

# Street Trees

## Guidance Report

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## **1. Introduction**

Local Governments are responsible for managing street trees. As land managers, service providers and government regulators, Local Government can play an important role in seeking to balance infrastructure and community needs with environmental conservation and sustainability.

The benefits of street trees are numerous and include environmental, amenity, health and social benefits. However, there can be constraints to planting street trees that occur in the planning phase, in the potential road safety impacts due to poor location or effect on sight lines, in the costs associated with planting and maintenance and in the potential of property and asset damage from falling branches or roots.

## **2. Purpose**

This document articulates the barriers that prevent Local Governments from investing into street trees, and the potential solutions to these barriers. This document has been designed as a practical guide to help Local Government's work through the issues surrounding street trees.

## **3. Background**

WALGA held a Local Government Street Trees workshop in 2014 to explore the issues that the sector faces when managing street trees. Four experts presented on some of the major aspects of dealing with street trees WALGA had identified street trees as a major issue for Local Governments and held this workshop to help Local Governments that were doing work in this area. The presentations given were about the urban heat island effect; planning and street trees; street trees from a Local Government perspective; and the role of street trees in water sensitive urban design.

Attendees at the workshop were asked to provide feedback about the issues Local Government faces in regards to street trees (RSVP list for the workshop is attached as Appendix 5). The following document:

- Outlines the issues that were identified by Local Government at the WALGA street tree workshop.
- Discusses these issues; and
- Provides possible solutions and examples.

Where possible, links have been provided to assist Local Governments.

## 4 Getting your community on board

Community plays an important role in establishing, protecting and maintaining street trees. However, some Local Governments struggle with community opposition or community apathy to street trees. This can occur for many reasons, including:

- changing demographic- overseas migrants, aging population (who may struggle with maintaining falling leaves, nuts and fruit) and working families seeking low maintenance gardens;
- Large numbers of rental properties – tenants less interested in maintaining gardens and verges;
- mess and tripping hazard created by falling leaves, nuts and fruit;
- damage to infrastructure caused by roots and branches;
- the perceived risk of falling branches;
- shaded pools and solar panels;
- blocked views;
- the perceived high cost of planting and maintenance; and
- The perceived risk of trees contributing to allergies.

### 1.1 4.1 Community Education of Street Tree Benefits

The first step that many Local Governments take to improve community engagement is to educate them on the benefits of street trees. This encourages positive views on street trees and minimises opposition. Most Local Governments include some form of community education/engagement in their street tree policies and plans. There are several different methods of delivering community education on street trees; the most common appears to be brochures or promotional information available on Local Government websites. Some examples of this promotional material can be seen below:

- City of Vincent: <https://www.vincent.wa.gov.au/residents/environment-health/adopt-a-tree-program/verges-trees-streetscapes.aspx>
- City of South Perth: <http://www.southperth.wa.gov.au/Services/Street-Trees>
- Town of Cambridge: <https://www.cambridge.wa.gov.au/Resident/Home-Neighbourhood/Your-property/Trees-Verges/Street-Trees>

It is also important to educate the public on the correct way to care for street trees. Examples of brochures and websites that contain information on caring for street trees include the following:

- City of Stirling- Caring for your street tree:  
<https://www.stirling.wa.gov.au/Services/Roads-streets-and-verges/Adopt%20a%20Street%20Tree/How%20can%20I%20help%20care%20for%20my%20street%20tree.pdf>

- City of Mandurah- Street tree care and maintenance:  
<https://www.mandurah.wa.gov.au/Services/Public-Works/Trees-and-Verge>

Holding events and running programs to increase the profile of street trees can also be an important part of a street tree community education strategy. Examples of events and programs run by WA Local Governments include:

- City of Stirling Street Tree Planting Program:  
<https://www.stirling.wa.gov.au/Services/Roads-streets-and-verges/community-tree-planting-program>
- City of Vincent Adopt a Verge Program:  
<https://www.vincent.wa.gov.au/residents/environment-health/environment-sustainability/programmes-events/adopt-a-verge.aspx>
- Shire of Serpentine Jarrahdale Free Verge Plants Program:  
<http://www.sjshire.wa.gov.au/verge-plants-now-available/>

A template for communicating the benefits of street trees to the community is available in Appendix 1.

## 5 Use policies to set out your intentions

Most metropolitan Local Governments have some form of street tree policy. Street tree policies and management plans are important because they set out a Local Governments goals, aims, principles and values in relation to trees. Although policies are not law, where a policy exists, Local Governments are required to have regard to the policy in the decision making process. There is no consistent approach to street tree policies across the Local Government sector, but the following text outlines a suggested approach.

### 1.2 5.1 High level strategies

A number of Local Governments choose to have a high level strategy, such as an urban forest strategy, to outline their overall strategic objectives. These high level strategies should also link to the Council Strategic Plan and Vision. This high level document is then supplemented with an implementation plan to outline how the objectives will be achieved.

For example, the City of Belmont has identified that it will “*replace lost canopy to a coverage that exceeds that of the baseline year of 2001*” in their 2013 Urban Forest Strategy. The City is currently drafting their Canopy Plan to identify how they will achieve this goal.

Strategies can include the following:

- The use of Australian Standard for the protection of trees on development sites (AS 4970-2009)
- How trees should be incorporated into new developments
- Set paved area shading standards (i.e. 30-50% shade over paved areas within 15 years)
- Set minimum (uncompacted-friable) soil volume standards (i.e. 30m<sup>3</sup> of soil per tree)
- How the urban forest will be monitored and measured
- Community education and consultation strategy
- Adopting relevant water sensitive urban design techniques

Examples of high level strategies include:

- City of Belmont Urban Forest Strategy:  
<http://www.belmont.wa.gov.au/CouncillorPortal/CouncillorMinuteAndMeeting/Minutes%20and%20Agendas%20Documents/Attachment%2010%20-%20Item%2012.9%20refers%20Urban%20Forest%20Strategy.pdf>
- City of Wanneroo Street Tree Master Plan:  
[http://www.wanneroo.wa.gov.au/download/downloads/id/1036/street\\_tree\\_master\\_plan](http://www.wanneroo.wa.gov.au/download/downloads/id/1036/street_tree_master_plan).

