Trees with the Location Types, a set of tree lists for the diverse locations across the City of Melbourne has been established.

These Location Type Tree Lists can be further refined according to additional criteria such as neighbourhood character, heritage, and degree of shade, and it is such site specificity that will be investigated in the Precinct Street Tree Master Plans.

The Urban Forest Diversity Guidelines are considered a live document, for regular review, and capable of being updated as new knowledge and understanding of the City’s requirements develops.
How to use this document

The information in this document is structured to facilitate clear decision making for street tree selection.

Chapter 1 – Introduction

The introduction outlines the relationship between the Urban Forest Strategy and the Urban Forest Diversity Guidelines.

It also summarises some of the key issues facing the growth of trees in Melbourne both today and in the future.

Chapter 2 – Tree Species Selection Criteria

This chapter outlines the selection criteria that have been chosen to identify which tree species are most suitable for the City of Melbourne’s diverse types of streets and parks.

Chapter 3 – Tree Planting in Melbourne

This chapter identifies the typical tree growing conditions across the types of street and park environment in Melbourne, with a focus on street trees and streetscapes.

Chapter 4 – Choosing the Right Tree

This chapter identifies the process for selecting the most appropriate tree species for a particular location.
1. Introduction

This chapter outlines the relationship between the Urban Forest Strategy and the Urban Forest Diversity Guidelines. It also summarises some of the key issues facing the growth of trees in Melbourne both today and in the future.
1.1 Overview

The City of Melbourne’s Urban Forest Strategy sets out the blueprint for achieving our vision of a resilient, healthy and diverse urban forest that will contribute to the health and wellbeing of our community and to the creation of a liveable city. A series of challenges currently faces our urban forest, and the City of Melbourne must now manage and transform our urban forest in a holistic and multidisciplinary manner in order to achieve our vision. The challenges we face include the fact that many boulevard and specimen trees are reaching the end of their natural life. Coupled with the effects of drought, increasing intensity of heat during summer, and water restrictions, this decline has been accelerated and in many cases is irreversible. The opportunity now exists to transform our public and private urban forest into a healthy, diverse, resilient and well designed forest that will enable our City to adapt to a changing climate, mitigate urban heat island effects and provide protection and wellbeing to the community.

The work that this opportunity provides will be guided by 6 principles developed to ensure all future work contributes to achieving our vision. These are:

- Adapt to climate change.
- Mitigate urban heat island effects.
- Create a water sensitive city.
- Create healthy ecosystems.
- Design our urban landscapes for community health, wellbeing and liveability.
- Position Melbourne as a leader in urban forestry.

As part of this process, a need has been identified to produce a scientifically based suite of tree species lists that highlight suitable tree species to suit various Location Types in Melbourne. This document will form the basis for ensuring diversity within our urban forest: diversity in species, age and growth rates. The scientifically based approach will ensure that overall tree selection is fit for purpose, within the context of individual sites and also of the municipality as a whole. Building the urban forest as a living ecosystem will rely on smart species selection to deal with issues such as improving biodiversity, improving soil moisture retention, reducing stormwater flows, increasing shade and canopy cover, reducing infrastructure conflicts and ensuring our urban forest provides the maximum benefits for our communities. This work will further inform species selection within all future park masterplans, precinct plans and capital works and renewal programs.

**Objectives of the Urban Forest Diversity Guidelines**

- Ensure urban forest diversification in age, species and health across the municipality.
- Provide scientifically based criteria for selecting tree species in urban Melbourne.
- Mitigate risk of pest and disease attacks.
- Develop a typology of City of Melbourne street and park locations and allocate relevant species for each Location Type.
- Ensure that nominated species are likely to survive and succeed in the face of predicted climate change.

**Values of Diversity**

To mitigate the risk of economic loss, financial advisors recommend asset diversification. The same principle applies for an environmental asset such as an urban forest. The greater the diversification within a forest, the lower the risk of losing the entire forest in one event, such as a pest and disease attack or an extreme heat event. By diversification we mean a variety of:

- Tree species.
- Ages of trees.
- Growth rates of trees.

By ensuring that these types of diversity are fostered in our urban forest, we are able to reduce overall vulnerability of our tree population.
History of Species Diversity
Adapted from Carver (1989), Spencer (1986), and Yau (1982).

After the initial settlement of Melbourne, when indigenous bushland was cleared to make way for a burgeoning township, trees were given little priority. In the early days they were seen as a resource to be utilised and little emphasis was given to the beautification of the town.

By the 1850s, Blue Gums were the main planting along the Yarra and St Kilda Rd due to their quick growing nature and their ability to withstand the extremes of Melbourne’s cool wet winters and hot dry summers. Avenues of Silky Oak, Grevillea robusta, were also planted between the Botanic Gardens and Princes Bridge. Plane trees, American Ash and Pinus radiata were all trialled throughout this period as avenues, proving themselves to be hardy specimens for the Melbourne landscape. Conifers also played a large role in forming the larger Victorian landscape around this time, with over 355,000 plants being custom grown at the Botanic Gardens for distribution to Governmental public reserves, schools, cemeteries, and churches throughout the state. Peppercorns were also favoured due to their lush foliage and heritage values.

Interestingly, by the 1870s, through Baron Von Mueller’s influence, the gentleman of society – including Municipal Mayors – fully recognised the benefits of street tree plantings in the city and in principal towns. Many of Melbourne’s reserves and parks were laid out at this time and many still reflect the preference for Conifers. By the 1880s however, Pines and Blue Gums had lost their popularity and replacement with other species had begun. Blue Gums in Victoria Parade were ringbarked by a local gardener, and many considered both Pines and Blue Gums too gloomy and dense. The Peppercorns also fell out of favour due, their large weeping habit considered inappropriate for successful street trees. The nature of deciduous trees’ shading during summer and allowing sunlight in winter was a new way of thinking in urban streetscape design to allow for the comfort of people. This was the beginning of the planting of Elms as shade trees.

By the early twentieth century, Planes, Elms, Oaks, Poplars, Lagunarias, Chestnuts and Phoenix canariensis were prescribed for the boulevards, streets and parks of Melbourne. For the drier areas north of Melbourne, Kurrajongs, Silky Oaks, Moreton Bay Figs, She-oaks and Golden Wattles were recommended. This period shows a much more diverse range of trees used in the more cultivated areas and highlights the thought that was given to trees environmental benefits and their abilities to withstand the Melbourne climate.

The rapid expansion of Melbourne’s suburbs after the First and Second World Wars saw bushland retreat and small scale trees being planted along the streets. Trees such as the Red Flowering Gum, Pittosporum, Lophostemon confertus and Prunus were popular, gracing newer suburbs. Particularly after the Second World War, natives had a resurgence in popularity with more Eucalypts, Melaleucas and Callistemons being introduced into Melbourne as street trees. Plane trees were particularly favoured for the ability to withstand harsh urban conditions such as air pollution and poor soil conditions. Planes replaced the St Kilda Poplars during the 1960s. During the 1980s, there was another wave of indigenous tree species selection and they were encouraged as plantings to promote native ecosystems and attract wildlife. Such trees included Eucalyptus maculata, E. nicholli, E. leucoxylon, E. sideroxylon and E. citriodora.

Melbourne’s climate, hydrology patterns and soil types provide the opportunity for many species of trees, both native and exotic, to grow well. The many types of space within our urban fabric further provide opportunity for various species such as park specimens, smaller fastigiates for narrow laneways and streets, large shade trees for medians, specimens for boulevards and natives for our indigenous landscapes. Compared to the northern hemisphere our history of species diversity amongst our urban forest appears to be relatively short, however various articles certainly highlight the changes in cultural trends, succession of tree species trials, and the recognition of the importance of diversity.

Given the immense value of Melbourne’s existing tree population, and the potential vulnerability to the future challenges such as climate change and the urban heat island effect, working towards greater species diversity is a high priority.
Measures of Diversity

In Melbourne’s existing stock of trees, River Red Gums represent 11.7% of our total tree population whilst Plane trees 8% and Elms 4.7%. Frequently cited, though not scientifically based, rules of thumb in the United States suggest:

- Plant no more than 30% of a family.
- Plant no more than 20% of a genus.
- Plant no more than 10% of a species.

These rules predate the rise of concern about impacts of climate change, which is likely to increase the risk of planting urban monocultures. They also omit any consideration given to the use of cultivars and clones. Clones are genetically identical to their mother stock and therefore further increase the risks associated with planting monocultures.

The rules above are therefore best seen as conservative guides only within the City of Melbourne context. The emphasis should be on a diversity greater than that suggested by these rules.

Given the immense value of Melbourne’s existing tree population, and its potential vulnerability to such future challenges as climate change and the urban heat island effect, working towards greater species diversity is a high priority.

Species Diversity

If we cumulate the planes and elms:

Table 1: Top fifteen species within the City of Melbourne

<table>
<thead>
<tr>
<th>Species</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eucalyptus camaldulensis</td>
<td>11.7</td>
</tr>
<tr>
<td>Platanus × acerifolia</td>
<td>8</td>
</tr>
<tr>
<td>Ulmus sp.</td>
<td>4.7</td>
</tr>
<tr>
<td>Corymbia maculata</td>
<td>4.5</td>
</tr>
<tr>
<td>Eucalyptus melliodora</td>
<td>3.7</td>
</tr>
<tr>
<td>Allocasuarina verticillata</td>
<td>3.4</td>
</tr>
<tr>
<td>Acacia sp.</td>
<td>2.9</td>
</tr>
<tr>
<td>Acacia mearnsii</td>
<td>2.6</td>
</tr>
<tr>
<td>Ulmus procera</td>
<td>2.6</td>
</tr>
<tr>
<td>Corymbia citriodora</td>
<td>2.3</td>
</tr>
<tr>
<td>Eucalyptus leucoxylon</td>
<td>2.3</td>
</tr>
<tr>
<td>Casuarina glauca</td>
<td>2.1</td>
</tr>
<tr>
<td>Melaleuca ericifolia</td>
<td>2.1</td>
</tr>
<tr>
<td>Eucalyptus sp.</td>
<td>1.9</td>
</tr>
<tr>
<td>Angophora costata</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Genus Diversity

Table 2: Top fifteen genera within the City of Melbourne

<table>
<thead>
<tr>
<th>Genus</th>
<th>%</th>
<th>Genus</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eucalyptus</td>
<td>24.9</td>
<td>Quercus</td>
<td>2.6</td>
</tr>
<tr>
<td>Acacia</td>
<td>11.3</td>
<td>Ficus</td>
<td>2.0</td>
</tr>
<tr>
<td>Platanus</td>
<td>9.2</td>
<td>Angophora</td>
<td>1.7</td>
</tr>
<tr>
<td>Ulmus</td>
<td>9.2</td>
<td>Callistemon</td>
<td>1.5</td>
</tr>
<tr>
<td>Corymbia</td>
<td>7.1</td>
<td>Lophostemon</td>
<td>1.3</td>
</tr>
<tr>
<td>Melaleuca</td>
<td>4.0</td>
<td>Melia</td>
<td>1.3</td>
</tr>
<tr>
<td>Allocasuarina</td>
<td>3.8</td>
<td>Fraxinus</td>
<td>1.1</td>
</tr>
<tr>
<td>Casuarina</td>
<td>2.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Family Diversity

Table 3: Top fifteen Families within the City of Melbourne

<table>
<thead>
<tr>
<th>Family</th>
<th>%</th>
<th>Family</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myrtaceae</td>
<td>42.3</td>
<td>Meliaceae</td>
<td>1.3</td>
</tr>
<tr>
<td>Mimosaceae</td>
<td>11.3</td>
<td>Pinaceae</td>
<td>1.2</td>
</tr>
<tr>
<td>Ulmaceae</td>
<td>10.3</td>
<td>Oleaceae</td>
<td>1.2</td>
</tr>
<tr>
<td>Platanaceae</td>
<td>9.2</td>
<td>Araucariaceae</td>
<td>1.1</td>
</tr>
<tr>
<td>Casuarinaceae</td>
<td>6.8</td>
<td>Aceraceae</td>
<td>1.0</td>
</tr>
<tr>
<td>Fagaceae</td>
<td>2.6</td>
<td>Proteaceae</td>
<td>1.0</td>
</tr>
<tr>
<td>Moraceae</td>
<td>2.0</td>
<td>Anacardiaceae</td>
<td>0.9</td>
</tr>
<tr>
<td>Rosaceae</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Having a large representation of any one particular family leaves Melbourne’s urban forest vulnerable to pest and disease outbreaks that are family specific. The Myrtaceae family accounts for forty three per cent of Melbourne’s tree base, a proportion which could potentially be devastated if plant pathogens targeting this family, such as Myrtle rust, take hold.

There is a noted high percentage of the genus Eucalyptus and the Family Myrtaceae within our tree population. This is due in part to the fact that many different species make up this genus and Family, many of which are native to Victoria and also to the fact that these species have proven successful as urban trees. It should be noted that Royal Park, Melbourne’s largest park at 170 hectares and maintained primarily as native bushland, houses many of these Eucalypts and Myrtaceae Family, including a large proportion of our 5,400 Eucalyptus camaldulensis. Whilst we note the level of vulnerability amongst the tree population due to these high percentages of one genus and one Family, they form very important indigenous landscapes within our municipality that are healthy, robust and iconic for Melbourne.
Useful Life Expectancy of Melbourne's Trees

Table 4: Life expectancy of trees within the City of Melbourne
Based on an assessment of 50% of the tree population

<table>
<thead>
<tr>
<th>Time Until Senescence</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>3</td>
</tr>
<tr>
<td>1-5 years</td>
<td>11</td>
</tr>
<tr>
<td>6-10 years</td>
<td>15</td>
</tr>
<tr>
<td>11-20 years</td>
<td>18</td>
</tr>
<tr>
<td>21-30 years</td>
<td>17</td>
</tr>
<tr>
<td>31-60 years</td>
<td>24</td>
</tr>
<tr>
<td>61+ years</td>
<td>12</td>
</tr>
</tbody>
</table>

Useful Life Expectancy is a year bracket attributed to each tree for which we expect that tree to remain as a healthy robust specimen in the landscape. During the assessment, the age of the tree, and its health, form and growth patterns, are taken into account to determine its life expectancy. From this analysis we can derive that approximately thirty percent of Melbourne's tree population will not survive in the landscape for another 10 years and forty eight percent will not last 20 years.

Useful Life Expectancy Of Melbourne's Elms

Table 5: Life expectancy of Elm trees within the City of Melbourne

<table>
<thead>
<tr>
<th>Time Until Senescence</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>6</td>
</tr>
<tr>
<td>1-5 years</td>
<td>22</td>
</tr>
<tr>
<td>6-10 years</td>
<td>26</td>
</tr>
<tr>
<td>11-20 years</td>
<td>21</td>
</tr>
<tr>
<td>21-30 years</td>
<td>11</td>
</tr>
<tr>
<td>31-60 years</td>
<td>10</td>
</tr>
<tr>
<td>61+ years</td>
<td>4</td>
</tr>
</tbody>
</table>

Fifty five percent of Melbourne’s Elm population will not remain in the landscape after ten years due to their age.

In a cumulative analysis of our species diversity, Elms make up just over twelve percent of our tree population. Of these Elms, approximately fifty five percent are coming to the end of their natural lives and will senesce in the next 10 years. That means that 3000 elms will need to be removed from our parks and streets within the next 10 years; 700 of these will be lost within one year. However, Elm trees are an essential and iconic component of the diverse future mix of Melbourne’s trees.

Conclusions

It is clear then that the City of Melbourne’s current urban forest is vulnerable. Elms and Planes dominate our boulevards and CBD streets and we hold a high percentage of the genus Eucalyptus and the Myrtaceae Family, all of which contributes to an uneven spread of tree types within our urban forest. This makes our urban forest vulnerable to pest and disease attacks, mass senescence of certain species is likely to occur, and can magnify the deleterious effects of specific weather conditions such as heat waves: and all of which can contribute to large costs in removals and replacements.

As a result the City of Melbourne proposes to implement the following benchmarks to reduce vulnerability:

Species:
By 2040 the urban forest will be composed of:
- No more than 5% of any one Species.
- No more than 10% of any one Genus.
- No more than 20% of any one Family.

Age and growth rates:
- Diversity of tree age and growth rates will be encouraged through regular plantings each year to 2040. These regular plantings are to be much greater than the numbers of trees removed each year.

Health:
- No more than 10% of our tree population will be in poor health by 2040.

Whilst this analysis looks at the City’s urban forest as a whole and sets strategic targets for managing vulnerability, the implementation of diversity actions at street and park level must reflect the larger vision.

The concept of reducing the percentage of the Myrtaceae Family from forty three percent to twenty percent of the entire population may seem drastic, but it is a long term benchmark that spans the life of a tree, not that of an electoral cycle. By increasing street and park tree plantings each year, the City of Melbourne intends to increase the overall population of trees incrementally over a number of years, whilst ensuring that the Myrtaceae Family dominate the total percentage less and less each year.
Therefore, operational plans, such as the precinct planting plans will be reviewed and developed to bridge the gap between strategic targets and day to day management of tree removal and planting. These precinct plans, along with supporting research papers and landscape implementation plans, will help us to determine how to best replace declining trees and increase street and park plantings within our targets that all align with the broader Urban Forest Strategy principles.

Key Outcomes from this Report

- A full review will be conducted of Melbourne’s Elm and Plane populations, determining best locations within the city to grow each species, with each species comprising no more than 5% of the total tree population. An historical and character review of each of our prominent Boulevards should also be conducted to ensure we maintain their integrity and identity through specimen plantings.

- Over time and through increased planting regimes, the percentage of Myrtaceae will be required to be gradually reduced to encompass no more than twenty percent of Melbourne’s total tree population.

- Regular tree planting each planting season until 2040 will ensure the number of mature trees within the overall population is reduced to a more even spread of ages.

- The review of each Council Tree Precinct Plan in conjunction with overall targets will determine the spread of species, genus and Family down to individual streets and parks. These precinct plans will also highlight opportunities for increased plantings.
## 1.2 Project Process

### The Development of the Urban Forest Diversity Guidelines to Date

Project consultants ASPECT Studios and Tree Logic developed a tree list of potential future-proof street and park trees. The Preliminary Tree Selection List needed to provide a diverse range of species options that work alongside the principles set out in the City of Melbourne's Urban Forestry Strategy.

There was no use of subjective criteria such as personal taste, aesthetic and cultural values, perceptions, design requirements or any site based constraint, in the development of the initial tree selection list.

The Preliminary Tree Selection List was large, informed by Tree Logic’s experience as one of Victoria’s leading arboricultural companies.

An internal committee at the City of Melbourne contributed information including success rates of tree species growing within the existing urban forest.

The extensive Preliminary Tree Selection List was reduced to make it more workable and enable critical evaluation of suitable species.

Species that did not meet the urban forestry criteria, for instance drought tolerance, heat tolerance, wind tolerance or susceptibility to pathogens, were removed.

### Project Process

<table>
<thead>
<tr>
<th>Project Process</th>
<th>Project Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Melbourne Urban Forest Strategy</td>
<td>Urban Forest Principles</td>
</tr>
<tr>
<td>Review the Streets of Melbourne</td>
<td>Fact sheet for all street and park types</td>
</tr>
<tr>
<td>What are the current urban constraints in tree growth in Melbourne? e.g. Services, roads, pavements, built form</td>
<td></td>
</tr>
<tr>
<td>Identify all the existing and emerging tree diversity issues for Melbourne</td>
<td>Diversity issues noted</td>
</tr>
<tr>
<td>e.g. Climate change, water, pathogens</td>
<td></td>
</tr>
<tr>
<td>Review existing street trees used by the City of Melbourne</td>
<td>Street trees reviewed</td>
</tr>
<tr>
<td>Develop a Preliminary Tree Selection List of all trees possibly suitable for inner Melbourne</td>
<td>Preliminary Tree Selection List</td>
</tr>
<tr>
<td>Determine the selection criteria for the trees of Melbourne</td>
<td>Selection criteria established</td>
</tr>
<tr>
<td>e.g. Drought tolerance, heat tolerance, wind tolerance, longevity, pollution tolerance, pathogen susceptibility and manageability, Community health concerns regarding allergies, shade cast, level of maintenance, and tree litter drop</td>
<td></td>
</tr>
<tr>
<td>Identify all the possible tree species suitable for Melbourne that meet the base selection criteria. Discard those that do not meet the base criteria.</td>
<td>Master List of Trees Suitable for Streets and Parks</td>
</tr>
<tr>
<td>Establish additional criteria that may be useful is determining a trees suitability within Melbourne e.g. Can be pruned to grow beneath powerlines.</td>
<td>Tree Matrix</td>
</tr>
<tr>
<td>Develop a classification system for Melbourne’s boulevards, streets, lanes and parks and set minimum criteria for trees within those locations</td>
<td>Location Typology and selection criteria for each Location Type</td>
</tr>
<tr>
<td>Apply minimum criteria to Master List of Trees Suitable for Streets and Parks to produce Tree Lists for Location Types</td>
<td>Tree Lists for Location Types</td>
</tr>
</tbody>
</table>

Figure 4: Process and outcomes in developing the tree selection process for the Urban Forest Diversity Guidelines.
1.3 Status of document

A ‘live’ document

This document is envisaged as a live document with the ability to be updated as more data and information becomes available.

It is a requirement that this document be interactive and flexible for the user. Street tree management and urban forestry is a concept that is quickly developing, both from practical experience and scientific research. As a consequence the limitations of the tree selection process are carefully considered. The document will be updated as information, data and research become available.

Following are some examples:

• Potential tree pathogens may affect a particular selected species. If this is unmanageable then the tree species will be taken off the list. Similarly new cultivars and selections that are more disease resistant may be added.

• Species with reduced litter drop may be included at a later time.

• Climate change results in further extremes in weather and the status and suitability of species needs to be updated.

• Reassessment of on-site conditions such as greater incorporation of ‘positive’ planting innovations including structural soil beneath porous paving, infiltration, pits, and WSUD basins, may lead to species additions.

Formal review

A formal review will take place every five years. The next review should analyse the following aspects:

• Diversity Guidelines objectives: including how diversity targets are distributed amongst the Precinct Planting Design Plans and the distribution of percentage based targets.

• The Diversity Guideline’s relationship to the Urban Forest Strategy and other City of Melbourne policies.

• The ten base criteria used to establish suitability to urban conditions. These criteria are not fixed.

In addition, changing community perceptions can be incorporated, including any community consultation outcomes.
There are a number of issues confronting diversity of tree species in Melbourne. These issues have directly informed the selection criteria by which the preferred tree species have been identified. Species age, health and growth rates are key issues.

### Species Diversity

Tree diversity within an urban forest landscape provides functional and aesthetic benefits as well as biological and ecological advantages. “A common tenet of popular ecology is that high species diversity contributes to the stability of ecosystems by reducing hazards of catastrophic loss of a particular species” (Richards, 1983). However, there is much evidence from plant ecological studies that relationships between diversity and stability cannot be as simply expressed as this premise suggests.

Whilst street tree species do not occur in monocultures to the same extent as agricultural crops or forest plantations, the presence of grand boulevards, and neighbourhood heritage and character can mean that urban areas are dominated by relatively few species. Whilst these species have proven adaptable to changing urban environs there is an inherent risk in planting few species throughout a city.

Miller and Miller (1991) recommend that “liberal use” of a species should not exceed 10% of the total tree population. Jaenson et. al. (1992) suggest that city foresters should use species percentages derived from rapid, sample surveys to “reassess their recommended species lists to achieve a 5%-10% ceiling on any one tree species”. Whilst these simple numerical limits have no scientific basis they form a well used rule of thumb for essentially not putting all of your eggs in one basket.

As discussed, the 10% rule may appear to be outdated when considering the enormity of climate change issues and the increased use of clones and cultivars.

The following factors will dictate species diversity:

- Existing landscape character.
- Proven adaptability and tolerances of species.
- Availability.
- Ability to fulfil functional requirements.

In street tree populations, stability depends primarily on the longevity of individual trees and sufficient numbers of successfully planted replacements.

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### Age Diversity

Good age diversity is essential for future population stability. Most importantly, species that have been proven to be adapted should be stabilised through ensuring the population of that species has a good age range. When replacing older trees, this is more important than encouraging species diversity. As Richards (1983) states, to do otherwise “is a misuse of ecological concepts. Species diversity contributes to the stability of a street tree population only to the extent that individual species or cultivars prove successful”.

On an economic level, diversity of age means that maintaining the urban forest becomes a more evenly paced process. Extremes – for instance those associated with sudden mass senescence – are minimised, allowing for budgets to be more easily managed and regulated.

### Size Matters

A strategically located large-stature tree has a bigger impact on conserving energy and mitigating the urban heat island effect than a corresponding quantity of smaller trees. Larger trees do more to:

- Reduce stormwater run off.
- Extend the life of street surfaces.
- Improve local air, soil and water quality.
- Reduce atmospheric carbon dioxide.
- Provide wildlife habitat.
- Increase property values.
- Enhance the attractiveness of an area.
- Promote human health and well being.

The bigger the tree, the larger the benefits and, ultimately, the better the community’s quality of life.
Planting Sites
Species diversity may be constrained by the range and availability of planting sites. In particular, the number and type of planting sites that allow plantings to attain larger sizes needs to be addressed.

An optimal planting site allows space for uninhibited root growth (in volume, surface area and shape of surface area), provides uncompacted soil, good solar access, sufficient space away from adjacent structures such as walls and from vehicular traffic, and is not limited by overhead conditions (e.g. power lines).

New planting sites can be developed within established avenues and landscapes to allow the planting of species different to the established species. In addition to increasing species diversity, such plantings may provide a highlight (for instance at roundabouts, medians, or in kerb outstands), or additional aesthetic value.

Above and below ground restrictions mean there will always be sites in the City of Melbourne that require the use of small stature trees.

Genetic Diversity and the Use of Cultivars
Plant breeding is the science of adapting the genetics of plants for the benefit of humankind and has been in practice since the beginning of civilisation. The overall aim of plant breeding is to improve the quality and performance of plants with the objective, in this case, of developing trees better adapted to the urban environment and ultimately for the benefit of the community.

The London Plane (Platanus x acerifolia) and Dutch Elm (Ulmus x hollandica) growing in Melbourne are cloned populations, so the concept of plant breeding it is not a new occurrence to Melbourne’s streets.

Genetic diversity means a population is comprised of a broad range of individuals expressing different characteristics.

Genetic diversity is important because:

- Through artificial selection for specific characteristics, for instance quick growth, we may unintentionally select against other desirable characteristics, for example disease resistance. Wild populations provide a gene bank that can reinvigorate and strengthen domesticated populations.
- Ecosystem diversity requires species diversity.
- Adaptability can only occur in diverse populations and ecosystems. Diversity is essential for survival. Diversity is the basis for a robust and resilient population.
- Local wild populations are more likely to be adapted to local conditions than populations from elsewhere.

The maintenance of wild relatives of domesticated species is essential to plant breeding and sustainable agriculture and horticulture.

Cultivars – specially bred and domesticated varieties of wild populations – are bred because they possess desirable characteristics. While this can be good, in doing so we reduce the overall population’s genetic diversity, leaving it less adaptable in the longer term.

Cultivars developed and grown in areas where the local conditions are different to those of the City of Melbourne must be regarded as unproven until they have been adequately tested under local site and cultural conditions.

Cloning is an extreme example of cultivation. Cloned populations have in the past been encouraged by some because the individuals “all look the same”, hence present more neatly, are all guaranteed to have the same characteristics of disease resistance and so on. Cloned populations however, because their genetic diversity is nil, are more at risk, and minimise the adaptability and survivability of the urban forest.

A balance needs to be maintained between the use of cultivars (and clones) and stock grown from wild populations of local provenance.

Climate Change
Climate change requires consideration in the tree selection process. Climate model projections for the coming decades indicate an increasing risk of below average rainfall for southern and eastern mainland Australia, higher temperatures and evaporation, and below average runoff. In particular there is a significant projected increase in frequency of extremely hot years and extremely dry years (CSIRO, 2010). The selection of species more suited to extended dry periods and high heat will be beneficial. Other stresses caused by warming will include more pests, pathogens and fires.

In urban environments reducing the effects of climate change, for example the heat island effect, can be achieved by planting more trees. Not only do trees supply shade, reducing ground temperatures, but also trees evapotranspire – that is they release water into the air – which not only reduces urban temperatures but also improves the quality of the microclimate. Water needs to be retained in the landscape in order for evapotranspiration to occur and for the benefits of the urban forest to be maximised. Incorporating water sensitive urban design initiatives is another strategy that can be incorporated into tree planting systems.
Native and Exotic Species

Urban areas are highly contrived and very little of the original landscape – including soil and water conditions – remains. Just because a plant is indigenous to a site does not necessarily mean that the current site conditions are optimal for its growth. Urban soils and other conditions are often very different to the conditions in which both indigenous and exotic trees are found in the wild.

The focus should be on tree species adapted to a site and with acceptable characteristics relative to the desired purpose.

Non-local Australian species, and exotic species, can make positive contributions to the landscape. In some cases, these species are better adapted to the conditions of the highly modified urban environment. They may have positive attributes and are able to fulfill specific landscape functions.

The planting of the wrong choice of species, and planting in inappropriate locations, is an indication of poor planning rather than poor tree selection. In many instances the requirements set out by policy or the brief prevent the selection of suitable site-tolerant species.

Much of the character of the City of Melbourne is created by the presence of iconic exotic trees.

Remnant, indigenous and native vegetation has an important role to play in urban landscapes. It should be noted, however, that the maturity of existing vegetation is impossible to replace and the diversity of natural plant communities is difficult to replicate. Preservation of existing natural and remnant vegetation is the most efficient way to incorporate biodiversity in urban landscapes.

The use of indigenous tree species in streets will have greater impact and benefit when used adjacent to open space that has significant remnant vegetation.

Vulnerability to Pathogens and Pests

Pest and diseases are a component of the urban landscape and the City of Melbourne recognises that control measures will be required at times to maintain healthy and aesthetically pleasing landscapes.

The City of Melbourne will focus on problem prevention through appropriate tree selection, planting and tree maintenance.

When selecting tree species for Melbourne’s streets all effort will be made to select species that are known to be pest and disease resistant.

We do not know, however, the extent of pest and disease resistance in many tree species, especially within the urban environment.

Moreover, there will be situations where the existing street tree species may be under threat but their ongoing use is imperative considering the strong landscape character or cultural importance they represent.

It is not possible to select a palette of tree species for urban streets that are immune from potential infestation from pathogens, particularly when some potential threats could impact on entire plant families such as Myrtaceae (Eucalyptus spp., Corymbia spp., Callistemon spp., Melaleuca spp., Tristaniopsis spp., and Lophostemon confertus).

A number of approaches will help minimise the impact of pests and disease on the urban forest, for instance: constant monitoring of the urban forest and including the involvement of the Department of Primary Industries in that monitoring, ensuring the general health and vitality of urban forest, providing greater diversity, building a database of pest and disease, making sure of hygiene controls during maintenance, and ensuring good communication and working links with bordering councils.
### Table 7: Existing pathogens and pests affecting trees within the City of Melbourne

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Species Affected</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armillaria luteobubalina</td>
<td>A soil-borne fungus that causes root rot in a wide variety of plants including many native plants and introduced ornamental plants.</td>
<td>At present there is no one simple method for controlling Armillaria. A combination of sanitation measures, good horticultural management and the addition of organic matter to soils can be expected to retard the activity of Armillaria.</td>
</tr>
<tr>
<td>Brushtail Possums</td>
<td>A range of native and exotic tree species.</td>
<td>Possums, flying foxes and other native animals are protected species under the Wildlife Act 1975. A possum management strategy will be developed to manage the possum population on the particular site.</td>
</tr>
<tr>
<td>Elm Leaf Beetle (Pyrrha/ta luteola, Xanthogaleruca luteola (Müller, 1766))</td>
<td>Most species of Ulmus, also Zelkova serrata. Chinese Elm (U. parvifolia) is relatively resistant.</td>
<td>A range of management options are utilised in the control of Elm Leaf Beetle.</td>
</tr>
<tr>
<td>Elm Bark Beetle (Scolytus multistriatus)</td>
<td>Ulmus spp., particularly English Elm (U. procera) and Wych Elm (U. glabra).</td>
<td>The Elm Bark Beetle causes no serious damage to elms. However, it is the carrier of Dutch Elm Disease.</td>
</tr>
<tr>
<td>Exotic nematodes (microscopic worm like organisms, or eelworms), belonging to the Aphelenchoididae Family of nematodes such as Bursaphelenchus hunanensis</td>
<td>Pine trees. An infestation by a pathogenic Aphelenchoididae species may result in a rapid decline in tree health, with the needles turning yellow to brown and the twigs becoming dry and brittle. Symptoms first appear in late spring/early summer. Dead pines killed by the nematode tend to retain their needles for six to twelve months.</td>
<td>The only available control is removal of the tree and either burning the wood or deep burial well away from other trees, to kill the nematode and any potential vectors. Not known to be an ongoing threat to pines in Victoria.</td>
</tr>
<tr>
<td>Fusarium Wilt (Fusarium oxysporum f.sp. canariensis)</td>
<td>Phoenix spp., Washingtonia filifera.</td>
<td>Management is dependent upon rapid and accurate diagnosis. Once correctly diagnosed appropriate management can be implemented.</td>
</tr>
<tr>
<td>Fig Psyllid (Mycopsylla fici)</td>
<td>Periodic defoliation of Moreton Bay Fig trees (Ficus macrophylla).</td>
<td>Council will continue to support Fig Psyllid research.</td>
</tr>
<tr>
<td>Psyllid (Cardiaspina spp.)</td>
<td>Cardiaspina cause the most damage to eucalypt foliage, especially to Eucalyptus camaldulensis.</td>
<td>Outbreaks occur periodically. Most native species of psyllids require no management; even when psyllid populations are abundant, plants can tolerate substantial feeding and psyllid populations will decline naturally. Develop integrated program for badly infested trees; monitor, cultural and chemical (imidacloprid stem or soil inject).</td>
</tr>
</tbody>
</table>
Sustainable urban forests require human intervention in order to regenerate and maintain them in a safe and aesthetically pleasing manner. The City of Melbourne maintains trees on Council managed land to fulfil its legislative and management obligations to residents and visitors to the area. The key to maintaining and enhancing the urban forest is ensuring quality tree maintenance. Maintenance work performed on Melbourne’s trees aims to manage tree health and enhance the quality of the treed landscape across the city as well as reducing the inherent risks associated with trees in an urban area.

