

Nillumbik Tree Management Guidelines

September 2018

Environmental Services

Tree Management Guidelines 2018

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1 Introduction

This document details how Council implements the *Nillumbik Tree Management Policy 2018* by managing and maintaining the existing canopy and planting additional trees to assist canopy renewal.

These guidelines have been based on Council's current commitments for tree management, Council's limited resources and conflicting priorities which constrain the extent of works. Furthermore, these guidelines, from time to time, may not be met or may have to be changed due to Council's constraints or by circumstances beyond the control of Council. These guidelines may change in response to environmental conditions, community priorities, government policy and best practice management. As a consequence some timeframes are outlined in these guidelines are indicative only.

Over 49% of the Shire, both public and private land is covered by the canopy (Jacobs *et.al*, 2014). This is one of the highest municipal canopy coverages in Victoria (Jacobs *et.al*, 2014). Council is responsible for maintenance of around 500,000 trees (see Appendix 6.1) on reserves, roadsides and other council owned or managed properties. This includes 800km of council managed roads, 750 properties and 850ha of reserves. Council's tree management program covers all planted or naturally grown trees on Council managed land.

Council's first priority within tree management is responding to reported tree risks as soon as reasonably practicable upon becoming aware of a risk, based on Council's constraints. If Council's constraints allow, Council may also adopt proactive tree maintenance programs for trees it is responsible for in areas considered to be higher risk. The risk is determined by the extent to which an area attracts the public and where trees exist, or where the public commonly gathers in proximity to trees.

Council currently delivers proactive tree maintenance works programs to meet the Electric Line Clearance Plan and assist in meeting the objectives of the Municipal Emergency Management Plan and Municipal Fire Management Plan. Tree planting programs are also in place based on community, horticultural and environmental needs.

1.1 Definitions

For clarity, definitions are provided for the following terms that are used in the Tree Management Policy and Guidelines.

Arborist

A person with training to Australian Qualification Framework Level 3 in Arboriculture or above or equivalent recognised and relevant experience that enables that person to perform tasks required by the Australian Standard 4373-2007 Pruning Amenity Trees.

Emergency or urgent tree works

Emergency or urgent tree works in Nillumbik are undertaken where the responsible officer considers that the tree or part of the tree presents an immediate risk of personal injury or property damage or where there is a requirement to create an emergency access to enable

emergency works. Emergency or urgent works are undertaken within 24 hours with any follow up non-urgent works occurring within 7 days or as part of the relevant maintenance program.

Hazard tree works

A tree or part of a tree is deemed to be hazardous following an assessment by a suitably qualified Arborist. The assessment will consider whether the tree has structural defects and/or poor health that may pose a risk of personal injury or property damage that exceeds an acceptable level. In determining the level of risk, the assessment will consider the likelihood of the tree or part of the tree failing within 12 months given normal weather conditions and the likelihood of a target being present in the area of potential impact.

Tree

Long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (Australian Standard 4373-2007).

Urban / Rural area

The urban area of the Shire is the area within the declared area (Appendix 6.4) for electric line clearance including Eltham North and the town centres outside the declared area.

The rural area of the Shire is the area outside of the urban area.

Indigenous vegetation

Vegetation species locally native to Nillumbik and/or a particular site of known provenance.

Native vegetation

Vegetation species from Australia but not indigenous to Nillumbik and can also be called non-local natives.

Exotic vegetation

Vegetation species from outside of Australia.

1.2 Qualified staff for tree management

Council will maintain a panel of appropriately trained and qualified tree maintenance staff and contractors to provide tree assessment reports and a variety of tree maintenance works. Tree maintenance works are delivered by an in-house staff team (Arboriculture Team comprising of an Arborist Team Leader and four qualified Arborists) and contractors. The contractors are sourced from a publicly tendered panel of contractors providing Arboricultural services.

Arboriculture staff will have up-to-date training in the following:

- Safe operation and maintenance of chainsaws
- Safe operation and maintenance of a chipper

- Working near powerlines
- Elevated work platform
- Tree climbing and aerial rescue
- Assessing trees for fauna
- Visual Tree Assessment (VTA)
- Quantified Tree Risk Assessment (QTRA)

Non-arboriculture staff in Open Space Maintenance and Council's After Hours Call Out staff should will do 'hazard tree identification' training including the process for reporting a hazard tree.

Staff and contractors doing pruning or removal works must have:

- appropriate qualifications in arboriculture (minimum level of Certificate 3 Arboriculture)
- expertise in pruning trees
- the ability to carry out the task to the highest level of safety.

1.3 Council's responsibilities for tree management

Table 1 provides a list of land classes that are used to determine whether Council is responsible for trees on that land.

Table 1. Determining Council's responsibility for tree management

Land type	Person/organisation responsible for tree management
Private property	Council is not responsible for the maintenance of trees on private property but will clear and remove overhanging vegetation, fallen private trees and branches that are on Council managed roads and Council land as required.
Council owned land	Council is responsible for the maintenance of trees on Council owned land unless leasing conditions place the responsibility back onto the lessee. This includes the removal of fallen trees and branches and reinstatement of fences damaged by a tree growing on Council land that may fall in to private property.
Land managed by Council but not Owned by Council	The owner of the land will be responsible for the tree maintenance; however, Council is responsible for the maintenance of trees on this land where there is a specific agreement stating this transfer of responsibility e.g. committee of management.
Electric Line Clearance area	Council is responsible to undertake electric line clearance to meet the current Electric Line Clearance Regulations within the defined declared area.

Land type	Person/organisation responsible for tree management
	In areas outside the declared area the responsibility for electric line clearance falls on to the regional power distribution companies in Nillumbik this is Ausnet Services.
Maintenance of trees around telecommunication lines	Council is not legally required to maintain trees around telecommunication lines, however to assist in the safety of residents Council will undertake tree pruning works around telecommunication lines on a reactive basis only, in instances where there is a service request and evidence of significant disruptions caused by trees contacting the telecommunication line.
Council managed roadsides	Council is responsible for the maintenance of all trees on local roads in the Shire and the trees of streetscapes/roadsides. Maintenance works are outlined in Council's Road Management Plan and Roadside Management Plan.
VicRoads controlled roads	Council has no responsibility for the control or management of the roadside vegetation on roads controlled by VicRoads (including trees) adjacent to these roads, unless specified in a maintenance agreement or in a 60km or less zone.

1.4 Responsibility for trees not on Council land

Council has no responsibility for trees located on private property or land outside of Council's control.

Trees on VicRoads managed roads

The most common report of tree issues on land not managed by Council relates to trees along main roads in Nillumbik which are managed by VicRoads. Where residents contact Council about a tree on a VicRoads managed road, their request is referred to the VicRoads customer service function unless within the Council managed area.

Trees on private land

Council may be contacted by residents who are concerned about trees on neighbouring private land that overhang their property. Residents are advised to discuss the issue with their neighbours and they may also contact the Dispute Settlement Centre of Victoria. This state government agency offers a free service including practical strategies, mediation services and education programs.

Council may be contacted by residents wishing to remove or prune trees on their land or wanting to know if another resident has a permit to remove or prune a tree. Council's Planning Services team provide advice about the requirement for a Planning Permit to prune or remove a tree on private property.

1.5 Documenting and communicating Council's tree management

This section outlines the methods Council uses to communicate and consult with residents, and other external stakeholders about tree works.

Our communications will use the following principles:

- Council will provide clear messages to the community about the tree services provided by Council
- Council will provide simple mechanisms for community to request tree works and keep them informed at each stage of service delivery
- Where practicable, Council will inform affected residents about tree works in their local area
- Council may inform or consult the community about major works and changes in policy
- Within bushland reserves and wetlands, Council will encourage community participation in tree planting.

1.5.1 Documentation system

Accurate and current documentation is important in achieving a successful tree risk management program. Accurate recording of all aspects of Council's tree assets and works provides management with clear information on the resource being managed and enables the tracking of issues related to specific trees.