- City of Armadale Urban Forest Strategy:  
[https://www.armadale.wa.gov.au/sites/default/files/assets/documents/publications/Urban\\_Forest\\_Strategy\\_-\\_June\\_2014\\_0.pdf](https://www.armadale.wa.gov.au/sites/default/files/assets/documents/publications/Urban_Forest_Strategy_-_June_2014_0.pdf)
  - City of Perth Urban Forest Strategy:  
<https://www.perth.wa.gov.au/planning-development/city-initiatives/urban-forest-plan>
- City of Melbourne Urban Forest Strategy:  
[http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Urban\\_Forest\\_Strategy.pdf](http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Urban_Forest_Strategy.pdf)
- City of Vancouver Urban Forest Management Plan:  
<http://vancouver.ca/files/cov/Urban-Forest-Strategy-Draft.pdf>

## 5.2 Operational policies and plans

Once a high level strategy has been set, Local Governments can outline how they will achieve and maintain their goals in operational /implementation plans. These operational street tree policies usually include issues such as planting of new trees, maintenance of existing trees and circumstances which may warrant tree removal. Local Government street tree policies contain information such as:

- Minimum size of new street trees to be planted (e.g. 100L);
- When street tree planting will be carried out (e.g. winter);
- Location that street trees should be planted;
- Why street tree pruning is undertaken and who is responsible;
- Circumstances that may warrant street tree removal;
- Investment required;
- Tree species selection criteria;
- Design principles (e.g. hierarchy of streets);
- Street tree planning; and Information about development applications where street trees are involved (maintenance and bonding mechanisms for street trees in new developments)
- Heritage considerations
- Neighbourhood character

Examples of street tree policies and guidelines include:

- City of Melville Street Tree Policy:  
<http://www.melvillecity.com.au/about-melville/council-information/policies/Street+Tree+Policy+-+CP-029>



- City of Subiaco Street Tree Policy:  
<http://www.subiaco.wa.gov.au/CityofSubiaco/media/City-of-Subiaco/Your-home/Trees-and-verges/Street-Tree-Policy-management-guidelines.pdf>
- South Perth Street Tree Management Plan:  
<https://southperth.wa.gov.au/residents/services/street-trees>
- Shire of Northam Street Tree Management Plan:  
[http://www.northam.wa.gov.au/Assets/Documents/Content/engineering/Street-Tree-Management-Plan\\_Adopted-2011-06-15.pdf](http://www.northam.wa.gov.au/Assets/Documents/Content/engineering/Street-Tree-Management-Plan_Adopted-2011-06-15.pdf)
- City of Greater Geraldton Street Tree Management Specifications:  
[https://www.cgg.wa.gov.au/Profiles/cgg/Assets/ClientData/Documents/Infrastructure/SV002\\_-\\_Street\\_Tree\\_Management\\_Specification.pdf](https://www.cgg.wa.gov.au/Profiles/cgg/Assets/ClientData/Documents/Infrastructure/SV002_-_Street_Tree_Management_Specification.pdf)
- Street tree policy and plan templates are available in Appendix 2.

### 5.3 Linking street tree policies into local planning

Where possible, Local Government could consider linking street tree strategies with their Local Planning Scheme and planning policy framework to ensure that street tree strategies are considered in making planning decisions. For example, a Local Government that has included its Urban Forest Strategy within a District Structure Plan could consider its canopy targets during discussions about public open space contributions in new subdivision applications. Where possible, collaborating with developers, the community and other stakeholders to draft policies and strategies would be beneficial.

More information about planning is available at:

- Department of Sport and Recreation's Guide to the WA Planning System  
[http://www.dsr.wa.gov.au/docs/default-source/file-about-us/file-plan-for-the-future/guide-wa-planning-system-\(web\).pdf](http://www.dsr.wa.gov.au/docs/default-source/file-about-us/file-plan-for-the-future/guide-wa-planning-system-(web).pdf)
- Department of Planning's Introduction to the Western Australian Planning System  
[http://www.planning.wa.gov.au/dop\\_pub\\_pdf/intro\\_to\\_planning\\_system.pdf](http://www.planning.wa.gov.au/dop_pub_pdf/intro_to_planning_system.pdf)

Some Local Governments use their Local Planning Scheme to protect trees on private property, as the trees contribute to the overall green network and/or may have historical value. For example, the City of Armadale and the Shire of Serpentine-Jarrahdale have provisions that include a number of mechanisms that protect and preserve trees.

- City of Armadale Town Planning Scheme – See clauses 5C.9 and 11.8  
<https://www.armadale.wa.gov.au/town-planning-scheme-no-4>
- Shire of Serpentine Jarrahdale Scheme Provision - Clause **7.13 Tree Preservation And Planting**  
[https://www.planning.wa.gov.au/LPS/DATA/Local%20Planning%20Schemes/Serpentine-Jarrahdale%20-%20Shire%20of%20\(Scheme%20\)/Scheme%20Text.pdf](https://www.planning.wa.gov.au/LPS/DATA/Local%20Planning%20Schemes/Serpentine-Jarrahdale%20-%20Shire%20of%20(Scheme%20)/Scheme%20Text.pdf)

Some Local Governments also have adopted tree preservation policies on private property. For example:

- The Town of Claremont passed their tree preservation policy in 2010 to provide guidelines on how to preserve trees within the Town. Town of Claremont Tree Preservation EN306  
[https://www.claremont.wa.gov.au/MediaLibrary/TownOfClaremont/Documents/Tree\\_Preservation\\_Policy.pdf](https://www.claremont.wa.gov.au/MediaLibrary/TownOfClaremont/Documents/Tree_Preservation_Policy.pdf)
- Town of Bassendean Local Planning Policy No 13 - Trees on Development Sites  
[http://www.bassendean.wa.gov.au/Profiles/bassendean/Assets/ClientData/Document-Centre/Local\\_Planning\\_Scheme\\_10\\_-\\_Policies/13.pdf](http://www.bassendean.wa.gov.au/Profiles/bassendean/Assets/ClientData/Document-Centre/Local_Planning_Scheme_10_-_Policies/13.pdf)
- Shire of Serpentine-Jarrahdale - Local Planning Policy No 28 - Street Trees  
<http://www.sjshire.wa.gov.au/assets/Uploads/LPP-28-Street-Trees.pdf>
- Town of Cottesloe Local Planning Policy – Street trees  
[http://www.cottesloe.wa.gov.au/d/Development/Planning\\_/Planning\\_Controls\\_Local\\_Planning\\_Scheme\\_Policies\\_Local\\_Laws\\_and\\_Design\\_Guidelines/Policies/XFM1S7UGQNI7TQ0HHV5AD1M887ZWK9/Y0SYNMF5O1H70KN.pdf/Street\\_Trees.pdf?](http://www.cottesloe.wa.gov.au/d/Development/Planning_/Planning_Controls_Local_Planning_Scheme_Policies_Local_Laws_and_Design_Guidelines/Policies/XFM1S7UGQNI7TQ0HHV5AD1M887ZWK9/Y0SYNMF5O1H70KN.pdf/Street_Trees.pdf?)
- Shire of Northam Local Planning Policy Manual - LPP 11 – Tree Preservation - Grevillea Street Subdivision Area  
[https://www.northam.wa.gov.au/Assets/Documents/Document-Centre/Northam-Shire-Policies/2013\\_LPP\\_111-3\\_-\\_Tree\\_Preservation\\_Policy\\_-\\_Grevillea\\_Street\\_Subdivision\\_Area\\_Combined.pdf](https://www.northam.wa.gov.au/Assets/Documents/Document-Centre/Northam-Shire-Policies/2013_LPP_111-3_-_Tree_Preservation_Policy_-_Grevillea_Street_Subdivision_Area_Combined.pdf)

The inclusion of these types of provisions with the Local Planning Scheme and/or the adoption of a Local Planning Policy clearly identifies Local Governments' intention when dealing with subdivision and development applications on private land, particularly around tree preservation and tree planting issues, which contributes towards any Urban Forest Strategy being developed or proposed.

### 5.3 Communicating street tree policies

Local Governments may also find it helpful to consider to how they will communicate their street tree policies to their local community. There are a number of tools available, and your communications team will be able to advise you on the most suitable options. The following links give examples of effective infographics and other communication tools being used by others to communicate street tree policies.

- City of Melbourne street tree infographic:  
[http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Urban\\_Forest\\_infographic.pdf](http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Urban_Forest_infographic.pdf)
- City of Melbourne urban forest strategy video  
[https://www.youtube.com/watch?v=BplUmxFCE8A&feature=player\\_embedded](https://www.youtube.com/watch?v=BplUmxFCE8A&feature=player_embedded)

More information about community engagement is also discussed in Section 4.1 'Getting your community on board'.

## 5.4 Using policies to deal with complaints

Policies can also be set for dealing with complaints and tree removal requests. They should include a list of circumstances that may warrant tree removal and a list of circumstances under which trees will not be considered for removal.

Examples of circumstances that may warrant tree removal<sup>1, 2, 3</sup>:

- The tree is dead or diseased and is unlikely to recover
- The tree presents a safety hazard and has been assessed as structurally weak and dangerous by the Local Government or a suitably qualified arborist
- The tree has been irreparably damaged by a storm
- The tree interferes with suitable sight lines at intersections
- Where the tree has been assessed as impeding on a council approved development after all retention attempts have been exhausted
- The tree is causing significant deterioration of the pavement after all attempts have been made to contain and direct root growth

The following are examples of common complaints about street trees that prompt residents to request removal. These circumstances should NOT of themselves warrant tree removal<sup>2,3,4</sup>:

- The tree causes nuisance due to leaf, flower, fruit or nut shedding
- To tree obscures or potentially obscures views
- The tree causes allergy or health problems
- The tree is in the way of a non-essential crossover or verge paving options
- The tree shades private gardens, solar panels, pools. etc.

Examples of street tree policies which include information on how to deal with complaints from the public are:

- Town of Cambridge Management of Street Trees:  
<https://www.cambridge.wa.gov.au/Resident/Home-Neighbourhood/Your-property/Trees-Verges/Street-Trees>

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<sup>1</sup> Town of Cambridge (2014). *Town of Cambridge Policy Manual- Management of Street Trees*. Retrieved 22 September 2014 from <http://www.cambridge.wa.gov.au/Home>

<sup>2</sup> City of Stirling (2014). Street Trees. Retrieved 22 September 2014 from <https://www.stirling.wa.gov.au/Services/Roads-streets-and-verges/street-trees>.

<sup>3</sup> Shire of Murray (2014). TPG3 Street Tree Removal. Retrieved 22 September 2014 from <http://www.murray.wa.gov.au/facilities/parks-ovals-reserves/trees-conservation/>

- Shire of Murray- Street Tree Removal: <http://www.murray.wa.gov.au/facilities/parks-ovals-reserves/trees-conservation/>

Street trees are seen as high value assets by most Local Governments so tree removal is considered as a last resort. However, it is important to note that in some cases tree retention may not be desirable or feasible for reasons such as a tree's location or species.

## 6 Protecting Trees

Tree protection is important due to the risks faced by street trees. Street trees can be accidentally damaged during construction works, as well as intentionally vandalised by members of the community.

### 6.3 Intentional damage

If there is community opposition to street trees, there is a potential for them to be damaged or removed by members of the public.

Some Local Governments refer to unauthorised pruning or removal of street trees on their websites or in street tree policies. Most state that unauthorised tree removal or pruning will result in prosecution under local public property laws. Penalties for unauthorised removal or damage to public trees can range from a warning to the recovery of costs for planting a replacement tree or a fine depending on the Local Government.