Council undertakes routine maintenance on publicly managed trees to:
- Reduce the risk to public safety.
- Decrease potential damage to property.
- Provide adequate clearances for pedestrians, vehicles, private property and sight lines.
- Provide clearances around services and utility lines.
- Manage tree health.
- To formatively shape young trees.

Regular maintenance also includes activities such as monitoring soil moisture, mulching, decompacting soils, upgrading irrigation and making health assessments.

Maintenance work on trees will also occur in response to unexpected events or emergencies, such as tree or branch failure resulting from severe storms.
Certain trees within the municipality may require specialist maintenance work. Palms also require specific maintenance works and some trees may require specialised tree surgery works.

Australian Standards and known best practice relating to tree management will be implemented and any operation known to be detrimental to long-term tree health is not appropriate.

Tree selection will consider a tree’s ability to be pruned in order to meet the above ground site constraints presented by the tree’s location. Tree selection will endeavour to utilise tree size and form (shape of the canopy) in order to reduce maintenance requirements.

Tree Litter

All trees will shed litter – leaves, bark, flowers, fruit – at some time during a given growing season. Tree selection will aim to avoid the use of trees that drop excessive litter, particularly fruit, which can cause trip hazards.

Containerisation and Tree Vaults

Containerisation is the practice of growing trees within structures that limit tree root growth to within a constrained volume of soil. It is not horticultural best practice to have street trees in containers and within vaults. This type of planting is not encouraged as it does not allow for long-term and sustainable street tree performance. The limited soil volumes will require either early replacement of trees when they have ‘exhausted’ their limited resources or intensive maintenance, such as root pruning and soil treatment. Trees in vaults and containers are heavily reliant on supplementary irrigation and effective drainage.

There are instances in the public domain where planting over structures is unavoidable. In these instances containerisation and vaults are unavoidable to allow street tree planting. In these instances maximizing soil volume is imperative. This soil volume needs to be provided in a ‘plate’ volume not as depth. This is to enable healthy root growth and adequate gaseous exchange. In these scenarios a tree’s soil volume may need to be a combination of below and above grade. This can provide urban design opportunities, for example using the raised edge of a container as a strong seating edge. In such instances, it will also be necessary for City of Melbourne’s arborists to advise on tree species selection, planting methodology and ongoing maintenance regimes.

Successful urban tree planting depends on the consideration of many features including species selection, site constraints, planting procedure, and post-planting maintenance. One essential site component directly affecting tree growth and performance is open soil area and soil volumes. If trees are expected to continue to maintain high levels of health and vigour (growth performance) post-planting they need to be able to access large volumes of soil as they continue to grow and their need for resources increases.

A plant grown in a container has limited root growth due to the volume of available soil. Crown growth will slow as a result, but not necessarily stop (Watson & Himelick, 1997). The same principal applies to trees planted in urban sites. Trees that have limited root space develop smaller root systems in proportion to canopy growth. This results in water stress that can subsequently predispose the tree to secondary pest and disease problems (Watson & Himelick, 1997).

Soil type, and irrigation are equally important considerations for successful containerisation.

See Appendix 6.
Water

Water stress affects most of the physiological processes involved in plant growth. As well as physical space, air and nutrient availability, a tree's moisture requirements need to be addressed in order to allow it to realise its full potential.

Strategies to maximise plant water availability include:

• Water Sensitive Urban Design (WSUD) initiatives, such as storm water harvest systems.
• Porous and permeable pavements.
• Bioretention basins (smaller areas like kerb outstands) and swales (for larger areas such as centre medians).
• Tree selection focussed on species that can tolerate extended dry periods and exposure to heat and wind.
• Supplementary irrigation systems.

In order to establish and successfully manage a tree in the urban landscape, it is important to have an appreciation of both the peak daily demand and the total amount of water required by the tree (Connellan, 2008). Any applied irrigation must be based on a planned approach with defined landscape outcomes.

Character, Community Values and Urban Design

The City of Melbourne has a long tradition of successful urban street and park characteristics that are highly valued and identifiable by the community.

This character includes the substantial avenues of Elms in Royal Parade, for example, heritage-style plantings within parks such as the Carlton Gardens, and the indigenous woodland of Royal Park.

The developed Master List of Street and Park Trees provides the substantial diversity of trees, and enough scope, to support the objectives of these valued “character streets and parks”.

In developing selection criteria for street trees and the main avenue trees in parks, intelligent consideration must be given to both horticultural issues and urban character. While this report is limited to identifying the most appropriate tree species for Melbourne, the final choice of tree species is highly dependant on the existing and desired streetscape or park character and existing heritage controls.

The Precinct Street Tree Master Plans will be the primary documents through which this local character will be explored and balanced with the urban forest diversity needs of the City of Melbourne.

Strategies and Technologies for Improving Tree Growth

There are a number of strategies and technologies that are being investigated by land managers around the globe to improve the performance of urban trees. Some significant approaches are outlined in the table below.

This document has not sought to consider the effect of new tree planting technologies on the appropriate selection of the City’s trees. The City of Melbourne’s urban forestry principles do not rely on improvements in planting technologies as a determinant of street tree performance. It is however expected that such technologies will only improve and build upon existing street tree performance.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing useable soil root volumes to maximise tree growth.</td>
<td>Street kerb extensions and blisters. Use of structural soil tree pits.</td>
</tr>
<tr>
<td>Increase opportunities for gaseous exchange of water and oxygen to maximise tree growth.</td>
<td>Use of porous or permeable pavements over structural soil.</td>
</tr>
<tr>
<td>Reduce conflicts between tree growth and providing free pedestrian access.</td>
<td>Use of porous or permeable pavements over structural soil.</td>
</tr>
<tr>
<td>Enable opportunities for passive irrigation in the street from stormwater drainage.</td>
<td>Use of tree pit kerb inlets.</td>
</tr>
</tbody>
</table>

Other Tree Planting Technologies

• Genetic selection, manipulation and tissue culture.
• Cultural treatments.
• Retrofitted growing systems.
• Structural soils and the use of structural cells.
• Planting site preparation.
Formal Street Tree Trials

Formal street tree trials enable new tree species to be tested and reduce the risk of trees planted within streetscapes failing. There has been little increase in the diversity of street tree species trialing since the formative street tree planting that gained traction with Clement Hodgkinson in the 1860s and with others in the early twentieth century. With the decline in the overall urban forest population and the onset of climate induced challenges, the selection of vigorous new species from around the world is urgent. Factors to consider in such evaluations should include:

- The evaluation of “trial” trees after growing in street conditions. Can they be upgraded or downgraded? Growing of trial trees can be carried out in conjunction with university research.

- The reason for trees either succeeding or failing can be carefully monitored and recorded to eliminate anecdotal or subjective information. While interactive web pages such as TREENET and AUSTEP can be useful, their inputs cannot be qualified easily.

Trialling will be conducted in small and industrial streets to minimise impacts of any unsuccessful trials.

A Master List of Trial Trees is provided in Appendix 7.
2. Tree Species Selection Criteria

This chapter outlines the selection criteria that have been chosen to identify which tree species are most suitable for the City of Melbourne's diverse types of streets and parks.
2.1 There is No Perfect Tree

Selection criteria was developed to provide a quantitative and qualitative basis for the Master List of Street and Park Trees for the City of Melbourne.

It should be noted that the City of Melbourne has many constraints on, and requirements of, its trees. No one tree can manage these constraints and meet all of these requirements in a perfect way.

There is no one perfect urban tree.

It is also important to understand that there is no one type of urban environment. The urban environment is a varied conglomeration of microclimates and heterogeneous soil conditions. Above ground or below ground site conditions can change dramatically within the space of a few metres. Consequently, a site analysis of each planting site will aid appropriate tree selection.

Climate change and increases in temperatures will also require consideration when selecting tree species.

The most successful strategy is to match the planting site limitations with the right tree for that site.

Appropriate site assessment and tree selection can have the following benefits:

- Minimised conflict between tree roots and adjacent infrastructure and buildings.
- Reduced incidence of pest and disease outbreaks. This can be achieved through selecting resistant varieties of trees and increasing species diversity through the City.
- Increased plant performance.
- Improved drought survival.
- Increased tree longevity so that tree benefits exceed costs. The benefit of an urban tree is directly proportional to its crown size or volume and longevity in the landscape.
- Reduced maintenance costs, particularly pruning. Pruning requirements can be reduced by selecting smaller trees under powerlines or narrow canopy form for main roads.
- Increased attractiveness of streetscapes, reinforcing the pervading landscape and architectural character.
- Reduced environmental demand – trees that have tolerance of drought and generally do not require additional resource inputs, such as irrigation or fertiliser, in order to perform satisfactorily.

Tree selection will take into account relative plant tolerances and adaptability, and integration into surrounding planting themes.

The basic issues regarding tree selection can be summarised as follows:

- Biological requirements relate to a tree’s ability to tolerate urban conditions. The species selected should have high tolerance levels that will allow establishment and sustained growth while producing desired benefits with low management inputs. Biological requirements also relate to available root space to sustain the potential tree size.
- Ecological issues include tree diversity, maintaining and enhancing existing significant areas of native and remnant indigenous vegetation, selecting plants that do not have the potential to become woody weeds that impact on natural systems.
- Functional and spatial issues include the trees’ ability to be pruned to provide required clearances, the trees root system and the degree of its impact on adjacent infrastructure, and above ground and below ground restrictions.
- Aesthetic issues consider the ability for trees to enhance the visual or other sensory (e.g., olfactory) amenity of a streetscape or area.
- Tree longevity: the longer a tree is allowed to grow in a site the greater the benefits to the landscape and return on initial investment.
- Availability: selected trees will need to be commercially available in the desired numbers and size for planting programs.
- Litter drop: leaves, flowers, fruit and bark can cause maintenance issues and trip hazards.
- Structural integrity: stock should be known to have received appropriate formative treatment whilst in the production nursery.
Figure 7: There is no perfect tree. The many constraints a tree must contend with to grow in inner Melbourne.
Figure 8: Tree opportunities. The preferred growing conditions and benefits of large canopy street trees.
2.2 Overview of Selection Criteria

The base selection criteria for determining the suitability of a street tree in Melbourne’s urban environment and changing climatic conditions are those that affect its ability to adapt to urban conditions.

A broad range of species from varied habitats have been tested against these base selection criteria to ensure the best possible outcome given specific individual site outcomes and constraints.

Ten base selection criteria for adaptability to urban conditions

Ten base selection criteria for adaptability to urban conditions have been identified. They reflect the species’ ability to respond to drought, heat, wind and pollution the species’ lifespan, pathogen and pest susceptibility and manageability, affect on community health and allergies, the degree and quality of shade cast, maintenance requirements and extent of tree litter produced.

These 10 criteria that affect a species’ adaptability to urban conditions are discussed more fully in the following pages.

As an aid to decision making, each species is given an overall numerical score from 1 to 50. This score is derived by assigning a value of 1 (low) to 5 (high) for each of the 10 base criteria.

While there is no such thing as the ‘perfect street tree’, a score of 50 points represents a highly adaptable and useful species.

The ten criteria were selected after lengthy discussion and review. The number of criteria was not selected as a neat ‘10’. Further review (in 5 years, or sooner if required) may conclude that the number and nature of these criteria can change. The higher the number of criteria the more accurate the scoring.

The ten identified base criteria are strictly performance or adaptability based.

Species that did not rank well against the ten base selection criteria were removed from the Master List of Street and Park Trees – the list of trees adaptable to urban conditions.

The Master List of Street and Park Trees includes all species that ranked well for being adaptable to urban conditions.

The highest scoring tree for urban adaptability is the Kurrajong (Brachychiton populneus).

As a street tree the Kurrajong may not be to everyone’s aesthetic tastes or provide the streetscape amenity that other lesser scoring trees can provide.

Moreover, it may not be suitable for many specific locations within the City of Melbourne – for instance in a shady laneway. Additional criteria are needed to choose a street tree.

Additional criteria

These criteria guide selection of the ‘right tree for the right place’. They consider a tree’s suitability for being grown beneath power lines, in building shade, being pruned to allow vehicular and pedestrian movement, adaptability to waterlogged soils, and tolerance of soil compaction.

These additional criteria are discussed more fully in the following pages.

Location Types

This strategy identifies 13 street location types and 2 park location types within the City of Melbourne.

Each of the 15 Location Types is associated with a set of minimum conditions necessary for the success of a street tree in that environment. Species can be rated for their suitability against each of the 15 Location Types. Tree lists for each of the 15 Location Types can thus be generated.

These species lists for each Location Type can be used by Council in precinct plan applications in which further considerations are then overlaid on these general and more specific species selection criteria.

The City of Melbourne Street and Park Location Types are discussed more fully in Section 3.

Non-rated Criteria

Additional considerations that may be used to further refine the selection of a street tree include, for example, heritage, biodiversity goals, microclimate goals, aesthetics and character. This strategy does not rate tree species against these criteria.

Park Trees

While most street trees can be grown in parks, the reverse is not always possible. Park trees include species that require greater root volumes than those generally achievable in the streetscape environment, and species of large size.

The list of park trees considered adaptable to urban conditions is different to the list of street trees considered adaptable to urban conditions. Not all of the ten base criteria for adaptability to urban conditions have been applied to determine an appropriate Master List of Park Trees. The criteria for selection do not include pollution tolerance, potential as allergen, and tree litter.

Park trees are generally larger tree species and cultivars suitable for planting in larger open spaces with reduced above and below ground constraints. Trees are generally able to develop natural form.
2.3 The Ten Base Selection Criteria Affecting Adaptability to Urban Conditions

Adaptability to urban conditions is a culmination of various plant tolerances that make a particular species or cultivar more or less suited to planting in urban landscapes, and here specifically the urban landscape of the City of Melbourne.

Each species’ adaptability to urban conditions was given an overall numerical score from 1 to 50. This score was derived by assigning a value of 1 (low) to 5 (high) for each of the 10 base criteria.

The ten base criteria are:

- Drought tolerance
- Heat tolerance
- Wind tolerance
- Longevity
- Pollution tolerance
- Pathogen and pest susceptibility and manageability
- Potential as allergen
- Shade cast
- Maintenance required
- Tree litter

Drought Tolerance

Drought tolerance is defined as the ability of a species to withstand extended dry periods. Generally plants that require less water (once they are established) are drought tolerant because they are adapted to regions with frequent drought or to soils with low water-holding capacity.

Value rating:
1 = not tolerant of extended dry periods.
5 = Highly tolerant of extended dry periods

Heat Tolerance

Heat stress can be defined as the rise in temperature beyond a threshold level for a period of time sufficient to cause irreversible damage to plant growth and development. Transitory or constantly high temperatures cause an array of changes to plant growth.

Value rating:
1 = Low = not tolerant of transitory or constantly high temperatures.
5 = High = Highly tolerant of transitory or constantly high temperatures.
**Wind Tolerance**

Degree to which species/variety is susceptible to limb breakage.

**Value rating:**
1 = Low tolerance to wind loads and generally resistant to limb breakage.
3 = Moderate tolerance to wind loads and generally resistant to limb breakage.
5 = High tolerance to wind loads and generally resistant to limb breakage.

**Longevity**

Expected life span that a tree species can be retained in a safe and aesthetically pleasing manner in the situation (providing site conditions remain unchanged). Most urban trees have reduced life spans compared to those found in natural habitats.

**Value rating:**
1 = short lived (< 50 years).
2 = Moderate life span (50-100 years).
3 = Moderate to long-lived species (100-150 years).
4 = Long-lived species (> 150 years).

**Pollution Tolerance**

Air pollutants can harm trees by two means; by being absorbed as chemical contaminants through stomata, and by being absorbed as dust and particulate matter on the surface of the leaf. Virtually all of the pollutants to trees are airborne, and include fluorides, oxidants, sulfur dioxide and carbon monoxide. Sunlight reacts with oxidants to form tree pollutants, like ozone and PAN (peroxyl acetyl nitrate). The effects of pollutants on trees can cause the tree to weaken and die.

The tolerance of species to pollution is largely related to their avoidance (or not) of uptake of pollutants by the leaves or in a biochemical tolerance of pollutants. Some plants can metabolize pollutants into less toxic substances. There is enormous variability between species as to their tolerance to pollution.

Pollution ratings are primarily based on referenced literature and experience.

**Value rating:**
5 = High = Highly tolerant of pollution
3 = Moderate = Moderately tolerant of pollution
1 = Low = poorly tolerant of pollution.
Pathogen and Pest Susceptibility and Manageability

This rating considers a particular species susceptibility to pests and pathogens. Major pests currently requiring management input are listed in Table 7. Potential pathogens that currently are not present but could impact on species have also been listed (see Table 8).

Value rating:
1 = High susceptibility to pathogens or pests, with control difficult.
5 = Low susceptibility to pathogens and pests, and control easy.

Potential as Allergen

Of the 50,000 different kinds of trees, less than 100 have been shown to cause allergies. Most allergies are specific to one type of tree or to the male cultivar of certain trees. The degree of allergic reaction, and the physical origin of the allergen (for instance, sap) known to cause allergic reaction, are indicated on the tree matrix.

Value rating:
1 = High potential as an allergen.
5 = Low potential as an allergen.

Shade Cast

This rating represents a qualitative estimate of the degree of shade cast projected by a tree. This rating also considers the form of the tree, for instance a broad tree will cast greater shade compared to a fastigiate tree.

Value rating:
1 = low shade cast.
2 = Moderate to low shade cast.
3 = Moderate shade cast.
4 = Moderate to high shade cast.
5 = Heavy shade cast.

Maintenance Required

This rating assumes typical pruning maintenance works such as pruning for sight clearances and clearance of powerlines. Maintenance activities are generally higher in a younger tree in order to attain the form to suit site constraints. This rating also indicates any specific maintenance requirements that may be required.

Levels:
5 = Low – Due to size or growth habit of the plant the degree of maintenance required would be less than the perceived maintenance inputs.
3 = Moderate – Typical assumes current cyclic pruning programs to meet site constraints, risk management and legislative requirements.
1 = High – Expected maintenance levels are higher than current maintenance standards, representing greater potential impacts with infrastructure or additional seasonal requirements.
Tree Litter

All trees will shed litter, leaves, bark, flowers or fruit at some time during a given growing season. As far as is possible the tree selections generally do not drop excessive litter. There are exceptions however, such as Magenta Brush Cherry, as these trees have other characteristics which make them suitable for certain planting situations.

Where excessive litter is a known for a particular species or cultivar, it has been noted on the tree matrix.

Value rating:
1 = Produces a considerable amount of troublesome litter.
5 = produces little troublesome litter.
2.4 Additional Criteria

Street type criteria are a further set of criteria that determine the tree selection for a specific type of street. Various types of street have specific affects on light availability, or restrictions such as the presence of overhead powerlines. These criteria guide selection of the ‘right tree for the right place’.

Shade Tolerance
Most tree species require full sun. There are some species that will tolerate lower light levels of part shade. There are no species selected in the matrix that tolerate full shade (less than 6 hours of filtered sunlight per day).

Categories:
- Full sun – More than 6 hours of direct sunlight.
- Full sun to part-shade – Either more than 6 hours of direct sunlight a day or filtered light for most of the day. (These species would be more suitable for streets that have low direct sun through a day.

Power Lines
Tree species were rated as being suitable for planting under power lines without pruning, with pruning (if specifically known, for instance Smooth-barked Apple (Angophora costata), or not suitable.

Soil Compaction Tolerance
Tree species were rated for their ability to withstand the highly compacted soils that often occur in the urban environment.

Waterlogged Soil Tolerance
Trees that can tolerate waterlogged soils are particularly useful for WSUD applications. Soils temporarily inundated with water lead to poor aeration. Species tolerant of waterlogged soils are often also tolerant of compacted soil conditions.

Value rating:
- 1 = not tolerant of periodic inundation.
- 3 = Moderate tolerance of periodic inundation.
- 5 = Highly tolerant of periodic inundation (and of low oxygen in soils).

Prunability for Vehicle Clearance
Trees often need to be pruned to allow clear passage of adjacent vehicular traffic.
Small, Medium and Large Planting Sites

Small, medium and large sites relate to the size of the potential tree planting sites. Note that a smaller site could sustain a larger tree species if the site and soils (planting system) were modified to allow a larger tree size.

Table 10 provides general guidelines for planting site sizes.

<table>
<thead>
<tr>
<th>Planting site</th>
<th>Total planting area (lawn, island, or soil strip)</th>
<th>Planting strip width</th>
<th>Distance from trunk to pavement or wall</th>
<th>Maximum tree size at maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Less than 9.5m²</td>
<td>1.0m to 1.3m</td>
<td>0.6m</td>
<td>Small (less than 9m tall)</td>
</tr>
<tr>
<td>Medium</td>
<td>9.5m² to 18.5m²</td>
<td>1.3m to 2.5m</td>
<td>1.2m</td>
<td>Medium (less than 15m tall)</td>
</tr>
<tr>
<td>Large</td>
<td>More than 18.5m²</td>
<td>&gt; 2.5m</td>
<td>&gt; 1.5m</td>
<td>Large (taller than 15m)</td>
</tr>
</tbody>
</table>
3. Tree Planting in Melbourne

This chapter identifies the typical tree growing conditions across the types of street and park environment in Melbourne, with a focus on street trees and streetscapes.
3.1 Introduction

The streets of Melbourne support a robust urban forest of approximately 22,800 trees. The streets have been planned with the intention of trees being an integral component. The street geometries of Melbourne have traditionally allowed for relatively generous growing areas. During the 1860s when Melbourne rapidly expanded, boulevards, wide medians and verges within the city areas and the main thoroughfares into the city were intentionally set out to allow tree planting to contribute to the streetscape character. Surveyor Robert Hoddle, at odds with Governor King, managed to ensure that every second north-south street be 95 feet (28.96m) wide.

The north-south and east-west grid has allowed strong linear avenue planting of consistent species that gives Melbourne a particular character not achieved in other Australian capitals.

There have been a number of spikes of diversification of street and park trees in Melbourne's history. These spikes in experimentation were championed by a number of motivated directors of the Royal Botanic Gardens and landscape designers. In most of these instances a desire for botanical experimentation and trialing resulted in higher species diversity. Trees that were grown in the parks were used in the streetscapes. Curious botanists like Ferdinand von Mueller experimented with a number of conifers from around the world. With climatic change and more extreme weather events expected in Melbourne, it is interesting to note how well conifers are adapted to such extremes.

In the 1920s and 1930s there was experimentation with Australian rainforest species and myrtaceous species. Deciduous trees were also extensively planted, including many of the Elms currently part of the urban forest. This period of planting has contributed to many of the mature trees that are now in decline within the city and parks. During the 1970s the resurgence of interest in native and endemic plants contributed greater species diversity to the streetscape. Ironically, some of the earlier plantings of Melaleucas were also condemned in the same period, blamed for infrastructure damage. Retrospectively, the damage that these smaller Melaleucas have caused is in dispute. This strategy recommends that some Melaleucas species continue contributing to the urban forest.

Platanus x acerifolia is a tree species that is fast growing, deciduous, and adaptable, and has been perceived as close to being the ‘perfect street tree’. As a consequence huge numbers of Plane trees were planted in Melbourne in the 1980s and 1990s in Melbourne and across the globe in temperate climate cities. However, in recent years the Platanus x acerifolia has proved itself to be highly vulnerable to extremes of high temperature in Melbourne’s climate. The hot summer of 2009 catalysed a severe decline for many of the city’s Plane trees.

The risk of creating an urban forest monoculture is becoming apparent in Melbourne with increasingly frequent droughts. In Sydney, the combination of Sycamore Lacebug and anthracnose infestation results in the urban forest of Plane trees developing a distinct khaki haze in February-April. It is as characteristic a seasonal event as the November purple haze of the Jacarandas in the suburbs.

The City of Melbourne Urban Forest Strategy and Urban Forest Diversity Guidelines aim to create another spike of diversification and trialing in the history of Melbourne’s park and street trees.
Central Activity District (CAD), Mixed Use, and Commercial Streets

The city streets and boulevards, surveyed by Hoddle, have space for growing street trees. As development has increased post World War Two there is greater pressure for space in the street. Space for advertising, and increase in the amount of services conduits and car parking, have created greater competition with tree growing space. An increase in building height has also resulted in longer periods of overshadowing, and increased building density has produced hotter microclimates.

Generally, medians where they exist provide more space for growing trees in than the street’s verges. Verge trees compete more for space than median trees, and so verge trees are more in conflict with human needs. Fortunately most of the overhead powerlines have been undergrounded, and while such undergrounding can cause restrictions to root growth area, it has eliminated canopy conflicts and so the potential for large trees is maintained.

The laneways are very narrow, and it is generally agreed that tree planting opportunities in these environments are limited due to space restrictions, low light, conflict with access requirements and commercial uses. Certain opportunities may still occur and the right tree species for the site will need close scrutiny.

Unfortunately, it is the trees in verges that are the most important for creating street tree amenity and shade. The north-south wide streets are congenial to large street tree planting, the east west streets and narrow streets have greater challenges, such as overshadowing and limited space. There are increasingly more opportunities for street tree planting as urban designers, politicians and Council planners are now prepared to change the internal geometries of streets to make them both more liveable and allow new opportunities for tree planting. Greater street tree diversity enables trees to be selected that can adapt to a variety of growing conditions, constraints and opportunities.

Refer to Chapter 4 for fact sheet on each Location Type.
Residential Streets

The residential streets of the City of Melbourne have huge potential for species diversification.

While more overhead services exist, particularly Optus cables, and in some instances the verges are narrower, the conditions for growing street trees in general provide greater opportunities than in the CAD.

Many residential streets have wide verges with no power lines, and have traffic calming ‘blisters’, parking lanes with lower frequency usage, little soil compaction from pedestrian traffic, and good solar access year round.

Medians are well populated with trees, but there is considerable potential for verge street tree diversification and better tree growth generally.

As with the city streets and boulevards, it is the street verges that are the most inhabited, so ideally this is where tree canopy cover should be located.

Residential streets provide a range of street conditions and types. The street geometry and width, overhead services or not, aspect, building awnings, access to adjacent soil volumes, parking arrangements, precinct character, water sensitive urban design opportunities, the age of the suburb, and streetscape design provide a multitude of scenarios.

Consequently, a large selection of tree species is required to reflect this broad range of planting situations.

Shorter streets and more diverse streetscape characters both enable and suit a finer grain of species implementation than is possible within the CAD.

Refer to Chapter 4 for fact sheet on each Location Type.
Park Types
The parks of Melbourne have a strong ‘Victorian’ era character that defines the city. The parks were opportunities for trialling Australian species, new species from other Botanical gardens, and recently discovered species from plant hunting expeditions. Fashions, environmental awareness, heritage, architectural styles and aesthetics have also influenced the composition of the City’s tree species population.

In marked contrast to these ‘Victorian’ parks, parks such as Royal Park have a character with greater emphasis on ecological goals, habitat provision, preservation of the remnant vegetation, and a celebration of space.

Refer to Chapter 4 for fact sheet on each Location Type.
4. Choosing the Right Tree

This chapter identifies the process for selecting the most appropriate tree species for a particular location.
4.1 Introduction

To successfully choose a street tree it is necessary to determine the type of location in which the tree is to be grown.

The right choice of species for a street tree will depend on a number of factors. Consideration needs to be given to:

- **Zoning**: whether the tree is in a residential area or the CAD.
- **The street’s form and use**: Is the street wide or narrow, does it have powerlines? What type of vehicles use the street?
- **The location within the street**: Is the tree on the street’s edge or does the street have a median in which the tree is to be positioned.
- **Desired qualities**: How much maintenance can be provided? How long-lived is the desired tree? How drought tolerant should the tree be? Pollution tolerant? How much shade is to be provided by the tree?

As discussed in Section 3, this strategy identifies 13 street location types and 2 park location types within the City of Melbourne.

Each of the 15 Location Types is associated with a set of minimum conditions necessary for the success of a tree in that environment.

For instance, the criteria for a tree in the wide verge of a CAD street are: canopy > 8m, height > 10m, shade rating > 2, pollution rating > 2, no overhead powerlines.

Species have been rated for their suitability against each of the 15 Location Types.

Tree lists for each Location Type can be found in the following pages.

These species lists for each Location Type can be used by Council in precinct plan applications in which further considerations are then overlaid on this general and more specific species selection criteria.

The choice of tree can then be refined by considering additional criteria such as heritage and neighbourhood character.

Figure 9: How to choose the right tree for the right location.
4.2 Determining Location Type

To determine the type of location in which the tree is to be grown, follow the diagram on this page and over the following 3 pages.

Zoning of Street or Park Location

Is the location in: the CAD; a park, park edge or median of a boulevard; a residential area?

- CAD
  - Park, park edge, or boulevard median
    - Residential
      - Continue on page 41.
    - Continue on page 42.
  - Continue on page 43.
CAD Street Type Location

Is the location in a footpath, a laneway or a median?

Footpath

Wide or narrow footpath?

Wide

STREET LOCATION TYPE IS 1 – CAD Wide Footpath. GO TO PAGE 44.

Narrow

STREET LOCATION TYPE IS 2 – CAD Narrow Footpath. GO TO PAGE 46.

Laneway

Median

Is the median wide or narrow?

Wide

Median has carparking?

Yes

STREET LOCATION TYPE IS 4 – CAD Wide Median With Carparking. GO TO PAGE 55.

No

STREET LOCATION TYPE IS 5 – CAD Wide Median With No Carparking. GO TO PAGE 55.

Narrow

STREET LOCATION TYPE IS 6 – CAD Narrow Median. GO TO PAGE 54.
Park, Park Edge, or Boulevard Median Type Location

Is the location in a park, at the edge of a park or in a boulevard median?

- Park
  - Edge of park or in median of boulevard
    - Are there trams?
      - Yes
        - STREET LOCATION TYPE IS 8 – Park Edge or Boulevard Median, With Trams. GO TO PAGE 58.
      - No
        - STREET LOCATION TYPE IS 9 – Park Edge or Boulevard Median, With No Trams. GO TO PAGE 60.
    - No
      - STREET LOCATION TYPE IS 7 – Park. GO TO PAGE 56.
Residential Street Type Location

Is the location in a Parking lane, a verge or a median?

Parking lane

Is the verge broad or narrow?

Verge

Broad

Are there power lines?

Yes

STREET LOCATION TYPE IS 11 – Residential Broad Verge with Powerlines. GO TO PAGE 64.

No

Narrow

Are there power lines?

Yes

STREET LOCATION TYPE IS 13 – Residential Narrow Verge with Powerlines. GO TO PAGE 68.

No

Median

Is the median wide or narrow?

Wide

STREET LOCATION TYPE IS 15 – Residential Wide Median. GO TO PAGE 72.