Ideally a tree asset register is the most comprehensive method to document and track all the trees and works on trees in the Shire. However, it is not practical to assess all the trees in the Shire. Previous work has been undertaken to document and map all the trees in the urban area of the Shire but this work has rapidly dated. The information in a tree asset database needs to be current and continually updated. Given that Council is not proactively inspecting all the trees in the urban area, it would require significant funding to establish and maintain a tree register. The funding would be better spent on managing known tree hazards.

Instead Council will be able to build and maintain a tree inventory database over time based on high use sites and heritage trees. Each tree that is inspected and a report provided, is geographically or GPS located and the information about the tree including any works can be stored electronically. A substantial database of tree inspections and tree works will build up over time.

Council will maintain recording systems to document and record information related to the tree assessments and works. The system addresses the following requirements:

- A procedure for inspection of assets and trees detailing relevant information as to the location, species, size, health and structure of public trees within the Shire. Refer to section 2.1 for guidelines on documenting the inspection, assessment, approval and prioritisation process.

- A documented system for assessing the risk posed by trees identified and prioritising the risk posed by such trees. Refer to section 2.1 for guidelines on documenting the inspection, assessment, approval and prioritisation process.
- A documented system for logging, responding to and tracking customer requests or notification of problems with respect to public trees including the type of work, the service delivery timeframe and the progress of work. Refer to the following sections for guidelines on recording customer requests, providing written notification to customers and reporting on the progress of work.
- An electronic record of proactive tree works including electric line clearance, box clearance and hazard tree works for bushfire mitigation.
- An electronic record of trees removed including at a minimum location, species, size and reason for removal.

1.5.2 Tree maintenance request system

Customers, both internal and external, contact Council about tree issues via phone, email or the webpage. Council receives an average of over 1,600 service requests per year relating to trees. The bulk of internal service requests are received from Waste, Roads, Emergency Management, Family Services and Leisure.

Council receives service requests for:

- Hazard trees and other tree maintenance works
- Box and electric line clearance
- Street tree planting
- Pest and disease control
- Tree vandalism

Council's Customer Service team provides advice about tree issues and enters any resulting service requests into Council's customer relationship management system (Pathway). The request is referred to the responsible Open Space Maintenance Officer who determines the outcome of the request following an assessment process as outlined in section 2.1.

1.5.3 Advising customers about tree works

Council notifies customers in writing about reactive and proactive works.

For service requests, the customer will be advised by email or letter about:

- Council's planned response to the request
- the planned completion date
- any changes in works planned or timeframes

Council has templates for common letters sent to customers in response to tree service requests including:

- Urgent maintenance works completed in response to a service request

- Tree maintenance to occur within 12 months in response to a service request
- Tree removal and pruning to occur within 12 months in response to a service request
- Pruning to occur within 12 months in response to a service request
- Tree removal to occur within 12 months in response to a service request
- Tree planting to occur in response to a service request
- Stump removal to occur within 3 months in response to a service request
- Vegetation obscuring vision along a road to be pruned within two months in response to a service request
- Request forwarded to VicRoads because it is on their land
- Tree maintenance not to occur in response to a service request as a result of an inspection
- Stump removal not to occur in response to a service request because it did not meet Council's criteria
- Tree planting not to occur in response to a service request because the site is not suitable
- Request forwarded to Parks Victoria because it is on their land
- Request forwarded to Ausnet Services because it is on their land
- Request forwarded to Telstra because it is on their land
- Request forwarded to Melbourne Water because it is on their land
- Request for a private landowner to prune overhanging vegetation

Where action is taken on a service request, the Pathway record will be updated to provide tracking of communication and work progress.

See Appendix 6.3 for an overview of the tree maintenance service request process.

Council also informs customers in writing, either by advertisement, letter or email, about proactive tree works including:

- Electric line clearance
- Box clearing and hazard tree inspection occurring along a road/street
- Whole street tree planting

The letters regarding box clearing and electric line clearance will include reference to the frequency of these proactive works.

1.5.4 Grievance procedure

- If a customer is dissatisfied with Council's recommendations relating to a service request they have a right of appeal in line with Council's Service Excellence Charter 2014. The Charter states that a customer may make a complaint when they are dissatisfied with the service Council provide or when Council fail to comply with its policies and procedures. A complaint may be lodged via the phone, in person or written correspondence.
- A complaint will be referred to a senior officer or manager of the respective area, for review.

1.5.5 Tree Management Policy and Guidelines Review

In line with AS/NZS 31000:2009 (Risk Management) an ongoing review of the Nillumbik Tree Management Policy and Guidelines is essential to ensure that tree risk management remains relevant.

Factors that affect the likelihood of inspection activities may change, for example, severe drought may cause rapid tree decline prompting the need for more frequent inspections. Similarly, knowledge gained through experience and implementation of tree management could provide beneficial insights and allow refinement of tree risk management. Review also involves learning lessons from the risk management process, by reviewing events, the treatment plans, and their outcomes.

Council's Tree Management Policy and Guidelines will be reviewed every 5 years. The Tree Management Guidelines may be reviewed at any time as a result of changes to legislation, environmental conditions or customer service processes.

2 Tree Maintenance

Nillumbik Shire Council is responsible for vast numbers of trees over a large area and within a varied landscape matrix context. Managing an extensive tree population is challenging and requires balancing community and amenity needs and landscape and ecological values for public safety to ensure that reasonable care is taken to manage the risks associated with tree hazards while enjoying the benefits provided by trees.

In the majority of cases, the large quantity of trees inhibits a proactive individual tree assessment approach. The time involved in the inspection procedure and the works generated from such inspections would be extensive, prohibitively expensive and in many cases may not significantly lower the level of risk.

This section outlines where Council is responsible for tree maintenance, how maintenance works are determined and carried out and how residents and the community are informed about tree maintenance works.

Council manages tree hazards of which it is aware and undertakes tree maintenance works as required on land as defined in Table 1 (page 8). The types of tree hazards which require maintenance works include:

- Trees with structural defects and/or poor health with a risk of limbs or the whole tree falling;
 - fallen trees or branches
 - visible splits in trunks or branch unions
 - broken branches hanging in trees
 - movement of a tree in the ground
- Stumps;
 - hazard to road users (including parking)
 - trip hazard to pedestrians (generally only in urban areas)
- Tree roots damaging property
- Trees interfering with electric or telecommunication lines
- Trees encroaching into the road clearance space causing danger to road users or causing damage or obstruction to the operation of road or non-road infrastructure on roadsides eg., obstructing roads, footpaths, street signs or street lights
- Regrowth of trees that will encroach into the road clearance space in the future

Council may also do other works to maintain tree health, particularly for significant trees, such as formative pruning and managing pests and diseases and creating additional habitat for fauna through artificial hollows or nest boxes.

Council has proactive and reactive tree maintenance programs:

- Reactive tree maintenance works are not planned or scheduled works. Reactive works are a response to information that identifies a potential tree issue or hazard.
- Proactive tree maintenance works are scheduled works carried out on in a specified timeframe to actively maintain trees in advance of tree issues arising. Council's proactive tree maintenance programs include electric line clearance in declared areas, box clearance on identified priority roads and inspections for tree hazards on

identified priority roads. If Council has the financial capacity, additional proactive tree maintenance programs may be undertaken based on priorities for public safety or tree health.

2.1 Tree inspection, assessment, prioritisation and approval

Once Council's responsibility for a tree or group of trees has been established there is a process for recording, inspecting, assessing, prioritising and gaining approval for tree maintenance works.

Reactive works are recorded as service requests following Council being made aware of an issue with a tree or group of trees. These requests will be triaged by Council's Arborist who determines whether the following are required:

- an Arborist report
- a planning permit (that may trigger offsets)
- an environmental assessment

Council also conducts proactive inspections for tree hazards as of part the bushfire mitigation program and may do additional proactive inspection programs determined by the potential risk to people and property. Tree inspections and assessments are used to make decisions about the type of tree maintenance works that may be required and the priority of works. Council officers, Arborists and arboriculture contractors may use a range or combination of tree inspection and assessment methods dependent on land use and perceived risk. The underlying principles of the tree assessment are explained in the Visual Tree Assessment (VTA) method developed by Mattheck and Breloer (1997).