There are no examples of specific street tree local laws in Western Australia; however street trees are generally covered under a broader local law. For example, street trees in the City of Joondalup are covered under the Local Government and Public Property Local Law and in the City of Stirling, street trees are covered under the Thoroughfares and Public Places Local Law. An example of a Street Tree Local Law from the eastern states is the City of Frankston Tree Protection Local Law, which can be accessed here:

[http://www.frankston.vic.gov.au/Environment\\_and\\_Waste/Environment/Trees/Local\\_Laws\\_for\\_Trees](http://www.frankston.vic.gov.au/Environment_and_Waste/Environment/Trees/Local_Laws_for_Trees)

### 6.4 Accidental damage

Street trees can be killed or damaged by a wide variety of construction activities if careful planning doesn't take place before construction begins. There are many things that landowners, council maintenance staff, and developers can do to minimise the impact of construction on trees, so it is important to promote best practice. One of the more common tools used is the concept of Tree Protection Zones.

#### 6.4.1 Tree Protection Zones

A Tree Protection Zone (TPZ) is a method of protecting trees on development sites and should protect both roots and crown spread simultaneously. The TPZ is a restricted area usually delineated by protective fencing<sup>4</sup>.

There is an Australian Standard (AS 4970-2009) on the protection of trees on a development site which states that tree protection zones should be the first line of defence against tree damage during construction activities<sup>1</sup>.

Prior to development, at the feasibility and planning phase, a detailed site survey should be carried out in which the existing trees should be accurately plotted on the survey plan (as per

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<sup>4</sup> Standards Australia (2009). AS 4970-2009 Australian Standard: Protection of trees on development sites. Retrieved 4 September 2014 from [https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKewiC3ZTy6Y\\_WAhVCFZQKHdIcBpsQFggmMAA&url=https%3A%2F%2Fwww.banyule.vic.gov.au%2Ffiles%2F86e1c5f1-f61f-4e8d-a9c2-a20e00ef5e3e%2FAS-4970-2009-Protection-of-trees-on-development-sites.pdf&usq=AFQjCNHrVKI53cJz7aRRf1nLnkmdCIPE6g](https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKewiC3ZTy6Y_WAhVCFZQKHdIcBpsQFggmMAA&url=https%3A%2F%2Fwww.banyule.vic.gov.au%2Ffiles%2F86e1c5f1-f61f-4e8d-a9c2-a20e00ef5e3e%2FAS-4970-2009-Protection-of-trees-on-development-sites.pdf&usq=AFQjCNHrVKI53cJz7aRRf1nLnkmdCIPE6g)

AS 4970-2009). The quality and environmental value of the existing tree stock should be evaluated at this stage so that informed decisions can be made about which trees to retain and remove.

TPZs should then be established around trees that are to be retained and protected. Fencing should be installed prior to site establishment and retained intact until completion of the works<sup>1</sup>. Signs identifying the TPZ should be placed around the edge of the protection zone and be visible from within the development site<sup>1</sup>.

The intention of a TPZ is to<sup>5</sup>:

- Provide a safe tree resource
- Provide adequate root space to sustain tree health, aesthetics and sustainability
- Minimise changes to the tree's growing environment; and
- Minimise physical damage and loss to the tree's root system, crown and trunk

To calculate the TPZ, the diameter of the tree is measured in centimetres (cm) at 1.5 metres (DBH)<sup>6</sup> above ground. Where a tree branches below 1.5 m, measure the smallest trunk diameter below the lowest branch. To establish the radial TPZ distance, multiply the diameter by 10. This distance should then be measured from the edge of the trunk of the tree to provide the circular protection area in all directions<sup>7</sup>. See figure 1.

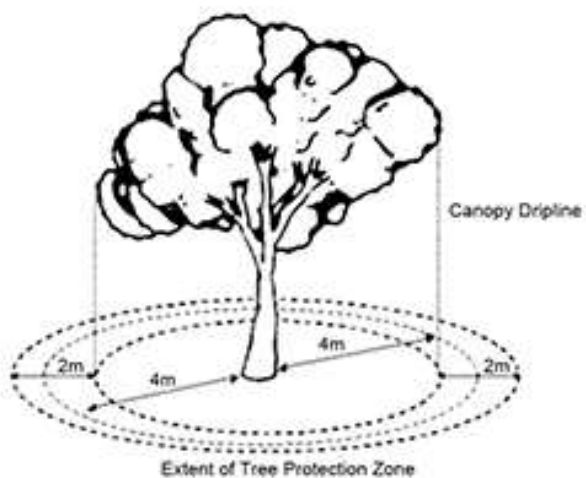


Figure 1: Tree Protection Zone Diagram<sup>8</sup>

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<sup>5</sup> City of Boroondara (no date). *Tree Protection*. Retrieved 2 September 2014 from <https://www.boroondara.vic.gov.au/waste-environment/trees-and-naturestrips/remove-prune-or-carry-out-works-near-tree>.

<sup>6</sup> 1.5 m above ground is the standard height for measuring tree diameter. In forestry, this is known as 'diameter at breast height' or DBH.

<sup>7</sup> Queensland Arboricultural Association. *What is a Tree Protection Zone?* Retrieved 2 September 2014 from <https://qaa.net.au/resources/calculations/>.

<sup>8</sup> ACT Government (2013). *ACT Tree Register*. Retrieved 22 September 2014 from [http://www.tccs.act.gov.au/city-living/trees/act\\_tree\\_register](http://www.tccs.act.gov.au/city-living/trees/act_tree_register).

The TPZ distances calculated using this method is intended to be a guide for the planning process and not an absolute rule. There will obviously be times when it is not possible to retain the optimum TPZ around each tree to be preserved<sup>2</sup>.

Development that requires less than 150mm of excavation and will have impact on a protected tree such as pathways or paving may be allowed within 3 meters of a protected tree<sup>12</sup>.

It was difficult to find information about the use of TPZs by WA councils; however, it was found that some LGs (e.g. City of Stirling and the Town of Bassendean) use TPZs to protect trees when residents and developers apply for building permits. The City of South Perth Street Verge Landscape Guidelines state that the TPZ for street trees will be assessed by the city as part of the verge landscaping application process<sup>9</sup>.

### 1.3

Most Local Governments use the Australian Standard for the protection of trees on development sites (AS 4970-2009). This Standard contains all the information needed to protect trees during construction activities, and is available from Standards Australia, <http://www.standards.org.au/Pages/default.aspx>.