Narrow

STREET LOCATION TYPE IS 16 – Residential Narrow Median. GO TO PAGE 74.
4.3 Location Types and Tree Selection Lists

Location Type 1 – CAD Wide Footpath

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metres</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lanes with central tramway, and bike lanes. Predominantly running east/west</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, tram cabling</td>
</tr>
<tr>
<td>Buildings</td>
<td>High, awnings</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside</td>
</tr>
<tr>
<td>Road centre</td>
<td>Tramway</td>
</tr>
<tr>
<td>Pathways</td>
<td>5.4 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge avenue</td>
</tr>
<tr>
<td>Examples</td>
<td>Collins Street, Bourke Street</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating > 2
- Pollution rating > 2
- No powerlines

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

Street Tree Considerations
- Requires formative pruning
- Minimum height clearance of 4.6 m on road
- Minimum height clearance of 2.5 m on footpath
- Requires shade rating greater than 3
- Requires high maintenance
- Low litter drop

Successful Tree Application

Problematic Tree Application
Location Type 2 – CAD Narrow Footpath

**Description of Key Characteristics**

<table>
<thead>
<tr>
<th>Key Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>4 lanes with central tramway, and bike lanes. Predominantly running east/west.</td>
</tr>
<tr>
<td>Overhead</td>
<td>Street lights, tram cabling</td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high buildings at footpath edge</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside</td>
</tr>
<tr>
<td>Road centre</td>
<td>Tramway</td>
</tr>
<tr>
<td>Pathways</td>
<td>3.6 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Footpath avenue</td>
</tr>
<tr>
<td>Example</td>
<td>Latrobe Street</td>
</tr>
</tbody>
</table>

**Typical Section**

```
| footpath | parking | traffic | tramway | traffic | parking | footpath |
```

**Typical Plan**
Chapter 4 // Choosing the Right Tree

**Tree Selection Criteria**
(Key requirements for generating suitable street trees from matrix)

<table>
<thead>
<tr>
<th>Canopy &lt; 10m</th>
<th>Height any</th>
<th>Shade rating &gt;2</th>
<th>Pollution rating &gt;2</th>
<th>No powerlines</th>
<th>Litter drop &gt;2</th>
</tr>
</thead>
</table>

**Recommended Trees**
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- **Acer buergerianum**
- **Acer campestre 'Elsiey'**
- **Acer campestre 'Evelyn'**
- **Acer platanoides 'Crimson Sentry'**
- **Acer platanoides 'Globosum'**
- **Acer rubrum 'October Glory'**
- **Acer rubrum 'Scarsen'**
- **Acer truncatum x A. platanoides 'Keithsform'**
- **Acer x freemanii 'Autumn Blaze'**
- **Agonis flexuosa**
- **Allocasuarina littoralis**
- **Allocasuarina verticillata**
- **Brachychiton acerifolius**
- **Brachychiton populneus**
- **Brachychiton rupestris**
- **Brachychiton x roseus**
- **Callistemon 'Harkness'**
- **Callistemon salignum**
- **Callistemon viminalis**
- **Casuarina glauca**
- **Catalpa bignonioides 'Nana'**
- **Celtis occidentalis**
- **Cercis siliquastrum**
- **Cinnamomum camphora**
- **Corymbia ficifolia**
- **Cupaniopsis anachardioides**
- **Cupressus glabra (syn. C. arizonica)**
- **Cupressus sempervirens**
- **Eucalyptus bancroftii**
- **Eucalyptus cosmoforma**
- **Eucalyptus gregsoniana**
- **Eucalyptus leucoxylon dwarf form**
- **Eucalyptus leucoxylon ssp. megalocarpa**
- **Eucalyptus mannifera subsp. maculosa**
- **Eucalyptus mellowiana**
- **Eucalyptus nicholli**
- **Eucalyptus pulchella**
- **Eucalyptus sideroxylon**
- **Eucalyptus spathulata**
- **Eucalyptus stotei**
- **Ficus microcarpa var. hillii**
- **Ficus platypoda**
- **Ficus rubiginosa**
- **Fraxinus excelsior 'Aurea'**
- **Fraxinus omus**
- **Fraxinus omus 'Meczek'**
- **Fraxinus pennsylvanica 'Aerial'**
- **Fraxinus pennsylvanica 'Cimmaron'**
- **Fraxinus pennsylvanica 'Urbante'**
- **Fraxinus velutina**
- **Geijera parviflora**
- **Ginkgo biloba 'Princeton Sentry'**
- **Gleditsia triacanthos var. inermis Varieties**
- **Jacaranda minirrholona**
- **Lagerstroemia indica x L. fauriei varieties**
- **Lepidoptemem petersoni**
- **Liquidambar formosana**
- **Lophostemon confertus**
- **Magnolia grandiflora 'Exmouth'**
- **Melia azedarach**
- **Metasequoia glyptostroboides**
- **Phoenix canarienssis**
- **Pistacia chinensis**
- **Pyrus calleryana varieties**
- **Quercus robur 'Fastigiata'**
- **Robinia pseudoacacia (Varieties)**
- **Schinus aralia**
- **Sophora japonica 'Princeton Upright'**
- **Styraxocarpus sinuatus**
- **Syzygium australie 'Pinnate'**
- **Syzygium paniculatum**
- **Tilia cordata 'Greenspind'**
- **Trachycarpus fortunei**
- **Tristaniopsis laurina**
- **Ulmus parvifolia**
- **Ulmus procera**
- **Ulmus x hollandica**
- **Washingtonia filifera**
- **Washingtonia robusta**
- **Waterhousea floribunda**

---

**Street Tree Considerations**

- Requires formative pruning
- Limited canopy spread 5-12 m (close to buildings/awnings)
- Minimum height clearance of 4.6 m on road
- Minimum height clearance of 2.5 m on footpath
- Requires shade rating greater than 3
- Requires high maintenance
- Cope with part shade from building
- Low litter drop
Location Type 3 – CAD Laneway

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>6-8 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>Single lane, often running south/north. Often shared with pedestrians and bike lane</td>
</tr>
<tr>
<td>Overhead</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Parking</td>
<td>None</td>
</tr>
<tr>
<td>Road centre</td>
<td>–</td>
</tr>
<tr>
<td>Pathways</td>
<td>1-2 metre footpath, building</td>
</tr>
<tr>
<td>Trees</td>
<td>Mostly on single side</td>
</tr>
<tr>
<td>Example</td>
<td>Royal Lane, Hardware Lane</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy < 10m
- Height any
- Pollution rating >2
- No powerlines
- Litter drop >2
- Building shade tolerance -yes

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer campestre ‘Elsrijk’
- Acer campestre ‘Evelyn’
- Catalpa bignonioides ‘Nana’
- Ceris siliquastrum
- Cupaniopsis anachardioides
- Eucalyptus leucocyylon dwarf form
- Ficus rubiginosa
- Ginkgo biloba ‘Princeton Sentry’
- Gleditsia triacanthos var.inermis Varieties
- Koelreuteria paniculata
- Liquidambar formosana
- Magnolia grandiflora ‘Evergreen’
- Melia azedarach
- Robinia pseudoacacia (Varieties)
- Sophora japonica ‘Princeton Upright’
- Syzygium australe ‘Pinnacle’
- Tilia cordata ‘Greenspire’
- Trachycarpus fortunei
- Washingtonia filifera
- Washingtonia robusta

Street Tree Considerations

- Limited canopy spread 6-8 m
- Tolerate shade
- Minimum height clearance of 4.6 m
Location Type 4 – CAD Wide Median With Carparking

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>4 lanes with central median, and bike lanes. Predominantly running north/south</td>
</tr>
<tr>
<td>Overhead Lighting</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high. Awnings</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside. Central median</td>
</tr>
<tr>
<td>Road centre</td>
<td>5m median with intermittent parking and trees</td>
</tr>
<tr>
<td>Pathways</td>
<td>3.6 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge, Central median</td>
</tr>
<tr>
<td>Example</td>
<td>Russell Street, Lonsdale Street</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating any
- Pollution rating ≥2
- No powerlines
- Litter drop ≥2

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

**Acer buergerianum**

**Acer campestre 'El сырк'**

**Acer platanoides 'Crimson Sentry'**

**Acer rubrum 'October Glory'**

**Acer rubrum 'Scarsen'**

**Acer truncatum x A. platanoides 'Keithsform'**

**Acer x freemanii 'Autumn Blaze'**

**Allocasuarina torulosa**

**Angophora costata**

**Araucaria cunninghamii**

**Banksia integrifolia subsp. integrifolia**

**Brachychiton acerifolius**

**Brachychiton populneus**

**Brachychiton x roseus**

**Casuarina cunninghamiana**

**Casuarina glauca**

**Cedrus atlantica**

**Celtis australis**

**Celtis occidentalis**

**Corymbia citriodora**

**Corymbia maculata**

**Cupressus arizonica**

**Cupressus sempervirens**

**Cupressus torulosa**

**Eucalyptus leucocorynn**

**Eucalyptus mannifera subsp. maculosa**

**Eucalyptus melliodora**

**Eucalyptus polyanthemos**

**Eucalyptus pulchella**

**Eucalyptus scoparia**

**Eucalyptus sideroxylon**

**Ficus microcarpa var. hirta**

**Ficus platypoda**

**Ficus rubiginosa**

**Fraxinus excelsior 'Aurea'**

**Fraxinus moulth**

**Fraxinus pennsylvanica 'Aerial'**

**Fraxinus pennsylvanica 'Cimmaron'**

**Fraxinus pennsylvanica 'Urbanite'**

**Fraxinus velutina**

**Gmelina parviflora**

**Jasminum frangulimum**

**Lagerstroemia indica x L. fauriei varieties**

**Leptospermum peregrinum**

**Liquidambar formosana**

**Liquidambar styraciflua 'Rotundiloba'**

**Lophostemon confertus**

**Macraura pumila 'Witchita'**

**Magnolia grandiflora 'Exmounth'**

**Melia azedarach**

**Mesembryanthemum druceoides**

**Olax europea**

**Palo wood tomentosa**

**Phoenix canariensis**

**Pinus canariensis**

**Pinus halepensis**

**Pinus patula**

**Pinus pinea**

**Pistacia chinensis**

**Platanus orientalis 'Digitata'**

**Platanus x acerifolia**

**Podocarpus elatus**

**Pyrus calleryana varieties**

**Pyrus nivalis**

**Quercus acutissima**

**Quercus agrifolia**

**Quercus bicolor**

**Quercus cerris**

**Quercus coccinea**

**Quercus fli**

**Quercus macrocarpa**

**Quercus palustris**

**Quercus phellos**

**Quercus robur**

**Robinia pseudacacia (Varieties)**

**Sapindus saponaria**

**Schinus atelna**

**Syzygium paniculatum**

**Taxodium distichum**

**Ulmus glabra 'Lutescens'**

**Ulmus parvifolia**

**Ulmus puzacra**

**Waterhousea floribunda**

**Zelkova serrata 'Green Vase'**
Location Type 5 – CAD Wide Median With No Carparking
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating > 2
- Pollution rating > 2
- No powerlines
- Litter drop > 2

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

Acer rubrum ‘October Glory’
Acer rubrum ‘Scarsen’
Acer × freemanii ‘Autumn Blaze’
Afrocarpus falcata
Agathis robusta
Allocasuarina torulosa
Angophora costata
Angophora floribunda
Araucaria cunninghamii
Araucaria heterophylla
Bankia integrifolia subsp. integrifolia
Bankia serrata
Casuarina cunninghamiana
Cedrus atlantica
Cedrus deodara
Celtis australis
Celtis occidentalis
Corymbia maculata
Cupressus glabra (syn. C. arizonica)
Cupressus torulosa
Eucalyptus bancroftii
Eucalyptus camaldulensis
Eucalyptus cinerea
Eucalyptus leucoxylon
Eucalyptus leucoxylon ssp. mегaliocarpa
Eucalyptus melliodora
Eucalyptus polyanthemos
Eucalyptus scoparia
Eucalyptus sideroxylon
Ficus macrophylla
Ficus microcarpa var. hillii
Fraxinus excelsior ‘Aurea’
Fraxinus pennsylvanica ‘Cimmaron’
Fraxinus pennsylvanica ‘Urbanite’
Ginkgo biloba
Gleditsia triacanthos var. inermis Varieties
Jascaranita miniwaterfall
Liquidambar formosana
Liquidambar styraciflua ‘Rotundiloba’
Lophostemon confertus
Macraea pittorica ‘Witchita’
Metasequoia glyptostroboides
Paulownia tomentosa
Pinus canariensis
Pinus halophila
Pinus patula
Pinus pinea
Pinus pinea var. ‘Pinea’
Pinus X acrocarpa
Pinus canariensis
Pinus nigra
Quercus acutissima
Quercus agrifolia
Quercus bicolor
Quercus canariensis
Quercus cerris
Quercus cocinea
Quercus ilex
Quercus macrocarpa
Quercus palustris
Quercus phellos
Quercus robur
Robinia pseudoacacia (Varieties)
Sapindus saponaria
Schinus arena
Syzygium paniculatum
Taxodium distichum
Ulmus glabra ‘Lutescens’
Ulmus parvifolia
Ulmus procera
Ulmus x hollandica
Waterhousea forsteriana
Zelkova serrata ‘Green Vase’

Street Tree Considerations

- Tolerate full sun
- High Crown/ large canopy spread required
- Minimum height clearance of 4.6 m
- Longevity

Successful Tree Application

Problematic Tree Application
Location Type 6 – CAD Narrow Median

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>4 lanes with central median, and bike lanes. Predominantly running north/south.</td>
</tr>
<tr>
<td>Overhead Lighting</td>
<td>Lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high. Awnings</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside</td>
</tr>
<tr>
<td>Road centre</td>
<td>2.5m planted median</td>
</tr>
<tr>
<td>Pathways</td>
<td>3.6 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge and central median</td>
</tr>
<tr>
<td>Example</td>
<td>King Street</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Location Type 7 – Park

Description of Key Characteristics

| Street Width | – |
| Traffic Lanes | – |
| Overhead | None |
| Buildings | – |
| Parking | Varied |
| Road centre | – |
| Pathways | Various pathways from road |
| Trees | Specimen plantings, mixed |
| Example | Botanic Park |

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer rubrum ‘October Glory’
- Acer truncatum x A. platanoides ‘Keithsform’
- Acer x freemani ‘Autumn Blaze’
- Agathis robusta
- Angophora costata
- Angophora floribunda
- Araucaria cunninghamii
- Araucaria heterophylla
- Brachychiton acerfolius
- Catalpa bignonioides
- Cedrus atlantica
- Cedrus deodara
- Corymbia citriodora
- Corymbia maculata
- Cupressus torulosa
- Ficus macrophylla
- Fraxinus pennsylvanica ‘Cimmaron’
- Liquidambar styraciflua ‘Rotundiloba’
- Metasequoia glyptostroboides
- Phoenix canariensis
- Pinus canariensis
- Pinus patula
- Pinus pinea
- Podocarpus falcatus
- Quercus cocinea
- Quercus phellos
- Taxodium distichum
- Ulmus parvifolia
- Washingtonia filifera
- Washingtonia robusta
- Zelkova serrata ‘Green Vase’

Street Tree Considerations

- Unlimited canopy spread
- Tolerate full sun
- Longevity
- Biodiversity potential – foraging habitat
Location Type 8 – Park Edge or Boulevard Median, With Trams

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>60 metres</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>6 lanes with central boulevard and tramway</td>
</tr>
<tr>
<td>Overhead</td>
<td>Lighting, Tram cabelling</td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerb and median edge</td>
</tr>
<tr>
<td>Road Centre</td>
<td>25m wide with tramline, footpath and median tree avenue</td>
</tr>
<tr>
<td>Pathways</td>
<td>3.6m roadside footpaths, narrow along median</td>
</tr>
<tr>
<td>Trees</td>
<td>Key central avenue, kerbside</td>
</tr>
<tr>
<td>Example</td>
<td>Victoria Parade</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating any
- No powerlines

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer platanoides ‘Crimson Sentry’
- Acer rubrum ‘October Glory’
- Acer x freemanii ‘Autumn Blaze’
- Afrocarpus falcata
- Agathis robusta
- Allocasuarina torulosa
- Angophora costata
- Angophora floribunda
- Bankia integrifolia subsp. integrifolia
- Banksia serrata
- Cassinia cunninghamhamiana
- Cassinia glauca
- Cedrus atlantica
- Cedrus deodara
- Celtis occidentalis
- Ceris stiggiaum
- Climatometrum camphora
- Corymbia citriodora
- Corymbia maculata
- Cupaniopsis anachardioides
- Cupressus sempervirens
- Cupressus torulosa
- Eucalyptus bicifolia
- Eucalyptus camaldulensis
- Eucalyptus cinares
- Eucalyptus cosmophylla
- Eucalyptus gregsoniana
- Eucalyptus leucophyll
- Eucalyptus mannifera subsp. maculosa
- Eucalyptus melliodora
- Eucalyptus nicholii
- Eucalyptus polyanthemos
- Eucalyptus pulchella
- Eucalyptus scoparia
- Eucalyptus sideroxylon
- Eucalyptus spathulata
- Ficus macrophylla
- Ficus microcarpa var. nilii
- Ficus platypoda
- Ficus rubiginosa
- Fraxinus pennsylvanica ‘Cimmaron’
- Fraxinus pennsylvanica ‘Urbans’
- Fraxinus velutina
- Gaigeria parviflora
- Gymnotheca nobilis ‘Princeton Sentry’
- Gleditsia triacanthos var. inermis Varieties
- Jacaranda mimosifolia
- Lagerstroemia indica var. fauriei varieties
- Liquidambar formosana
- Liquidambar styraciflua ‘Rotundifolia’
- Lophostemon contortus
- Madder panorma ‘Wichita’
- Metasequoia glyptostroboides
- Paulownia tomentosa
- Pinus canariensis
- Pinus pinea
- Platanus orientalis ‘Digitata’
- Platycladus X acerifolia
- Podocarpus elatus
- Pyrus nivalis
- Quercus acutissima
- Quercus agrifolia
- Quercus bicolor
- Quercus canariensis
- Quercus cerris
- Quercus cocinea
- Quercus fies
- Quercus macrocarpa
- Quercus palustris
- Quercus phellos
- Quercus rubra
- Robinia pseudoacacia (Varieties)
- Sapindus saponaria
- Ulmus glabra ‘Lutescens’
- Ulmus parvifolia
- Ulmus procera
- Zelkova serrata ‘Green Vase’

Street Tree Considerations

- Tolerate crown pruning to tram wires
- Tolerate full sun
- Longevity
Location Type 9 – Park Edge or Boulevard Median, With No Trams
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating >3

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer rubrum 'October Glory'
- Acer truncatum x A. platanoides 'Keilholtzform'
- Acer x freemanii 'Autumn Blaze'
- Agathis robusta
- Araucaria cunninghamii
- Catalpa bignonioides
- Cedrus atlantica
- Cedrus deodara
- Corymbia citriodora
- Corymbia maculata
- Cupressus torulosa
- Fraxinus pennsylvanica 'Cimmaron'
- Liquidambar styraciflua 'Rotundifolia'
- Metasequoia glyptostroboides
- Phoenix canariensis
- Pinus canariensis
- Pinus patula
- Pinus pinea
- Podocarpus falcatus
- Quercus cocinea
- Quercus phellos
- Taxodium distichum
- Ulmus parvifolia
- Zelkova serrata 'Green Vase'

Street Tree Considerations

- Tolerate full sun
- Unlimited canopy spread
- Minimum height clearance of 4.6 m over road

Successful Tree Application

Problematic Tree Application
Location Type 10 – Residential Parking Lane

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>20 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential, setback</td>
</tr>
<tr>
<td>Parking</td>
<td>Mixed</td>
</tr>
<tr>
<td>Road centre</td>
<td>–</td>
</tr>
<tr>
<td>Pathways</td>
<td>&lt; 2.5 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>In roadway between parking bays. Occasional WSUD</td>
</tr>
<tr>
<td>Example</td>
<td>Acland Street South Yarra, George Street East Melbourne</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Street Tree Considerations

Potential large and high canopy

Minimum height clearance of 4.6 m

Tolerate full sun

Variety of shade rating

Potential tolerance to water logging (WSUD)

Recommended Trees

(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer rubrum 'October Glory'
- Acer rubrum 'Scarsen'
- Acer x freemanii 'Autumn Blaze'
- Allocasuarina torulosa
- Angophora costata
- Araucaria cunninghamii
- Banksia integrifolia subsp. integrifolia
- Celtis australis
- Celtis occidentalis
- Cupressus glabra (syn. C. arizonica)
- Eucalyptus bancroftii
- Eucalyptus leucocoryn
- Eucalyptus leucocoryn ssp. megalocarpa
- Eucalyptus mellodora
- Eucalyptus platypus
- Eucalyptus polyanthemos
- Eucalyptus scoparia
- Eucalyptus sideroxylon
- Ficus microcarpa var. hillii
- Fraxinus excelsior 'Aurea'
- Fraxinus pennsylvanica 'Crimson King'
- Fraxinus pennsylvanica 'Urbanite'
- Fraxinus velutina
- Jacaranda mimosifolia
- Liquidambar formosana
- Liquidambar styraciflua 'Rotundifolia'
- Lophostrobus confertus
- Metasequoia glyptostroboides
- Olea europea
- Paulownia tomentosa
- Pinus canariensis
- Pinus halepensis
- Pinus patula
- Pinus pinaster
- Pinus pinea
- Platanus orientalis 'Digitata'
- Platanus X acerifolia
- Podocarpus elatus
- Pyrus calleryana varieties
- Pyrus nivalis
- Quercus acutissima
- Quercus agrifolia
- Quercus bicolor
- Quercus cococnea
- Quercus ilex
- Quercus macrocarpa
- Quercus palustris
- Quercus phellos
- Quercus robur
- Quercus rubra
- Syzygium paniculatum
- Taxodium distichum
- Ulmus glabra 'Lutescens'
- Ulmus parvifolia
- Ulmus procera
- Waterhousea floribunda
- Zelkova serrata 'Green Vase'

Tree Selection Criteria

(Key requirements for generating suitable street trees from matrix)

- Canopy > 8m
- Height > 10m
- Shade rating any
- WSUD > 3
- Pollution rating >3
- No powerlines
- Litter drop >3
- Maintenance >3
Location Type 11 – Residential Broad Verge With Powerlines
Chapter 4 // Choosing the Right Tree

**Tree Selection Criteria**
(Key requirements for generating suitable street trees from matrix)

<table>
<thead>
<tr>
<th>Canopy &lt;10m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height any</td>
</tr>
<tr>
<td>Shade rating &gt;2</td>
</tr>
<tr>
<td>Powerlines</td>
</tr>
</tbody>
</table>

**Recommended Trees**
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer buergerianum
- Acer campestre ‘Elfin’
- Acer campestre ‘Evelyn’
- Acer platanoides ‘Globosum’
- Acer truncatum x A. platanoides ‘Kerstform’
- Agonis flexuosa
- Allocasuarina littoralis
- Allocasuarina verticillata
- Angophora h apida (Syn. A. coriaria)
- Banksia integrifolia subsp. integrifolia
- Banksia serrata
- Brachychiton populneus
- Brachychiton rupestris
- Callistemon ‘Harkness’
- Callistemon salignum
- Callistemon viminalis
- Catalpa biglobosa ‘Nana’
- Celtis australis
- Celtis occidentalis
- Ceris sanguinaria
- Cercis occidentalis
- Corymbia eximia
- Corymbia ficifolia
- Cupaniopsis anacardioides
- Eucalyptus cosmophylla
- Eucalyptus gregoriiana
- Eucalyptus leucocarya dwarf form
- Eucalyptus leucocarya ssp. megapectora
- Eucalyptus platypus
- Eucalyptus stoeiatalis
- Ficus platypoda
- Fraxinus excelsior ‘Aurea’
- Fraxinus ornus
- Fraxinus ornus ‘Meczek’
- Fraxinus pennsylvanica ‘Urbante’
- Galipea parviflora
- Hakea francisiana
- Jacaranda mimosaefolia
- Koelreuteria paniculata
- Lagerstroemia indica x L. fauriei varietals
- Leptospermum petersonii
- Liquidambar formosana
- Lophostemon confertus
- Magnolia grandiflora ‘Esmouth’
- Melia azedarach
- Olea europea
- Pistacia chinensis
- Pyrus nivalis
- Robinia pseudoacacia (Varieties)
- Sapindus saponaria
- Tilia cordata ‘Greenspire’
- Tristaniopsis laurina
- Ulmus x hollandica
- Zelkova serrata ‘Green Vase’

**Street Tree Considerations**

- Tolerate crown pruning to powerlines
- Tolerate full sun
- Minimum height clearance of 2.5 m
- Restricted height under powerlines
- Tolerate crown pruning to powerlines
Location Type 12 – Residential Broad Verge With No Powerlines

To come
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

<table>
<thead>
<tr>
<th>Canopy</th>
<th>Height</th>
<th>Shade rating</th>
<th>No powerlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;6m</td>
<td>&gt;10m</td>
<td>&gt;2</td>
<td></td>
</tr>
</tbody>
</table>

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

Acer rubrum ‘October Glory’
Acer rubrum ‘Scarsen’
Acer x freemanii ‘Autumn Blaze’
Agathis robusta
 Allocasuarina torulosa
 Allocasuarina verticillata
 Angophora costata
 Angophora forbsunda
 Bankia integrofolia subsp. integrofolia
 Bankia serrata
 Brachychiton populneus
 Brachychiton rupestris
 Brachychiton x roseus
 Casuarina cunninghamiana
 Casuarina glauca
 Cedrus atlantica
 Cedrus deodara
 Celtis australis
 Celtis occidentalis
 Cinnamomum camphora
 Corymbia eximia
 Corymbia flicata
 Corymbia maculata
 Cupaniopsis anachardioides
 Cupressus glabra (syn. C. arizonica)
 Cupressus torulosa
 Eucalyptus bancroftii
 Eucalyptus camaldulensis
 Eucalyptus cinerea
 Eucalyptus costophylla
 Eucalyptus leucocoryn
 Eucalyptus leucocoryn ssp. megalocarpa
 Eucalyptus melliodora
 Eucalyptus platytypos
 Eucalyptus polyanthemos
 Eucalyptus pulchella
 Eucalyptus scoparia
 Eucalyptus sideroxylon
 Eucalyptus spathulata
 Ficus macrophylla
 Ficus microcarpa var. hirtii
 Ficus rubiginosa
 Fraxinus excelsior ‘Aurora’
 Fraxinus pennsylvanica ‘Aeral’
 Fraxinus pennsylvanica ‘Cimmaron’
 Fraxinus pennsylvanica ‘Urbanite’
 Fraxinus velutina
 Ginkgo biloba
 Gliricidia triacanthos var. inermis Varieties
 Jacaranda mimosifolia
 Koelreuteria paniculata
 Liquidambar formosana
 Liquidambar sylvnitus ‘Potpourri’
 Lophostemon confertus
 Macura pomerita ‘Wichita’
 Magnolia grandiflora ‘Exmouth’
 Metasequoia glyptostroboids
 Olea europea
 Phoenix canariensis
 Pinus canariensis
 Pinus halepensis
 Pinus patula
 Pinus pinaster
 Pinus pinea
 Platanus orientalis ‘Digitata’
 Platanus X acerifolia
 Podocarpus elatus
 Pyrus calleryana varieties
 Pyrus nivalis
 Quercus acutissima
 Quercus agrifolia
 Quercus bicolor
 Quercus canariensis
 Quercus cerris
 Quercus coccinea
 Quercus flex
 Quercus macrocarpa
 Quercus palustris
 Quercus phellos
 Quercus robur
 Robinia pseudacacia (Varieties)
 Sapium sebiferum
 Schinus areira
 Sycamum paniculatum
 Taxodium distichum
 Tilia cordata ‘Greenspire’
 Ulmus glabra ‘Lutescens’
 Ulmus parvifolia
 Ulmus procer
 Ulmus x hollandica
 Waterhousea floribunda
 Zelkova serrata ‘Green Vase’

Street Tree Considerations
Tolerate crown pruning to powerlines
Tolerate full sun
Minimum height clearance of 2.5 m
Location Type 13 – Residential Narrow Verge With Powerlines

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane with central parking/median area, and bike lanes</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential, setback</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerb and perpendicular median parking</td>
</tr>
<tr>
<td>Road centre</td>
<td>Median parking, Occasional planting</td>
</tr>
<tr>
<td>Pathways</td>
<td>&lt; 3.6 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge</td>
</tr>
<tr>
<td>Example</td>
<td>Faraday Street, Carlton</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Acer buergerianum
Acer campestre ‘Elstrijk’
Acer campestre ‘Evelyn’
Acer platanoides ‘Globosum’
Acer truncatum x A. platanoides ‘Keithsform’
Agonis flexuosa
Allocasuarina littoralis
Allocasuarina verticillata
Angophora h fake (Syn. A. cordifolia)
Banksia integrifolia subsp. integrifolia
Banksia serrata
Brachychiton populneus
Brachychiton rupestris
Callistemon ‘Harkness’
Callistemon salignus
Callistemon viminalis
Catapta bignonioides ‘Nana’
Celtis australis
Celtis occidentalis
Cercis siliquastrum
Corymbia eximia
Corymbia ficifolia
Cupaniopsis anachardioides
Eucalyptus cosmophylla
Eucalyptus gregsoniana
Eucalyptus leucophloyn ssp. megalocarpa
Eucalyptus platypus
Eucalyptus st Stick
Ficus platyptoda
Fraxinus excelsior ‘Aurora’
Fraxinus ornus
Fraxinus ornus ‘Meczek’
Fraxinus pennsylvaniaica ‘Urbanite’
Geijera parviflora
Jactaranda mimosolecta
Koelreuteria paniculata
Lagerstroemia indica x L. fauriei varieties
Leptospermum petersoni
Liquidambar formosana
Lophostemon confertus
Magnolia grandiflora ‘Exmouth’
Melia azedarach
Olea europaea
Pistacia chinensis
Pyrus nivalis
Robinia pseudoacacia (Varieties)
Sapinum sebiferum
Tilia cordata ‘Greenspire’
Tristaniopsis laurina
Ulmus x hollandica
Zelkova serrata ‘Green Vase’

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

- Canopy <10m
- Height any
- Shade rating >2
- Community health >3
- No powerlines

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer buergerianum
- Acer campestre ‘Elstrijk’
- Acer campestre ‘Evelyn’
- Acer platanoides ‘Globosum’
- Acer truncatum x A. platanoides ‘Keithsform’
- Agonis flexuosa
- Allocasuarina littoralis
- Allocasuarina verticillata
- Angophora h fake (Syn. A. cordifolia)
- Banksia integrifolia subsp. integrifolia
- Banksia serrata
- Brachychiton populneus
- Brachychiton rupestris
- Callistemon ‘Harkness’
- Callistemon salignus
- Callistemon viminalis
- Catapta bignonioides ‘Nana’
- Celtis australis
- Celtis occidentalis
- Cercis siliquastrum
- Corymbia eximia
- Corymbia ficifolia
- Cupaniopsis anachardioides
- Eucalyptus cosmophylla
- Eucalyptus gregsoniana
- Eucalyptus leucophloyn ssp. megalocarpa
- Eucalyptus platypus
- Eucalyptus st Stick
- Ficus platyptoda
- Fraxinus excelsior ‘Aurora’
- Fraxinus ornus
- Fraxinus ornus ‘Meczek’
- Fraxinus pennsylvaniaica ‘Urbanite’
- Geijera parviflora
- Jactaranda mimosolecta
- Koelreuteria paniculata
- Lagerstroemia indica x L. fauriei varieties
- Leptospermum petersoni
- Liquidambar formosana
- Lophostemon confertus
- Magnolia grandiflora ‘Exmouth’
- Melia azedarach
- Olea europaea
- Pistacia chinensis
- Pyrus nivalis
- Robinia pseudoacacia (Varieties)
- Sapinum sebiferum
- Tilia cordata ‘Greenspire’
- Tristaniopsis laurina
- Ulmus x hollandica
- Zelkova serrata ‘Green Vase’
Location Type 14 – Residential Narrow Verge With No Powerlines

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>20 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential, setback</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel or perpendicular kerb parking</td>
</tr>
<tr>
<td>Road centre</td>
<td>-</td>
</tr>
<tr>
<td>Pathways</td>
<td>2.5 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb planting</td>
</tr>
<tr>
<td>Example</td>
<td>Stawell Street North Melbourne</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

<table>
<thead>
<tr>
<th align="left">Canopy 5-10m</th>
</tr>
</thead>
<tbody>
<tr>
<td align="left">Height 5-20m</td>
</tr>
<tr>
<td align="left">Shade rating &gt;3</td>
</tr>
<tr>
<td align="left">Community health &gt;3</td>
</tr>
<tr>
<td align="left">No powerlines</td>
</tr>
</tbody>
</table>

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

- Acer buergerianum
- Acer campestre 'Evelyn'
- Acer platanoides 'Crimson Sentry'
- Acer truncatum x A. platanoides 'Keithsform'
- Acer x freemanii 'Autumn Blaze'
- Afrocarpus falcata
- Agathis robusta
- Allocasuarina littoralis
- Allocasuarina torulosa
- Allocasuarina verticillata
- Angophora costata
- Angophora floribunda
- Banksia serrata
- Brachychiton acerifolius
- Brachychiton populneus
- Brachychiton rupestris
- Brachychiton x roseus
- Callistemon 'Harkness'
- Callistemon salignus
- Callistemon viminalis
- Casuarina cunninghamiana
- Casuarina glauca
- Catalpa bignonioides 'Nana'
- Cedrus atlantica
- Cedrus deodara
- Celtis australis
- Celtis occidentalis
- Cercis silquardia
- Chinomorpha camphora
- Corymbia fencifolia
- Corymbia maculata
- Cupanopisis anardilloides
- Cupressus glabra (syn. C. arizonicum)
- Cupressus sempervirens
- Cupressus torulosa
- Eucalyptus bicotillo
- Eucalyptus cinerea
- Eucalyptus cookiana
- Eucalyptus greggii
- Eucalyptus leucoxylon
- Eucalyptus manglesiana
- Eucalyptus melliodora
- Eucalyptus nitrata
- Eucalyptus platypus
- Eucalyptus polyanthera
- Eucalyptus pulchella
- Eucalyptus scoparia
- Eucalyptus sideroxylon
- Eucalyptus spathulata
- Ficus macrophylla
- Ficus microcarpa var. hillii
- Ficus platypoda
- Ficus rubiginosa
- Fraxinus excelsior 'Aurea'
- Fraxinus ornus
- Fraxinus ornus 'Meczek'
- Fraxinus pennsylvanica 'Fastigiata'
- Fraxinus pennsylvanica 'Crimson'
- Fraxinus pennsylvanica 'Urbanite'
- Fraxinus velutina
- Geijera parviflora
- Ginkgo biloba
- Gleirisia tricoarctos var. sericulosa
- Jacaranda mimosaefolia
- Koelreuteria paniculata
- Lagerstroemia indica x L. fauriei varieties
- Lepidopterum peterssonii
- Liquidambar formosana
- Liquidambur styraciflua 'Rotundifolia'
- Lophosterum confusus
- Magnolia grandiflora 'Exmooth'
- Melia azedarach
- Metasequoia glyptostroboides
- Olea europaea
- Phoenix canariensis
- Pinus canariensis
- Pinus halepensis
- Pinus patula
- Pinus pinaster
- Pistacia chinensis
- Platamnus orientalis 'Digitata'
- Platanus X acerifolia
- Podocarpus elatus
- Pycus calleryana varieties
- Pycus nigra
- Quercus acutissima
- Quercus bicolor
- Quercus coccinea
- Quercus flexuosa
- Quercus macrocarpa
- Quercus palustris
- Quercus phellos
- Quercus robur
- Quercus rubra
- Robinia pseudoacacia (Varieties)
- Sapindus suteiferum
- Schinus aranea
- Sophora japonica 'Princetona Upright'
- Stenocarpus sinuatus
- Syzygium microphyllum
- Taxodium distichum
- Tilia cordata 'Greenspire'
- Trachycarpus fortunei
- Tristaniaopsis laurina
- Ulmus glabra 'Lutescens'
- Ulmus parviflora
- Ulmus x hollandica
- Waterhousea floribunda
- Zelkova serrata 'Green Vase'
## Location Type 15 – Residential Wide Median

### Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>30 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane with central median, and bike lanes</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential, setback</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerb</td>
</tr>
<tr>
<td>Road centre</td>
<td>3-8m wide planted median</td>
</tr>
<tr>
<td>Pathways</td>
<td>&lt; 3.6 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge and central median</td>
</tr>
<tr>
<td>Example</td>
<td>Canning street, Drummond Street, Carlton</td>
</tr>
</tbody>
</table>

---

### Typical Section

```
| footpath | parking | bike | traffic | median | traffic | bike | parking | footpath |
```

### Typical Plan
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

<table>
<thead>
<tr>
<th>Canopy &gt; 8m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height &gt; 10m</td>
</tr>
<tr>
<td>Shade rating any</td>
</tr>
<tr>
<td>Community health &gt;3</td>
</tr>
<tr>
<td>No powerlines</td>
</tr>
</tbody>
</table>

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

Acer platanoides ‘Crimson Sentry’
Acer rubrum ‘October Glory’
Acer rubrum ‘Scarsen’
Acer truncatum x A. platanoides ‘Keithsform’
Acer x freemanii ‘Autumn Blaze’
Afrocarpus falcata
Agathis robusta
Allocasuarina torulosa
Angelopora costata
Angelopora floribunda
Anraucaria cunninghamii
Anraucaria heterophylla
Bankia integrofolia subsp. integrofolia
Cassinaea cunninghamiana
Casuarina glauca
Cedrus atlantica
Cedrus deodara
Celtis occidentalis
Cercis siliquastrum
Cinnamomum camphora
Corymbia citriodora
Corymbia maculata
Cupaniopsis anachardioides
Cupressus sempervirens
Cupressus torulosa
Eucalyptus banksii
Eucalyptus camaldulensis
Eucalyptus cinerea
Eucalyptus cosmoephyla
Eucalyptus gregsoniana
Eucalyptus leucocoryn
Eucalyptus mannifera subsp. maculosa
Eucalyptus melliodora
Eucalyptus nicholi
Eucalyptus polyanthemos
Eucalyptus pulchella
Eucalyptus scoparia
Eucalyptus sideroxylon
Eucalyptus spathulata
Ficus microcarpa var. nillii
Ficus platypoda
Ficus rubiginosa
Fraxinus pennsylvanica ‘Cimmaron’
Fraxinus pennsylvanica ‘Urbant’
Fraxinus velutina
Geigeria biloba ‘Princeton Sentry’
Gleditsia triacanthos var. inermis Varieties
Jasminum nudiflorum
Lagerstroemia indica x. latifolia varieties
Liquidiambra feroxiana
Liquidiambra styraciflua ‘Rotundiloba’
Lophosterom conifortus
Madrura pomelella ‘Wichita’
Matatexagia glyptostroboides
Paulownia tomentosa
Pinus canariensis
Pinus pinea
Platanus orientalis ‘Digitata’
Platanus X acerifolia
Podocarpus elatus
Pyrus nivalis
Quercus acutissima
Quercus agritolia
Quercus bicolor
Quercus canariensis
Quercus cerris
Quercus cocconeae
Quercus ilex
Quercus macrocarpa
Quercus palustris
Quercus phellos
Quercus rubra
Robinia pseudoacacia (Varieties)
Sapindus saponifera
Schinus arora
Tilia cordata ‘Greenspire’
Ulmus glabra ‘Lutescens’
Ulmus parvifolia
Ulloa procera
Zelkova serrata ‘Green Vase’

Street Tree Considerations
Potential large and high canopy
Tolerate full sun
Minimum height clearance of 2.5m
Variety of shade rating
Location Type 16 – Residential Narrow Median

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>20 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane with central median</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential, setback</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerb</td>
</tr>
<tr>
<td>Road centre</td>
<td>2-3m planted/infill median or intermittent parking/median</td>
</tr>
<tr>
<td>Pathways</td>
<td>2.5 metre footpath</td>
</tr>
<tr>
<td>Trees</td>
<td>Larger median planting, kerb planting</td>
</tr>
<tr>
<td>Example</td>
<td>Pitt Street Carlton, Lothian Street North Melbourne</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan

[pic of street scene]
Chapter 4 // Choosing the Right Tree

Tree Selection Criteria
(Key requirements for generating suitable street trees from matrix)

Canopy <15
Height > 10m
Shade rating any
No powerlines

Recommended Trees
(Based on Tree Selection Criteria relevant to Street Tree Considerations)

Acer buergerianum
Acer campestre 'Ellesrijk'
Acer campestre 'Evelyn'
Acer platanoides 'Crimson Sentry'
Acer platanoides 'Globosum'
Acer rubrum 'October Glory'
Acer rubrum 'Scarlet Blaze'
Acer truncatum x A. platanoides 'Keithsform'
Acer x freemanii 'Autumn Blaze'
Afrocarpus falcata
Agathis robusta
Agonis flexuosa
Allocasuarina littoralis
Allocasuarina torulosa
Allocasuarina verticillata
Angophora costata
Angophora floribunda
Brachychiton acerifolius
Callistemon salignus
Callistemon viminalis
Casuarina glauca
Cedrus decotara
Corymbia citriodora
Corymbia maculata
Cupressus sempervirens
Eucalyptus bicostata
Eucalyptus camaldulensis
Eucalyptus cineara
Eucalyptus leucoxylon
Eucalyptus leucoxylon ssp. megalocarpa
Eucalyptus mannifera subsp. maculosa
Eucalyptus melliodora
Eucalyptus nicholii
Eucalyptus platypus
Eucalyptus polyanthemos
Eucalyptus pulchella
Eucalyptus scoparia
Eucalyptus sideroxylon
Eucalyptus spathulata
Ficus microcarpa var. Hili
Fraxinus pennsylvanica 'Aerial'
Fraxinus pennsylvanica 'Crimmon'
Fraxinus pennsylvanica 'Urbante'
Fraxinus velutina
Ginkgo biloba 'Princeton Sentry'
Gleditsia triacanthos var. immaculata Varieties
Jasminum nudiflorum
Liquidambar formosana
Liquidambar styraciflua 'Rotundifolia'
Macrae pomerita 'Wichita'
Malus domestica 'Dethystroides'
Pauwienia tomentosa
Phoenix canariensis
Pinus pinea
Platanus orientalis 'Digitata'
Platanus X acerifolia
Podocarpus elatus
Prunus calleryana varieties
Quercus acutissima
Quercus agrifolia
Quercus bicolor
Quercus canariensis
Quercus coccinea
Quercus ilex
Quercus macrocarpa
Quercus phellos
Quercus robur
Quercus robur 'Fastigiata'
Quercus rubra
Robinia pseudoacacia (Varieties)
Sapindus saponaria
Schinus arenaria
Sophora japonica 'Princeton Upright'
Stenocarpus sinuatus
Tilia cordata 'Greenspire'
Tristania laurina
Ulmus glabra 'Lutescens'
Ulmus parvifolia
Ulmus procera
Washingtonia filifera
Washingtonia robusta

Street Tree Considerations
Potential large and high canopy
Tolerate full sun
Minimum height clearance of 4.5m
Variety of shade rating

Urban Forest Diversity Guidelines – Tree Species Selection Guidelines for the City of Melbourne
Asterisked references refer to works not mentioned within the body of the document.


Urban Horticulture Institute – Cornell University http://www.hort.cornell.edu/department/faculty/bassuk/uhi/walk5.html


The following texts are mentioned within the body of the document but are not yet detailed within the references.


Müller, 1766

Grabosky, Bassuk, & Towbridge (2002).

(Connellan, 2008)

(Rich, P.M. 1990. Characterizing plant canopies with hemispherical photographs.)
Appendix 2: The Tree Selection Matrix as Interactive Tool

The Urban Forest Tree Diversity Guidelines employ a tree selection matrix as the interactive tool for tree species selection.

It is this interactive tool that has produced the tree lists by Location Type.

However, because the Tree Selection Matrix can be used interactively, it is able to generate additional specific tree lists for a wide range of criteria above and beyond those used to produce the tree lists presented within the main body of this report.

The Tree Selection Matrix provides an effective way of organising, sorting and prioritising tree species characteristics, tolerances and susceptibilities so as to provide informed and useful tree species selections.

The Tree Selection Matrix requires the user to determine the characteristics required for tree species within a given environment – for instance the verge of a busy east-west CAD street – thus encouraging a relationship to be established between tree selection and site specifics across the City’s streetscapes and parks.

In order to aid the City of Melbourne’s objectives, the Tree Selection Matrix provides three distinct tree lists from which appropriate tree selections can be made. The range of selection criteria across the three tree species lists is consistent. The three tree species lists are:

- **Street trees:** The principle component of the urban forest within the public domain.
- **Park trees:** These contribute significant avenues of tree planting to the cities greenery. While most street trees can be grown in parks, the reverse is not always possible. The park tree list includes species that require greater root volumes than those generally achievable in the streetscape environment, and species of large size.
- **Trial trees:** Included to expand the diversity of the tree species population, through streetscape trialing. Once the performance of these trees can be determined the matrix can be updated to reflect this new knowledge – the Tree Selection Matrix is a ‘live’ tool, intended to be reviewed on a regular basis.

Detailed instructions on how to use the Tree Selection Matrix follow.

Using the Matrix

To understand how to use the matrix as an interactive tool, these Guidelines demonstrate a simple staged process of producing the street tree list for one Location Type (in the example the location is Location Type 1 – CAD Wide Footpath), and then further refining that list (in the example, the list is refined to show only trees suitable for shady conditions).

The matrix is a highly flexible tool able to generate plant lists for effectively all locations and conditions throughout the City of Melbourne.

A profile of a typical street can be constructed using the type parts much like a mix and match book. This can help profile any typical scenario in a street type and provide a tree list that is flexible to cover differing scenarios such as powerlines, narrow verge, median planting opportunities. Therefore a truly diverse list of trees can be generated for any given street. This list can then be filtered further in the precinct plans.

Dimensional criteria are probably the most important, and the best place to start when refining tree lists. Remember trees may fail the criteria by being, for example, 1 metre too short or narrow. It is up to the discretion of Council to change the field to capture trees that are perceived as still being useful in this application and satisfying the objectives.

The selection criteria are supplemented by further information included in the Tree Selection Matrix that can be used by Council to scrutinise the tree candidates for the application after initial sorting and refining.

It is anticipated that this matrix will be supported by the graphic cross sections and that a street cross section can be generated to cover most variables found in the extent of a street, such as awnings, powerlines that switch verges, etc. The inclusion of such Location Types is a future exercise that may be explored.
### The Matrix at a Glance

**Tree Species**
Botanical and common name

**Tree Information Data**
Botanical and horticultural information

Base Criteria for Adaptability to Urban Conditions
The criteria by which each street species must fulfill to be acceptable for planting in City of Melbourne.

**Adaptability to Urban Conditions Rating**

**Additional Selection Criteria**

**Location Types**
Showing which trees are suitable.

#### Table: Tree Information Data

<table>
<thead>
<tr>
<th>Adaptability to Urban Conditions Rating</th>
<th>Location Type 1</th>
<th>Location Type 2</th>
<th>Location Type 3</th>
<th>Location Type 4</th>
<th>Location Type 5</th>
<th>Location Type 6</th>
<th>Location Type 7</th>
<th>Location Type 8</th>
<th>Location Type 9</th>
<th>Location Type 10</th>
<th>Location Type 11</th>
<th>Location Type 12</th>
<th>Location Type 13</th>
<th>Location Type 14</th>
<th>Location Type 15</th>
<th>Location Type 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Availability Type</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Shade Tolerance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Maintenance Required</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Growth Rate</td>
<td>Fast</td>
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<tr>
<td>Base Criteria</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

---

The matrix at a glance provides an overview of the adaptability of various tree species to urban conditions, including their common availability, shade tolerance, and maintenance requirements. Each species is rated for its growth rate and is detailed under tree information data.
Example

Demonstrating how to produce a street tree list for Location Type 1 – CAD Wide Footpath, and refine that list to show only trees suitable for shady conditions.

### Step 1

Identify the column on the Tree Selection Matrix that shows Location Type 1 – CAD Wide Footpath
Step 2

After the sort criteria for this column of the Matrix to exclude all trees marked “No”.

To do this click on the symbol in the top cell of the Location Type 1 – CAD Wide Footpath column. Click on the checkbox next to “No” to deselect that sort option and thus exclude all trees marked “No” from being displayed. Click OK to finish this step.

Note that here you can identify the selection criteria used to establish which trees are marked suitable (yes) and unsuitable (no).

In this example the criteria are Canopy >8m, Height >10m, Shade rating > 2, Pollution rating > 2, and suitable for growing where there are no powerlines.
Step 2 continued

You can see here that only trees marked “Yes” in the Location Type 1 – CAD Wide Footpath column are being displayed.

<table>
<thead>
<tr>
<th>Tree Species</th>
<th>Heat Tolerance</th>
<th>Cold Hardiness</th>
<th>Pollen</th>
<th>Shade Tolerance</th>
<th>Root System</th>
<th>Root Runners</th>
<th>Pest &amp; Disease</th>
<th>Heat Stress</th>
<th>Water Stress</th>
<th>Salt Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald Cypress</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bald Cypress</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Bald Cypress</td>
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<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

This is the list of trees considered adaptable to urban conditions and suitable to Location Type 1 – CAD Wide Footpath, and shown on page 45.
Step 3
To further refine this list to show only trees suitable to shady conditions, it is necessary now to sort the Matrix by the column “Shade Tolerance”
Step 3 Continued
To sort the Shade Tolerance column click on the symbol in the top cell of the Shade Tolerance column. Click on the checkbox next to “No” to deselect that sort option and thus exclude all trees marked “No” from being displayed. Click OK to finish this step.
**Step 3 Continued**

You can see here that only trees both marked “Yes” in the Shade Tolerance column and in the Location Type 1 – CAD Wide Footpath column are being displayed.

This is the list of trees considered adaptable to urban conditions and suitable to Location Type 1 – CAD Wide Footpath, and suitable for being grown in shady conditions.
### Tree information data

**Tree name**
Provides botanical name, (genus, species, variety and cultivar) according to accepted international code of taxonomic classification, and common name.

**Origin**
Country or region where tree species grows naturally. Cultivated plants (cultigens) have been listed as cultivars – plants bred or selected for certain characteristics.

**Rate**
Estimated growth rate of particular tree species. Based on expected extension growth; slow 100mm to 300mm per annum, moderate 300mm to 500mm per annum, fast up to or greater than 500mm per annum.

**Height and width**
Estimated canopy height and width, in metres, of the species or cultivar growing in urban landscapes in Melbourne. Estimation based on referenced literature and experience.

**Tree form**
- **Broad domed** = Broad spread, rounded. Generally crown is as wide as it is high.
- **Sub form** – Broad domed, pendulous. As above with pendulous branchlets.
- **Broad domed, ascending.** As above with ascending, upright branches
- **Narrow domed** = narrow spread, oval, ovoid. Generally crown taller than it is wide.
- **Sub form** – Narrow domed, pendulous. As above with pendulous branchlets.
- **Narrow domed, ascending.** As above with ascending, upright branches
- **Pyramidal** = conical. Crown generally wider at base than at apex.
- **Sub form** – Pyramidal, tiered. Branches layered or arranged in whorls
- **Columnar** = fastigiate, spired
- **Vase** = ascending branches, fanning out from trunk. Crown wider at top than at base.

**Palm.** Generally, one straight stem and crown of large evergreen leaves that are either palmately (‘fan-leaved’) or pinnately (‘feather-leaved’).

**Availability**
Indicates whether species or variety is commonly available from commercial nurseries in sufficient numbers, or is rarely available from specialist nurseries. This may indicate whether a desired species or cultivar should be contract grown. Also indicates different production methods.

**Biodiversity Potential**
The study of urban ecology is relatively recent, with research on how living organisms interact with each other in cities relatively limited. Climate change and the planning of the built environment have resulted in shifts within the urban ecology. Urban ecology research has, as an example, been able to explain the presence of the normally warm temperate and subtropical Grey Headed Flying Fox set up in permanent camps in the city. Research by the Australian Research Centre for Urban Ecology has shown that the heat island effect, reduction in frosts, increased planting of flowering eucalypts (whose flowering is stimulated by irrigation and a lack of natural pests) has allowed these mammals to colonise Melbourne. It is information such as this that can inform how planning for the urban forest can be beneficial in achieving biodiversity goals. As with research input generally, more data is required to better define these goals. Information has been provided in the tree selection that does provide some guidance on trees that have a value for food or foraging.
Appendix 3: Location Typology – Additional Location Types

The following pages show Location Types considered for, but not included in, the final Location Typology for Trees Within City of Melbourne Streets and Parks.
Streets Types

5_Boulevard_Existing
60m wide, 4 tree rows, 4 roadways, 2 laned, kerb-side parking, tramway, 5m wide medians, footpaths
Example: St Kilda Road, Royal Parade, Flemington Road

Typical Section

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>60 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>8 lane boulevard with double medians and central tramway, Bike lanes at road edge.</td>
</tr>
<tr>
<td>Overhead</td>
<td>Lighting, Tram cabelling in centre</td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium and/or parkland</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside</td>
</tr>
<tr>
<td>Road centre</td>
<td>Two planted and grassed medians</td>
</tr>
<tr>
<td>Pathways</td>
<td>3 metre/various width footpath, Setback from road edge</td>
</tr>
<tr>
<td>Trees</td>
<td>4 main avenues</td>
</tr>
<tr>
<td>Example</td>
<td>St Kilda Road, Royal Parade, Flemington Road</td>
</tr>
</tbody>
</table>

Typical Plan
CAD Laneway Wide

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>10-12 metres</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>Mostly single lane. Often running east/west</td>
</tr>
<tr>
<td>Overhead Lighting</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium to high at footpath edge</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside mostly on one side</td>
</tr>
<tr>
<td>Road centre</td>
<td>-</td>
</tr>
<tr>
<td>Pathways</td>
<td>&lt; 3 metre footpath at roadside</td>
</tr>
<tr>
<td>Trees</td>
<td>Often on one side of street</td>
</tr>
<tr>
<td>Example</td>
<td>Little Collins Street, Flinders Lane</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Park and Road

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>20 - 30 metres</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane shared with tramway</td>
</tr>
<tr>
<td>Overhead</td>
<td>Lighting, tram cabling</td>
</tr>
<tr>
<td>Buildings</td>
<td>Medium height and parkland</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerbside</td>
</tr>
<tr>
<td>Road centre</td>
<td>May have tramway</td>
</tr>
<tr>
<td>Pathways</td>
<td>Narrow to wide, Often setback off road</td>
</tr>
<tr>
<td>Trees</td>
<td>Larger trees in park</td>
</tr>
<tr>
<td>Examples</td>
<td>The Avenue Parkville, Rathdowne Street, Domain Road</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Park Road Through

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>20 metre</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>2 lane</td>
</tr>
<tr>
<td>Overhead Lighting</td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>None</td>
</tr>
<tr>
<td>Parking</td>
<td>Varied or none</td>
</tr>
<tr>
<td>Road centre</td>
<td></td>
</tr>
<tr>
<td>Pathways</td>
<td>Varied pathways, with setback from road edge</td>
</tr>
<tr>
<td>Trees</td>
<td>Avenues along road and pathways</td>
</tr>
<tr>
<td>Example</td>
<td>Birdwood Avenue</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
Park Avenue

Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>–</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>–</td>
</tr>
<tr>
<td>Overhead</td>
<td>–</td>
</tr>
<tr>
<td>Buildings</td>
<td>–</td>
</tr>
<tr>
<td>Parking</td>
<td>–</td>
</tr>
<tr>
<td>Road centre</td>
<td>–</td>
</tr>
<tr>
<td>Pathways</td>
<td>Narrow to wide pedestrian pathway network</td>
</tr>
<tr>
<td>Trees</td>
<td>Avenue plantings</td>
</tr>
<tr>
<td>Example</td>
<td>University Square</td>
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</table>

Typical Section

Typical Plan
Residential Narrow Street

Description of Key Characteristics

<table>
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<tr>
<th>Street Width</th>
<th>12-15 metres</th>
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</thead>
<tbody>
<tr>
<td>Traffic Lanes</td>
<td>Single lane, or shared</td>
</tr>
<tr>
<td>Overhead</td>
<td>Powerlines, lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Residential</td>
</tr>
<tr>
<td>Parking</td>
<td>Parallel kerb</td>
</tr>
<tr>
<td>Road centre</td>
<td>–</td>
</tr>
<tr>
<td>Pathways</td>
<td>&lt; 2.5 metre footpath at road edge</td>
</tr>
<tr>
<td>Trees</td>
<td>Kerb edge</td>
</tr>
<tr>
<td>Example</td>
<td>Bayswater Road Kensington</td>
</tr>
</tbody>
</table>

Typical Section

Typical Plan
### Container

#### Description of Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Width</td>
<td>Varied</td>
</tr>
<tr>
<td>Traffic Lanes</td>
<td>Pedestrian traffic primarily</td>
</tr>
<tr>
<td>Overhead</td>
<td>Lighting</td>
</tr>
<tr>
<td>Buildings</td>
<td>Varied heights</td>
</tr>
<tr>
<td>Parking</td>
<td>--</td>
</tr>
<tr>
<td>Road Centre</td>
<td>--</td>
</tr>
<tr>
<td>Pathways</td>
<td>Varied width pathway and open space</td>
</tr>
<tr>
<td>Trees</td>
<td>Container plantings</td>
</tr>
<tr>
<td>Example</td>
<td>Bourke St Mall, Docklands, Roof Gardens, Southbank.</td>
</tr>
</tbody>
</table>

#### Typical Sections

- Footpath
- Container
- Walkway
- Container
- Footpath

#### Typical Plan

- Footpath
- Container
- Walkway
- Container
- Footpath
What makes a useful street tree for Melbourne according to the tree selection matrix?

An adaptable street tree that is vigorous is desirable in Melbourne’s future urban forest. The scoring of the Base Criteria shows that careful consideration of the species was considered initially. All the 148 species pass. There are no trees that can be considered as having a low adaptability as they have been culled in the first instance. All trees have a moderate adaptability or higher. The trees can be given intervals of adaptability to help analyse the list and determine which trees can be used in priority tree replacement streets.

Intervals for analysis can include:

1) Moderate Adaptability: 25-33. Examples of species in this lower ranking bracket that comprises 10% of the list include:
   - Trident Maple
   - Lilly Pilly
   - Norfolk Island Pine
   - Moreton Bay Fig
   - Pistachio
   - Stenocarpus
   - Golden, English and Dutch Elms

There are no clear patterns, as there are many genera found in the moderate adaptability found in the next higher. However trees that benefit from water and shelter such as the cool climate Maples, Australian rainforest species and Elms tend to be found in this range.

2) Moderate to High Adaptability: 33-41. Examples of species in this median range bracket comprising 71% of the list include:
   - Norway Maple
   - She-Oak
   - Coastal Banksia
   - Common Hackberry
   - Bottlebrush
   - Corymbia sp.
   - Eucalyptus sp.
   - Port Jackson Fig
   - Ash
   - Melaleuca

A large representation of the Australian myrtaceous trees such as Eucalypts, Corymbias and Melaleucas. There are also number of harder deciduous trees from Asia, southern Europe, the Mediterranean and America. Pines also dominate.

3) High Adaptability: 42-50. Examples of species in this higher range bracket comprising 5% of the list include:
   - Kurrajong
   - Cypress Pines
   - Cypress
   - Liquidamber
   - Holly Oak

An eclectic group of trees, this includes Australian native trees from the interior and dry slopes, the Cypress from USA and the Middle East and evergreen oaks. All trees from harsh dry climates.
Appendix 5: Limitations, Qualitative Judgments and Research Data

The assessment criteria for the street tree diversity list have been developed with expert technical opinion that covers arboricultural experience, from landscape architectural advice and also from Council's own experience and input. The application of urban forest management practice within Australian cities is relatively recent. There is a lack of critical data and research. As a consequence, to make the assessment of the tree selection criteria the limitations need to be identified to define qualitative judgment.

Research Data
The performance of street trees in Melbourne is based on what has been growing in the City’s streets over time and what has been growing in similar climates in adjoining Council Local Government Areas with similar climates. There are horticultural factors such as frosts, soil types and planting methods and practices that vary across the Greater Melbourne area. The tree diversity list is intentionally ‘live’ to allow trialing of new species and consequent research data to be incorporated. Research from universities and technical institutes is limited by funding provided both publicly and privately. It is unfortunate in Australia that such funding is limited, though it is hoped that this will change. Research data is critical for Council to manage the urban forest effectively.

Shade Rating
The quality of shade that trees provide in the city is an important attribute. The quality and extent of shade has a direct impact on street microclimate, personal comfort and ultimately the liveability and success of our streets. Shade rating like biodiversity potential is an important goal for planning the urban forest. However the methods for determining shade quality are not easily qualified by scientific data. While the Leaf Area Index (LAI) is a measurement of leaf area per unit ground surface area, it is not a determinant for shade quality. LAI is used in agriculture and forestry to predict crop and tree growth for production. Other techniques include hemispherical (or fisheye) photography. This technique involves analyzing tree canopy photography, however is applicable to ecological or canopy forest cover. It measures the amount of solar penetration in the canopy, not for individual street trees. Light sensors can be used for individual trees, however data would need to be logged over time to determine solar radiation levels and canopy architecture. (Rich, P.M. 1990. Characterizing plant canopies with hemispherical photographs.)

For this study the shade quality is determined by what we assess to be a comfortable shade level. The shade levels were defined in intervals from heavy to light. These patterns of shade have been identified with photographs as a gauge of shade intensity.
Appendix 6: Crown Projection Method

To calculate how much soil is needed for a given size tree, the Urban Horticulture Institute (2003) based at Cornell University in the United States has developed a step-by-step methodology. The following is a shortcut version of that methodology that can be used to approximate soil volume requirements.

1. Measure the distance from the tree’s main trunk to the dripline, or consult a reference book to find the optimum mature spread of the tree you are considering. Estimate that the tree will reach 75% of the optimum. Take half of the realistic spread, which is the radius, r.

2. Calculate $3.1416 \times r^2$. That’s the crown projection, the area under the dripline of the tree.

3. For every square meter of crown projection, provide 0.6m$^3$ of soil.

Example: Platanus x acerifolia (London Plane) has the ability to reach 20m height x 18m canopy width (avg.) with a trunk diameter of 45cm measured at 1.4m from ground level. Tree is growing in Melbourne with no irrigation. The canopy radius would be 9.0m.

The crown projection would be $(3.14)\times(9.0 \times 9.0) = 254.46m^2$

$254.46m^2 \times 0.6 = 152.68$ cubic meters of soil volume needed.

Tree roots generally will not be found deeper than one meter; consequently one meter is used as a depth dimension (unless you know the planting site will be shallower). 15270cm/100cm = 152.7m$^2$; the area of useable soil in your planter (equivalent to a planting site that’s approximately 12.3 meters wide, 12.3 meters long, and 1.0 meter deep).

Watson & Himelick (1997) also use the crown projection method and suggest as a general guide that root space should be 60cm deep within the projected crown area. This method is also supported in part by the notion that fine root density is usually greater beneath the canopy than beyond (Gilman, 1997).
## Appendix 7: Master Lists of All Street Trees, Park Trees and Trial Trees

### Master List of Street Trees

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer buergerianum</td>
<td>Swamp Maple</td>
</tr>
<tr>
<td>Acer campestre 'Birgink'</td>
<td>Siberian Maple</td>
</tr>
<tr>
<td>Acer campestre 'Evelyn'</td>
<td>Persian Maple</td>
</tr>
<tr>
<td>Acer platanoides 'Crimson Sentry'</td>
<td>Crimson Sentry</td>
</tr>
<tr>
<td>Acer platanoides 'Robustum'</td>
<td>Robustum</td>
</tr>
<tr>
<td>Acer rubrum 'October Glory'</td>
<td>October Glory</td>
</tr>
<tr>
<td>Acer rubrum 'Siberian'</td>
<td>Siberian</td>
</tr>
<tr>
<td>Acer truncatum x A. platanoides</td>
<td>Flat-leaf Maple</td>
</tr>
<tr>
<td>Acacioflexus</td>
<td></td>
</tr>
<tr>
<td>Allocaeca torulosa</td>
<td>Carolina Umbrella Tree</td>
</tr>
<tr>
<td>Allocaeca torulosa</td>
<td></td>
</tr>
<tr>
<td>Anopogon costata</td>
<td></td>
</tr>
<tr>
<td>Anopogon floribunda</td>
<td></td>
</tr>
<tr>
<td>Anopogon hispida (Syn. A. cordofolia)</td>
<td></td>
</tr>
<tr>
<td>Araucaria cunninghamii</td>
<td>Monterey Cypress</td>
</tr>
<tr>
<td>Araucaria heterophylla</td>
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<tr>
<td>Banksia integrifolia subsp. integrifolia</td>
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</tr>
<tr>
<td>Banksia serrata</td>
<td></td>
</tr>
<tr>
<td>Brachychiton acerifolius</td>
<td>China Boxwood</td>
</tr>
<tr>
<td>Brachychiton populus</td>
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</tr>
<tr>
<td>Brachychiton spinosum</td>
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<tr>
<td>Brachychiton x roseus</td>
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</tr>
<tr>
<td>Callistemon 'Harkness'</td>
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<td>Callistemon salignus</td>
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<tr>
<td>Callistemon viminalis</td>
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<td>Cassia cunnninghamiana</td>
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<tr>
<td>Casuaia glauca</td>
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</tr>
<tr>
<td>Calatia bigononoides 'Nana'</td>
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<tr>
<td>Cedrus atlantica</td>
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<td>Cedrus decora</td>
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<td>Celtis australis</td>
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<td>Celtis occidentalis</td>
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<td>Ceris siliquestrum</td>
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<tr>
<td>Cinnamomum camphora</td>
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<tr>
<td>Corymbia citridera</td>
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<tr>
<td>Corymbia exima</td>
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</tr>
<tr>
<td>Corymbia foetida</td>
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</tr>
<tr>
<td>Corymbia maculata</td>
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<tr>
<td>Cupanorrhys australis</td>
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</tr>
<tr>
<td>Cypresus glabra (Syn. C. anizionica)</td>
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</tr>
<tr>
<td>Cypresus sempervirens</td>
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<td>Cypresus torulosa</td>
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<tr>
<td>Eucalyptus banksfrothi</td>
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<td>Eucalyptus camaldulensis</td>
<td>Flindersia</td>
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<td>Eucalyptus cinerea</td>
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<td>Eucalyptus costaphylliana</td>
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<td>Eucalyptus gregatoriensis</td>
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<td>Eucalyptus leucoxylon</td>
<td>Flindersia</td>
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<td>Eucalyptus leucoxylon ssp. megalacarpa</td>
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<td>Eucalyptus mannifera subsp. maculosa</td>
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<td>Eucalyptus melliodora</td>
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<td>Eucalyptus nicoeli</td>
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<td>Eucalyptus platypus</td>
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<td>Eucalyptus polyphleosyn</td>
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<td>Eucalyptus pulchella</td>
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<td>Eucalyptus scoparia</td>
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<tr>
<td>Eucalyptus sideroxyn</td>
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<tr>
<td>Eucalyptus spathulata</td>
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<tr>
<td>Eucalyptus stoeate</td>
<td></td>
</tr>
<tr>
<td>Ficus macrophylla</td>
<td></td>
</tr>
<tr>
<td>Ficus microcarpa var. hillii</td>
<td></td>
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<tr>
<td>Ficus platycoda</td>
<td></td>
</tr>
<tr>
<td>Ficus rubiginosa</td>
<td></td>
</tr>
<tr>
<td>Fraxinus excelsior 'Aurora'</td>
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</tr>
<tr>
<td>Fraxinus ornus</td>
<td></td>
</tr>
<tr>
<td>Fraxinus ornus 'Meczek'</td>
<td></td>
</tr>
<tr>
<td>Fraxinus pennsylvanica 'Aerial'</td>
<td></td>
</tr>
<tr>
<td>Fraxinus pennsylvanica 'Cimmaron'</td>
<td></td>
</tr>
<tr>
<td>Fraxinus pennsylvanica 'Urbanite'</td>
<td></td>
</tr>
<tr>
<td>Fraxinus velutina</td>
<td></td>
</tr>
<tr>
<td>Gelera parviflora</td>
<td></td>
</tr>
<tr>
<td>Grigio biloba</td>
<td></td>
</tr>
<tr>
<td>Grigio biloba 'Prinston Sentry'</td>
<td></td>
</tr>
<tr>
<td>Gleditsia triacanthos var.variiniani</td>
<td></td>
</tr>
<tr>
<td>Harleia francesiana</td>
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</tr>
<tr>
<td>Jacaranda miniota</td>
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</tr>
<tr>
<td>Koelreuteria paniculata</td>
<td></td>
</tr>
<tr>
<td>Lagerstroemia indica x L. fauriei varietes</td>
<td></td>
</tr>
<tr>
<td>Leptospermum petersonii</td>
<td></td>
</tr>
<tr>
<td>Liquidambar formosana</td>
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</tr>
<tr>
<td>Liquidambar styraciflua 'Rotundiloba'</td>
<td></td>
</tr>
<tr>
<td>Lophostemon confertus</td>
<td></td>
</tr>
<tr>
<td>Macura pomelina 'Witchita'</td>
<td></td>
</tr>
<tr>
<td>Magnolia grandiflora 'Exmouth'</td>
<td></td>
</tr>
</tbody>
</table>

### Master List of Park Trees

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer rubrum 'October Glory'</td>
<td>October Glory</td>
</tr>
<tr>
<td>Acer truncatum x A. platanoides</td>
<td>Flat-leaf Maple</td>
</tr>
<tr>
<td>Alnus cordata</td>
<td></td>
</tr>
<tr>
<td>Callitris glaucophylla (formerly C. columnellaris)</td>
<td></td>
</tr>
<tr>
<td>Callitris preissi</td>
<td></td>
</tr>
<tr>
<td>Carpinus betulus 'Fastigiata'</td>
<td></td>
</tr>
<tr>
<td>Cedrus canadensis 'Forest Pansy'</td>
<td></td>
</tr>
<tr>
<td>Eucalyptus curtis</td>
<td></td>
</tr>
<tr>
<td>Eucalyptus gardneni</td>
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<tr>
<td>Eucalyptus haematomsora</td>
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<tr>
<td>Eucalyptus polytracantha</td>
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<tr>
<td>Eucalyptus riscioni</td>
<td></td>
</tr>
<tr>
<td>Eucalyptus wimmeriensnes 'Honey Pots'</td>
<td></td>
</tr>
<tr>
<td>Fidensia maculosa</td>
<td></td>
</tr>
<tr>
<td>Fidensia australis</td>
<td></td>
</tr>
<tr>
<td>Fraxinus americana var.</td>
<td></td>
</tr>
<tr>
<td>Lithocarpus densiflorus</td>
<td></td>
</tr>
<tr>
<td>Phellodendron amurense</td>
<td></td>
</tr>
<tr>
<td>Pyrus betulaefolia 'Southworth'</td>
<td></td>
</tr>
<tr>
<td>Salix m. 'Sterling'</td>
<td></td>
</tr>
<tr>
<td>Tilia tomentosa</td>
<td></td>
</tr>
<tr>
<td>Tipuana tipu</td>
<td></td>
</tr>
</tbody>
</table>

### Master List of Trial Trees

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abies pinsapo 'Glaucia'</td>
<td></td>
</tr>
<tr>
<td>Acer monspessulanum</td>
<td></td>
</tr>
<tr>
<td>Alnus cordata</td>
<td></td>
</tr>
<tr>
<td>Callitris glaucophylla (formerly C. columnellaris)</td>
<td></td>
</tr>
<tr>
<td>Callitris preissi</td>
<td></td>
</tr>
<tr>
<td>Carpinus betulus 'Fastigiata'</td>
<td></td>
</tr>
<tr>
<td>Cedrus canadensis 'Forest Pansy'</td>
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<tr>
<td>Eucalyptus curtis</td>
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<tr>
<td>Eucalyptus haematomsora</td>
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<tr>
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<tr>
<td>Tilia tomentosa</td>
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<tr>
<td>Tipuana tipu</td>
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Community Consultation Report:
City of Melbourne
Draft Urban Forest Strategy
July 2012
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1. Introduction

1.1. Background

A draft Urban Forest Strategy (Strategy) has been prepared in response to three key challenges - climate change, population growth and urban heating and the fact that significant numbers of Melbourne’s trees are now in decline. This decline is due to trees approaching the end of their natural lifespan and many trees having been severely affected by prolonged drought and water restriction. Almost 39% of municipal trees are expected to be lost within 20 years.