A proactive or reactive inspection for tree hazards may involve the following steps:

- Ground inspection or drive-by/windshield assessment to identify potential hazardous trees that require further inspection
- Visual tree assessment to identify and evaluate hazards within the trees
- Quantified Tree Risk Assessment (QTRA) to establish tree risk
- Fauna and habitat assessment if required

The level of detail of a tree assessment will vary depending on the situation. Due to the time constraints, a rapid visual assessment by a qualified Arborist or an assessment of an obvious hazard by the After Hours Call Out officer is required for urgent tree requests. However when the works are not urgent then a written tree assessment report may be required.

2.1.1 Drive-by/Windshield inspection

Inspections of roadside trees can initially use a drive-by/windshield inspection method. Windshield surveys are most efficient when the assessor is looking for one or two particular tree characteristics. An Arborist may undertake these drive-by assessments or a staff member trained in visual tree assessment.

The assessment aims to identify visual indicators of faults or road clearance issues, which suggest a tree requires further inspection. The method is limited in that it can only assess defects seen from the road, as only that side of the tree will be visible. Furthermore, even on the visible side, small defects, such as narrow cracks or girdling roots, may not be apparent.

The method is better in identifying major, more visible hazards than minor hazards (Rooney *et al.*, 2005). Given resource limitations, drive-by/windshield inspections can provide a cost-effective approach to assess large areas or long sections of roadside vegetation. This method may also be useful after storms, where damage to trees or fallen branches may be visible from the road. This method is also useful when service request information is around sightlines or road safety issues.

The main factor in deciding when and where to use the windshield survey is efficiency. Some limitations of the survey method are outlined below:

- The windshield survey works well in low-traffic areas as in high-traffic areas the drivers and assessors are concerned about the traffic. In high-traffic areas, walking or using other means, such as a bicycle to move from tree to tree, is advisable.
- Poor weather conditions can limit visibility and delay assessment schedules.
- If the trees are not well maintained the method may not be suitable due to the volume of work it generates or that some tree defects may be missed, a thorough street tree inventory may be the best choice. If the trees are reasonably maintained, the windshield survey could be used to quickly locate developing hazards such as hanging branches or recent storm damage.

The drive-by/windshield inspection method can also be used for regular update of streetscape conditions for the development of planting programs.

2.1.2 Ground inspection

Ground inspections of trees can be used for scheduled asset tree inspections of council properties and parks. The method can also be used to undertake more detailed inspections of street trees. Ground inspections may also be undertaken following a drive by/windshield assessment to inspect defective trees in further detail. Ground assessments of high risk zones will be undertaken by an Arborist while other lower risk zones may be inspected by an Arborist or a staff member trained in visual tree assessment.

The process consists of a walk through inspection of trees located in a site. In remote sites it may only be necessary to inspect trees within striking distance of a target. The inspection is based on overt, visual indicators of faults that suggest a tree requires further inspection. Trees should be inspected from all sides for the seven indicators of tree defects (adapted from Pokorny, 2003):

- Dead tree – a dead tree or branches.
- Decay – wood that has rotten or is missing from trunk or major structural branches, includes cavities, holes, open cracks, bulges or fungal fruiting bodies.
- Crack – a split through the bark into the wood where the wood has separated, in the trunk or major branches.

- Root problems – inadequate anchorage of the roots, includes dead, severed, decayed, or girdling roots, trunk lean, or evidence of soil root movement, soil movement or soil lifting.
- Canker – an area where the bark or cambium are dead on trunk or branches. Appears as a wound in the bark that can be relatively deep.
- Weak branch union (attachment) - an epicormic branch union/attachment with included bark includes co-dominant stems or unions of large branches, often with pronounced collar formation.
- Poor architecture – growth patterns indicate structural imbalance or weakness in the branch, stem or tree.

This method may not detect all problems with all trees, yet it should identify the majority of major faults or those most likely to cause harm.

2.1.3 Visual Tree Assessment (VTA)

The VTA is a method of evaluating structural defects and stability in trees. The first stage is the visual inspection of the tree for defect symptoms and vitality. If problems are suspected on the basis of symptoms a thorough examination is done. If a defect is confirmed it could be measured or further diagnostic work undertaken, for example testing the strength of the defective tree part, root plate investigation, or pathogen identification.

2.1.4 Quantified Tree Risk Assessment (QTRA)

To prioritise reactive works Council and Council’s contractors use the QTRA (Quantified Tree Risk Assessment) method to assess the risk posed by a tree. Council uses the QTRA score to place works into priority categories (urgent, non-urgent and no works). The QTRA was developed in the United Kingdom and applies established and accepted risk management principles to tree safety management based on likelihood.

Tree safety management is a matter of limiting the risk of harm from tree failure while maintaining the benefits conferred by trees. Firstly, QTRA assesses and quantifies the targets (people and property) upon which the tree could fail; allowing tree managers to determine whether or not and to what degree of rigour a survey or inspection of the tree is required. Where necessary, the tree or branch is then considered in terms of both impact potential (size) and probability of failure. Values from the assessment of these three components (target, impact potential and probability of failure) are combined to calculate the probability of significant harm occurring.

The system moves the management of tree safety away from labelling trees as either ‘safe’ or ‘unsafe’, which require definitive statements of tree safety from either tree surveyors or tree managers. Instead, QTRA quantifies the risk of significant harm from tree failure in a way that helps tree managers to balance safety with tree value and operate to a predetermined limit of reasonable or acceptable risk.

Figure 1: QTRA Advisory Risk Thresholds (Quantified Tree Risk Assessment Limited, 2017).

Thresholds	Description	Action
1/1 000	Unacceptable Risks will not ordinarily be tolerated	Control the risk
	Unacceptable (where imposed on others) Risks will not ordinarily be tolerated	Control the risk Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value Review the risk
1/10 000	Tolerable (where imposed on others) Risks are tolerable if ALARP	Assess costs and benefits of risk control Control the risk only where a significant benefit might be achieved at a reasonable cost Review the risk
	Broadly Acceptable Risk is already ALARP	No action currently required Review the risk

See [Website link to QTRA Tree Safety Management](#) for the full method.

2.1.5 Arborist reports

On completing an inspection an Arborist will produce a report including:

- Tree species
- Tree size
- Tree health
- Hazard assessment
- Structural defects
- Location
- QTRA
- Recommendation for works
- Additional comments including the identification of habitat such as hollows
- Further investigative work could also include a more detailed inspection of the tree involving, for example, aerial inspection, and decay detection or root plate exploration.

2.1.6 Planning permits

Section 52.17 of the Nillumbik Planning Scheme (Native Vegetation) specifies Council's responsibilities when removing, destroying or lopping **native vegetation**, including dead native vegetation. It includes the exemptions where a planning permit is not required.

Section 43.01 of the Nillumbik Planning Scheme (Heritage Overlay) specifies Council's responsibilities when removing, destroying or lopping **trees identified in the schedule to the overlay** (i.e. covered by a heritage overlay that includes tree controls). This includes all significant trees (see section 2.12). Note: not all heritage overlays include tree controls and the overlay may only specify specific plants.

Section 42.03 of the Nillumbik Planning Scheme (Significant Landscape Overlay) specifies Council's legal responsibilities when removing, destroying or lopping **any vegetation on land covered by a Significant Landscape Overlay**. It includes the exemptions when a planning permit is not required.

Section 42.01 of the Nillumbik Planning Scheme (Environmental Significance Overlay) specifies Council's responsibilities when removing, destroying or lopping **any vegetation including dead vegetation identified in the schedule to the overlay** (i.e. covered by an environmental significance overlay that includes tree controls).