### 1.4

- A TPZ calculator is available online from TreeTec, which aligns with the Australian Standard **AS 4970-2009**)

[http://www.treetec.net.au/TPZ\\_SRZ\\_DBH\\_calculator.php](http://www.treetec.net.au/TPZ_SRZ_DBH_calculator.php)

- City of Melbourne Tree Protection Fact Sheet

[http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Tree\\_protection\\_fact\\_sheet.doc](http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Tree_protection_fact_sheet.doc)

## 6.4.2 Valuation of Street Trees and Compensation for Tree Removal

Some Local Governments calculate the monetary value of a particular street tree to protect them from damage. For example, the City of Melbourne calculates the value of street trees that need to be removed due to development<sup>10</sup>. The City breaks the costs of removal of a

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<sup>9</sup> City of South Perth (no date). *Street Verge Landscape Guidelines*. Retrieved 4 September 2014 from <http://www.southperth.wa.gov.au/Documents/Services/Verges/Street-Verge-Landscape-Guidelines.pdf>.

<sup>10</sup> City of Melbourne (no date). *Tree Valuations in the City of Melbourne*. Retrieved 15 September 2014 from [www.melbourne.vic.gov.au/.../tree\\_valuation\\_fact\\_sheet\\_2013.doc](http://www.melbourne.vic.gov.au/.../tree_valuation_fact_sheet_2013.doc).

public tree into four categories: removal costs, amenity value, ecological services value, and reinstatement costs<sup>5</sup>. Details of these costs are outlined as follows<sup>6</sup>:

- Removal costs- Accounting to the fees incurred by Local Government for physically removing the tree
- Amenity value- Calculated using a formula which takes into account the following characteristics of a tree:
  - Basic value: determined by matching the trunk diameter at breast height with a standard base value
  - Species factor: Takes into account a tree's natural life span and its rate of growth in a particular environment.
  - Aesthetics: The aesthetic value is determined by the impact on the landscape if the tree were removed.
  - Locality: The locality factor is determined by the tree's geographical situation.
  - Tree Condition: The tree condition value is determined by the corresponding total score of the assessment criteria.
- Ecological Services Value: The ecological benefit a tree provides is calculated with the i-Tree Valuation tool.
- Reinstatement Costs: The level of reinstatement required takes into consideration the location, the significance, the biodiversity provision and the amenity of the tree.
- City of Melbourne tree valuation worksheet  
[http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Tree\\_valuation\\_fact\\_sheet\\_2013.doc](http://www.melbourne.vic.gov.au/Sustainability/UrbanForest/Documents/Tree_valuation_fact_sheet_2013.doc)

In the City of Melbourne, the City's arborist assesses whether public trees can be removed for development. When approved, the associated cost of the tree (as calculated using the above valuation method) is paid to the Local Government or representative prior to removal.

The City of Fremantle uses the Draft Australian Standard DR 99307 Amenity trees-guide to valuation as a guide for determining the amount of compensation paid by a developer or resident for damaging a tree. The money received is then used to replace the tree elsewhere in the streetscape.

#### 6.4.2.1 i-Tree tool

i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and community forestry analysis and benefits assessment tools. It is used to quantify the value of trees across the world, including urban Australia (see the report [http://2020vision.com.au/media/7145/where\\_are\\_all\\_the\\_trees.pdf](http://2020vision.com.au/media/7145/where_are_all_the_trees.pdf)). The i-Tree suite includes the following urban forest analysis tools and utility programs:



- [i-Tree Eco](#) - gives a broad picture of the entire urban forest.
- [i-Tree Streets](#) – shows the benefits provided by a municipality's street trees.
- [i-Tree Hydro](#) (beta) - simulates the effects of changes in tree and impervious cover characteristics within a watershed on stream flow and water quality.
- [i-Tree Vue](#) - uses satellite-based imagery to assess a community's land cover
- [i-Tree Design](#) - uses Google Maps to see how tree selection, tree size, and placement around your home affects energy use and other benefits.
- [i-Tree Canopy](#) produces a statistically valid estimate of land cover types and estimates values for air pollution reduction and capturing atmospheric carbon.

More information about i-Tree is available at <http://www.itreetools.org/applications.php>

## 6.5 Other ways to protect trees

Some street trees have special significance due to certain characteristics. Individual trees as well as groups of trees may be highly valued by the community and warrant special protection. Reasons for including trees on significant tree registers include; visual/aesthetic, botanic/scientific, ecological and historical/cultural and social<sup>11</sup>.

Some Local Governments have their own Significant Tree Registers:

- Shire of Broome-  
<http://www.broome.wa.gov.au/files/assets/public/council/policy/449.pdf>

City of Mandurah- <https://www.mandurah.wa.gov.au/environment/Trees-and-Bushland/significant-tree-register> A template for a significant street tree register is available in appendix 3

## 7 Maintenance

When planting street trees, it is important to consider the costs associated with their ongoing maintenance. Trees require the most maintenance while they are becoming established during the first two years after planting. During this time trees need additional watering during the summer months while the roots are maturing. Certain tree species planted in certain locations will also require pruning periodically so this also needs to be considered.

Local Governments can be responsible for funding street tree planting, and the watering and pruning of street trees in existing developments. In Western Australia, developers are often required to plant street trees and maintain them for two years in new developments. Where trees cannot be planted during the development stage, a landscaping bond for the trees is taken and once building is completed Local Governments plant street trees.

Good succession planning is also a vital part of a maintenance regime. Trees are living organisms that have definite lifespans<sup>12</sup>. Trees all eventually reach a senescent phase

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<sup>11</sup> City of Mandurah (2010). Significant Tree Register. Retrieved 15 September 2014 from <https://www.mandurah.wa.gov.au/environment/Trees-and-Bushland/significant-tree-register>.

<sup>12</sup> Centennial Parklands (2002). Tree Master Plan. Retrieved 4 September 2014 from [http://www.centennialparklands.com.au/about/planning/tree\\_master\\_plan](http://www.centennialparklands.com.au/about/planning/tree_master_plan).

where they are likely to have more health and disease problems<sup>5</sup>. These may become safety concerns and require increasing management<sup>5</sup>. Although good management can prolong the life of old trees it is also important to plan for the future by steadily replacing trees<sup>5</sup>.