The draft Strategy sets out how the City of Melbourne can transition the urban forest to a future forest that is diverse, resilient and responsive to the varied needs of the community and the city. Its vision is to become a city within a forest rather than a city with a forest.

Once the draft Urban Forest Strategy has been adopted by Council, Council Officers will commence the implementation of this strategy through the development of Tree Precinct Plans and Boulevard Master Plans. These plans will be developed via a collaborative process with the community.

1.2. Overview of consultation process


Acknowledging that community interest in the Strategy would be high, an extensive community engagement process was undertaken to provide an opportunity for all members of the community to provide feedback through a variety of convenient channels.

Additionally, endeavours were made to seek publicity across a broad range of media channels to generate widespread community awareness of the strategy and associated consultation period so that all members of the community knew that they had an opportunity to be involved. Social media networks were also used.
Highlights during the consultation period included:

1. An Urban Forest – Eco City Forum in the Town Hall on 20 November 2011 with 135 participants.

2. 110 community members attended nine precinct based consultation meetings held between January and March 2012.

3. A bespoke website was developed to provide a fulltime ‘online forum’ for the duration of the project, which generated:
   a. 4249 individual visitors
   b. a combined total of 11,991 site visits
   c. 20,316 page views
   d. 818 downloads of the Strategy
   e. over 19,000 words in submissions and commentary from 177 commentators.

4. 5,034 unique views of the strategy information on the corporate website.

5. A short video conveying key messages about on the Strategy was view over 2,500 times.

6. More than 30 media articles, letters and editorials informing the community about the strategy on TV and radio and in the newspapers.

7. 10,000 copies of a specially designed Avant postcard by Michael Leunig to promote the consultation period were distributed throughout inner Melbourne.

8. 419 entrants submitted art works to the Urban Forest Art and Design Competition from across 71 Melbourne suburbs and Victorian regional areas.

9. Winning entries from the Urban Forest Art and Design Competition displayed throughout city in November to promote the consultation period and the strategy.
2. Outcomes

2.1. Summary of Feedback

Feedback revealed that the community predominantly supports the Strategy. Indeed, the Strategy received widespread academic and industry support both locally, nationally and internationally. With notable commendations from world leading urban forest expert from the University of Copenhagen, Prof. Cecil Konijnendijk and from Prof. Lindsey Falvey, formerly Dean of the Faculty of Agriculture, Forestry and Horticulture, University of Melbourne.

The Strategy has been revised to reflect feedback received during the consultation period where appropriate. However, it must be noted that many comments received during the consultation pertained to expressions of preference on the topic of species origin which was not pertinent to consultation on the Strategy.

Green roofs and walls were a significant topic of focus during the consultation. It was highlighted by many community members that more needed to be mentioned in the Strategy about the role of green roofs and walls. It was also noted on several occasions that the Strategy predominantly referred to trees alone instead of trees and vegetation. Efforts have been made to address these omissions within the Strategy.

Another topic of significant community focus was the diversity targets outlined within the Strategy. In particular, many members of the community were concerned about what a target of no more than 5 per cent of one species would mean for Melbourne’s iconic Elm trees. There was also a keen focus on the cultural identity and heritage of Melbourne’s urban forest.

In response to feedback provided by Friends of the Elms, Cynnamon Dobbs, Urban Forester and PhD candidate with ARCUE, University of Melbourne was engaged to undertake further assessment and modelling of the composition of the urban forest and Arboricultural Consultant Steve Frank was commissioned to collect additional field data on our elm trees. As a result of this work, the species, genus and family tables within the document have been revised. Dr Dave Kendal, ARCUE, University of Melbourne and Dr Peter May were also engaged to assist with the further development and refinement of the articulation and considerations of the diversity target.

Almost all commentators on the Strategy expressed opinion about species preference for Melbourne’s tree population. Most were polarized in their options. It is not the intention of the Strategy to provide detail on actual species selection for any location in the municipality. This is a matter that was addressed in all consultation meetings. Species is a topic that will
be dealt with in the implementation phase of this strategy if it is endorsed through the development of Tree Precinct Plans. To address the feedback that was received, Section 6 of the strategy has been fully revised. Detailed information is now provided on the Tree Precinct Plans and how and when they will be developed. It is intended that these plans be developed collaboratively with the community.

During the consultation period, it also became apparent that the history section within the Strategy was lacking. Anna Egan, PhD candidate, University of Tasmania was commissioned to provide a more comprehensive overview of the history of Melbourne’s urban forest.

### 2.2. Resulting Amendments to the Strategy

The Strategy has been revised to reflect feedback received during the consultation period. The following table provides details of what sections have been revised and the extent of those revisions:

**Table 1: Summary of revisions**

<table>
<thead>
<tr>
<th>Strategy Contents</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction</td>
<td>Minor wording changes.</td>
</tr>
<tr>
<td>2 Executive Summary</td>
<td>Minor wording changes.</td>
</tr>
<tr>
<td>3 Background &amp; Context</td>
<td>Extensive change has occurred.</td>
</tr>
<tr>
<td>3.1 What is an Urban Forest?</td>
<td>Section 3.2 Benefits of the Urban Forest has been updated to include references to green roofs, green walls and vegetation in general.</td>
</tr>
<tr>
<td>3.2 Benefits of the Urban Forest</td>
<td>Section 3.2 Benefits of the Urban Forest has been updated to include references to green roofs, green walls and vegetation in general.</td>
</tr>
<tr>
<td>3.2.1 Environmental benefits</td>
<td>3.3.1 Historical development has been completely rewritten by Anna Egan, PhD candidate from University of Tasmania. This section was rewritten to reflect community concern regarding Melbourne’s cultural heritage. This section now elaborates the evolution of Melbourne’s urban forest in a manner that provides a reference point of the development of a new set of Tree Precinct Plans and Master Plans.</td>
</tr>
<tr>
<td>3.2.2 Community benefits</td>
<td>3.3.1 Historical development has been completely rewritten by Anna Egan, PhD candidate from University of Tasmania. This section was rewritten to reflect community concern regarding Melbourne’s cultural heritage. This section now elaborates the evolution of Melbourne’s urban forest in a manner that provides a reference point of the development of a new set of Tree Precinct Plans and Master Plans.</td>
</tr>
<tr>
<td>3.2.3 Economic benefits</td>
<td>3.3.1 Historical development has been completely rewritten by Anna Egan, PhD candidate from University of Tasmania. This section was rewritten to reflect community concern regarding Melbourne’s cultural heritage. This section now elaborates the evolution of Melbourne’s urban forest in a manner that provides a reference point of the development of a new set of Tree Precinct Plans and Master Plans.</td>
</tr>
<tr>
<td>3.3 Evolution of Melbourne’s Urban Forest</td>
<td>3.3.1 Historical development has been completely rewritten by Anna Egan, PhD candidate from University of Tasmania. This section was rewritten to reflect community concern regarding Melbourne’s cultural heritage. This section now elaborates the evolution of Melbourne’s urban forest in a manner that provides a reference point of the development of a new set of Tree Precinct Plans and Master Plans.</td>
</tr>
<tr>
<td>3.3.1 Historical development</td>
<td>3.3.2 The urban forest today – all tables in this section have been updated with new data that has been collected during the consultation period. The ULE map has also been updated</td>
</tr>
<tr>
<td>3.3.2 The urban forest today</td>
<td>3.3.2 The urban forest today – all tables in this section have been updated with new data that has been collected during the consultation period. The ULE map has also been updated</td>
</tr>
<tr>
<td>3.3.3 Policy context</td>
<td>3.3.2 The urban forest today – all tables in this section have been updated with new data that has been collected during the consultation period. The ULE map has also been updated</td>
</tr>
<tr>
<td>Section</td>
<td>Details</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>3.3.3 Policy context</td>
<td>Now contains a simple diagram instead of text.</td>
</tr>
<tr>
<td>4 Issues &amp; Challenges</td>
<td>Minor wording changes.</td>
</tr>
<tr>
<td>4.1 Ageing tree population</td>
<td></td>
</tr>
<tr>
<td>4.2 Water</td>
<td></td>
</tr>
<tr>
<td>4.3 Climate change</td>
<td></td>
</tr>
<tr>
<td>4.4 The urban heat island effect</td>
<td></td>
</tr>
<tr>
<td>4.5 Population increase and urban intensification</td>
<td></td>
</tr>
<tr>
<td>4.6 Towards our Future Forest</td>
<td></td>
</tr>
<tr>
<td>5 Principles &amp; Strategies</td>
<td>This section remains predominantly the same; however section 5.2.3 has been notably revised by Dr Dave Kendal and Dr Peter May.</td>
</tr>
<tr>
<td>5.1 Our priorities</td>
<td></td>
</tr>
<tr>
<td>5.2 Principles</td>
<td></td>
</tr>
<tr>
<td>5.3 Strategies</td>
<td>Section 5.3.5 has been revised to amend the word biodiversity to urban ecology to address confusion between diversity and biodiversity highlighted during community consultation. The term urban ecology is broader and encompasses traditional biodiversity and other ecological perspectives.</td>
</tr>
<tr>
<td>5.3.1 Increase canopy cover</td>
<td></td>
</tr>
<tr>
<td>5.3.2 Increase urban forest diversity</td>
<td></td>
</tr>
<tr>
<td>5.3.3 Improve vegetation health</td>
<td></td>
</tr>
<tr>
<td>5.3.4 Improve soil moisture and water quality</td>
<td></td>
</tr>
<tr>
<td>5.3.5 Improve urban ecology</td>
<td></td>
</tr>
<tr>
<td>5.3.6 Engage and collaborate with the wider community</td>
<td></td>
</tr>
<tr>
<td>6 Implementation Framework</td>
<td>Significantly revised.</td>
</tr>
<tr>
<td>6.1 Green Governance</td>
<td>Fuller detail has been provided in sections 6.2 and 6.3.</td>
</tr>
<tr>
<td>6.2 Priority Implementation Actions</td>
<td>The Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. This was a core focus during community consultation. Section 6.2 now states that the community will have an opportunity to collaborate on the development of these plans. It also</td>
</tr>
<tr>
<td>6.3 Measurement, monitoring and review</td>
<td></td>
</tr>
<tr>
<td>6.4 Funding resources</td>
<td></td>
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</tbody>
</table>
provides details on timeframes and the proposed method of development for the Tree Precinct Plans and the Boulevard Master Plans.

6.2 now contains new information on the Exceptional Tree Register and the importance of trees in the private realm. It also includes the Growing Green Guide and expresses a critical need to develop more information on green roofs and green walls. The section in i-Tree has been updated.

Section 6.3 now contains comprehensive details on plans for Measurement, monitoring and review of the urban forest.

Glossary

Selected References

Minor updates.

3. Website Submissions
3.1. Overview

A bespoke website was created to provide an online forum for the duration of the consultation period and was open to all members of the community. The website received 11,991 site visits from 4,249 unique visitors. Of these visitors, 177 became website members to make comments and submissions on the strategy.

- 4,249 Visitors
- 11,991 Site visits
- 20,316 Page views
- 1,595 Document Downloads
- 818 Strategy Downloads
- 177 Commentators
- 19,000 Words

3.2. Comments and submissions

The following section provides an overview of the comments made on the website. Comments have been abbreviated in some instances and they have attributed to the public usernames that were published on the site. Anything not regarded as direct feedback
specifically on the strategy has not been included – this includes general conversation on the site and general commentary on other people’s postings.

It should be noted that strong preferences were expressed about native and exotic tree selections but it is not the aim of this Strategy to deal with the micro level of what occurs on each street.

Comments have been categorised, based on reoccurring themes, into the following subheadings:

- Endorsements
- Species Diversity
- Biodiversity
- Productive landscapes
- Green Infrastructure and private realm contribution
- Various

### 3.2.1. Endorsements

<table>
<thead>
<tr>
<th>No.</th>
<th>Submitter/Username</th>
<th>Summary of comments</th>
</tr>
</thead>
</table>
| 1.  | Prof. Lindsay Falvey, formerly Dean of the Faculty of Agriculture, Forestry and Horticulture, University of Melbourne. | A COMMENDABLE AND VISIONARY PLAN WORTH READING BEFORE ENGAGING IN EMOTIVE REACTION  
It is pleasing to see a plan with a 60 year time horizon that is based on maintaining our heritage in the light of experience of more than a century, and is informed by applied science. The subject is difficult to relay in short public gatherings, such as the recent Residents 3000 meeting, simply because it is complex and emotive. Emotional responses about 'our' Plane trees, denial of long evidence of dying Elm trees, and assumptions that the majority of the City's trees are popular European species may be normal for many of us who have grown up in and around the City - but they seem to be misconceptions. Planned replacement, with multi-decade budgetary commitments, is the only responsible response that I can see; the authors of the report are to be commended. Failure to act would be to deny the legacy of even greater foresight by our forefathers and their adventurous vision for what has become a fine City.  
20 Nov 2011 |
<p>| 2.  | BB46               | I am so impressed with the plan to ensure Melbourne's 'urban forest'. The science is convincing enough to support |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Submitter/Username</th>
<th>Summary of comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>this kind of planning as a survival strategy. Even if we were not facing potentially damaging climate change, the U/forest strategy is warranted as social-cultural policy - something that seems to have been central to the strategies of our forebears. 27 Nov 2011</td>
</tr>
<tr>
<td>3.</td>
<td>Rafael Katigbak</td>
<td>I applaud the City of Melbourne for coming up with this forward-thinking initiative. 21 Nov 2011</td>
</tr>
<tr>
<td>4.</td>
<td>Simone</td>
<td>This is a fantastic and comprehensive strategy. I am so pleased. There will be a lot of angst about the loss of some elm trees, however there are many beautiful sculptural trees that are better adapted to current and future conditions that can be mixed in to great effect. Also a property owner I know that trees increase the value of my property so all Melbourne residents should be very pleased with the new strategy. And realize that few other councils are so future orientated and well informed.</td>
</tr>
<tr>
<td>5.</td>
<td>Ben</td>
<td>I strongly support this strategy. I particularly support the push for greater diversity of species. I greatly value Melbourne’s &quot;avenues&quot; of exotic trees; however, I don’t see this strategy as a threat to these avenues. If applied sensitively, I can’t see why our streetscapes would be greatly changed by this strategy. Indeed, a greater diversity would make it easier to maintain a stock of exotic trees. Greater diversity would also add to our &quot;urban forest&quot; by increasing the amount and diversity of wildlife attracted to our streets and backyards.</td>
</tr>
<tr>
<td>6.</td>
<td>Gregg</td>
<td>I think it’s a great idea and one that I’m sure we’ll see replicated in Sydney in the not too distant future.</td>
</tr>
</tbody>
</table>
| 7.  | JaneB              | I commend you for the vision and the planning and research, which underpins the strategy. As you point out, we are now enjoying the realisation of the vision our predecessors had, with the wonderful avenues of mature trees in so many of our parks. But trees don't live forever - would that they did. The emotive aspects of the issue are evident, not least in a few of the responses. And it's so superficially easy and attractive to cling to the "just replace a dying one with the same type’ or to reduce the complexity of the discussion to a simplistic line like 'Council plans to chop down trees!!"
<table>
<thead>
<tr>
<th>No.</th>
<th>Submitter/Username</th>
<th>Summary of comments</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Tough issue. I applaud the principles... I support the strategy. But I also will mourn losses when they come, fully acknowledging how much I love the look and the feel of the avenues of deciduous trees in so many parts of Melbourne city. We'll need courage and conviction and yes, much vision and commitment to future generations. But oh yes, a city in a forest - how glorious an idea.</td>
</tr>
<tr>
<td>8.</td>
<td>AlanW</td>
<td>This sounds like a good plan to me. It's a shame that it had not been started sooner.</td>
</tr>
<tr>
<td>9.</td>
<td>Zara</td>
<td>I support a move toward a greener city that supports biodiversity.</td>
</tr>
<tr>
<td>10.</td>
<td>GemmaBC</td>
<td>I think it is great that City Of Melbourne are taking the steps towards developing an Urban Forest Strategy for Melbourne. With all the information that was presented in the short video from health and well-being, environmental sustainability and urban design, it absolutely makes sense to adopt a strategy like this one. I love living in Melbourne and adore the all the trees and parks that contribute so much beauty to our city. To see planning and development by the City of Melbourne toward strategies that will allow this to beauty to continue flourish is innovative and exciting. It is exciting because with a strategy like this is place hopefully Melbourne will continue to remain most of the most liveable cities in the world.</td>
</tr>
<tr>
<td>11.</td>
<td>RLB</td>
<td>The strategy offers a refreshing approach for challenges facing Melbourne’s urban forest. I think attempts to introduce a new range of appropriate tree species, regardless of origin, is wise and reflects the social diversity within the city. Whilst I accept many plantings may fail as we learn what works and what doesn’t, much of the public may not. It will therefore be important to learn as much as possible about these species prior to planting in urban environments. Regardless of selected species, I suspect energy savings will be worth much less than increased social benefits.</td>
</tr>
<tr>
<td>12.</td>
<td>loafingoaf</td>
<td>I'm personally very supportive of the plan - particularly the diversity elements. Obviously certain streetscapes and boulevards benefit enormously from a uniformity of planting - I'd hate to see St Kilda Rd or Royal Parade lose their elms.</td>
</tr>
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<td>13.</td>
<td>Susan</td>
<td>Congratulations to the Melbourne City Council for having the vision to promote an urban forest. The</td>
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<td>concept is wonderful. As an Australian, I would like to see a reversal of the cultural cringe. Just because previous generations ripped out our native trees and replaced them with, mostly, European trees, does not mean that that has to be the way forever. It would be fabulous if more indigenous trees and shrubs could be introduced into the plan. Our trees are built for our climate. Our native birdlife needs our indigenous vegetation. Furthermore, our native indigenous trees and shrubs are beautiful.</td>
</tr>
<tr>
<td>14.</td>
<td>Vic</td>
<td>I totally agree with the Strategy, mainly because it has been designed as the best possible response to the Climate Change.</td>
</tr>
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| 15. | GreenTumbsUp     | I congratulate the council for attempting to have a strategy.  

As already confirmed, I fully agree with seeing the urban forest strategy being incorporated into "greening" buildings and other infrastructure. To extend this point further, it is critical to see this strategy become more integrated (with a longer term goal to make it mandatory) with future building/infrastructure and planning (eg: the recent Arden-Macaulay plan) and not just retro-fitted on/into what is leftover.  

Also, I can't see how graphic "visions" printed in the 1st pages of this strategy (of bountiful green rooftoops) are realised? These graphics are what (I think) people want to see and the ultimate goal, so the strategy needs to actively encourage this "vision" and enforce this level of active (rather than passive) thinking and design with developers, planners, architecture, council leaders and policy makers. This strategy must work its way to the forefront of future thinking and a plan of how this will be done would be great.  

In regards to the Hundertwasser’s Waldspirale housing in Germany...why has this been stated as being the "aspirational" position? This is the essence of what an urban forest is all about! The strategy will only succeed (in the long term) if it actively works towards building bold “inspirational” output and not "aspirational" (which only encourages back-pedding).  

The plan to look after our existing forest is excellent as an ongoing activity and I can see things happening already, which is a great thing to see and feel. Great |
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<tr>
<td>16.</td>
<td>Mara Ripani</td>
<td>I often find the City of Melbourne to be an exceptional leader, with a strong progressive vision and open minded to issues facing contemporary society. Congratulations on your Urban Forest Strategy. I look forward to experiencing a higher quality of life as a result of its implementation. I look forward to: a cooler microclimate, shade on hot summer days, and a more aesthetic journey as I commute by bike.</td>
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<td>17.</td>
<td>Ros</td>
<td>Good work Melbourne.. please bring your concept to City of Greater Bendigo!!!</td>
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### 3.2.2. Species Diversity

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<td>18.</td>
<td>Username: Fitzroy14</td>
<td>Species diversity has been further addressed within the new draft.</td>
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<td></td>
<td>&quot;A lack of diversity in plant species and age is putting our tree stock at great risk. Just as you would diversify financial assets, a diverse urban forest with many plant species and varying life expectancies reduces vulnerability and risk. Melbourne's trees are highly vulnerable to disease. Myrtle Rust, a disease that has spread in Queensland, has the potential to infect and possibly kill more than 45 percent of our trees.&quot;</td>
<td>This comment is not false, but it has been removed.</td>
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<td>19.</td>
<td>You should remove this misleading statement, as it’s false. This is a scare tactics and we don’t need that here. Myrtle Rust, yes its in Queensland and can effect trees of the Myrtaceae family, like Eucalyptus, Callistemon, Melaleuca etc. These are small to large trees. This family represents around 30% planted in Melbourne. So the plan would be not to plant any more of this family of trees? If you think this disease is a risk to our trees?</td>
<td>Species diversity has been further addressed within the new draft.</td>
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| 19. | **Username: Rubisco**  
“We are saying that we should not have more than 5% of any one species of tree in the municipality so that we can reduce our exposure from threats such as attack from pest and disease and extreme weather”.  
Are there any references to support the 5% figure?  
Is there any survey data to support to the notion that there is a significant pest & disease problem in the urban canopies?  
Plants that resist "extreme" weather are unlikely to be exotics so this provides a good "out" for the claim that exotics will not be replaced with natives.  
Even using the last 15 years rainfall data, we have enough water to support deciduous trees. This is so because of the NS pipeline and the desal and it does not even include recycled waste water and recovered storm water which are highly underutilised. |                                                                                               |
| 20. | **Username: Clancy**  
I would also like to see the incorporation of indigenous species, would this not also help with issues surrounding adaptation to climate change? Delving even deeper, how about edible indigenous species in our landscapes. There’s is part of the food security solution. | The strategy does not differentiate or express preference between native, indigenous or exotic trees. |
| 21. | **Username: native trees**  
I would really like to see that if there is going to be an even spread of varying species that there be a greater emphasis on utilising native species. | The strategy does not differentiate or express preference between native, indigenous or exotic trees. |
| 22. | **Username: Dr Dave Kendal**  
Australian Research Centre for Urban Ecology  
(RBG/University of Melbourne)  
IMPACTS OF TOO MUCH DIVERSITY?  
In general, a thorough and well researched strategy that will improve the health and wellbeing of both the vegetation and the people of Melbourne.  
However, I am concerned about the somewhat arbitrary benchmarks proposed for species/genus/family diversity. The original 'rule of thumb' (not strongly scientifically | Author of this comment was invited to assist in redrafting the diversity section. |

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<td>(based) from the US suggests that no more than 10% of street trees should come from any one species, 20% from any one genus and 30% from any one family. These are halved in the strategy which proposes that the urban forest should be composed of no more than 5% of one species, 10% of one genus and 20% of one family. This means that the proportion of trees coming from the dominant native family (Myrtaceae) would be more than halved by 2040. My specific concerns about this are:</td>
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<td>- the US guidelines are from places with a much greater diversity of native and urban trees at the genus and family level. South-east Australian trees (particularly outside rainforests) are totally dominated by two families (Myrtaceae and Fabaceae) and two genus (Eucalyptus and Acacia).</td>
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<td>- In contrast, species diversity is much higher in the Myrtaceae than most other tree families, both in urban and native forests. There is also much greater diversity within species as many Eucalypts and Acacias are grown from seed, or naturally recruited in natural areas in parks or riparian corridors. This results in much greater resilience at the species level than for species from many other families.</td>
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<td>- These factors mean that the US guidelines cannot be directly translated to an Australian context due to the difference patterns of diversity in native forests, and certainly not halved at the family and genus level. The proposed benchmarks would results in a substantially lower proportion of native trees in the City of Melbourne.</td>
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<td>- This is likely to have a detrimental impact on many native fauna species (particularly birds) as a number of scientific studies show that some native species are advantaged by the planting of native street trees.</td>
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<td>- This may also have a detrimental impact on the people living in and visiting the City of Melbourne, as studies show a significant proportion of the population prefer native vegetation over exotic vegetation. This has been related to demographic characteristics such as education level, which are increasing in the population generally, and suggests that native trees will become more preferred in the future.</td>
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<td></td>
<td>The strategy as a whole is welcome with excellent guiding principles, but these apparently minor benchmark recommendations have potentially large and possibly detrimental effects on the composition of Melbourne's urban forest.</td>
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23. **Username: JamesP**

An allowance needs to be made for the fact that the distinctive character of elms shapes the face of central Melbourne, and they’re as much a part of our heritage as

*The strategy does not differentiate or express*
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<td>any Victorian building. So the 5% diversity allowance doesn't allow for this critical heritage value to be maintained to the degree necessary to retain the stunning character they impart to the central area. The figure needs to be significantly increased in their case, while taking the critical steps necessary to ensure genetic diversity and disease resistance in the variety of elms planted. Otherwise it's vandalism in the guise of well-meant policy.</td>
<td>preference between native, indigenous or exotic trees.</td>
</tr>
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| 24. | **Username: AlanW**  
Remembering also that the recent drought nearly wiped the elms out and has left them looking a shadow of their former selves. What happens if such droughts become more common? It would be a shame to carry all our eggs in a few baskets and find ourselves with whole areas without mature trees because we failed to learn from experience. I would like to think that there are ways we can better nurture and protect the elms in the future but we should remember that they may be more vulnerable than we would like. | Species diversity has been further addressed within the new draft. |
| 25. | **Username: Fitzroy14**  
Melbourne has a huge range of both exotics and native trees, many different varieties of tree have been planted over 100 years in many parks, gardens and streets. Do we introduce another 20 species, to say it's more diverse? We need to plant trees both evergreen and deciduous, exotic and native. Plant the tree for the location not because its native or deciduous. | Species diversity has been further addressed within the new draft. |
| 26. | **Username: Philgreen**  
The "just plant natives" is a narrow and misinformed approach. Endemic vegetation has it's place but Melbourne's treescape deserves to retain a solid mix of deciduous species. This is particularly important when you consider that Melbourne is one of the last refuges for the genus Ulmus. Melbourne currently has one of the worlds largest and most impressive elm populations on the planet | The strategy does not differentiate or express preference between native, indigenous or exotic trees. |
| 27. | **Username: Native Trees**  
I think over all this is an exciting initiative, one that I fully support! However, I'm wondering what percentage of native trees are going to be planted under the strategy? Seems to me that there should be a strong commitment focused on planting as many native trees as possible. | The strategy does not differentiate or express preference between native, indigenous or exotic trees.  
**Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct.** |
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| 28. | **Username: Jake**  
Out of all the trees to be removed, how many are being replaced with exact species and how many are to be replaced with natives? What makes Melbourne so beautiful is the structured landscapes and the elm lined boulevards.  
if a tree is dead, why not replace it with a like tree? | **Response**  
The strategy does not differentiate or express preference between native, indigenous or exotic trees.  
Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail. |
| 29. | **Username: timbrown13**  
I really like the drive behind the report. Green up our city, make Melbourne a green city filled with trees and birds. I do have a big problem with placing arbitrary limits on the number trees from a species, genus or family. There are good reasons for doing so, which are clearly spelt out in the report. There are other factors to also consider. Given the decline of the River Red Gum across Victoria, Melbourne could keep up the relatively high numbers it has in the city. These trees will look grand in 400 years when they reach the age of the current specimens in the botanical gardens and other places. Other eucalypt species will provide nesting hollows in time. If the nesting hollows are managed the brushtail possum pest issues might not be such a pest, with ringtail possums and birds residing.  
If the Myrtaceae family is to be reduced to 20% representation by 2040 from the current 43% levels, this means letting half of the trees die before thinking about planting replacements. There will only be really old trees representing the family at this point. The Myrtaceae family represents a massive proportion of the native species of trees from the Melbourne area and I think that having a 40% limit on this family is about the right mix. | **Response**  
Species diversity has been further addressed within the new draft. |
The report states that
By 2040 the urban forest will be composed of: No more than 5% of any one Species. No more than 10% of any one Genus. No more than 20% of any one Family. I think that this should apply to exotic species and the native species should be double that. 10% for species, 20% for genus and 40% for family. (I would say triple if the COM was going compromise and meet me half way).

The position of the exotic trees should be for street trees, as Melbourne is characteristically known, and the natives can be used in the parks. However this should be mixed up a little as is currently done. This way the Elm lined streets do not loose their value. If every street was Elm lined the would be no demand and hence the price would drop. Elms work well in parks too.

Sustainable futures are balanced futures, with the expectation of less rainfall, disease outbreak, increased population, increase car travel, the COM can not put all its eggs in one basket, but I think that they need to rethink about the right mix of trees that will suit the opinions of the people and the unknown conditions of the future.

Thank you for the opportunity to contribute to the discussion.