The Environmental Significance Overlay does not require a planning permit to remove, lop or destroy vegetation to the minimum extent necessary for any of the following works:

- Bracken control
- Vegetation works on Crown land
- Emergency works
- Fire protection
- Noxious weeds
- Pest animal burrows
- Planted vegetation
- Regrowth
- Road safety
- Surveying

Council does not require a planning permit for the following works (refer to the overlays or consult with Planning Services):

- Emergency works
- Pruning to achieve the minimum clearance space around electric lines
- Most fire protection works
- Most works to maintain road safety
- Removal of Noxious weeds not covered by a Heritage Overlay
- Removal of exotic (non-native) trees not covered by a Significant Landscape Overlay or Heritage Overlay
- Removal of the following native weeds not covered by a Significant Landscape Overlay or Heritage Overlay (Note: there is a limit on the number and area of weeds that can be removed without a permit – see section 52.17 of the Municipal Planning Scheme):
 - *Acacia floribunda* (White Sallow Wattle)
 - *Acacia howittii* (Sticky Wattle)
 - *Acacia longifolia* subsp. *longifolia* (Sallow Wattle)
 - *Acacia pravissima* (Ovens Wattle)
 - *Acacia retinodes* var. *retinodes* (Wirilda)

- *Melaleuca armillaris* subsp. *armillaris* (Giant Honey-myrtle)
- *Pittosporum undulatum* (Sweet Pittosporum)
- *Kunzea leptospermoides* (Yarra Burgan)
- In some cases removal of planted trees
- If works require tree removal or lopping the responsible officer should:
 - Determine if the vegetation is native (including non-indigenous plants native to Victoria)
 - Check to see if a Significant Landscape Overlay or Heritage Overlay applies and if so consult the overlay and its schedule/s
 - Liaise with Planning Services to determine if a planning permit is required. If a planning permit is required, a statutory planner will guide the officer through the planning process including all necessary assessment and community consultation. The officer must ensure all planning requirements are met including offset planting.

The responsible officer should always refer back to the legislation and if in doubt, contact Council's Planning Services.

2.1.7 Native fauna and habitat assessment

Where maintenance works are required for trees in areas of environmental significance which may provide habitat for native animals the following process will be followed to minimise the impact on native animals while allowing works to occur. This process provides guidance for contractors and staff to meet obligations under the *Prevention of Cruelty to Animal Act* and *Flora and Fauna Guarantee Act*.

For larger scale tree pruning and removal works programs including box clearing and hazard tree removal, the process for fauna assessments will include:

1. A habitat assessment of the works area is undertaken to identify trees with potential habitat. This assessment looks for hollows, large trees, nests and other signs of habitat. Notes are recorded of potential habitat trees. As well as assessing the habitat along a road, an assessment is made of the potential habitat in the context of the surrounding landscape.
2. A fauna specialist may be required to complete an on ground inspection of the priority trees and streets to identify trees that have signs of recent fauna activity.
3. The fauna specialist provides Council with a list of the identified trees and a recommendation on how Council could proceed with the works. The recommendation may include alternative pruning techniques, delaying the works until after the young have left the tree and pruning of the tree while the fauna specialist is present.
4. The fauna specialist will be on site when tree works are being undertaken on identified habitat trees with fauna activity and will work with arborists to manage the fauna in the tree.
5. If necessary, the works manager will leave pruning works on the identified trees until last so as not to delay the rest of the works. If works can't be delayed, the fauna specialist will supervise the tree works.

2.1.8 Reasons for not undertaking tree maintenance works

Some of the requests to undertake tree maintenance or removal will not result in an inspection as the reason for the request is not valid. Trees not deemed hazardous will not be removed if the basis of the request is around leaf litter, insect and animal habitat, overshadowing and/or opinions of attractiveness. Trees offer too much amenity value to remove if they are performing their biological functions safely. Council is unable to respond to invalid requests.

The following provides a list of requests that do not result in an assessment and the reason for refusal.

To increase light to a property eg. for solar panels - Tree pruning can only be undertaken for the health of the tree or for safety reasons. Street and park trees are for the benefit the whole community. Trees cannot be removed for the purpose of a single property.

Debris and litter-fall from a street tree - The nature of a tree's lifecycle is to drop leaves, flowers, fruit and bark. Even evergreen trees drop their leaves however this is spread over the course of the year not all at once like deciduous trees. Trees cannot be removed for debris and litter-fall.

The tree is unattractive or the resident would prefer another type of tree - Council prunes or removes trees for with regard to the health of the tree and for safety reasons but not for aesthetic values.

The tree harbours wildlife - An ecosystem service provided by trees is habitat value for wildlife such food and shelter. This is something unique about living in Nillumbik that makes it different from other councils in metropolitan Melbourne.

2.1.9 Prioritising tree maintenance works

Arborist reports, permit requirements and environmental assessments will be reviewed to classify all trees identified as posing a potential hazard into a priority category as shown in Table 2 below. These priorities and timeframes are risk based (based on the QTRA assessment score) and assume normal weather conditions.

Table 2: Priority categories for reactive tree maintenance works

Priority	Arborist inspection finding	Response to customer
Emergency or urgent	Imminent risk of causing personal injury or property damage	Tree hazard made safe within 24 hours of notification and fully completed within 7 days
	Emergency access/emergency repair	Emergency access provided within 24 hours

Non-urgent	After 12 months, a potential risk of causing personal injury or property damage	Works completed within 12 months with stump removal, where required, completed within 3 months of a tree removal
No works	Tree determined to be very low risk of causing personal injury or property damage.	No works required. Customer is able to contact Council after 12 months to reinspect the tree or if there is a change to the tree such as a large branch failing.

- All inspections will be done by a suitably qualified Arborist with the exception of urgent tree requests received by an After Hours Call Out officer. The Arborist will recommend the most appropriate tree maintenance works to make the tree safe and assign the works to a priority category. Works may involve pruning or removal
- Council's Arborist is responsible for assigning the priority for works and this will be informed by Council's policy and guidelines, the outcome of any Arborist's report, planning permit and/or environmental assessment
- Council's contracted Arborist consultants assess all tree service requests using VTA and QTRA which will generate an Arborist report. Council's Arborist will receive the report with recommendations to then apply for a permit and/or actions the works (depending on the priority of the works urgent/non-urgent).
- The customer will receive written notification of the outcome of the inspection and any planned works within 30 working days
- Works are assigned to a contractor or the tree crew to complete in the recommended timeframe. The distribution of works between internal staff and contractors is based on the complexity of the job, influx of requests, the equipment needed and the requirements of the site
- Tree maintenance works are prioritised based on the outcome of the tree inspection and assessment process. Works may include pruning or removal, in some cases the outcome of the inspection and assessment process is that no works are required.

2.2 Emergency or urgent tree works

An urgent tree is a tree/branch which has fallen, up rooted, or hanging/leaning over a road, footpath or structure (bus shelter, building, carpark, playground etc.). An urgent service request requires as much supporting detail as possible eg. location, size, species if known along with photos if available which can be sent to nillumbik@nillumbik.vic.gov.au. The tree will be assessed immediately and made safe. Works will be undertaken in 7 days and the customer will be notified.

Emergency or urgent tree works are undertaken where the responsible officer or consultant considers that the tree or part of the tree presents an immediate risk of personal injury or property damage or where there is a requirement to create an emergency access to enable emergency works. Emergency or urgent works are undertaken within 24 hours with any

follow up non urgent works occurring within 7 days or as part of the relevant maintenance program.

Requests for emergency or urgent tree works are routinely received with high numbers experienced during wind storms. An Arborist's reports may also identify a requirement for urgent works.

Council's Arboriculture unit are responsible for identifying and responding to emergency or urgent tree works during working hours. Outside working hours, these will be assessed by Council's After Hours Call Out Officer. Further advice and assistance may be sought by the Team Leader Arboriculture or an arboriculture contractor from the Open Space tree maintenance panel. The responsible officer will ensure that works are undertaken within 24 hours of notification and fully completed within 7 days.

A planning permit is not required for emergency or urgent works. However, this only includes removing, destroying or lopping the part of vegetation that presents the immediate risk. If in doubt, the responsible officer should refer to the Nillumbik Planning Scheme or contact Council's Planning Services where practicable.