The City of Armadale includes provisions for succession planning in their Urban Forest Strategy. This is available within the City of Armadale Urban Forest Strategy - [https://www.armadale.wa.gov.au/sites/default/files/assets/documents/publications/Urban\\_Forest\\_Strategy\\_-\\_June\\_2014\\_0.pdf](https://www.armadale.wa.gov.au/sites/default/files/assets/documents/publications/Urban_Forest_Strategy_-_June_2014_0.pdf)

## 8 Species Selection

Street trees provide wildlife habitat and food sources, and therefore play a role in preserving biodiversity. Street trees enhance existing wildlife corridors and planting of indigenous and native species in streets near bushland areas can complement native revegetation in open space reserves.

However, Local Governments can find it difficult deciding which species to plant within their verges and public spaces, as there are many factors to consider. It is important to select trees that are hardy enough to survive the specific climatic conditions of an area to ensure they will require little maintenance. Other plant characteristics to consider when selecting tree species include projected height, size and growth habit of roots, types of leaves and flowers produced and life span. The impact of deciduous trees near aquatic environments needs careful consideration, as deoxygenating leaf litter can be washed into waterways.

Examples of Local Government Street Tree Species lists:

- City of Joondalup:  
<http://www.joondalup.wa.gov.au/live/streetscapes/streettreeguidelines.aspx>
- City of Nedlands: <http://www.nedlands.wa.gov.au/street-trees>
- Town of Claremont:  
<https://www.claremont.wa.gov.au/MediaLibrary/TownOfClaremont/Documents/Street-Tree-Masterplan-July-17.pdf>

Ultimately it is up to the individual Local Government on which species it chooses to plant.

There is no single source of information available to help Local Governments decide on species selection. The following documents were used by the Town of Bassendean, when they were deciding what palette of species to be used. These resources may be helpful to other Local Governments:

- Holliday, I. (2002). *A field guide to Australian Trees*. 3rd ed. Australia: Reed new Holland. 328
- French, M. (1997). *The special eucalypts of Perth and the South West*. Perth: F&N Publications
- Holliday, I. & Watson, G. (1980). *A gardener's guide to eucalypts*. Australia: Rigby Publishing
- Brooker, M. & Kleining, D. (1999). *Field guide to eucalypts Volume 1: south-eastern Australia*. 2nd ed. Australia: Bloomings Books.
- Brooker, M. & Kleining, D. (1999). *Field guide to eucalypts Volume 2: south western and southern Australia*. 3rd edition. Australia: Bloomings Books.
- Powell, R. (2009). *Leaf and branch: trees and tall shrubs of Perth*. Perth: Department of Environment and Conservation.
- Nicolle, D. (2013). *Native eucalypts of southern Australia*. Adelaide: D. Nicolle
- Rodd, T. (2001). *Botanica's trees and shrubs*. Australia: Random House Publishing
- Holliday, I. (2004). *Melaleucas: a field and garden guide*. 2nd ed. Australia: Reed New Holland.
- Coombes, A. (1992). *The eyewitness handbook of trees*. Australia: DK Adult.

A species list template is available in Appendix 5

## 9 Competition for verge space

Street trees are usually planted on verges where space is often limited. Verge space is shared by pedestrian and cyclist paths, parking and public infrastructure such as overhead power lines and underground services which can create conflict for space.

If the location of street trees is inappropriate they may interact with and cause damage to underground infrastructure or cause a safety hazard if they grow too close to above-ground power lines. Tree roots also have the potential to crack footpaths. This can be mitigated by use of root barriers when planting street trees<sup>13</sup>.

Using permeable pavements is another option for mitigating pavement damage from street trees. Permeable pavements allow stormwater to infiltrate through the paving surface and can be used as an alternative to conventional hard, impervious surfaces that typically surround trees in food paths, roadways and car parks<sup>14</sup>. When permeable pavements are correctly designed and installed they have the potential to minimise the incidence of pavement damage by tree roots and promote healthier and faster growing trees<sup>14</sup>.

More information on permeable pavements is available at

[http://treenetmedia.com/up/pdf/2012/Trees%20as%20essential%20infrastructure\\_Beecham.pdf](http://treenetmedia.com/up/pdf/2012/Trees%20as%20essential%20infrastructure_Beecham.pdf).

### 9.3 Common Trenching

Traditionally during construction, gas lines are laid in one trench and utility wires are laid in an adjacent trench. With common trenching, all utilities are installed in a common trench, leaving more space for trees. However, common trenching and putting services and utilities under the road have proved extremely difficult to implement. This can be mitigated by requiring minimum verge reserves widths that can accommodate all services and street trees<sup>15</sup>. The Department of Planning is looking to address minimum verge widths through its review of the Liveable Neighbourhoods document.

### 9.4 Trenchless Technologies

The use of trenchless technologies (e.g. soil vacuuming, air spading, directional boring) should also be considered where possible. Trenchless technology offers methods by which underground utilities may be installed without damage to overlying pavement and may also reduce impacts on nearby trees.

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<sup>13</sup> Western Australian Planning Commission (2009a). Street Trees and Utility Planning Discussion Paper. Retrieved 10 March 2014 from <http://www.planning.wa.gov.au/publications/1123.asp>

<sup>14</sup> Beecham, S. (2012). The 13<sup>th</sup> National Street Tree Symposium 2012. Retrieved 27 February 2015 from [http://treenetmedia.com/up/pdf/2012/Trees%20as%20essential%20infrastructure\\_Beecham.pdf](http://treenetmedia.com/up/pdf/2012/Trees%20as%20essential%20infrastructure_Beecham.pdf)

<sup>15</sup> Western Australian Planning Commission (2009a). Street Trees and Utility Planning Discussion Paper. Retrieved 10 March 2014 from <http://www.planning.wa.gov.au/publications/1123.asp>

## 9.5 Liveable Neighbourhoods

Liveable Neighbourhoods is a WAPC adopted operational policy, and is to be considered in the design of urban development. Liveable Neighbourhoods applies to structure planning and subdivision for greenfield sites and for the redevelopment of large brownfield and urban infill sites<sup>16</sup>.