Is 90,000 trees in the City of Melbourne by 2040 enough?
I would like to see many more trees than that

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<tr>
<td>30</td>
<td><strong>Username: choking on plane trees</strong></td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<td>Diversity is crucial - in the inner urbs we are living in a Plane tree forest. Why are we so hung up on single-species avenues? Whilst plane trees provide brilliant summer shade, so do other species. You only have to stand in the street outside my house to see how their fine particles cast off at certain times of the year cause people to cough and almost choke as they walk. Let’s identify alternatives and replace them over the next 2 decades. Furthermore, let’s prune the remaining ones so they don’t monopolise all the ground water and develop into giant monsters (20 years ago our council had an active program of annual pruning, now they’ve given up!).</td>
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<td>31</td>
<td><strong>Urbanite</strong></td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<td>I want to see a bigger variety of trees being planted. Why isn't there more flowering trees - think Singapore and Japan. I'd also like to see more ambitious planting styles-be a contemporary capital city. Not everything has to be a monotonous monoculture, particularly in locations where you plant trees where there has been nothing before. And what about Docklands? There's a good opportunity to rescue a desolate concrete jungle from obscurity with some bold choices in plantings. Also what about flowers? Apart from the Town Hall and on a section of St Kilda Rd I can't think of any nice arrangements in the city. Why isn't it worth investing in some beautiful flowers? The city</td>
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<td>32.</td>
<td>Margaret Morley</td>
<td>Species diversity has been further addressed within the new draft. <strong>It has also been made clear throughout the consultation process that St Kilda Road will always have Elms.</strong></td>
</tr>
<tr>
<td></td>
<td>I would like to see oaks replaced by oaks elms replaced by elms etc. These trees were planted 100 years ago and have survived many droughts and if a tree dies replace it with like for like and do not rip out beautiful trees just in case there is another drought. What makes Melbourne so beautiful are the trees. The Elms and oaks add a beauty and lushness that natives just don't give. A case in point is the replacement of poplars with natives around the shrine. I am over 50 years old and if you pull out and relace those trees in St Kilda rd then I will never again see them in their splendour in my lifetime. I am opposed to the wilful destruction of these beautiful trees just to help some greenie beaucrat justify there position.</td>
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<td>33.</td>
<td>Marg Jungwirth</td>
<td>The Open Space Strategy deals comprehensively with the topic of more parks for the municipality. <strong>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</strong></td>
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<tr>
<td></td>
<td>Melbourne is famous for it's beautiful parks and trees; the city's elms and plane trees in particular, because they give great shade with their canopy cover. Keep them. Water recapture from the city should be able to adequately water them. Eucalypts and native trees / bushes aren't suitable for our city. They provide little shade, limbs regularly fall and &quot;rubbish&quot; drops from the trees making them unsuitable to sit under. Ants often accompany them, adding further danger. Separate bush parkland is vital, on the city outskirts, as in Royal Park - the vital lungs of the City and home to native fauna and flora. More parks need to be created. More trees need to be planted to offset the rapidly increasing population of Melbourne and it's fringes - both the resident population and the visitors and workers, who create much of the &quot;pollution&quot;. I DON'T agree with the wide variety of trees proposed, as replacements for our avenues. Trees need to be appropriately placed. Footpath trees are a hazard for pedestrians and a nuisance and danger to traffic - particularly as they are not adequately maintained by Council.</td>
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### 3.2.3. Biodiversity

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<tr>
<td>34.</td>
<td>Bev Walshe</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
</tr>
<tr>
<td>35.</td>
<td>Username: Gregg</td>
<td>A biodiversity and urban ecology strategy is currently under development. That strategy will consider this issue more appropriately.</td>
</tr>
<tr>
<td>36.</td>
<td>Username: Simone</td>
<td>A key target within the strategy is to Protect and enhance a level of biodiversity which contributes to the delivery of healthy ecosystem services.</td>
</tr>
<tr>
<td>37.</td>
<td>Username: Timbrown13</td>
<td>A biodiversity and urban ecology strategy is currently under development. That strategy will consider this issue more appropriately.</td>
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### 3.2.4. Green Infrastructure and private realm contribution

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<td>38.</td>
<td>Username: Fred</td>
<td><strong>A biodiversity and urban ecology strategy is currently under development. That strategy will consider this issue more appropriately.</strong></td>
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<td>39.</td>
<td>Username: HWR</td>
<td><strong>We share the view that greening the private realm is a very important factor in helping to increase our urban forest. We have incorporated more on green infrastructure throughout various sections of the revised draft.</strong></td>
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<td>40.</td>
<td>Username: Simone</td>
<td><strong>We share the view that greening the private realm is a very important factor in helping to increase our urban forest. We have incorporated more on green infrastructure throughout various sections of the revised draft. However, enforcement of green space is beyond the scope of this strategy.</strong></td>
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<td>41.</td>
<td>Username: Jane B</td>
<td><strong>Several illustrations and examples of what some future streetscapes look like are currently contained within the document.</strong></td>
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<td>42.</td>
<td>Imagine our forbears had a pretty good idea of what their future avenues and gardens would look like when those magnificent trees matured. I'm not sure we do yet.</td>
<td>We share the view that greening the private realm is a very important factor in helping to increase our urban forest. We have incorporated more on green infrastructure throughout various sections of the revised draft. However, enforcement of green space is beyond the scope of this strategy.</td>
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<td><strong>Username: Nedsfield</strong></td>
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<td>I agree with Dr.Greg Moore, and hope that residents will be consulted and that rooftop gardens or green walls become mandatory on future high density projects.</td>
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<td>43.</td>
<td>I am looking forward to this plan including not only street trees, parks and significant trees on private property but also engaging with workers and residents to make the best use of spaces which could be 'greened'. As a CBD resident and worker I observe people actively using public and private city spaces which in some cases are quite ugly but the only choice in a short break from work. It is quite simple to beautify an area through planting not only trees but shrubs and vertical gardens. The smallest space can become more attractive and contribute to reducing the heat island effect. Council is challenged by developers and at times the street trees lose the battle to remain on the condition the developer replaces the tree post building. Council must be more vigilant in maintaining trees remain even during development. The core reason for insisting on an Urban Forest Strategy is to maintain the vibrancy and health of the citizens of the city. The trees contribute to the beauty of the city and in turn positively affect the citizens.</td>
<td>We share the view that greening the private realm is a very important factor in helping to increase our urban forest. We have incorporated more on green infrastructure throughout various sections of the revised draft. However, enforcement of green space is beyond the scope of this strategy.</td>
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<td></td>
<td><strong>Username: deanne</strong></td>
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<td></td>
<td>I am looking forward to this plan including not only street trees, parks and significant trees on private property but also engaging with workers and residents to make the best use of spaces which could be 'greened'. As a CBD resident and worker I observe people actively using public and private city spaces which in some cases are quite ugly but the only choice in a short break from work. It is quite simple to beautify an area through planting not only trees but shrubs and vertical gardens. The smallest space can become more attractive and contribute to reducing the heat island effect. Council is challenged by developers and at times the street trees lose the battle to remain on the condition the developer replaces the tree post building. Council must be more vigilant in maintaining trees remain even during development. The core reason for insisting on an Urban Forest Strategy is to maintain the vibrancy and health of the citizens of the city. The trees contribute to the beauty of the city and in turn positively affect the citizens.</td>
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<td>44.</td>
<td>I support the strategy wholeheartedly. I like the idea of diversity of species. However, I think there should be more emphasis on the establishment of rooftop gardens and small trees. Many buildings in the CBD look down on others and they are ugly with air conditioning units, old tanks, rubbish. The building owners are not aware, it seems that other have to look at the mess all day long.</td>
<td>We share the view that greening the private realm is a very important factor in helping to increase our urban forest. We have incorporated more on green infrastructure</td>
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3.2.5. Productive landscapes

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<td>47.</td>
<td>Username: fgiorlando</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for</td>
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I believe that we need to actively consider how urban forests can be productive as well as aesthetically pleasing. I have been dismayed, for instance, by the planting of ornamental pears, where productive trees
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<td></td>
<td>could give fruit too.</td>
<td>each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<td>While I understand that the use of fruiting trees may increase maintenance costs, and that consideration needs to be made to species requiring only moderate watering, the benefits appear to outweigh the costs, for instance:</td>
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<td>- an increased awareness of food transport issues and how these can be mitigated by growing food locally</td>
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<td>- consideration for how motor vehicle pollution affects amenity and health</td>
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<td>- increased community building by sharing of local food</td>
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<td>- providing native habitat</td>
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<td>I have actively planted native and introduced fruiting trees in my small urban plot (persimmon, apple, citrus, etc.) and am amazed by the productivity of such an approach and the pleasure of sharing fruit with my neighbours. The plants considered do not need to be only fruit trees, and some could even provide a valuable harvest when the plant has reached maturity. For example, the use of cork oaks in the Canberra plantings were of considerable value (unfortunately most burned in bushfire). Other types of vegetation are well suited to urban environments and also provide harvest, for example pergolas of passionfruit, kiwi or grape.</td>
<td>I believe that consideration needs to be given to the values of this type of planting rather than the current blanket disapproval of productive species.</td>
</tr>
<tr>
<td>48.</td>
<td>Username: Alan W</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<td></td>
<td>I see no reason why we couldn't plans all kinds of productive varieties of trees around the city. However, I would expect that some people will see something wrong with the idea of free fruit growing in city trees because no one is making money from it.</td>
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<tr>
<td>49.</td>
<td>Username: David Hancocks</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<td>I have been very impressed with the extent to which the</td>
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<td>City Council is supporting and encouraging people to develop and maintain both productive and decorative gardening on the nature strips alongside neighborhood streets. The results are visually as well as practically delightful.</td>
<td>developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<tr>
<td>50.</td>
<td><strong>Username: Cheli</strong> I was wondering if consideration had been made towards planting food trees as part of the strategy - a mix of fruit and nut trees (native or otherwise) could be useful in the future for all residents, even considering flowering trees for honey production as I know there are now a few urban honey producers in the city?</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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<tr>
<td>51.</td>
<td><strong>Username: Llamas</strong> As much as I like the city there is one thing that bugs me. It's the parks. All the parks in the city are really boring. Like, REALLY boring. One of the main reasons is that there is major flaws in how these parks are designed. Most children (and teens for that matter.) like having some sort of thing they can interact with in parks, like playgrounds. Now I'm not against playgrounds, but the problem with that is not everyone wants to use them. Many children love to climb trees. As a matter of fact I do too. It's nice to sit up in a tree watching the world pass by below; being unseen in the open park. The problem in the city though, is that many of the trees are gum trees, or something that has no branches. I also live in the city, but as we all know many families will come to the city for a day out; bringing children and teens. So my final request is this: Could you please, please, please plant climbable trees?</td>
<td>Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.</td>
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### 3.2.6. Various

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<td>52.</td>
<td><strong>Username: James</strong></td>
<td><em>No change. Adapting to climate change is a core focus within the strategy.</em></td>
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<td>Kindly keep the observance of your global warming faith to your private life. Only the spectacularly arrogant or deluded feel the need to impose their beliefs on us poor misguided non-believers.</td>
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<td>53.</td>
<td><strong>Username: Bilby</strong></td>
<td><em>Section 6 on implementation has been extensively revised within the new draft.</em></td>
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<td>Personally, I would love to see a huge increase in tree cover - why the long timescale on achieving this? All we need to do is identify sites and develop an online plan. I would like to see an online map devised with potential planting sites identified, so that individuals, organisations and residents can take action and plant trees legally should they so desire. Such a map would also allow residents to calculate the canopy cover, cooling and economic benefits of the trees in their street / block and take action to improve things at the local level. There also needs to be a system whereby home owners can redirect excess tank and roof rainwater to street trees.</td>
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<td>54.</td>
<td><strong>Username: Ben</strong></td>
<td><em>This is not a sentiment reflected in the strategy.</em></td>
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<td>While I agree with spirit of Bilby’s comments, I would worry that allowing individuals to plant trees in public spaces would cause a lot of conflict and ultimately undermine the aims of the strategy.</td>
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<td>55.</td>
<td><strong>Username: Steve</strong></td>
<td><em>Section 6 on implementation has been extensively revised within the new draft.</em></td>
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<td>Great idea re community involvement - decentralising some of the systems to fulfill the project would seem to facilitate a quicker rollout and would enable communities to have hands on control of some aspects of the project. These wouldn’t need to be at odds with the central rules behind the urban forest itself as any planting could reflect the strategy.</td>
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<td>56.</td>
<td><strong>Username: Alan W</strong></td>
<td><em>Section 6 on implementation has been extensively revised within the new draft.</em></td>
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<td>I think there is plenty of room for more trees, on hot and sunny days a lack of shade becomes obvious. I would even suggest that we could have even more trees than the future target set in this plan.</td>
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| 57. | **Username: JamesP**  
Watering - During the drought summer I watched, day after day, as a cricket pitch in Fawkner Park was lushly watered while trees only 50 metres away suffered and died due to lack of it. It was enraging and surreal. Similarly, the complete shedding of leaves by drought-stressed planes in the CBD could have been reduced by a better summer management policy. Council needs to get their act together on this one, and commit the resources to it, because all the planting in the world is pointless if the maintenance isn't up to scratch. And it clearly isn't. More funds, better policy, better management.  
Section 6 on implementation has been extensively revised within the new draft. |
| 58. | **Username: Fitzroy14**  
One of the biggest problems now with Council is it does not have its staff to maintain the parks and gardens. There was a time City of Melbourne was a leader in parks and gardens. Sound horticultural and basic knowledge of running the best parks and gardens. Trees in the CBD and centre medians were watered on a regular basis. But the tree islands have now been filled with granite gravel. So any rain just runs off. I would like to know where you think Council can plant tens of thousands of extra trees?  
Section 6 on implementation has been extensively revised within the new draft. |
| 59. | **Username: Philgreen**  
If the Melbourne Urban Forest Strategy is to really work Melbourne City must employ it own garden staff and arborists. Personally I believe we Melbournians have to begin to act along the lines of the strategy...but.... I want to see a committed budget, long term staffing and long term community involvement in planning, planting, removals and re-planting. We owe a legacy to the next 150+ years, especially after we have been benefiting from the legacy of our forebears. Come on council and strategy team.  
Section 6 on implementation has been extensively revised within the new draft. |
| 60. | **Username: JamesP**  
Unlike say 'city in a garden' Singapore, I don't believe Council is prepared to make the longterm deep financial and resources commitment to provide the proper watering and maintenance the project demands to be truly great. Let's remember: this is Council so petty minded it even turned off its fountains in the last drought, while Sydney's played nonstop.  
Section 6 on implementation has been extensively revised within the new draft. |
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| 61. | Username: Sarah Yeomans  
The goals are undeniably the right way to go - canopy, water conservation, etc. But I have observed that actions by councils do not support the goals. Trees are removed rather than shaped around wires, and never replaced, unless by an occasional pathetic pear shrub. Nature strips on the non-wire side of streets are underplanted. Councils pander to tree fear among the rate payers, and happily remove trees for no better reason than a crack appeared in a footpath, or a drain was blocked, rather than provide education on foresting goals - including the need to factor in a plumber's eel every year or two. And as long as councils continue to approve developments without room for, and requirement of, several large trees, we are done for. We need trees of all ages for different reasons - habitat and beauty and shade by mature trees, higher carbon removal by teenage trees. I would like to see more citizens plant bigger trees on their own property, and councils take the lead in education and in planning legislation. | Section 6 on implementation has been extensively revised within the new draft. |
| 62. | Username: Reubsinit  
This city that we all share, love and live in is by far one of the most beautiful cities I've seen in the world and most certainly one of the most liveable. I agree with the approach that is being made here, the council needs to offer more incentive for the community to be involved with the planning of the city scape, especially when it comes to parks and gardens. Perhaps the council could be more involved in creating public awareness about the benefits that come from such a project to the city as a whole and the individual. There is so much reward in being able to create and utilise facilities that the public desire at heart. The biggest problem with living in a metropolis is the isolation and separation of the a natural being (which we are) from the wilderness and our natural surroundings. It would be interesting to know, whether or not you included it in your research; how much space there is available for roof top gardens. I've worked in the city before and as Sue said, it's dreary and depressing and there's no excuse as to why that space can't be utilised. And what a difference it would make to the sight of the city. | Section 6 on implementation has been extensively revised within the new draft. |
4. Written Submissions

4.1. Individuals

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<td>Gabby Stannus</td>
<td>Congratulations for taking a long-term planning perspective. I have a few suggestions to make.... If not already doing so, I encourage you to work through Council’s capital works process to increase our urban forest and open space. It should become standard that our engineers have to factor in urban forest creation into their tenders, not only replace 'like' for 'like'. Does a road need to remain a road? It would be great to see a productive urban forest. Growing such a forest would help meet the need to feed and resource our increasing inner-city human population, especially in response to peak oil. Allowing for what we know about the life span of species already planted and those to be planted in the future, we could plan for their eventual decline and removal from the landscape when they could be used for other purposes, e.g. furniture, construction. We could also harvest edible produce from our forest. Habitat values of course would need to be considered if we are to take a truly ecological perspective. This productive aspect of an urban forest is missing from the section on economic values. If you haven't already, you may like to speak to Adam Zaborszczyk, Senior Sustainability Officer, City of Melbourne re: the CSIRO Smart Grid project he is working on. They are mapping energy infrastructure in the municipality. Perhaps an opportunity to identify/prioritise those areas of our municipality where you would like trees to grow better that are currently constrained by archaic infrastructure, i.e. overhead electricity wires. In addition, you may like to consider how to work with building owners whose properties are nearing the end of their life-span in order to increase the amount of open space and urban forest opportunities. We don't need to replace 'like' with 'like', i.e. another high-rise building. Perhaps these buildings could come down, materials be reused elsewhere and the site purchased to help green our city? Maybe there are other ways to achieve this objective that don’t involve purchasing the site? I realise that this may require a long term strategy, but perhaps you could start by exploring opportunities through the City of Melbourne’s 1200 Buildings program? I wish you the best of luck in your goal to create an urban forest. I look forward to living in a city within a forest!</td>
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<td>Nina Earl</td>
<td>This Urban Forest Strategy is, in principle, an ambitious, commendable, and sensible plan that, if adopted, would greatly benefit the natural and built environment and amenity for the people of Melbourne, and may encourage greening of other municipalities.</td>
<td>The strategy does not differentiate or express preference between native, indigenous or</td>
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<td>However, as a conservation volunteer, I find the recommended species list highly disappointing in that it favours introduced trees of which many are deciduous that, yes, would increase species diversity in the CBD, but is a lost opportunity to increase local biodiversity for the greater benefit of our local natural environment. Australia has few native deciduous trees, so the recommended species would not respect the landscape character of this country, and certainly not Melbourne and surrounds. Our unique native flora are found nowhere else in the world and, together with associated fauna, give Melbourne and Victoria its distinct landscape character. For too long now, planners, developers, landscapers, the horticultural industry and colleges have favoured introduced plants, often creating ubiquitous or generic landscapes and urban plantings that can be seen in many parts of the world. It is time to restore and showcase our local native flora (and fauna) that would also bring back iconic aromatic fragrances of the Victorian bush that once signalled arrival in Melbourne. Much will be revealed in the detail of this Strategy, and aspects may change as plans are implemented. However, please ensure:</td>
<td>exotic trees. The species list provided will not be rejected from the diversity guidelines as requested because the forest of the future needs to include both exotic and native species. This is part of Melbourne’s cultural identity and is clearly articulated within the Strategy.</td>
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<td>1. Successive Councils continuing support.</td>
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<td>2. The intent remains for greening to relieve the built environment, rather than disguise an increase in it.</td>
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<td>3. Predominance of Australian and local native trees in the recommended species.</td>
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<td>Otherwise, specific comments on this Strategy follow:</td>
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<td>5.1</td>
<td>Our priorities. It is good to see proper recognition of the contribution of private green spaces and urban forests to urban greening:</td>
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<td>Private green spaces across Melbourne are an important component of our urban ecology that contribute to neighbourhood wellbeing, connectedness to nature and biodiversity, and help our city adapt to changing climates. These private urban forests also need nurturing and growth.</td>
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<td>5.2</td>
<td>Principles. These seven Principles are excellent. Suggested inclusions or requests in bold:</td>
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<td>To mitigate and adapt to climate change</td>
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<td>Build a resilient urban forest that can tolerate and continue to thrive in future climatic extremes.</td>
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<td>Ensure a diversity of tree species and ages to maximise resilience against pests and diseases.</td>
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<td>Increase overall vegetation biomass to assist in storage and</td>
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<td>sequestration of carbon.</td>
<td>urban ecology strategy is currently under development. That strategy will consider this issue more appropriately.</td>
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<td>To reduce the urban heat island effect</td>
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<td>Build a functioning healthy urban forest canopy to provide shade and cooling to reduce heat absorption and emission by the built environment.</td>
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<td>Develop green public spaces to improve human thermal comfort and maximise health benefits.</td>
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<td>Capture more stormwater to increase filtration into the soil and enable maximum evapotranspiration.</td>
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<td>To become a Water Sensitive City</td>
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<td>Promote use of innovative techniques for Water.</td>
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<td>Sensitive Urban Design, such as rain gardens, bioswales, underground storage reservoirs and biofilters.</td>
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<td>Use alternative water sources for irrigation to reduce potable water use.</td>
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<td>Ease stormwater flows and peaks by replacing impervious surfaces with porous materials to reduce heat absorption and encourage soil moisture retention.</td>
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<td>To design for health and wellbeing</td>
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<td>Provide cool shaded spaces in summer; sunlight access in winter.</td>
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<td>Plan and manage the urban forest to ensure longevity of green spaces for future generations.</td>
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<td>Create well-designed public spaces to encourage outdoor activity, social connectedness, respite, exercise and general sense of wellbeing.</td>
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<td>Design for Liveability and Cultural Integrity</td>
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<td>Design landscapes to reflect the cultural integrity, identity and character of Melbourne. Request: please define ‘cultural’; is it European/multicultural/Koori? Suggest: a few non-invasive but hardy trees and vegetation that have historical significance.</td>
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<td>Lead by example in the creation of world class spaces, parks and streetscapes.</td>
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<td>Design spaces for people to reconnect with nature.</td>
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<td>Design spaces that create a sense of place and enable reflection and tranquility.</td>
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<td>To create healthier ecosystems</td>
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<td>Support healthy ecosystems in order to provide maximum benefits</td>
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<td>In terms of clean air, water and soils.</td>
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<td>Expand and improve biological and structural diversity.</td>
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<td>To position Melbourne as a leader in urban forestry</td>
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<td>Create world class open spaces, parks and streetscapes.</td>
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<td>Increase Australian-based urban forestry research.</td>
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<td>Inform and involve the community in decision-making for landscape adaptation and change.</td>
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<td>Increase the public profile and understanding of the attributes, role and benefits of the urban forest.</td>
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5.3 Strategies. These five Strategies are excellent, and all are of equal importance:

1. increase canopy cover;
2. increase urban forest diversity;
3. improve vegetation health;
4. improve soil moisture and water quality;
5. improve biodiversity;
6. inform and consult the community.

5.3.1 Increase canopy cover

Map of municipality’s canopy cover. Suggest: colour key under map for easy interpretation.

Large canopy trees. This canopy cover Strategy favours wide canopy trees; however, such selection would limit the species used. Suggest: for biodiversity reasons and where space allows, canopy spread could be achieved with group plantings of smaller/narrower canopy trees.

Target: City of Melbourne’s Canopy Cover will be 40 per cent by 2040. Suggest: for clarity, state the current % of canopy cover.

Actions. Good.

5.3.2 Increase urban forest diversity. Target and Actions. Good, in principle, except for the unacceptable recommended species lists in the Urban Forest Diversity Guidelines as follows:

Urban Forest Diversity Guidelines 2011

Recommended Species. Strongly disagree: the lists of recommended species for given criteria is a disgrace! These trees will do little to increase local biodiversity or native wildlife habitat, which makes the claims in this Urban Forest Strategy disingenuous. The recommended introduced species would increase habitat for starlings and Indian mynahs, etc, but not for local native animals. In the sample list (below) of 73 tree species, 20 are Australian and only eight are Victorian, and the remainder are from other continents. About half are deciduous so leaf drop would be enormous and an unnecessary expense in keeping streets and paths clear of leaves, and many become invasive and
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<td>some are toxic.</td>
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<td>Suggest: for clarity, the species criteria lists should have ratings per tree shown.</td>
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<td>The need to consider site conditions, senescent tree stock, disease, and climate tolerance in species selection is understandable. But request: for local biodiversity and potential invasive species reasons, please reconsider this species list in favour of a predominance of Australian and local native trees, including the attractive Kurrajong (Brachychiton populneus) that this Diversity Guideline rejects: <em>(list provided is not included for the purposes of brevity)</em></td>
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<td>5.3.3 Improve Vegetation Health. Actions. Good. All are important, but it is great to see the intent to create median strips for tree space, and to replace asphalt and concrete with pervious surfaces.</td>
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<td>5.3.4 Improve soil moisture and water quality. At last, the wisdom and value is realised, in this Strategy, of retaining rainwater in the landscape or harvesting it for later use—even in a city—instead of utilitarian diversion of it to waterways. Thank you.</td>
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<td>Target. Suggest: reference in this target to climate, Soil moisture levels will be maintained at levels to provide healthy growth of vegetation and cooling of the urban environment.</td>
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<td>5.3.5 Improve biodiversity. It is inflexible thinking that has led to cities versus biodiversity protection when they can, indeed, co-exist. Whilst this Strategy recognises the need for, protection of and value of biodiversity within Melbourne, it is vague about what biodiversity means as it does not refer to local biodiversity. Request: (1) for clarity, define the term ‘biodiversity’ in the context of this Strategy; (2) ensure an increase in biodiversity levels of Australian or local native vegetation.</td>
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<td>Request: that the unfortunate emergence of introduced myrtle rust does not overly affect choices of species, genus and family plantings for this Strategy, as some adaptation to the disease is likely.</td>
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<td>Target. Request: insert a reference to Australian and local biodiversity, to ensure an increase in local biodiversity that would improve local ecosystem services: Melbourne’s green spaces will protect and enhance a level of Australian and local Melbourne biodiversity which contributes to the delivery of ecosystem services.</td>
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<td>Actions. These are excellent actions:</td>
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<td>• Review City of Melbourne’s Biodiversity Action Plan and conduct</td>
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<td>an opportunity assessment.</td>
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<td>• Integrate biodiversity values into the planning of parks, green spaces, precinct and waterways through Master Plans, Structure Plans, Precinct Plans and the Total Watermark–City as a Catchment Review.</td>
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<td>• Increase the diversity of tree species amongst the tree population to provide diversity of food sources, protection and habitat.</td>
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<td>• Utilise water sensitive urban design to encourage biodiversity in our soils through the improvement of groundwater levels.</td>
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<td></td>
<td>• Provide habitat through dead trees where possible, ensuring health and safety for everyone. Yes, important—the role of dead trees in ecosystems is misunderstood and, therefore, undervalued in the general community.</td>
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<td></td>
<td>• Maintain ongoing relationships with key research institutes such as ARCUE (University of Melbourne) and CSIRO Ecosystem Sciences. Yes, it is essential to maintain liaison with the valuable ARCUE and CSIRO.</td>
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<td>• Develop programs to encourage the interaction between people and nature and to raise awareness. Yes, very necessary.</td>
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<td>• Enhance ecological connectivity through the provision of urban forest corridors along streetscapes between our green spaces. Yes, streetscapes provide great opportunity for ecological links.</td>
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<td>• Develop productive urban landscapes – where possible in the public realm, but primarily through encouragement and incentives for private realm gardens. Suggest: encouraging public and private landholders to lend or donate their land for pocket parks, green corridors, and urban forests for the greater good. The Adelaide ‘Backyards 4 Wildlife’ program is a great model.</td>
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<td></td>
<td>Additional biodiversity actions. Please add or consider the following actions:</td>
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<td>1. Re-establish Ecological Vegetation Classes (local native plant communities) where possible.</td>
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<td>2. Possible links for endangered flora and fauna—especially for vulnerable grasslands. Suggest (a) some local native grassland meadows are re-established in some city parks; (b) re-introduce Lowland Snowgums where possible.</td>
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<td>3. Ecological links between the coast and hinterland.</td>
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<td>4. Introduce local native understorey vegetation, where possible, to aid survival of canopy trees.</td>
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|      | 5.3.6 Inform and consult with the wider community. Yes, seeking support from the general community would be vital for the success
and appreciation of this Strategy.

Target. The community will have a broader understanding of the importance of our urban forest, increase their connection to it and engage with its process of evolution. Yes, this is a very important aim for continued community support.

Actions. These are excellent actions to involve the general community in the implementation of this Strategy:

• Enable the community to have a say in the design of landscapes of the future. Admirable but difficult! Australia is a nation of migrants, some of whom want to see familiar plants from their homeland, but many of these plants have become invasive, displaced native flora and fauna and disrupted ecosystems. Suggest: public comment is sought within defined species lists.

• Use innovative tools to engage and involve with this strategy.

• Encourage diverse conversations about the urban forest.

• Direct the emergence of urban forestry as an essential planning discipline.

• Align with other local municipalities to enhance the whole Melbourne urban forest. Yes, a good thing, if Australian and local natives are promoted.

• Encourage and support further research into Australian urban forestry.

• Create opportunities and co-benefits of producing this strategy: align with other strategies to ensure greater impact, increase field of research, and develop relationships with private landholders. Yes, there would be much to learn during implementation of this Strategy and from liaising with others.

• Work with the traditional owner groups within the City of Melbourne to develop community programs that increase community knowledge of the cultural significance of treed landscapes in our Environment. Yes, delighted to see intent to involve traditional owners. Request: traditional owner groups to advise on the creation of local native bush food and medicine gardens as an educational tool.

• Develop health and wellbeing indicators to benchmark the role of our urban forests in contributing to human health. Yes, this does need to be better understood by urban planners, responsible authorities, governments and agencies.

Additional community action: please set up Friends groups to assist with implementation of this Strategy and with ongoing care of parks, gardens, reserves and streetscapes.

6 Implementation Framework. Yes, it would be wonderful, indeed, if the City of Melbourne does `lead the practice of urban forestry in
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<th>Name</th>
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<tr>
<td>Australia</td>
<td>The greening of all our municipalities, regional centres and villages would be fabulous and represent a remarkable shift in our development culture but, again, request Australian and local natives are promoted.</td>
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<td></td>
<td>6.1 Integrated planning</td>
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<td>Intra-Council integration. Yes, it is vital to this Strategy that there is sharing of information and cooperation between relevant Council departments. This is sometimes lacking in local government and can result in competing interests and financing, or good initiatives being stymied or undone.</td>
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<td>Community and inter-professional integration. Request: please clarify this ambiguous statement: ‘role of non-public proponents becomes more influential by raising public and bi-partisan political awareness’.</td>
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<td>Inter-municipal integration. Yes, ‘systematic assessments of the urban forest across a larger bio-geographical area’, regardless of political or other boundaries, would be very worthwhile.</td>
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<td>National action. Yes, local action, such as the implementation of this Urban Forest Strategy, may result in similar national action.</td>
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<td></td>
<td>6.2 Implementation tools</td>
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<td></td>
<td>Online access. Yes, these days, online access is everything!</td>
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<td></td>
<td>Documents. City of Melbourne’s Tree Precinct Plans; Urban Forest Diversity Guideline; and Urban Forest Community Engagement Plan. Yes, principal guiding documents would be needed to support and inform this Strategy.</td>
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<td></td>
<td>Main supporting documents. Biodiversity Action Plan; Community Health and Wellbeing indicators; Pest and Disease Risk Management Strategies; Significant Trees Register (Heritage, Significant Private); Open Space Strategy; Green Infrastructure Implementation Guide; Parks and Gardens Master Plan Reviews; and Draft Urban Agriculture Policy. These eight additional documents would seem to comprehensively support and inform this Strategy.</td>
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<td>Suggest: careful cross-referencing of all the above documents, which can be overlooked in preparation of such a large Strategy.</td>
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<td>Technical tools—I-tree Eco. Using a measure of environmental and financial values to assess urban forests may be useful, providing they are applied equally and that the dollar value alone does not determine outcomes. Suggest: the evolving Atlas of Living Australia web tool might be useful in informing this Strategy about known flora and fauna in Melbourne and surrounds and any attention required to particular species. Other tools—ULE/Tree health assessments; Thermal imaging; and Weather stations. These would seem to provide useful information for this Strategy.</td>
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</table>
6.3 Measurement, monitoring and review. Yes, all are essential to a sustainable development approach for this future ‘city within a forest’.

6.4 Funding resources. Yes, agree with seeking unconditional funds from sources other than Council’s budget—developers, businesses, grants, perhaps philanthropy. Suggest: developer open space contributions for new developments should also have a levy to improve existing infrastructure of roads, sewerage, and stormwater.

Glossary

Ecosystem services. Request: to ensure correct understanding of this term, please change this statement: ‘Ecosystem services are the benefits all living things, including people, obtain from ecosystem processes’.

Add glossary definitions. To assist understanding, please add definitions of plant species, genus and family.

Additions to this Strategy. Please add or consider the following for this Strategy:

Night lighting—pollution and insects. Light pollution is an increasing blight on the environment due to people’s obsession with uplights, downlights, spotlights, security lights, neon lights, architectural lights, garden lights, etc.

Light pollution decreases visibility of the night sky; uses enormous amounts of energy that emits greenhouse gases and contributes to global warming; disrupts sleep patterns of people and animals; disrupts wildlife behaviour; and kills enormous numbers of insects that are essential in the wildlife food chain and for ecosystem services, including pollination. The increasing use of bug zappers also kills too many insects. People must learn to live with insects.

ARCUE stated in The Age Sunday 5 June 2011:

‘Light pollution is a threat to biodiversity and alters animal behaviour and feeding habits. Night-flying insects cannot resist light. Research from Europe has shown a dramatic reduction in the number of and diversity of insects, particularly moths, in cities when compared to the village-farmland edge. They estimate billions of insects are dying. It not only reduces food sources for animals, but also it reduces the number of pollinators. Light pollution also affects when plants flower and when they go dormant in winter.’

This Strategy will increase habitat for insects, which is desirable, but it must also include measures to protect them. Request: (1) Minimal night lighting, with essential lights hooded or insect-friendly-lighting; and (2) a ban on bug zappers. Insect-friendly lighting design and colours are available now.