Council will only remove trees that are hazardous or structurally unsound, are likely to fail in the near future and if there is a possible target (person or property). A structurally unsound tree in an area with no target (eg. middle of a paddock) is not considered a hazard. The Parks and Open Space Coordinator, Team Leader Arboriculture or tree crew will make the final decision to remove a tree. Council will keep a record of trees removed under the emergency work provisions to ensure replanting occurs where appropriate.

Emergency tree works during and after a major storm event (wind speeds over 90 kph) may be eligible for Natural Disaster Relief Funding from the state government. Storm data including service request log, contractor invoices and photos should be collected and retained as evidence for a Natural Disaster Relief Funding claim.

Refer to Appendix 6.3 for the decision making process regarding emergency or urgent tree service requests.

Emergency or urgent tree works requested by other agencies

Requests for emergency or urgent tree works may also come from other authorities such as Yarra Valley Water. For example, in the case of Yarra Valley Water, the requests usually relate to a leaking water main on a nature strip and a tree that is blocking access to repair a leak.

The authority must provide details of the exact location and tree, the reasoning for works and a timeframe for the works. Council then assess and inspect to determine the complexity of the job, considering each request on its merits. Council will assist the authority by completing the job as soon as possible. However, complex jobs requiring a contractor and traffic control may take up to 24 hours.

The authority will be kept informed of the timeframe for completion of the works. If the works require the removal of a tree in an area of high environmental or public sensitivity, a letter will be placed in the mailbox of adjoining residents informing them of the tree removal and the reason for the urgent action. Council's Customer Service team will be kept informed of

the urgent works. However, in an emergency situation informing of pruning or removal works may occur after the works have been completed.

2.3 Non-urgent tree maintenance works

A non-urgent tree is a tree which looks diseased, dead or is overgrowing onto private property, footpath or road. This tree falls under tree inspection in pathway. This will then be assessed by a qualified Arborist (according to the process outlined in Section 2) within 30 working days. Customers will receive notification. If works are required, they will be completed within 12 months. Council will also do maintenance works on trees within 12 months that do not pose an immediate hazard, but based on an Arborist report may pose a significant risk to the public within the next 12 months.

Refer to Appendix 6.3 for the decision making process regarding tree service requests.

2.4 Box clearance and other clearance works

Council's *Road Management Plan 2012* requires a program to maintain:

- Box clearances (a vegetation-free space roads, footpaths and trails)
- The visibility of street lights, road signs and traffic control devices
- Clearance along lines of sight on roads

This allows:

- Adequate movement of road and foot traffic
- The safe passage of road machinery and emergency vehicles, especially those involved in fire suppression
- Residents attempting egress or access of properties to flee fire situations
- Appropriate sight line clearances to allow adequate vision for the movement of traffic

Council may prune or remove vegetation from road associated assets including roads, footpaths and trails in response to service requests and as part of the bushfire mitigation program. The recommendations of the Municipal Fire Management Planning Committee currently specify box clearing along priority roads. Priority roads are roads that if rendered un-trafficable would have the greatest negative impact on the community. The Municipal Fire Management Planning Committee provides guidance for determining priority roads. Refer to Council's Municipal Fire Management Plan for a current list of priority roads.

Box clearing works on priority roads are undertaken on a proactive basis through a scheduled program. The total length of priority roads is 153 kilometres, which is divided into a 4 year maintenance program with an average of 39.5 km of priority roads required to be box cleared each year. This timeframe is a balance between practicalities, costs, resources and the expected regrowth in to the clearance space that will occur between cycles.

Box clearing work on non-priority roads is undertaken on a reactive basis. Service requests are assessed and prioritised based on the road hierarchy, road usage data and extent of vegetation growing in the clearance space.

The list of proposed roads for box clearing is provided to the panel of arboriculture services contractors to quote on as a competitive process. Prior to works starting, Council will send a letter to inform all residents along roads scheduled for box clearance works. Box clearance on both priority and non-priority roads is exempt from a planning permit if works remove the minimum extent of vegetation necessary to maintain the safe and efficient functioning of an existing public road.

2.5 Electric line clearance

Council has responsibility for clearance of vegetation around electric lines in declared areas in accordance with the Electricity Safety (Electric Line Clearance) Regulations (Energy Safe Victoria). The regulations require Council to prepare an Electric Line Clearance Management Plan by 31 March each year.

The declared area is the area within Nillumbik which can largely be defined as the low bushfire risk urban areas in the south of the Shire, excluding parts of Eltham North (see appendix 6.4). In areas outside the declared area regional power distribution companies are responsible for electric line clearance. In Nillumbik this is currently Ausnet Services.

Council seeks to do electric line clearance works on a two year cycle (high voltage lines are cleared annually), clearing half the declared area each year prior to the start of the declared fire season in accordance with the code. Although the code requires Council to maintain the required clearances at all times, completion of works prior to the fire season will ensure that the fire risk is minimised.

The electric line clearance space varies depending on the following:

- Line type (high or low voltage or service)
- Span distance (distance between poles)
- Bushfire risk rating of the area

Pruning to achieve the minimum clearance space around electric lines is exempt from a planning permit.

For details on Council's electric line clearance responsibility and works program refer to the Nillumbik Electric Line Clearance Management Plan.

2.6 Telecommunication line clearance

Telstra, who own the aerial telecommunication cables, are responsible for their installation, maintenance and inspection. Telstra do not have a programmed and managed inspection program of their aerial assets, and the Municipal Association of Victoria advise that there is

no specific legislation requiring councils to clear trees from near aerial telecommunication cables. Council is responsible for management of roadside vegetation.

Telstra only undertake repairs to their cables in response to the monitoring of their network or to reported faults and do not maintain trees that are impacting aerial telecommunication cables. In response to a service request after a telecommunication network fault caused by trees, Council will clear any portion of the tree that has been in continuous contact with the abraded cable sheath.

When requested, Council will arrange for an inspection by a qualified Arborist, and where necessary, works near telecommunication cables in situations where the sheath of the cable has been abraded and a portion of the tree remains in continuous contact with the cable.

2.7 Tree removal

Council seeks to avoid tree removal wherever possible; however the outcome of an assessment may require unavoidable tree removal. Council will seek to retain large, healthy and structurally sound trees and structural branches. However, removal may be considered for the protection of public safety, assets or tree health.

Removal may be justified when:

- A tree or branch poses a risk to property or life
- Trees and/or branches encroach into the clearance space and pruning or other traffic management structure cannot achieve a safe outcome
- There is clear evidence that a tree has been impacted (hit/knocked) by vehicles
- A tree is impeding lines of sight along roads
- Immature trees with a trunk diameter less than 16cm are growing within the road formation (road batter) and have the potential to cause an obstruction in the future
- It is needed to maintain a healthy urban forest
- It helps ecological restoration in bushland reserves (such as weed control or ecological thinning)
- It facilitates approved development and infrastructure improvements, including vehicle crossovers between the road and a property
- A tree is listed as an environmental weed but does not form part of a significant hedge such as the Hawthorn hedges in Kangaroo Ground.

Following are options to avoid removal:

- Only removing the vegetation required to achieve the outcome
- Pruning the outer branches of large dead trees, leaving the main trunk and shortened structural limbs. This is only considered if it is a requirement of a planning permit or where the tree is located in a reserve in an urban area or along a roadside or in a reserve in a rural area and where the tree is located away from an asset and it can be safely retained for habitat
- Changing the location of vehicle crossovers where possible.

The process followed is dependent on statutory requirements. Decisions to remove trees will be made on a case-by-case basis balancing public safety, tree health, environmental protection and amenity values. This includes tree removal, but also major lopping or pruning works that may have similar requirements.

For non-emergency works the process involves:

1. Identifying the need for removal including investigating all other tree management options and considering the impacts to public safety and the natural environment
2. Considering and applying relevant federal and state native flora and fauna legislation and planning overlays
3. Seeking a planning permit if required
4. Assessing environmental sensitivity and responding according to the processes outlined below
5. Community consultation where appropriate
6. Tree removal works
7. Planting a replacement tree or providing a vegetation offset.