The Department of Planning is currently reviewing its Liveable Neighbourhoods policy. Although not yet endorsed, and therefore subject to change, the Department of Planning is signaling an increase in minimum verge widths to allow space for street trees. Requirement 4.1 of the draft document states “All streets accommodate space for utility services and landscaping in a minimum verge of 5 metres.”<sup>17</sup> The recommended width for road reserves in Liveable Neighbourhoods is 15.4m, however many new subdivisions have been using 15m road reserves which leaves little space for trees. The Association will continue to advocate through the Liveable Neighbourhoods review for verge widths that accommodate street trees where practicable.

## 10 Useful information

The following links are other sources of information that Local Governments may find helpful.

### 10.3 Urban Forest Mapping

The Department of Planning in close collaboration with the CSIRO have produced a report on the Urban Forest of Perth and Peel. Through a combination of complex digital photography and mapping technology all trees three meters and above have been captured and combined into data sets on the urban tree canopy. This data is available spatially through the Association’s Environmental Planning Tool.

Alternatively, contact the Department of Planning directly or download the report at <http://www.planning.wa.gov.au/publications/7216.asp>

### 10.4 WALGA’s Environmental Planning Tool

The EPT is an online geographic information system (GIS) that provides easy access to spatial information. It is a useful tool that will assist Local Government land use planning. To subscribe to the Environmental Planning Tool, contact the WALGA Environment Team by email [environment@walga.asn.au](mailto:environment@walga.asn.au) or phone 08 9213 2000.

### 10.5 National Urban Forest Alliance

The National Urban Forest Alliance exists to develop, partner trial, and implement systems, programs, communications, guidelines, landscaping and infrastructure to grow the Australian

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<sup>16</sup> Department of Planning. 9 April 2013. Liveable Neighbourhoods. Retrieved 24 November from <http://www.planning.wa.gov.au/650.asp>

<sup>17</sup> Department of Planning. October 2014. Liveable Neighbourhoods Working Preliminary Draft. Unpublished.

Urban Forest. While it is mainly based in the Eastern States, Local Governments may find the tools useful.

- National Urban Forest Alliance  
<http://www.nufa.com.au/Home>

## 10.6 2020 Vision

This program is working to address the factors preventing green space development across metropolitan Australia. They aim to make Australian urban areas 20 percent greener by 2020. There are tools and resources available at their website

- 2020 Vision  
[http://2020vision.com.au/media/7145/where\\_are\\_all\\_the\\_trees.pdf](http://2020vision.com.au/media/7145/where_are_all_the_trees.pdf)

**Disclaimer** – The material in this publication may include the views or recommendations of third parties, which do not necessarily reflect the views of the Western Australian Local Government Association (WALGA), or indicate its commitment to a particular course of action. WALGA has made every effort to ensure that the information provided in this publication is accurate, however accepts no responsibility for any direct or indirect damage or loss resulting from the use of any information included in this publication.

Thank you to all the Local Governments who were willing to share their information and provide input into this document. There are many other Local Governments doing great work with regards to street trees, unfortunately we couldn't include an exhaustive list in this document. If your Local Government has done something great that you'd like to share please let us know.

## Appendix One: Template for communicating the benefits of street trees to the community<sup>18, 19, 20, 21</sup>

### STREET TREES INFORMATION PAGE ON LG WEBSITE TEMPLATE

#### 1. Street verge responsibilities

What is the street verge?

Who owns and maintains the street verge?

#### 2. Benefits of street trees

#### 3. How do I get a street tree for my verge?

#### 4. Street tree care and maintenance

- Watering
- Pruning
- Removal

#### 5. Tree species around the City/Town or Trees of Special Significance

#### 6. Assistance for residents

#### 7. Resources, e.g.

- Street tree species guide
- Street tree policy
- Urban Forest Strategy

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<sup>18</sup> City of Vincent (no date). Verges, Trees & Streetscapes. Retrieved 14 November 2014 from <https://www.vincent.wa.gov.au/residents/environment-health/adopt-a-tree-program/verges-trees-streetscapes.aspx>

<sup>19</sup> Town of Cambridge (2013). Maintaining Street Trees. Retrieved 14 November 2014 from <https://www.cambridge.wa.gov.au/Resident/Home-Neighbourhood/Your-property/Trees-Verges/Street-Trees>

<sup>20</sup> City of South Perth (no date). Street Trees. Retrieved 14 November 2014 from <https://southperth.wa.gov.au/residents/services/street-trees>

<sup>21</sup> City of Mandurah (2008). Street Tree Care & Maintenance. Retrieved 14 November 2014 from <https://www.mandurah.wa.gov.au/services/Public-Works/trees-and-verge>

## Appendix Two: Street tree policy and plan templates<sup>22, 23</sup>

### URBAN FOREST FRAMEWORK TEMPLATE<sup>24</sup>

1. Preface
2. The Value of an Urban Forest Strategy – Strategy should acknowledge the requirement for policy, financial and resourcing considerations

#### 2.1 Policy Context

3. “Urban Forest” and “Urban Forestry”

#### 3.1 Benefits of the Urban Forest

4. The City’s Urban Forest Strategy

#### 4.1 A Milestone Approach

Milestone 1- Undertake mapping of LG’s Urban Forest

Milestone 2- Urban forest strategy and initial canopy target

Milestone 3- Development of Canopy Plan and formalised targets

Milestone 4- Implement Canopy Plan

Milestone 5- Review and Evaluate Progress

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<sup>22</sup> City of Stirling (2009). Street Trees Policy. Retrieved 14 November 2014 from <https://www.stirling.wa.gov.au/Council/Policies-and-local-laws/Policy%20and%20Local%20Laws/Street%20and%20Reserve%20Trees%20Policy.pdf>

<sup>23</sup> Town of Cambridge (2014). Town of Cambridge Policy Manual- Management of Street Trees. Retrieved 14 November from <https://www.cambridge.wa.gov.au/Resident/Home-Neighbourhood/Your-property/Trees-Verges/Street-Trees>