Community Produce Gardens. Suggest: community produce gardens amongst apartments in areas such as at Docklands would...
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<td>relieve the built environment and unite the local community.</td>
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<td>Pocket Parks. Suggest: new green pocket parks—even a single canopy tree—amongst built-up areas would provide green relief and a place for local people to gather. There are unused spaces and brownfield sites in the CBD that owners may be willing to sell, lend or lease for pocket parks, particularly if a site is being redeveloped.</td>
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<td>Mandatory green cover for new developments or redevelopments. Suggest: mandatory 10-20% green cover per lot for new developments or redevelopments.</td>
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<td>This Urban Forest Strategy has the potential to be very influential on the amenity, character and local native biodiversity of the City of Melbourne, in positive and negative ways. Regarding local biodiversity, every care must be taken to enhance our local native flora and fauna diversity and habitat.</td>
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4.2. Groups

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<td>Allan roger</td>
<td>Fully support the overall goal. The most obvious situation is what the City does about its existing trees and in particular how it replants. Current practices may or may not accord with these expectations. Recent examples may serve to illustrate how, with the best of intentions, mis-steps can be taken.</td>
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<td>Example 1</td>
<td>Over recent years the original paper barks in the pavement were removed (because of the damage that their root systems were doing to adjoining buildings). New trees were installed within the car-parking zone. These proved unsatisfactory because of the high ground water level in that area. Before the present trees were planted there was an extensive process of consultation and various option were presented. Opinions were canvassed from everyone in the adjoining area but no strategic vision was presented. The outcome was presumably largely based on aesthetics and oak trees were selected on the basis of a popular vote. The consultation process was commendable but the outcome, in the absence of vision and leadership, was not. The oaks are thriving but they will contribute to the overall ecological well being of the area or the metropolis. Similarly, oaks have been planted in the central reservation of Canning Street to replace the original elms. In marked contrast the central reservation in Pitt Street was planted with eucalypts. They have established themselves very quickly and are now alive with local birds.</td>
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<td>Example 2</td>
<td>The City has a practice of lifting and re-laying blue stone sets along the side of roads and in the many laneways. The sets are dug up</td>
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Mandatory greening in the public realm is not a focus of this strategy, however efforts have been made to include better reference to the private realm with specific inclusions in Section 6 relating to green roofs, green walls and exceptional trees in the private realm.

Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the
and set aside. The space is then excavated down s further 80 to 100 mms. A concrete base is then installed and the sets are re-laid and grouted. But, of course they are not re-laid with the same surfaces pointing up or in exactly the same positions as before. The result is that all the wear marks that carry the information of the past – the cultural heritage - is lost. What results is a system the merely looks old but no longer tells its story. Where are the worn tracks of the steel wheeled night soil lorries? Gone in a jumble of blue stones. The other effect of this process is that the root systems of any nearby trees that lay immediately below the blue stones and that were fed by the water filtering down through the joints have been destroyed. In addition that area now drains more quickly. All infiltration has ceased and the capacity of the area to contribute to a healthy urban forest has been reduced.

If we take the broad ecologically relevant urban forest as the over arching conceptual framework it can then be argued that:

the City of Melbourne, through its Urban Forest Strategy should:

1. Set out to establish an ecosystem-wide approach - a continuous system of eco-system corridors and nodes - as the overarching framework within which it and other local governments, within the metropolitan area and more widely, operate.

2. Within its own area of responsibility adopt an eco-system corridor and node approach as its own land use and urban forest strategy.

3. Ensure that all its operational construction and reconstruction activities are consistent with the declared urban forest strategy.

4. Recognise that the appropriate planting regime for these corridors and nodes would ensure that the flora and fauna indigenous to the area are sufficiently dominant to secure the functional integrity of the indigenous bio-system as a whole. (eg This can be achieved by small plantings along a street or a larger project in a Council owned Reserve.)

5. Acknowledge that there may be a few situations where overarching cultural considerations suggest that iconic non-indigenous species and eco-system environments be maintained (The Botanic Gardens is an obvious example and perhaps Royal Parade and a few other sites).

6. Accept responsibility to provide appropriate supplementary life-supporting feeding, breeding and nesting environments for indigenous species (invertebrates, animals and plants) that would not normally be acceptable within an urban forest. (For example safety considerations may preclude the retention of very old hollow trees that are likely to collapse or lose limbs. That being the case it is necessary to provide the required facilities.

A key target within the strategy is to Protect and enhance a level of biodiversity which contributes to the delivery of healthy ecosystem services. A biodiversity and urban ecology strategy is currently under development. That strategy will consider this issue more appropriately.

Kay Oddie An ‘urban forest’ is broadly defined as “the sum of all trees and vegetation, soil and water that provides valuable development of these plans. Section 6 of the strategy has been revised to include this detail.

Many of these suggested
ecosystem services which are essential for a healthy liveable city.” And “Our trees are the most recognisable and important element within the urban forest”.

It is acknowledged that the Strategy should concentrate on trees, however ‘other vegetation’ including shrubs, ground covers and grasses already comprises a significant part of Melbourne’s green spaces: in public parks, gardens and extensive sporting fields; embankments and wetlands; in the private realm - gardens. Proposed planning for increased density in Melbourne calls for roof top gardens, balcony and vertical gardens – these will be predominantly be planted with ‘other vegetation’ types.

‘Other vegetation’ types are significant contributors to the positive/desired environmental parameters set out in the Strategy, including biodiversity, habitat, cooling and shade, water and soil moisture retention, water quality and re-use, mitigation of heat island effects, vegetation and soil health and community health and wellbeing.

The ecological health of an urban forest is dependent on the different vegetation types; the aim of the Strategy should encompass the wider ecological role of the urban forest. More attention should be given to ‘other vegetation’ throughout the document. The Strategy would be greatly improved if a whole section was devoted to the recognition and roles of the other types of vegetation. As the companion document “Urban Forest Diversity Guidelines - 2011 Tree Species Selection Strategy for the City of Melbourne” (ASPECT Studios & Tree Logic 2011) sets out for trees, so could a similar document be prepared giving guidance for the roles and use of shrubs, ground covers, grasses and aquatic plants in the urban setting.

The second document would have particular relevance for parks, gardens, reserves, many smaller local green spaces as well as future rooftop gardens, vertical gardens, balconies. Swales, wetlands and rain gardens could also be included. Sports fields and summer/winter grass species selection, which have relevance to lawn areas in parks and gardens (public and private) could be included. All of these are locations for ‘other vegetation’ and deserve more attention in the Urban Forest Strategy.

Wide Canopies, Shading, Cooling and Mitigation of Heat

amendments have been included.

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Wide Canopies, Shading, Cooling and Mitigation of Heat
Island Effect / Solar Access in Winter

The benefits of wide canopies are emphasised in the draft Strategy for their summer shade, cooling and mitigation of heat island effect. However, solar access in winter in our parks, other open spaces and streets is also very important in Melbourne – for community health and wellbeing and for energy efficiency in buildings.

Vitamin D deficiency is becoming more prevalent in our population. Denying adequate solar access in winter in parks and other open spaces by selectively referring to ‘wide canopy trees’, ‘shading and cooling’ and ‘mitigation of heat island effect’ in the draft document is not justified from a community health and wellbeing point of view. For buildings, solar access in winter has demonstrable light and heat benefits and energy efficiency. The ability of trees to provide both summer shade and winter solar access is not mutually exclusive. Deciduous trees, light or open canopies will serve both functions.

Solar access in winter is not mentioned in the draft document as an Environmental benefit (3.2.1), Community benefit (3.2.2) or Economic benefit (3.2.3) – but should be. And although mentioned in 5.2 Principles, it is not elaborated upon in the subsequent Strategies – but again should be.

Trees in Streets versus Trees in Parks, Gardens and Other Open Spaces

Another issue where the draft Strategy fails to appropriately differentiate trees is street trees and trees in parks/gardens/other open spaces. Besides location, they do not necessarily share the same function or relationships to their settings. The Strategies in Chapter 5 overly concentrate on trees in the street setting in contrast to the companion document “Urban Forest Diversity Guidelines” (ASPECT Studios & Tree Logic 2011), which recognises other settings.

Many of the concerns raised above relate to the first part of the draft Strategy. It certainly doesn’t present as a document relating to an ‘urban forest’ as defined in its introduction.

The companion document “Urban Forest Diversity Guidelines” (ASPECT Studios & Tree Logic 2011) provides
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<td>a wider understanding and more comprehensive analysis of what constitutes Melbourne’s ‘urban forest’. It is recommended that this document set the example for the first part of the Strategy.</td>
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<td>The first part of the draft Strategy appears overly repetitive; it would benefit from expert editing.</td>
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<td>In addition, corrections are required to the End Notes: Text numbers are missing or out of order; End Note references are missing; references in End Notes are not all included in the Glossary.</td>
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<td><strong>Specific comments</strong></td>
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<td>In the light of the general comments above, the following specific suggestions are made:</td>
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<td><strong>Introduction</strong></td>
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<td>page 1</td>
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<td>para 1: Surely, Melbourne’s ‘renowned’ parks beyond the Central City and to the north and west deserve to be included, namely Royal Park, Princes Park, Flagstaff Gardens and Fawkner Park. They also ‘contribute greatly to the city’s character, social and cultural life’.</td>
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<td>para 5: Creating Melbourne’s urban forest has another purpose that should be mentioned: to promote healthy ecosystems.</td>
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<td>para 7:</td>
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<td>Add: At the same time, it is important to maximise solar access in winter for the health and wellbeing of the community and for energy efficiency of buildings.</td>
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<td>Another important attribute of an urban forest is to enhance ecology, including biodiversity and habitat.</td>
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<td>page 2</td>
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<td>para 3: Add: Building the urban forest ... improving biodiversity and habitat .... reducing stormwater flows, improving water quality and re-use .... increasing shade and canopy cover in summer and allowing solar access in winter ....</td>
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<td>Executive summary</td>
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<td>page 3</td>
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<td>Strategy 4: Add: Improve soil moisture, water quality and re-use. Target: ... and storm water re-use will be promoted.</td>
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<td>Another benefit of an urban forest is the ability to improve water quality and re-use, e.g. through diminution of stormwater run-off by processing through swales and wetlands (which are integral parts of the urban forest) and through re-use for irrigation.</td>
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<td>Strategy 5: Add: Melbourne’s green spaces will ... which contributes to healthy ecological systems and the delivery of ecosystem services.</td>
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<td>It is noted that the ecological role of an urban forest is not defined in the draft Strategy (i.e. the relationships of plants and animals and the promotion of biodiversity and habitat). ‘Ecosystem services’ only relate to people (see Glossary).</td>
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<td>3rd last paragraph: Add: Most importantly ... that provide multiple benefits for public health and wellbeing and for the environment.</td>
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<td><strong>Background &amp; Context</strong></td>
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<td><strong>3.1 What is an Urban Forest?</strong></td>
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<td>para 1: Must add: It incorporates ... river and creek embankments, wetlands and other waterways ...</td>
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<td>The aquatic vegetation of wetlands and waterways is also important.</td>
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<td>para 3: 1st sentence: Should add: Urban forestry ... sociological, environmental, economic ... benefits ...</td>
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<td>and last sentence: developers, business, industry ...</td>
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<td>Businesses should also be expected to participate in the greening of the City and development of its Urban Forest. Retrospective greening of buildings and places should be encouraged.</td>
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<td>para 5: 3rd sentence: Add: ... planning of urban trees and vegetation. 4th sentence: Add: ... arboriculture, horticulture and urban design.</td>
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Melbourne’s urban forestry history very much includes the horticultural aspects of its parks and gardens, e.g. the shrub and floral beds.

para 6: 2nd sentence: Add: Essentially ... such as ... environment, conservation, ...

### 3.2.1 Environmental benefits

- **Reduce stormwater flows and nutrient loads**

  It is not only trees that can perform these functions. Add: Wetlands and swales with their different types of vegetation are also important means for trapping stormwater, improving water quality and reducing nutrient loads.

- **Provide habitat and enhance biodiversity**

  1st sentence: Habitat provision applies to plants as well as animals. For example, nitrogen-fixing acacias provide a supportive habitat as ‘primers’ for eucalypts’ growth. And water habitat (cf definition of urban forest (3.2.1)) in the form of wetlands very much applies to plants as well as animals (cf lower photograph on same page).

  Therefore add to sentence: Although few cities ... and provides habitat for plants and animals.

  Last sentence: By planting ... biodiversity and a wider range of habitats can be enhanced.

### 3.2.2 Community benefits

- **Providing a sense of place and creation of local identity**

  Trees and other vegetation types (shrubs, ground covers, grasses) also physically define a place, e.g. the shrub and floral beds of the Fitzroy Gardens, the Flagstaff Gardens and the Australian Native Gardens and the extensive lawn areas of the City’s parks and gardens. Therefore add: A city’s landscape ... because trees and vegetation physically define a place.

- **Reducing sun exposure to people**

  Must recognise that providing solar access in winter is a desirable attribute for community health and wellbeing for an urban forest in Melbourne and include as a Community
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<td>benefit in this section. Why is solar access in winter being totally ignored by the Urban Forest Strategy?</td>
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<td>2.</td>
<td>• Reducing heat related illnesses</td>
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<td>Are buildings really at “higher risk of heat related morbidity”!</td>
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<td>3.</td>
<td>3.2.3 Economic benefits</td>
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<td></td>
<td>• Reducing energy costs</td>
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<td>Solar access in winter is “a good thing” when it comes to sunlight and solar heat to contribute to a building’s energy efficiency in winter. The question is repeated: Why are the benefits of solar access in winter being totally ignored by the Urban Forest Strategy?</td>
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<td></td>
<td>• Storing and sequestering carbon</td>
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<td></td>
<td>The abbreviation for carbon dioxide is written with a subscript - CO₂</td>
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<td></td>
<td>• Reducing water costs</td>
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<td></td>
<td>Surely this should be an economic benefit of an urban forest? By collecting, purifying and re-using rainwater and stormwater through wetlands, swales, rain gardens, vertical gardens, etc. the cost of potable water use can be saved. Examples of re-use of water includes irrigation of sports fields, use in fountains and ornamental ponds.</td>
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<td></td>
<td>Evolution of Melbourne’s Urban Forest</td>
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<td></td>
<td>3.3.1 Historic development</td>
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<td></td>
<td>para 3: Melbourne’s “highly valued” green spaces include its many grassed and treed streetscapes. They have greater historical relevance than more recent and far less prevalent ‘green roofs and walls’ and should be included in the last sentence.</td>
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<td></td>
<td>para 3: Part of the historic development of Melbourne’s urban forest, has been the Council’s recognition of the significance of its parks and gardens that form part of the City’s “rich palette of green spaces”. This has been done through the preparation of master plans for these major parks and gardens. Thus it would be appropriate to include such recognition by adding to the paragraph:</td>
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<td></td>
<td>Melbourne has taken significant steps to recognise the</td>
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<td>Summary of comments</td>
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<td></td>
<td>historic, cultural, arboricultural, horticultural and ecological importance of its major parks and gardens by preparing master plans to guide their ongoing management and development.</td>
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<td></td>
<td><strong>3.3.2 The urban forest today</strong></td>
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<td></td>
<td>para 1: Surely Royal Park as “a highly valued (and distinctive) landscape” should be included?</td>
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<td></td>
<td>para 4: What about including the more common birds, e.g. rainbow lorikeets and wattle birds that frequent our trees (especially following the extensive planting of native tree species in the 1970s/1980s), instead of the less common Kookaburras and Kingfishers?</td>
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<td></td>
<td>para 4: Last sentence: Not all birds on our waterways are “migratory” – swans and ducks are just two examples. And what about birds feeding in our waterways? Please reword:</td>
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<td></td>
<td>Various waterways across the municipality provide valuable habitat for birds, also providing food sources and nesting sites.</td>
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<td></td>
<td><strong>Tree canopy cover</strong></td>
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<tr>
<td></td>
<td>page 12</td>
<td></td>
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<td></td>
<td>This section makes no mention of deciduous versus evergreen trees, which as previously mentioned, is important when considering good solar access in winter. It is also important when considering levels of openness of a canopy – a factor recognised in the companion “Urban Forest Diversity Guidelines - Tree Species Selection Strategy for the City of Melbourne” which will inform tree planting in Melbourne’s urban forest over the next 20 years. ‘Canopy cover’ is not the only benchmark that should be considered.</td>
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<td></td>
<td>Where are the attributes of shrub and ground covers in contributing to a resilient and sustainable urban forest mentioned?</td>
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<td></td>
<td><strong>Tree species</strong></td>
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<td></td>
<td>page 13, 2nd para:</td>
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<td></td>
<td>It is incorrect that Royal Park “houses our entire population of River Red Gums”. This species also occurs along the</td>
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<td>Summary of comments</td>
<td>Response</td>
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<td></td>
<td>Moonee Ponds Creek and Maribyrnong River.</td>
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<td>Upper RH table:  Tea-tree belongs to the Leptospermum Genus; Paperbarks belong to Melaleuca Genus. Which species/which genus should be in the table??</td>
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<td></td>
<td>Useful Life Expectancy (ULE) of the City of Melbourne’s trees</td>
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<tr>
<td></td>
<td>page 14</td>
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<td></td>
<td>Why is ‘Useful Life Expectancy’ not defined in the Glossary?</td>
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<td></td>
<td>Given the dramatic estimates of loss of Melbourne’s existing population of trees, the Strategy’s ULEs should have scientific credibility. The parameters for estimating ULE should be given in more detail; also the scientific validity of the assessment process used and the professional qualifications and experience of the assessors. The assessments should be made publicly available. Without the methodology being provided, the assigned ULEs cannot be verified and are likely to face challenge.</td>
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<td></td>
<td>As a resident of Shiel Street, North Melbourne, I certainly question the 10 year ULE put on the trees in the street.</td>
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<td>A disturbing ‘chain-saw’/’chop it down’ appears to be the default situation in the Strategy. Where does the Strategy spell out a process whereby the viability of a tree can be prolonged by prudent tree surgery or other measures; pro-active pest/disease treatment; improvement in site conditions, etc?</td>
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<td>Similarly, there is no process relating to infill plantings in existing tree avenues; it would appear to be ‘chop them all down’, rather than infill plant where appropriate. In a 60-100+ year lifetime of a tree, infill trees will catch up, continuing the integrity of the tree avenue and, in heritage areas, preserving the heritage streetscape value.</td>
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<td>The diagram on page 14 is far too small to be clearly read.</td>
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<td></td>
<td><strong>4.1 Ageing tree population</strong></td>
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<td></td>
<td>The last paragraph ventures into planning issues and “retrofitting landscapes for better conditions for future trees”. An important addition would be to call for new developments to have lower site coverages or to adhere to planning</td>
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<td>No.</td>
<td>Summary of comments</td>
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<td></td>
<td>scheme guidelines so as to allow greater permeability of soils and enable better conditions for tree and other vegetation growth and viability. Clauses 54 and 55 of the Melbourne Planning Scheme recommend maximum residential site coverages of 60%. It would be great if this could be strongly recommended in the Urban Forest Strategy for the City’s projected urban renewal areas.</td>
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<td></td>
<td>The above comment is also relevant to the following section:</td>
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<tr>
<td></td>
<td><strong>4.5 Population increase and urban intensification</strong></td>
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<td></td>
<td>There is <em>every</em> reason why the urban renewal areas - Urban Renewal Areas and Areas of Ongoing Change - <em>must</em> also become part of the “green lungs” of the City.</td>
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<tr>
<td></td>
<td><strong>Chapter 5</strong></td>
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<td></td>
<td><strong>5.2 Principles</strong></td>
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<td>These are admirable principles. It would be nice to see them better reflected in the Strategies that follow.</td>
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<td></td>
<td><strong>5.3.1 Increase canopy cover</strong></td>
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<td></td>
<td>Thermal images should be provided for <em>both</em> summer and winter situations. The summer images would show the heat island effect and indicate where increased canopy cover would be beneficial. The winter images would show the buildings and spaces where solar access/beneficial effects of solar energy should be promoted. The images should be read in conjunction with each other in selecting tree species for the street and park typologies. This needs to be spelt out in this section and its Actions.</td>
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<td></td>
<td><strong>Actions:</strong></td>
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<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; dot point: Add:</td>
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<td></td>
<td>• Select the most appropriate vegetation type and species for each location given spatial and climatic constraints, <em>desired climatic outcomes</em> and neighbourhood character.</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; dot point: Add:</td>
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<td>• Ensure that the overall urban design for places ... best designed for our urban forest, for people and for the environment.</td>
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<td>No.</td>
<td>Summary of comments</td>
<td>Response</td>
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<tr>
<td>5.3.2</td>
<td>Increase urban forest diversity</td>
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<td></td>
<td>para 2: Needs reworking/expert editing - avoiding mixing the metaphors/grouping</td>
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<td>unlike with unlike/‘avenues’ in parks but not streets?? ....</td>
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<td></td>
<td>para 3: 1st sentence: add: Every plant ... penetrate buildings, streets, parks</td>
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<td></td>
<td>and other open spaces; Last sentence: add: The interactions ... to connect to</td>
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<td>nature, for promotion of biodiversity and habitat and for the different forms ...</td>
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<td>Actions:</td>
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<td></td>
<td>Not forgetting ‘other vegetation’, an additional dot point should be added:</td>
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<td></td>
<td>• Enhance the strata diversity in our urban forest through the planting of shrubs,</td>
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<td>ground covers, grasses and aquatic plants where appropriate.</td>
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<td>Where does respect for heritage streetscapes, parks, gardens and conservation</td>
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<td>areas and their plantings receive recognition in the Strategy? The companion</td>
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<td>document recognises this, why not the Strategy itself? The Urban Forest Strategy</td>
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<td></td>
<td>and heritage should not be mutually exclusive.</td>
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<td>5.3.3</td>
<td>Improve vegetation health</td>
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<td></td>
<td>1st para: Add: To maximise ... it is imperative to ensure that our trees and</td>
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<td></td>
<td>vegetation are healthy.</td>
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<td></td>
<td>Actions: 7th dot point:</td>
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<td></td>
<td>This dot point could be expanded to include other locations in addition to</td>
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<td></td>
<td>median strips where large healthier trees could be grown. Other opportunities</td>
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<td>include extending nature strips (e.g. Roden St, West Melbourne) and creating</td>
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<td>pocket parks – which have often been formed from former/unused road reservations</td>
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<td>(e.g. the pocket park at the junction of Courtney/O’Shanassy/Leveson Sts, North</td>
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<td>Melbourne).</td>
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<td>5.3.4</td>
<td>Improve soil moisture and water quality</td>
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<td>No.</td>
<td>Summary of comments</td>
<td>Response</td>
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<td></td>
<td>Add dot point:</td>
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<td></td>
<td>• Install swales and wetlands to increase stormwater capture, improve water quality and re-use.</td>
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<td>5.3.5</td>
<td><strong>Improve biodiversity</strong></td>
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<td></td>
<td><strong>Target:</strong> Add: Melbourne’s green spaces ... to the delivery of ecosystem and ecosystem services.</td>
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<td>As noted in comments above, ‘ecosystem services’ applies to people; ‘ecosystem’ includes plants, animals and the environment.</td>
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<td><strong>Actions:</strong></td>
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<td>3&lt;sup&gt;rd&lt;/sup&gt; dot point: add/reword:</td>
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<td>• Increase the diversity of tree and other plant species to provide increased biodiversity, habitat and to promote healthy ecosystems.</td>
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<td>8&lt;sup&gt;th&lt;/sup&gt; dot point; add:</td>
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<td></td>
<td>• Enhance biological connectivity through the provision of urban forest corridors along streetscapes and biolinks between green spaces.</td>
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<td>Chapter 6</td>
<td><strong>6.2 Implementation tools</strong></td>
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<td>3.</td>
<td><strong>Urban Forest Community Engagement Plan</strong></td>
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<td></td>
<td>Correct: • Parks and Gardens Master Plans.</td>
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<td></td>
<td>In the lifespan of the Urban Forest Strategy, all the documents in the list are likely to be subjected to review, so the Master Plans should not be singled out.</td>
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<thead>
<tr>
<th>No.</th>
<th>Summary of comments</th>
<th>Response</th>
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<tbody>
<tr>
<td>1</td>
<td>Our organisation applauds the objectives expressed in the document of the Draft Urban Forest policy. The trendy name tends to conceal the fact that we are dealing mostly with street trees.</td>
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<tr>
<td></td>
<td><em>The document does not suggest the wholesale felling of trees. The section</em></td>
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</table>

Julianne Bell, Protectors of Public
<table>
<thead>
<tr>
<th>No.</th>
<th>Summary of comments</th>
<th>Response</th>
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<tbody>
<tr>
<td></td>
<td>We recognise that the drought has impacted badly on Melbourne’s trees and that it was the intransigence of the Bracks Government for refusing to assist the City of Melbourne to drought proof the trees by, for instance, building a sewer mining project in Princes Park which would have supplied water to Melbourne’s parks and street trees.</td>
<td>on useful life expectancy has been revised to clearly express that it not a tameable for removals.</td>
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<tr>
<td></td>
<td>We are alarmed, however about suggestions that there will be a wholesale felling of trees classified as nearing the end of their lives. In particular we are concerned over the fate of avenues</td>
<td>With respect to the history and heritage of the urban forest, the history section has been extensively revised and rewritten.</td>
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<tr>
<td></td>
<td>Staff of the City of Melbourne appears to have a purist view about removal of avenues of trees and maintain that the entire avenue should be removed rather than attempting removal of failing trees and interstitial planting of the gaps. At a hearing on the World Heritage Management Plan of the Royal Exhibition Building and Carlton Gardens held by heritage Victoria, Mr Rob Adams suggested that as the Plane Tree avenue on the Carlton Gardens was nearly the end of its life then the whole avenue should be removed. Our arborist Mr Rob Galbraith, who gave evidence, was of the opinion it was the finest avenue of plane trees in Victoria are healthy and have another 20 years or so lifespan.</td>
<td>List of tree removals are update on the corporate website monthly.</td>
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<td></td>
<td>Several years ago we had the unfortunate example of the avenue of Camperdown elms - 550 elms in the main street – which a Committee of representatives including Heritage Victoria and Friends of the Elms with I believe the support of the City of Melbourne arborist recommending the whole avenue be felled. The Corangamite Shire Council accepted the recommendations our consultant arborist that the few gaps be filled by interstitial plantings. Consequently a moratorium has been placed on the destruction of the elm avenue and elm avenues in side streets. They have adopted a policy of interstitial planting in any gaps. between trees.</td>
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<td></td>
<td>We would request that the City of Melbourne identify exactly what trees you are proposing to remove and what species you are proposing to plant in their stead. Additionally with regard to avenues we would like explanations as to why healthy trees cannot be saved and replacement trees of the same species planted in the gaps. (We realise that there may be problems with this approach in St Kilda Road.)</td>
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<td></td>
<td>We would like to stress the unique character of Melbourne as a Victorian-era city and the global significance of Melbourne’s elm trees. Dutch Elm Disease (DED) has killed 40 million elms in the Northern Hemisphere and more recently, in New Zealand and Japan. Worldwide, elm trees are an endangered species.</td>
<td>The suggested amendments have been included.</td>
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<td></td>
<td>We think the Urban Forest Diversity Guidelines document, needs to state that Australia does not have Dutch Elm Disease, (chart at top of p18) It should also state the existence of the government- backed, DED Contingency Plan, for action if DED.</td>
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<td>No.</td>
<td>Summary of comments</td>
<td>Response</td>
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<td>Is ever discovered in Australia.</td>
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<td>We believe the document needs to give a greater emphasis to elm trees being an essential component of the diverse future mix of Melbourne’s trees.</td>
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<td>We are pleased to note that the planned future composition profile of Melbourne’s trees allows for the same number of elm trees as at present. However, with an increased number of trees overall the percentage of elm trees will decline. We would like to see some flexibility on this issue.</td>
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<td>We are also pleased to note the intention to retain elms as the trees to line iconic boulevards (Royal Parade, Victoria Parade). It needs to be noted that Melbourne’s elm avenues are the last remaining examples of mature elm avenues in the world.</td>
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<td>In fairness to the structure of Melbourne’s elm trees, it needs to be noted that poor and extensive pruning 50 years ago, caused immense damage and has reduced the life of many of Melbourne’s elm trees.</td>
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<td>We do not agree with the statement (p34 – Urban Forest Diversity Guidelines) that refers to Plane trees as the ‘perfect street tree’ and would like to see this reference deleted.</td>
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<td></td>
<td>We appreciate the use of the concept ULE in managing the tree population of Melbourne. We understand ULE cannot be an exact tool and in the final analysis a judgement has to be made about what (or if) a tree is to be removed. In this respect we would recommend to err on the side of caution.</td>
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<td>We strongly support the initiatives that have been taken (or will be taken) to harvest storm water. We appreciate the effect such moves will have on the long-term health of Melbourne’s trees. We would urge Melbourne City Council to make adequate provision in their budget to implement these measures.</td>
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<td>The future success of the proposed measures will depend on the skill level of the contractors engaged. This will also apply to the future maintenance of the trees. We have observed many unnecessary losses of trees, due to poor contract work.</td>
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<td>Finally, we would like to congratulate the authors of the document, for having the foresight, of not only tackling the difficult situation of an aging tree population, but also to double the number of trees and canopy cover, in the city. We also appreciate the nature of the consultative process and value the opportunity we have been given to respond.</td>
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5. Precinct Meetings

5.1. Overview

Nine precinct based community consultations were held between 6 February and 28 March 2012. All residents groups were contacted in December 2011 to provide advance notice about these meetings. All residents groups were also invited to participate in the planning of these precinct based meetings. Some did not respond, some declined and some assisted in the organisation of the meetings.

Over 110 attendees participated in nine precinct based meetings. Representatives from the respective residents groups were present at a precinct meeting, excepting representation from the East Melbourne residents group.

These meetings provided an opportunity to precinct the urban forest strategy and to have a group discussion with a focus on the precinct. All attendees were invite to make submissions via the online forum or in writing.

The table below provides the details of each meeting.

<table>
<thead>
<tr>
<th>Precinct</th>
<th>Location</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kensington</td>
<td>Kensington Association, Holy Rosary Primary School</td>
<td>06 February 2012</td>
</tr>
<tr>
<td>North Melbourne</td>
<td>North Melbourne Library</td>
<td>21 February 2012</td>
</tr>
<tr>
<td>Docklands</td>
<td>The Hub, Docklands</td>
<td>07 March 2012</td>
</tr>
<tr>
<td>Royal Park</td>
<td>Walmsley House, Royal Park, Parkville</td>
<td>13 March 2012</td>
</tr>
<tr>
<td>South Yarra</td>
<td>South Yarra Senior Citizens Centre, Fawkner Park</td>
<td>14 March 2012</td>
</tr>
<tr>
<td>CBD</td>
<td>Residents 3000, Multicultural Hub</td>
<td>19 March 2012</td>
</tr>
<tr>
<td>Southbank</td>
<td>MICM Property, City Rd</td>
<td>20 March 2012</td>
</tr>
<tr>
<td>East Melbourne</td>
<td>East Melbourne Maternal and Child Health Centre at Powlett</td>
<td>27 March 2012</td>
</tr>
</tbody>
</table>
6. Urban Forest –Eco City Forum

6.1. Setting the scene

On November 28\textsuperscript{th} 2011, a world café style event was held to outline the Urban Forest Strategy. 135 members of the community attended this forum.

The night was promoted via email and advertisement. In order to encourage conversation, information about the strategy was sent to attendees prior to the forum.

The evening was conducted by an independent facilitator supported by City of Melbourne staff as table facilitators. The format of the evening was small table conversations responding to a presentation and questions. Attendees were encouraged to raise their own questions as well.

6.2. The process

After an introduction to the Forum by Cr Cathy Oke and workshop facilitator Kimbra White, participants moved through the following series of steps:

1. Introductions – participants were invited to share their names, reasons for coming and what is important to them about the forest strategy, with the other members of their table. (Responses appear in Part 3.1 of this Report.)

2. Presentation - An overview of the key elements of the draft Strategy was presented by Ian Shears accompanied by a power point presentation containing visual images extracted from the Strategy.

3. Key responses to the strategy - The members of each table discussed what they liked in the draft Strategy and what aspects could be improved, to provide feedback to Council. (Responses appear in Part 3.2 of this Report.)

4. Focussed discussions - followed on key topics including biodiversity, cultural identity and heritage, and others suggested by participants. Individuals were invited to move to the discussion table of most interest to them and move between tables freely. Ian Shears, Rob Adams and Yvonne Lynch were available throughout this period to answer any questions that arose. (Key points discussed and suggestions made appear in Part 3.3 of this Report.)

5. Q & A Panel - comprising Cr Cathy Oke, Ian Shears and Prof Rob Adams, addressed as many as possible of the questions put to the panel via the index cards.
6. Evaluation forms were completed
7. Cr Oke addressed participants about the next steps to be taken including that their feedback would be collated into a report of the Forum and a full set of answers to the questions posed would be posted on the Urban Forest Strategy website.

6.3. Overview of Evaluation Forms

A survey of participants was handed out at the conclusion of the evening to gauge attendees feedback about the event.

The majority of attendees identified themselves as Residents with the next two most represented groups being “Related Industry” and “Academic”

![Q1: Describe yourself]

**Attendee Understanding**

Attendees were asked for their perception of their understanding of the strategy before the forum and after. A five point scale was used, ranging from “no understanding” to “very good understanding” of the strategy. The forum can be seen to have a generally positive impact on attendees understanding.
General comments

In order to encourage broad commentary, a free text option was offered where general comments were encouraged. These were then analysed for themes.