2.7.1 Assessment and consultation for small-scale tree removal in low environmentally sensitive areas

Small scale tree removal planned for areas of low native vegetation and habitat significance can be characterised as follows:

- Removal and replacement of street trees planted by Council in urban areas
- Exotic trees throughout the Shire not identified as significant in the Eltham Heritage Study (1996), Nillumbik Heritage Study (1996), Significant Tree Register (1999), Nillumbik Heritage Study Stage 2 (2001) and C13 Heritage Amendment (Draft 2006)
- Works resulting from an approved Master Plan which includes a Tree Removal Management Plan
- Roadwork, road widening, footpaths or other capital works where designs have been approved by the Director of Sustainability and Place, any consequential tree removal, where communication with the local community has occurred and where a planning permit is not required.
- Tree removal works associated with road maintenance and electric line clearance works
- Tree removal in a recommendation by an Arborist and associated with a service request.

In these cases tree removal works can be referred directly to the tree crew or a contractor if a planning permit is not required. Information will be provided, as required to adjoining landowners or affected residents.

2.7.2 Assessment and consultation for small-scale tree removal in high environmentally sensitive areas

These works involve the removal of a small number of trees (less than 5) in a bushland reserve. Depending on the location, relevant officer(s) from Open Space and Environment will determine if tree removal should occur or if there are more appropriate tree maintenance options available.

Assessment will involve:

- A site inspection by an Arborist
- Consideration of the Arborist's report
- Desktop analysis of available environmental data

Their assessment will consider:

- The impact to fauna habitat
- Public safety
- Public amenity
- Potential for ongoing maintenance

Information will be provided, as required to adjoining landowners or affected residents.

2.7.3 Assessment and consultation for large-scale removal works in environmentally sensitive areas

Large-scale removal works involve the removal of more than 5 trees in the same area and may require the development of a Tree Removal Management Plan and approval by Council's Environment, Biodiversity and Sustainability Coordinator and Manager of Environment.

The plan should include:

- Implementation of the Victoria's Native Vegetation Permitted Clearing Regulations 2013
- A method for removal
- The timeframe for works
- A strategy for rehabilitation of the site
- A communications plan identifying the most appropriate method to inform the community of the removal works.

The communications plan component will vary depending on the level of sensitivity. It may include:

- A sign on the site
- Information provided to adjacent properties and/or user groups indicating:
 - action to be taken (or action that was taken in the case of emergency work);
 - reasons why retention is not possible;
 - timetable for works, and

- replacement program and timeframes (if applicable)
- For removal with a higher degree of environmental significance and/or lower risk to public health and safety:
 - information about the plan provided to the wider group with a comment period provided allowing residents an opportunity to comment on the proposal
- For highly sensitive matters, such as works on public land where community/friends groups take an active interest in maintenance:
 - consultation with the interested parties prior to developing a preferred option and management plan
- For high sensitivity/environmental impact tree removals and if determined by the Manager of Environment:
 - notification to the Ward Councillors.

2.7.4 Pruning/removal of habitat trees

Where a tree is of significant size to form hollows in branches, the preference in certain circumstances is to prune the outer branches and shorten structural limbs so that the main trunk remains to create a habitat tree. This encourages hollows to naturally occur over time in the trunk and limbs, providing habitat for native fauna.

Trees will not be retained for habitat along roadsides in urban areas unless directed as part of a planning permit. Trees may be retained for habitat in reserves in urban areas and roadsides and reserves in rural areas where safe to do so. Council will prune trees for habitat in rural areas where the pruned tree is located away from private property, roads, car parks and footpaths, so that its future failure does not present a hazard. The location of the habitat tree should be recorded so that the tree may be inspected on a scheduled basis.

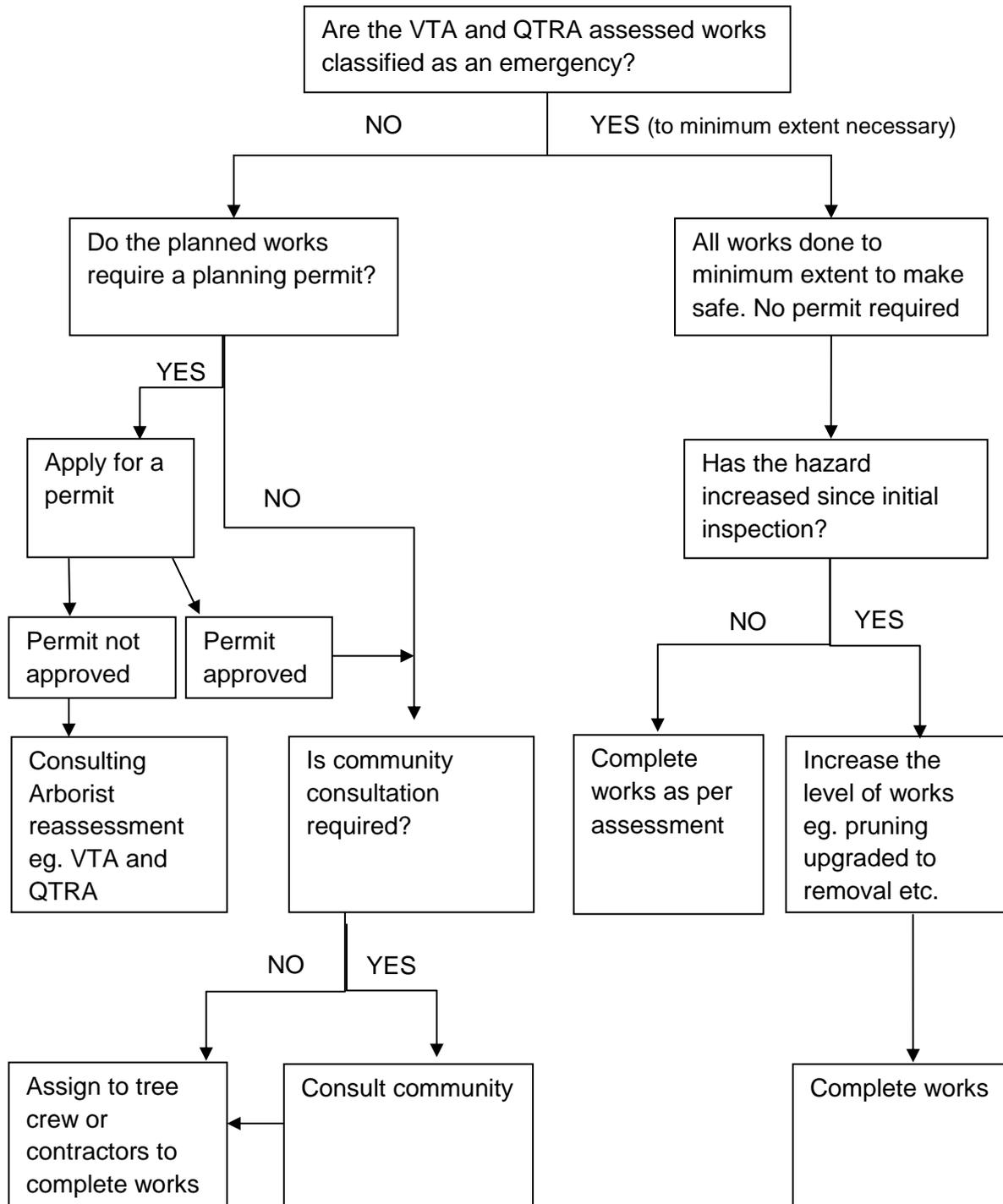
2.7.5 Tree removal for vehicle crossovers

Residents or developers may request the removal of trees on Council land for the installation of vehicle crossovers or for property development purposes. Council requires residents or developers to take into account the location of trees in the road reserve or on nature strips when designing buildings or contemplating vehicle crossings. Residents and developers cannot assume that Council allows a tree to be removed to provide access.