<sup>24</sup> City of Belmont (2014). City of Belmont Urban Forest Strategy. Retrieved 14 November 2014 from <http://www.belmont.wa.gov.au/CouncillorPortal/CouncillorMinuteAndMeeting/Minutes%20and%20Agendas%20Documents/Attachment%2010%20-%20Item%2012.9%20refers%20Urban%20Forest%20Strategy.pdf>



## STREET TREE POLICY TEMPLATE

Objective

Scope

Definitions

Legislation/Local Law Requirements

Policy

- Street Tree Planting: include planting locations and tree spacing
- Street Tree Watering
- Pruning of Street Trees
- Unauthorised Street Tree Planting
- Street Tree Removal
- Property Developments
- Non Compliance



### Appendix Three: Significant Tree Register Template<sup>25</sup>

Scientific Name	Common Name	Location	Significance	Height	Canopy Spread	Trunk Diameter	Plated	Approximate Age	Origin
<i>Eucalyptus rudis</i>	Flooded Gum	Road reserve Marina Quay Drive Erskine, Outside Function Centre	Outstanding visual/aesthetic significance	15m	15m	Left trunk: 800mm Right trunk: 600mm	Remnant speciman	Unknown	

<sup>25</sup> City of Mandurah (2014). Register of Trees. Retrieved 4 November from [https://www.mandurah.wa.gov.au/~/\\_media/Files/CoM/Environment/Trees-and-Bushland/Register-of-Significant-Trees.pdf?la=en](https://www.mandurah.wa.gov.au/~/_media/Files/CoM/Environment/Trees-and-Bushland/Register-of-Significant-Trees.pdf?la=en)

## Appendix Four: Species List Template<sup>26</sup>

Scientific Name	Common Name	Height Range (m)	Suitable for Coastal Areas	Not Suitable for Near Bushland Areas	Australian Native	Western Australian Native	Deciduous	Only for Very Large Verges	Only for Replacement in Existing Areas
<i>Agonis flexuosa</i>	WA Peppermint/ Willow Myrtle	6-10	√			√			
<i>Corymbia citrodora</i>	Lemon Scented Gum	40-50			√			√	√

<sup>26</sup> City of Joondalup (2009). Preferred Street Tree Species List. Retrieved 4 November 2014 from <http://www.joondalup.wa.gov.au/Live/Streetscapes/StreetTreeGuidelines/PreferredStreetTreeSpeciesList.aspx>

## Appendix 5: Local Government Street Trees Workshop RSVP List

RSVP List for the Local Government Street Trees Workshop held on Thursday, 5 June 2014.

Name	Local Government	Position
Erin Harrison	Eastern Metropolitan Regional Council	Environmental Advisor
Ariadne Macleod	Eastern Metropolitan Regional Council	NRM Officer
Ian Hunter	City of Stirling	Manager Parks and Reserves
Matt Williams	City of Stirling	Technical Officer Parks
Graham Harris	City of Stirling	Technical Officer Tree Services
Ross Carville	City of Stirling	Planting Officer Tree Services
Gabriela Eiris	City of Stirling	Community Tree Officer Tree Services
Phil Koziol	City of Stirling	Supervisor Tree Services
James Henson	City of Rockingham	
Adam Johnston	City of Rockingham	
Jenni Harrison	City of Cockburn	Environmental Officer
Andy Jarman	City of Cockburn	
Michael Hamling	City of Joondalup	
John Newton	City of Joondalup	
Gavin Renyolds	City of Joondalup	
John Corbellini	City of Joondalup	
Stephanie Izzard	City of Joondalup	Urban Planner
Nick Brown	City of Joondalup	Landscape Design Officer
Louise Borrello	City of Joondalup	
Erin Jago	City of Joondalup	
Paul Bradford	City of Melville	
Nicholas Gillon	City of Melville	
Michelle Vaughan	City of Melville	
Dana Prince	City of Melville	
Craig Sanders	City of Melville	
Dave Puddy	City of Melville	
Pamela Walker	City of Canning	
Vic Bijl	City of Belmont	Arborist
Elizabeth Hobbs	Shire of Kalamunda	Landscape Design Officer

Jeremy Maher	City of Bayswater	Environmental Coordinator
Steve Cruickshank	Shire of Collie	Parks and Gardens Supervisor
Rod Strang	City of Bayswater	Parks and Gardens Manager
Penny Fletcher	City of Victoria Park	Parks and Technical Officer
Dion Johnson	City of Victoria Park	Acting Business Unit Manager
Todd Wooding	City of Victoria Park	Acting Streetscapes Supervisor
David MacDonald	Shire of Meekatharra	Community Development Officer
Trevor Pearman	Shire of Capel	
Adam Niclair	Shire of Capel	
Shane Faber	Shire of Capel	Operations Manager
Ross Farlekas	Town of Cambridge	Manager Infrastructure Parks
Mark Crowther	Town of Cambridge	
Lonja Dean	Shire of Kalamunda	Coordinator Community Facility Maintenance
Tamara Wikes-Jones	Shire of Kalamunda	
Alan Dolphin	City of Perth	Technical Officer- Arboriculture and Horticulture
David Hammer	City of Perth	Arboriculturist / Horticultural Advisor
Janine Ahola	City of Melville	Senior Landscape Architect
Cameron Tuck	City of Mandurah	Superintendent Cityparks
Mark Denning	City of Swan	Asset Management Planner
Keith Wragg	City of Swan	
Michael Leers	City of Fremantle	Coordinator Parks and Landscape
Jason Pitman	Perth NRM	Environment Program Assistant
Geoff Colgan	City of South Perth	Assistant Manager City Environment
Shane Bacskai	Shire of Augusta Margaret River	
Craig Yound	Shire of Augusta Margaret River	Manager Works
Russell Jones	Shire of Donnybrook Balingup	Works & Services Supervisor
Anne Cullen	Shire of Donnybrook Balingup	Parks & Gardens Team Leader
Debbie Brace	Shire of Donnybrook Balingup	Environmental Officer
Michelle Rolle	City of Subiaco	Parks & Gardens Team Leader
Dan Steven	Shire of Bridgetown	