The most common themes were that people appreciated the opportunity to discuss the strategy with the City of Melbourne and the attendees. While a significant number felt the evening was planned and delivered well, a number also had a converse view, with the most common issue being confusion about the purpose of the forum.

A number felt the evening was too short to cover all the issues, however a number felt the evening was informative and there was commentary to the effect that the evening has whetted attendees’ appetite for further engagement.

Community Consultation Suggestions

Attendees were asked if they had suggestions for further community consultation with regard to smaller areas of the City.

Electronic means including website and email were well represented, however a significant number felt that community involvement would assist, including Resident Groups’ other community groups and local champions involvement.
6.4. Forum participants’ feedback

Given the substantial amount of feedback provided by Forum participants, responses have been grouped under headings created by the author and duplications removed and duly noted.

6.5. What we like

<table>
<thead>
<tr>
<th>Nature of the Strategy</th>
<th>Whole concept (*4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thinking from a whole range of directions – nutrients into soil, water approach (*3)</td>
</tr>
<tr>
<td></td>
<td>Identifies an important issue and planning suitable action (*3)</td>
</tr>
<tr>
<td></td>
<td>Plans for a future of 50-100 years (*3)</td>
</tr>
<tr>
<td></td>
<td>Like that its evidence based (*3)</td>
</tr>
<tr>
<td></td>
<td>Plan for future resilience</td>
</tr>
<tr>
<td></td>
<td>More aspirational than other cities (eg Sydney)</td>
</tr>
<tr>
<td></td>
<td>Proactive – recognises Melbourne’s unique character, especially Elm trees</td>
</tr>
<tr>
<td></td>
<td>Metrics – data collecting, value of trees</td>
</tr>
<tr>
<td>Broad source of data</td>
<td>Increase of trees (*3)</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Detail in the document – applaud “meat on the bones”</td>
<td>Diversity of trees (*3)</td>
</tr>
<tr>
<td>Looks impressive and scientific</td>
<td>Replacement of trees (*2)</td>
</tr>
<tr>
<td>Impressed by data collection</td>
<td>Realistic re diversity</td>
</tr>
<tr>
<td>Holistic approach – first slide: Cultural Context</td>
<td>The Exceptional Tree Register</td>
</tr>
<tr>
<td>Applaud the initiative – should be worked on over time</td>
<td>Increasing canopy coverage</td>
</tr>
<tr>
<td>Solid principles</td>
<td>Canopy cover idea good, particularly in Carlton – median strip planting provides shading on both sides of the street</td>
</tr>
<tr>
<td>Good coverage of issues</td>
<td>Co-existing with nature – objective</td>
</tr>
<tr>
<td>Not just a conversation about native vs exotic trees but diversity, functionality</td>
<td>Creating spaces and attracting people</td>
</tr>
<tr>
<td>Implantation tools will be driven by community at local level</td>
<td>Phasing out, constantly green space</td>
</tr>
<tr>
<td>A well-considered process and strategy – educating the public, open and transparent in delivery</td>
<td></td>
</tr>
<tr>
<td>(the idea of) city in a forest</td>
<td></td>
</tr>
<tr>
<td>Targets for species – creating diversity</td>
<td></td>
</tr>
<tr>
<td>Great it’s happening</td>
<td></td>
</tr>
<tr>
<td>Its about placement of trees in streets and other areas; achieving the canopy is the most important. Need variety to achieve practical objectives.</td>
<td></td>
</tr>
<tr>
<td>Process rather than responding to emergencies</td>
<td></td>
</tr>
<tr>
<td>“Stopping the rot”</td>
<td></td>
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</tbody>
</table>

**Presentation**

| Visuals – before and after – better than words | |
| Challenges and risks clear – a bit confronting but necessary | |
| Basic facts re why important | |

**Components of Strategy**
<table>
<thead>
<tr>
<th>Questions and suggestions</th>
<th>Use of the 15 criteria for tree selection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consideration of water</td>
</tr>
<tr>
<td></td>
<td>Integration of “place making”</td>
</tr>
<tr>
<td></td>
<td>Involving people in the hardscaping (eg recreation use)</td>
</tr>
<tr>
<td></td>
<td>Address biodiversity</td>
</tr>
<tr>
<td></td>
<td>Combined with WSUD</td>
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<tr>
<td></td>
<td>Storm water catchment is great. Keep it local</td>
</tr>
<tr>
<td></td>
<td>Tree life expectancy map</td>
</tr>
<tr>
<td></td>
<td>Communication of tree removal</td>
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<tr>
<td></td>
<td>WSUD preparing ground</td>
</tr>
<tr>
<td></td>
<td>Different ways of planting trees</td>
</tr>
<tr>
<td></td>
<td>Forest rather than rows of trees</td>
</tr>
<tr>
<td></td>
<td>Opportunities re planting in different ways</td>
</tr>
<tr>
<td></td>
<td>Want interstitial planting, where possible.</td>
</tr>
<tr>
<td></td>
<td>Stormwater harvesting is good – good to spend $ on it</td>
</tr>
<tr>
<td></td>
<td>Birrarung Marr landscape could be applied elsewhere</td>
</tr>
<tr>
<td></td>
<td>Roof top gardens and green walls – cooling effect</td>
</tr>
<tr>
<td></td>
<td>Pollution link in UFS – range chemical, light (could need more detail)</td>
</tr>
<tr>
<td></td>
<td>VicRoads – distance trees to curbs ~ 3 metres – what will Council do about that?</td>
</tr>
<tr>
<td></td>
<td>Wind tunnels</td>
</tr>
</tbody>
</table>
6.6. What needs improving

<table>
<thead>
<tr>
<th>The Strategy and its presentation</th>
<th>Accessibility of information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Title – not sure about “Urban Forest”</td>
</tr>
<tr>
<td></td>
<td>Massive over-reaction – …. are sensationalising</td>
</tr>
<tr>
<td></td>
<td>- What CoM is saying is dramatic</td>
</tr>
<tr>
<td></td>
<td>- It’s getting our attention</td>
</tr>
<tr>
<td></td>
<td>More information on the strategy</td>
</tr>
<tr>
<td></td>
<td>Require the specifics</td>
</tr>
<tr>
<td></td>
<td>More table information provided – too brief and more detail needed</td>
</tr>
<tr>
<td></td>
<td>The draft strategy is too difficult to read</td>
</tr>
<tr>
<td></td>
<td>5 page summary should be distributed before the forum takes place (*2)</td>
</tr>
<tr>
<td></td>
<td>Roles and responsibilities of all involved?</td>
</tr>
<tr>
<td></td>
<td>Scare tactics used</td>
</tr>
<tr>
<td></td>
<td>More information about the strategy’s projects – the implementation and types of trees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ian provided the policy, not strategy – should have been presented</td>
</tr>
<tr>
<td>How will Council communicate over time on-going information?</td>
</tr>
<tr>
<td>Will they be removing healthy trees from avenues?</td>
</tr>
<tr>
<td>Will they be cutting down whole avenues, or phased? – Interstitial planting?</td>
</tr>
<tr>
<td>Not included as a guiding principle. Would like it included.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough effort – research – to save the Elms. Should not be defeatist.</td>
</tr>
<tr>
<td>Address diseases – cure. Save the Elms and plant new Elms. More research.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community engagement and education</th>
</tr>
</thead>
<tbody>
<tr>
<td>People’s awareness and education needs to be part of the strategy</td>
</tr>
<tr>
<td>Concerned that Council will/may neglect to engage community – challenge for implementation phase</td>
</tr>
<tr>
<td>Communication and education of strategy – too isolated in audience</td>
</tr>
<tr>
<td>More information – good over period of time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprehensive about species – if canopies are important, then Northern Hemisphere</td>
</tr>
<tr>
<td>Should not necessarily abandon Melbourne’s historic tree avenue plantings for ‘eclectic’ mixes and plantings</td>
</tr>
<tr>
<td>Topic</td>
</tr>
<tr>
<td>---------------</td>
</tr>
</tbody>
</table>
| Species       | Species – same concern about indigenous trees.  
|               | - This issue is important to the character of Melbourne (conflict with indigenous trees)  
|               | - Look and how brittle.  
| Need more talking about specific species | - Melbourne = uniformity wanted = European architecture  
|               | - Impact of avenues  
| Elms – what is in mind? |  
| Suggest more natives |  
| 15 criteria / diversity. Do we have trees that fit the criteria, including indigenous? |  
| Complexity of variety of trees difficult to look after and costly |  
| Rapid canopy planting – Maculas in Birrarung Marr planted closely |  
| 2 year estimate for trees; 3-4 years required for some species |  
| Species diversity – why 5%? Who came up with the number? |  
| Concerned by the numbers associated with increased diversity (ie 5,10,20) Very difficult in urban situation. Very aspirational. |  
| More attention to aesthetics – colour and texture – for replacement trees. |  
| Not clear on role of indigenous species |  
| Tree health / soil health though balance of species diversity? |  
| Diversity – need to retain historical aspects but also need to change |  
| Tree removal   | Concerned about removal of trees – which ones will go?  
|               | Communication of tree removal |  
| Water         | Question – what’s our capacity to water these trees? Why aren’t we pumping water from the Yarra?  
|               | Water – permeable surfaces (is it an afterthought?) need to be in planning scheme  
|               | Emphasis WSUD and therefore increase biodiversity  
|               | Link to City as a Catchment principles |  
| Fauna         | Possums – more about the management of them and impact increasing tree numbers will have on population of possums increasing  
|               | - Strategy to keep them out of private gardens  
|               | ? has fauna been included?  
|               | Has habitat been considered – for invertebrates, insects, birds?  
|               | Management of possums – more information on biodiversity |  
| Other plantings | Street trees do not have undergrowth |
| Consider vegetation other than trees and grass - linking elements |
| Biodiversity corridors linking parks |
| Understanding of vegetation’s relevance |
| Forest strategy should acknowledge other layers in a forest – middle (shrub) layer and ground cover |

| Other greening approaches |
| Green roof image – remove as its not a reality and reinforces concept of landscapes need to be ‘European’ |
| Want more mix of other options. WSUD, vertical planting, green walls, roofs etc. Not just trees |

| Urban canopy |
| 22% to 40% - conservative target. Think it should be higher, ~60% over 30 years |
| (canopy lag) be managed? |
| If trees are taken out now, there will be an increase in the Heat Island Effect in the interim – how will it ….. |

| Planning and regulation |
| Will there be planning guidelines that will be enforced? (Eg set-backs so that trees can be planted) |
| Integrated policies (eg requiring developers to plant trees) |
| No provisions as yet for developers to green their sites (eg roof top gardens) |

| Private land |
| Focus only on public land – what can city do with trees in other areas? |
| How strategic land could be bought back by the municipality for green wedges and green corridors |
| Need to identify areas of under used land (eg ‘dero’ buildings) and green them |
| Include land owners’ engagement (not just CoM space) and adjacent councils |

| Limitations and risks |
| Physical resources – manpower |
| How do we maintain the trees? |
| Managing future problems – does the UFS consider all potential threats? |
| Commitment to IT resourcing |
| Silos exist within council – only starting to be overcome – shared teams. |

| Challenges |
| Asking today’s residents to sacrifice trees that give shade for future generations |
| What impact on street scapes, especially avenues and consistency? |

| Suggestions and comments |
| Further consideration of permeable surfaces |
| Community caretaking role considered |
| Urban composting |
| Laneways and recycled water |
| With higher density of development, more green is needed |
| Greater development of suitable activities in Royal Park and other under-used parks |
| Street trees and cars – issues with damage and hassle to cars from bird droppings etc |
| Canopy cover to be included in Carlton at the cost of car park spaces |
| Heat canopy |
| Improve data capture GIS info capture (Info Tech resources) |
| Make data collected (like ULE) available |
| UFS – idiotic – we create the problem (global warming focus) and patch it up with trees. Need greater strategic approach to address the cause. |
| Encouraging people to walk, finding walking spots |
| Density increasing : less space for trees |
| Conflicting ideas: population growth (issue for trees) VS bringing more people into the city to see trees |

6.7. Detailed discussion on key topics

The key points discussed and recommendations proposed by each of the groups follow. Topics are arranged in order of the amount of comment recorded for each.

6.7.1. Biodiversity

**Key discussion points**

- Biodiversity involves balance between all species, big fauna, insects and birds etc
- Vertical walls and roofs have a role to play in encouraging biodiversity – insects and birds
- Forest strategy to take more ecological approach where possible
- Urban Forest Strategy, but it doesn’t consider the forest very much. Its mainly an urban tree strategy. More scope for forests – biodiversity.
- Growth areas (provide) opportunity to incorporate biodiversity / forest. Set aside land, requirements for developments to incorporate habitat, bees, insects, green walls etc
- Measures for ensuring biodiversity. (eg how far does a bee need to fly to find a flower or flowering tree?)
- How do trees support biodiversity? Animal life?
- Need wildlife corridors to connect vegetation – divided by roads
- Concerned about native biodiversity – concerned that exotic trees won’t support native fauna species.
- Species that attract fauna – location. (Food attracts animals)
• Road safety – some trees are dangerous (limbs). Public safety (Caryimia)
• Creating / enhancing habitat and biodiversity.
• Urban forest can provide habitat for more than just bats and possums. Need understorey to encourage birds, insects.
• Maintenance is important – impacts on biodiversity.
• Mowing, dogs off leashes
• When trees removed, should be replaced with bird attracting species.
• Dogs and foxes
• Risk that a species of tree could be favoured in tree selection because of its ability to thrive in urban environment. This could lead to a decrease in biodiversity.
• An opportunity to create habitats in dry areas under trees – rocks, grass clumps – to encourage lizards, birds. Plant appropriate species eg kangaroo paw. To create habitat for smaller species – insects, lizards, birds etc
• Capture/ knowledge of biodiversity values
• Value of a ‘full strata of vegetation’ (Healthy ecosystems)
• Competing uses in the landscape
• Role of streets for biodiversity
• How can we connect people to nature?
• Price difference living …to a park
• Use installations and ….

Suggestions
• Biodiversity Conservation Act. Are there opportunities to protect endangered species in Melbourne? Use this as an opportunity to encourage urban forest. London – decline of a particular bird species led to promotion and encouragement of green roofs. Developers required to provide ‘grasslands’ on roof.
• Require developers to incorporate biodiversity in developments. Use EPBC to require developers to do this.
• Plant bird attracting species
• Look at creating wildlife corridors
• Location of species needs to be considered carefully so that animal species (eg bats and possums) don’t have negative impact on people. (eg trees in fruit – food availability needs to be considered)
• Appropriate trees (function) for location
• How do you manage interaction between wildlife and impact on health of trees? (eg possums impacting on trees)
• How does council know the biodiversity values of existing trees?
• Control of natural pests
• Integration of planning scheme with UFS – knowing the context
• How can the UFS address carbon sequestration?
• Preserve and increase existing biodiversity
• Mobile forest (cluster of trees community can use for attractive Moomba float … - use insect attracting trees, half in flower and show people

• Use charismatic insects – interpretation; biodiversity = more insects; street trees/public trees underpin city biodiversity – need to think about implications of planting

• Water – key to biodiversity – increase in flying foxes through planting of more flowering trees

**Actions resulting from suggestions**

• *A biodiversity and urban ecology strategy is currently under development. That strategy will consider the biodiversity issues more appropriately.*
6.7.2. Species Diversity

Key discussion points

- Understand that we need greater diversity but what are the species?
- What species are being proposed?
- Are species being trialled so we can learn – maintenance requirements
- Natives – need more maintenance budgets
- What’s the basis of the 5%?
  - We have a consistency that creates the character / aesthetic value
  - Important to keep avenues
  - Who’s to say variety is best?
- Indigenous tree species offer aesthetic value if grouped
- Need to consider under stories (bird habitat, clears up pests)
- Oaks and Elms do not drop leaves and branches as often as gums
  - They are our history – our life blood
  - Been poorly maintained and looked after
  - Beautiful varieties that we are not using and should be
  - Oaks have a strong structure
- Stagger tree removal and replacement
- Docklands – recently planted Norfolk Island Pines (Docklands Boulevard) – large canopy and trees were planted too close together. Planted too many trees, remove 2 out of every 3.
- We need to know about species, canopy cover and space between trees.
- Are there policy/design guidelines that ..(unfinished)
- How do we manage our future requirement and manage short term enjoyment?
- Further afield looking for tree species – beyond old continents Euro avenues
- Further diversity in the population
- Retaining key landscapes (eg key boulevards) not necessarily to save the species but unified theme
- Ability to use trees in different ways
- Combining species
- As we increase growing capacity (WSUD, soil etc) we increase species diversity
- Native/exotic – out of date idea
- More locally specific planting in Kensington North along Moonee Ponds Creek.

Suggestions

- Streets in Port Phillip – trees are magnificent; trees on both sides
- Trees will have to be cut down but its necessary (ruthless but needed)
- Budgets – buy property and turn it into parkland
• Garden origin species
• Bette an ugly tree that survives than a heritage ‘beautiful’
• Things are moving
• Not just traditional route – hedges, other shade
• Structural diversity
• Respond to how trees respond, as some won’t do well

Actions resulting from suggestions

• Budgets/developer contributions to buy property and turn it into parkland are addressed specifically in the Open Space Strategy 2012.
• The species diversity section with in the strategy has been addressed.
• The strategy does not differentiate or express preference between native, indigenous or exotic trees. Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.
6.7.3. Water recycling (WSUD)

Key discussion points
- Increase median width (remove car parking road width)
- Tree in median clash less with buildings and footpaths
- What happens to budgets if councillors change and don’t support?
- Concerns that it took 10 years to come to this
- Lack of community interest in water
- Must water world significant Elms
- Culture and attitude towards tree
- Intensify the median planting / more understorey
- Replicate the success of the Russell St tree
- Large and new building water recovery systems
- What is Melbourne doing to recycle water?
- Modify gutters to allow water through to soil
- Review Princes Park recycling scheme
- Sewer mining power intensive and expensive?
- Increase growing zone of trees (medians)
- Replicate stormwater harvesting scheme in Fitzroy Gardens in other parks
- Revert back to non-cemented pitcher laying gutters and laneways
- Basement pumps – use water for vegetation
- WSUD in Kensington
- Stubb St for WSUD

Suggestions
- Residents encourage stay involved and combined advocacy
- Is there a role for council to advocate to state government against water restrictions/modified water restrictions to allow for tree watering?
- Educate community/business of value of trees/vegetation
- Identify what the trees need (eg key nutrients, soil conditions)
- Little sprinklers on the edge of buildings to cool street
- Capture stormwater locally (WSUD)
- Inexpensive technology
- Increase soil infiltration
- Replicate Bellair St implementation
- Increase opening around tree basins
- Improve permeability
• Permeable road

Actions resulting from suggestions

• A core focus within the Strategy is to improve the health of vegetation and to implement water sensitive urban design measures where possible and feasible and to utilise water sensitive urban design to encourage biodiversity in our soils through the improvement of groundwater levels.

• Tree Precinct Plans, which are yet to be developed, will inform opportunities for further water sensitive urban design opportunities for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.
6.7.4. Cultural Identity and Heritage

**Key discussion points**
- Other means of stopping disease than species diversity
- What makes and avenue and avenue? It’s not mixed
- Complementary to heritage Victoriana
- Water finite, trees have to be more independent of water, cf olive trees
- Species of trees that can survive in adverse conditions
- Found Urban Forest term a bit misleading, new, not something that jumps into people’s minds like parks. Could use a different term?
- Presented with problem, strategies are sound
- More information on tree species
- Applauded strategies
- We need an inventory of heritage trees
- Strive to maintain the status quo (in heritage places such as Carlton/Fitzroy Gardens)
- Natural heritage, pre-Captain Cook/Port Phillip landscapes – good for tourism
- Melbourne needs to have an identity. Some uniformity in trees, repetition. Significant because of avenue of trees, European avenues. Relationship between trees and buildings.
- How will we maintain Melbourne identity?
- Species complementary to identity
- How will achieve maintenance of identity in a complementary way with an edict of 5% of species
- Important to maintain ‘green’ in Melb, including colour in our trees

**Suggestions**
- Where is the water going to come from?
- Can you plant trees on top of roof tops?
- What impact can roof top gardens have?
- Both Aboriginal and European heritages should be preserved
- Accommodation with climate change
- Surface watering?
- Planting around Birrarung Marr looks good, too much has died at Carlton Gardens.
- Love the Australian landscapes
- Vision and courage to bring together native and European in a particularly Melbourne identity
- Gums may not be an applicable street tree, beautiful park tree – different species have different roles
Actions resulting from suggestions

- Section 3.2 of the strategy has been extensively revised and rewritten to acknowledge respect for the cultural identity and influences of Melbourne’s urban forest. A more complete history and evolution has been articulated.
- More on rooftop gardens/green roofs has been included in the strategy.
- The species diversity section within the strategy has been addressed.
- The strategy does not differentiate or express preference between native, indigenous or exotic trees. Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.
6.7.5. Cultural Identity

**Key discussion points**
- Spaces for interaction – street trees won’t provide that – surrounded by concrete
- Can we reclaim more space for parks and trees – West and Docklands? – equity is important – access to trees
- MSS and Structure Plans need to provide more green spaces
- Fisherman’s Bend opportunity – Planning creates our future heritage
- Diversity is true representation of heritage – presettlement to Victoria city
- Strategy represents the issue well
- Return entirely to indigenous with strategic iconic areas to maintain visual cultural heritage
- Indigenous don’t give shade as much – important element
- Need more food trees – maintenance issues should not be an excuse
- Productive street scapes – volunteers to maintain (Castlemaine example)

**Suggestions**
- Interpretive material can help public experience the parks, the heritage issues
- Heritage is an evolving issue – mix is evolving
- Have protected areas for heritage
- More green spaces for people to connect to nature, sit, congregate
- Attracting people to use spaces through interacting with public spaces – volunteers – Green Army to look after trees – urban landcare

**Actions resulting from suggestions**
- *Heritage Victoria has been consulted as part of this consultation process.*
- *Measures are already in place to protect areas of heritage significance. The species diversity section with in the strategy has been addressed.*
- *The Open Space Strategy deals specifically with more green spaces for people.*
- *The strategy does not differentiate or express preference between native, indigenous or exotic trees. Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.*
6.7.6. Contested Spaces

**Key discussion points**

- Business should be rewarded for improving Green Spaces
- How can individuals encourage building owners to construct Green roofs/vertical gardens?
- Helsinki – silver birch tree planting proves high density and UF is possible
- Private space is decreasing with increasing house sizes. There should be a debate about whether the public pay for the loss.
- When designing spaces (eg landscape arch), trees are low in priority – we need to raise their status! And how do we do this?
- How do we get developers to include UF in their projects?
- How do we get authorities to require it?
- What strategies (eg Metro Consultation) can we as a community influence?
- Docklands example – commercial priorities dominate and commentary from the public demonstrate this.
- We need trees but also discrete spaces for UF (chunks of trees, plazas, non-commercial public spaces)
- Plazas (paved spaces) that are in private spaces need to provide public amenity
- Street trees are critically important where there are reduced house gardens
- Targets need to be binding on both council and state government

**Suggestions**

- Local roads (80% of the public domain) need to be returned to the non-transport public use (a useable public space) – Nature Deficit Syndrome
- Consult young children and parents
- Getting people together in cooperation (prof disciplines) will help
- Legislation and regulation is needed to require developments to meet agreed targets (eg green star)
- Start aspirational and these should eventually become minimum standards
- Maintenance and management (whole of life) is critical
- City of Melbourne needs to advocate to state government
- The inner metro councils (IMAP) should advocate for state to adopt UF targets

**Actions resulting from suggestions**

- Further collaboration with the community and other agencies has been addressed within sections 5 and 6 of the strategy.
6.7.7. Money and resources

**Key discussion points**

- Issues with co-ordination with state government budgets – to fund large-scale projects such as sewer mining (as suggested 2005) for drought proofing
- $10,000/tree valuation. This is a very low number. Does this account for the carbon sink effect?
- Volume of tree replacement in a short period of time and whether Council/community has the resources. Is there money?
- Even if there is money, is there the capacity to deliver? Are there enough experts? People on the ground?
- Within council how does doubling the number of tree planted (for example) get signed off by Council?
- Concern of wastage of resources with planning too close together.
- Problems with planting according to financial management, particularly at the end of the financial year when needing to expend – getting trees that are available, not best. (eg Royal Park – inappropriate species)
- Tender for purchase of trees should be open, and open for public inspection.
- A lot of resources involved – massive project.

**Suggestions**

- Dovetail UFS into broader Council management. Coordination across functional barriers – with roads, infrastructure etc
- Guard against any conflicts of interest – probity
- Need to consider private land more especially in CBD. 60% of the area in East Melbourne.

**Actions resulting from suggestions**

- Section 6.4 within the strategy addresses funding resources specifically.
6.7.8. Staging and sequencing

Key discussion points
- More detail in regards to replanting, concerned about how and when it will happen
- Didn’t answer the questions
- Needs some principles in the strategy to guide
- Only replace when it is critical
- Fear factor – is it going to be ‘blocked clearing’? Stages need to be communicated.
- Precinct replacement
- Concerned about the facts
- Hard to commit to consultation
- Unnecessarily early removal
- How will the planting be affected? Big and little trees – tree survival.

Suggestions
- More transparency and specifics on what will happen
- Provide examples of how it’s going to happen
- Assurance that the trees won’t be removed in one go
- Informing and consulting the community
- Pictures and mock-ups of scenarios will help people visualise
- Acknowledge controversial topics
- Staged replacements

Actions resulting from suggestions
- Several illustrations of future scenarios for Melbourne are contained within the strategy.
- Sections 5 and 6 address consultation and collaboration with the community.
- Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.
6.7.9. Research

Key discussion points

- Research gaps – quantifying ecosystem services (info from Nth America) ie air quality (compounds worse than traffic)
- Looking at interaction between people and trees
- Comparative heat studies related back to thermal studies
- Different people relate to different trees (like/hate; ornamental/growth)
- Increase in canopy cover to 40% - differing degrees of shade create different qualities/capabilities
- Shade – evergreen vs deciduous; evergreen transpire more; deciduous – important when in leaf
- Cultural shift in attitudes towards trees – conifers in streets; seasonality – Melbourne specific ie early summer shade, late maples and elms – species selection – testing in the city
- Toulouse as an analogue – similar geomorphology (Eur Mediterranean climates much wetter and drier summers)
- Money (public) vs experimental planting

Suggestions

- Social research – human dimensions; anthropology? Sociology? Etc
- What other climates are similar? What are the natural comparators? Difficult to find somewhere with similar transpiration processes for trees
- Biodiversity research usually in remnant vegetation – should relate to streetscapes and cultivated vegetation
- Just need to try some species with diversity. If it fails, it doesn’t matter.

Actions resulting from suggestions

- Section 6 has been revised to address research gaps.
- Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.
6.7.10. Undergrowth

**Key discussion points**

- The urban forest is not just about the trees
- The urban forest includes the middle (shrub) and ground covers too
- To increase biodiversity and habitat: Ecology
- Heritage streetscapes are important to retain
- Recreate ecosystems to encourage insects and birds
- Greening streets will make people want to walk/cycle in them
- Green factor style required eg green walls
- Developments do not provide for any greening. They should be made to in the planning scheme.
- More permeable surfaces in the streets
- Could they be more costly to maintain undergrowth.
- The amount of open space provided by developments should relate to the size of the development
- The planning scheme should charge to reflect the UFS
- Very important to biodiversity.

**Suggestions**

- Put in road closures, parks, gardens and reserves and waterway corridors
- Get a diversity of plants within the municipality
- Growing trees and other plants in clumps, sections
- Provide guidelines to people about what to grow in their gardens
- Adopt their own naturestrip to plant out.
- Window boxes in streets to improve the look of the street
- Should be requirement under the planning scheme to require treed/grasses streets (Green Street)
- Review the large areas of road and land and reduce.

**Actions resulting from suggestions**

- *The strategy has a target of achieving diversity within the municipality*
- *A Sustainable Gardening in the City booklet has been produced and was launched in June 2012 to provide guidelines to people about what to grow in their gardens and is available on the website.*
- *This strategy does not make recommendations for the planning scheme.*
- *Tree Precinct Plans, which are yet to be developed, will inform species selections for each precinct. The community will have an opportunity to collaborate on the development of these plans. Section 6 of the strategy has been revised to include this detail.*
6.7.11. Community Participation

**Key discussion points**
- CoM can do this but we need to inform – private (balconies) as well as public (open spaces)
- Need to inform community/get the message out – participation increases understanding
- Melbourne News is good, but we need information in the language of students
- Different ways of getting people involved and linking things eg landcare for singles (a way to meet)

**Suggestions**
- Family Fun Days – linking to the UF activities – getting Chinese people to talk about their approach to…
- Build into everything we do – festivals
- Spring planting days – improve reach and expression of activities (make sure we are reaching multi-cultural groups/renters/students)
- Interactive – education and awareness
- Putting all activities into the context of the UF strategy
- Ambassadors: like the previous possum lady in schools
- The strategy is about public space
  - It’s also about private spaces
  - Issue: renters – how do we build sense of working as a community (sustaining street)?
- Clash of building codes/planning schemes/environmental goals
- Community participation
  - In finalising strategy
  - And into the roll out/implementation of the plan. Essential if it is going to work.
  - CoM to work out effective way/s to enlist us in the rollout (as ambassadors, in projects, as water carriers …)
  - We need daytime meetings
  - Enlisting local businesses: to get their staff to help with projects/plantings
- Got to get out to the people

**Actions resulting from suggestions**
- Sections 5 and 6 address consultation and collaboration with the community.
- Community planting days are held twice a year.
6.7.12. Urban Heat Island

Key discussion points
- If Melbourne’s population growth increases, especially in inner city and outer suburbs, how do we manage URI?
- Do we need yet more expansion of Melbourne Metro Area or a separate city?
- CoM need to work more with its neighbouring LGAs to get a more coordinated approach.
- What are the best intervention methods for reducing URI in the central city?
- What international examples are there that CoM wants to benchmark against? (eg Chicago)
- Reference: Graham (?) Hopkins (Adelaide) “Living Architecture” – about green roofs and walls

Suggestions
- Key interest in the benefit of all green ‘types’ to URI (not only trees) – CSIRO have collected 30 years data from CBD (shows 1.5-2.0°C increase in temp)
- Agrees with point about population growth in Melbourne Metro – should we increase growth boundaries?
- Greater opportunity for LGAs to play a much more investigative role (and not just pursue inappropriate policy)
- If density increases then we need to increase GI
- CSIRO really wants to share more research
- What other things have been taken into regard with respect to human and other species’ health?
- What’s being done to reduce vehicle movements and other impacts that compromise street vegetation health?
- Victorian Government needs to support LGAs.
- Concrete surfaces (including slab construction development) are very bad for radiation. Very important to see how the City works with developers.
- Reflective heat (eg from Rialto) is enormous – adjacent buildings when Rialto constructed heated up by several degrees (leading to more air conditioning being required). Radiation heat as important as heat absorption.
- Lots of knowledge in this room – how can we keep in touch? Assist one another?
- Can we distribute participants’ details?
- Case Study – Readers Digest Building (Surry Hills NSW) roof garden (40 years ago)

Actions resulting from suggestions
- Mitigating the urban heat island effect is a core focus of the Strategy. Section 6 has been revised to articulate gaps for further research and the importance of collaborating further to build the urban forest for the future.
6.7.13. Canopy Cover

Key discussion points
- Trees changing colour in the parks is beautiful
- Need to plan for future
- This is an opportunity for future - need education to understand
- How do you manage canopy cover properly – need proper free maintenance
- Conclusive that need more – increase
- Need deciduous – winter necessary – important in Melba for cold winters and hot summers
- Buildings getting higher, creating more shade

Suggestions
- Kensington banks area – new park – needs attention
- Diversity important to protect from disease
- Need people and budget
- How about vertical planting? What is happening?
- Like to see research – density and shade of old deciduous tree vs evergreen like red river gum
- Maintain the ‘spirit’ of Melbourne’s landscape
- Trees in Holland Park – mainly eucalypts have bare dirt under them. Need to choose trees that let things grow under them. Turn off in summer particularly in recreation areas.

Actions resulting from suggestions
- The Strategy has been revised to include more on green roof and walls.

6.7.14. General Discussion

Key discussion points
- Strong move towards greening the city
- Heritage – make sure character of Melbourne is not compromised. Victorian architecture city.
- Very sad to see trees in decline (map) but well done CoM for taking action.

Suggestions
- See planting happen as soon as possible. Don’t be gung ho about new planting.
- Can’t change the building so why change the planting?

Actions resulting from suggestions
• Heritage will to be compromised, a principle within the strategy is to maintain Melbourne’s cultural identity and heritage.

7. Urban Forest Art & Design Competition

The urban forest Art and design competition was organised to raise awareness in the community about the importance of our urban forest and to set the scene for the urban forest strategy consultation period.

The competition was launched on 29 August 2011 with a closing deadline of 14 October 2011. Winners were announced on 18 November 2011 and the winning designs were displayed in various public locations around the city.

CATEGORIES

• Open (over 18 years old)
• Secondary school students (13 years to 18 years old)
• Primary school students (5 years to 12 years old)
• Kindergarten -Under 5’s

The 4 winning entries receive the following prizes:

• Winner Open: $5,000
• Winner Secondary: $1,000 for their school for sustainability purposes.
• Winner Primary: $1,000 for their school for sustainability purposes.
• Winner Kinder Under 5’s: $1,000 for their kindergarten/child care centre / for sustainability purposes.
Urban Forest Art & Design Competition 2011