If a property owner requires a new vehicle crossing in a location at or near an existing street tree, a Council Arborist will assess the tree. If the tree is mature and healthy and the proposed crossing is closer than 3 metres from the trunk of the tree, then a vehicle-crossing permit will be denied. If the crossing can be moved further than 3 metres away from the tree, then a permit may be given to construct a vehicle cross over.

However, if the tree is assessed to be in poor condition or streetscape/amenity value, the resident or developer may need to submit a planning application to remove the tree and also pay for any fees associated with the permit. The permit will be assessed and if approved, the resident or developer will be responsible for organising and paying for the tree removal works as stated in the planning permit using one of Council's approved contractors. Figure 2 outlines the decision making process for pruning or removing a tree by a qualified Arborist.

Figure 2: Tree pruning and removal process by an Arborist after a Visual Tree Assessment and QTRA.



2.8 Stumps

Stump removal is the process of grinding a tree stump to below ground level and backfilling the hole to make the ground level. When a tree is removed the trunk will be cut off near ground level. In most cases, it is not necessary to remove the stump unless it poses a safety hazard to the public. Council will inspect and remove stumps that pose a hazard within 3 months.

2.9 Tree roots

The roots of trees on Council land can cause damage to nearby infrastructure such as driveways (including crossing places), other paved areas, or private pipes (such as water, sewerage, gas etc.).

The claimant must provide evidence of the cause. Evidence could include the claimant exposing the roots under the damaged infrastructure and requesting Council to inspect, or a written report from an Engineer.

Council will inspect the tree and the damaged area. Possible solutions may include severing the roots, installing a root barrier or removing the tree. The preferred option is to remove the tree and stump to eliminate any possible chance of further damage that Council may then be liable for repairing. Severing of roots and root barriers will be considered for listed significant trees. A planning permit with an Arborist and Engineer's report may be required.

2.10 Regrowth management

Regrowth is a regenerative stress response (eg. drought, pruning, vandalism, pathogen attack etc). This can be epicormic growth (new shoots forming up trunks or along structural branches), root suckering (shoots form and emerge at points along a tree's root system), lignotuber shoots in some *Eucalyptus* species (shoots emerge from the base) and graft regrowth (shoots emerge from the grafting sites rootstock).

Regrowth can be an issue under electric lines, in the box clearance space and along road corners where it can reduce sight lines. Where possible, regrowth should be managed by removal to ground level and applying the cut stump with herbicide to prevent regrowth.

2.11 Tree vandalism

Tree vandalism is the deliberate poisoning, removal or damage of a tree. Vandalism to trees occurs infrequently in Nillumbik. Unauthorised tree pruning is when a resident or property owner damages a tree on Council land, makes the tree structurally unsound or reduces the aesthetics through inappropriate pruning without written permission from Council.

Existing processes are in place to follow up with enforcement where there is sufficient evidence of vandalism. Council will not retain vandalised trees as a deterrent unless specified by the enforcement process.

In both instances of tree vandalism and unauthorised tree pruning, Council may seek reimbursement of the damage and the lost amenity value of the tree. Cost of repair or replacement of a damaged or removed tree will be based on commercial rates derived from an approved tree valuation method such as the Burnley Method (Fitzgerald 2005).

2.12 Significant trees

Significant trees are individual trees or a group of trees (such as avenues), which have unique or noteworthy features that the community consider important. These trees may have environmental/ecological, historical, cultural or horticultural value (see below). Significant trees on private and public land within the Shire are listed as a Schedule to the Heritage Overlay of the Nillumbik Planning Scheme.

Table 3: Examples of characteristics and definitions of tree significance used by the National Trust

Significance	Description	Qualifying Tree Types
Horticultural Value/ Rarity	Outstanding horticultural or genetic value; could be an important source of propagating stock, including specimens that are particularly resistant to disease or exposure. Any tree of a species or variety that is rare.	<ul style="list-style-type: none"> • Tolerance selection (pest & disease) • Propagating potential • Scientific value • Only known species • Rare species (2 to 50 known specimens) • Particularly old • Outstanding specimen of type (size/age/aesthetic value) • Curious form
Historic, Aboriginal Cultural or Heritage value	Tree could have value as a remnant of a particular important historical period or as a remnant of a site or activity no longer in action. Tree has a recognised association with historic aboriginal activities, including scar trees. Tree commemorates a particular occasion, including plantings by notable people, or having associations with an important event in local history.	<ul style="list-style-type: none"> • Farm remnant/windrow/hedge • Local past industry • Historic garden/park/cemetery • Important landmark • Connection to Aboriginal culture eg. scarred trees and Corroboree trees • Historic planting style (e.g. Avenue) • Commemorative tree for cultural group, war, Royalty, visiting dignitary and Australian, Victorian or Local public figure

Significance	Description	Qualifying Tree Types
Ecological value	Tree could have value as habitat for indigenous wildlife, including providing breeding, foraging or roosting habitat, or is a component of a wildlife reserve.	<ul style="list-style-type: none"> • Breeding habitat • Foraging habitat • Remnant Indigenous vegetation
Other	Trees that do not fit into other categories but have an intrinsic value that sets them aside from other trees.	<ul style="list-style-type: none"> • Sentimental • Landscape • Covenant Protection (section 173 agreements)
Significant avenue	Street trees in good to very good condition. The species are well suited to the site. There is approximately 85-100% stocking in the street. The trees create an 'Avenue Effect'. There is a distinct link to the building period or surrounding landscape. There may be an attached significance to the trees (particularly if there is an indigenous content). A significant avenue may also be an identified 'Avenue of Honour' to commemorate a significant historical event.	

(Adapted from National Trust of Australia (Victoria): Significant Tree Register Criteria)

The Nillumbik Planning Scheme provides the mechanism for the public to nominate trees of historical or cultural significance. There are currently 154 trees and 3 avenues or hedgerows of trees on 29 sites on Council owned or managed land listed in the Heritage Overlay and by the National Trust. The Heritage Overlay requires Council to maintain these trees to best practice standards. Significant trees on Council owned and managed land are listed in Appendix 6.5.

The Electric Line Clearance Regulations require councils to provide the power supply companies with a list of significant trees that are in proximity to overhead electric lines. The power company is then obligated to inform Council each time they intend to undertake pruning works of a significant tree.

Service requests (community and internal) trigger tree inspections and maintenance works. Council may run a program of proactive inspections and maintenance if financial resources allowed.

Managing significant trees may include removal if they pose a risk to public safety. Tree works on any listed significant tree will require a planning permit unless the works are emergency works. If a significant tree is removed for emergency works, the Strategic Planning Unit must be notified so that they can modify the Schedule to the Heritage Overlay.

Replanting with the same species may not retain the historical significance unless the significant tree is part of an avenue, has a relationship to a historical house or notable person or is a rare species. In these cases, propagation (if possible) from the original tree for replacement planting may be appropriate. Environmental factors need to be considered when using this option.

Significant trees on public land as such an asset and allow for community appreciation thought being about to interact with these trees. Council could actively promote and raise community awareness of these trees, such as:

- Making a map and list of significant trees available
- Providing information on Council's website
- Writing articles for community newsletters, local papers and social media
- Developing a brochure or fact sheets
- Developing signage

An education program should only be implemented once a proactive maintenance program is in place and ongoing to manage the significant trees.

3 Tree Maintenance Work Specifications

The following section specifies the on-ground requirements of tree maintenance works delivered by Council's tree crew or a contractor. Council will maintain high tree maintenance standards at all times.

The majority of tree maintenance includes pruning or tree removal for the following purposes:

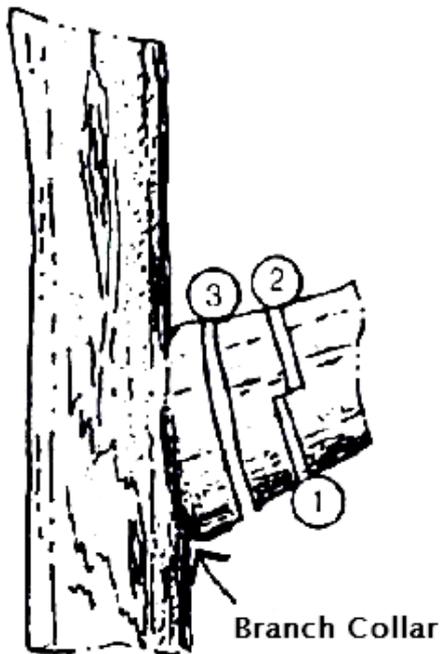
- Providing clearance around electric lines in designated areas
- Providing clearance for footpaths and roadways (box clearing) and around street signage and street lights
- Removing branches or trees that pose a hazard to people or property, including dead wood and hanging and fallen branches
- Clearing branches that have hard contact with a telecommunication line
- Formative pruning - if required
- Tree maintenance can also include removal of stumps, management of tree roots and control of pests and diseases.

3.1 Delivering pruning and tree removal works

When delivering pruning and tree removal works the tree crew or contractor will:

- Only remove trees or structural branches at the direction of the responsible Council officer. They will ensure any appropriate permits or consultation has occurred. Except for emergency works, will only be done at the recommendation of a suitably qualified Arborist
- Aim to deliver a high standard of pruning works that reduces the hazard posed by the tree while leaving a healthy, well-balanced tree of good growth and aesthetically pleasing appearance. Pruning that would negatively impact long-term tree health is to be avoided
- Prune to the Australian Standard 4373-2007 Pruning of Amenity Trees. This Australian Standard describes methods for pruning of trees and encourages correct and uniform practices. It is for use on amenity trees and includes formative pruning, hazard reduction, selective pruning and thinning
- Use the Three Cut Method when pruning vegetation to minimise the extent of wounding (see Figure 3). The Three Cut Method of pruning, when done correctly, minimises damage to the tree and reduce the likelihood of tearing the bark and damaging the vascular system of the exposed stub.

Figure 3: Three cut method for removing large limbs and branches



The collar of the branch needs to be located prior to pruning. The first cut is applied to the underneath of the limb to be removed to a depth of approximately a third into the limb or to the point where the weight of the limb prevents any further cutting.

The second cut occurs on the top of the limb immediately above the undercut. This cuts through the rest of the limb and the previous undercut ensures that the severed limb falls cleanly without tearing any bark from the limb stub or trunk of the tree.

The third cut removes the limb stub to a point which minimises the area of the trunk or limb stub exposed to the air, which in turn minimises the opportunity for disease organisms to enter the tree. It is important not to cut into the collar so effective callousing can occur and future incorporation into the trunk (eg. the pruning site closes over reducing pest and disease likelihood).

- Some trees cannot be pruned to meet the purpose of the works and the Australian Standard. In these circumstances prune to the best possible standard to achieve an outcome that is safe for the public and limits the impact to the tree health. Examples of works that can meet the standard include:
 - the tree is old or lacking vigour and inappropriate pruning may cause a decline in health or even tree death
 - pruning could lead to extensive stress and encourage epicormic regrowth that has poor attachment
 - maintaining clearance requires removal of structural branches, causing undue harm, such as creating large wounds that providing entry points for pathogenic organisms and decay
 - the tree provides important habitat (see section 3.1.1).

If works involve removing a tree the tree crew or contractor will also:

- Only remove trees or structural branches at the direction of the responsible Council officer. They will ensure any appropriate permits or consultation has occurred

- Not grub out tree stumps if they provide habitat or occur in an environmentally sensitive area
- Cut tree stumps of no habitat value as close to the ground as possible unless located where regrowth is desirable and likely to occur
- For stump removal for bushfire mitigation works such as slashing, cut the stump level with the ground or treat with a stump grinder
- For tree removal works in the box clearance space and environmental weeds, remove stumps to ground level and treat with herbicide to prevent regrowth.

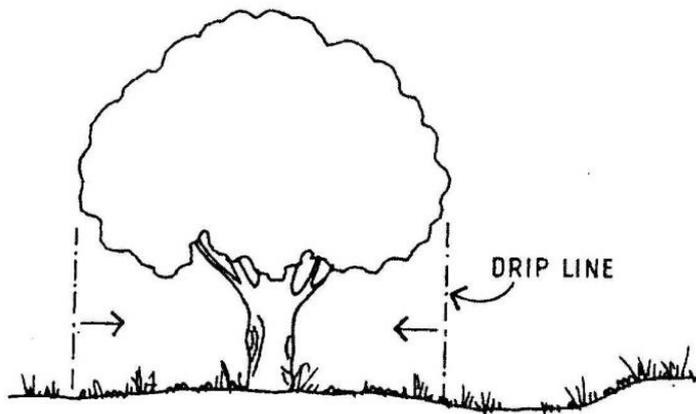
3.1.1 Habitat retention

Trees and their hollows provide important habitat for many native species. Older large indigenous trees provide the best habitat (food, hunting sites, breeding sites, shelter and refuge). As trees age, they naturally form hollows in the trunk and limbs that provides habitat for many birds and mammals. Urban and rural development has increased the loss of many of these larger habitat trees so all trees (living or dead) with potential hollows are of high retention value.

To help retain habitat, works will:

- As far as possible retain habitat for wildlife
- If a tree shows signs of use by animals or contains hollows, talk to the responsible Council officer. They may determine that a fauna specialist should be present during works
- Only remove the minimum amount of vegetation required to achieve the purpose of the pruning works. The responsible Council officer assessing the tree should have thoroughly assessed other options (such as using white lines to direct traffic away from kerb or installing warning signs in streets known to have low clearance)
- Fell trees/branches onto roads in bushland road reserves to minimise disturbance to the ground and to vegetation on the road reserve when possible
- Avoid the use of heavy machinery around bushland vegetation
- Prune back large dead trees to retain as habitat
- Ensure minimal disturbance to the soil and existing vegetation. Identify and mark out works zone, avoid disturbing vegetation outside the works zone and construct temporary fencing if required
- Minimise the use of heavy machinery/vehicles within the drip line of trees to avoid root damage and soil compaction (see Figure 4). Fell timber (using chainsaw and cherry picker) so that machinery does not enter the bushland road reserves. If machinery has to move off the road formation or onto adjacent land this must be authorised by the responsible Council officer or the owner of the land.

Figure 4: Avoid using heavy machinery and disturbing soil under tree drip lines



3.1.2 Removing and disposing of pruning material

Pruning material is to be chipped and removed from site on the same day as the works are undertaken, unless the pruning or tree removal works are part of a storm event when the pruning or removal may not be completed for a number of days.

When pruning or removing vegetation **in urban areas** the tree crew or contractor should, where practical:

- Retain felled limbs of indigenous trees containing hollows and consult with the Environmental Works team for a site where limbs can be relocated to continue to provide habitat
- Remove remaining pruning material from the site and dispose of at an appropriate green waste processing or transfer facility.

When pruning or removing vegetation **in bushland** the tree crew or contractor should:

- For indigenous trees:
 - retain cut branches and trunks greater than 30 centimetres in diameter as habitat logs. Cut logs into lengths. If practical, consult with the Environmental Works team for another site where limbs can be relocated so that they can continue to provide habitat
 - mulch smaller felled vegetation for use on-site or elsewhere
 - cut larger felled vegetation that cannot be retained or chipped on-site into smaller pieces and leave for collection by the public
- Where possible, remove weeds from the site and dispose of at an appropriate green waste processing or transfer facility
- Saw, split, or chip vegetation with due regard to the understorey. Restrict these activities to as few sites as possible and use a cleared site if one is available close by
- Unless exemptions apply, do not 'tidy up' areas of indigenous vegetation, leaf litter, rocks, trees with hollows, naturally fallen limbs and dead vegetation at various stages of decay, standing pools and marshy ground. These all provide quality habitat for wildlife and should be retained on the roadside. Consult with

Environment, Biodiversity and Sustainability Coordinator and the Municipal Fire Prevention Officer if uncertain.

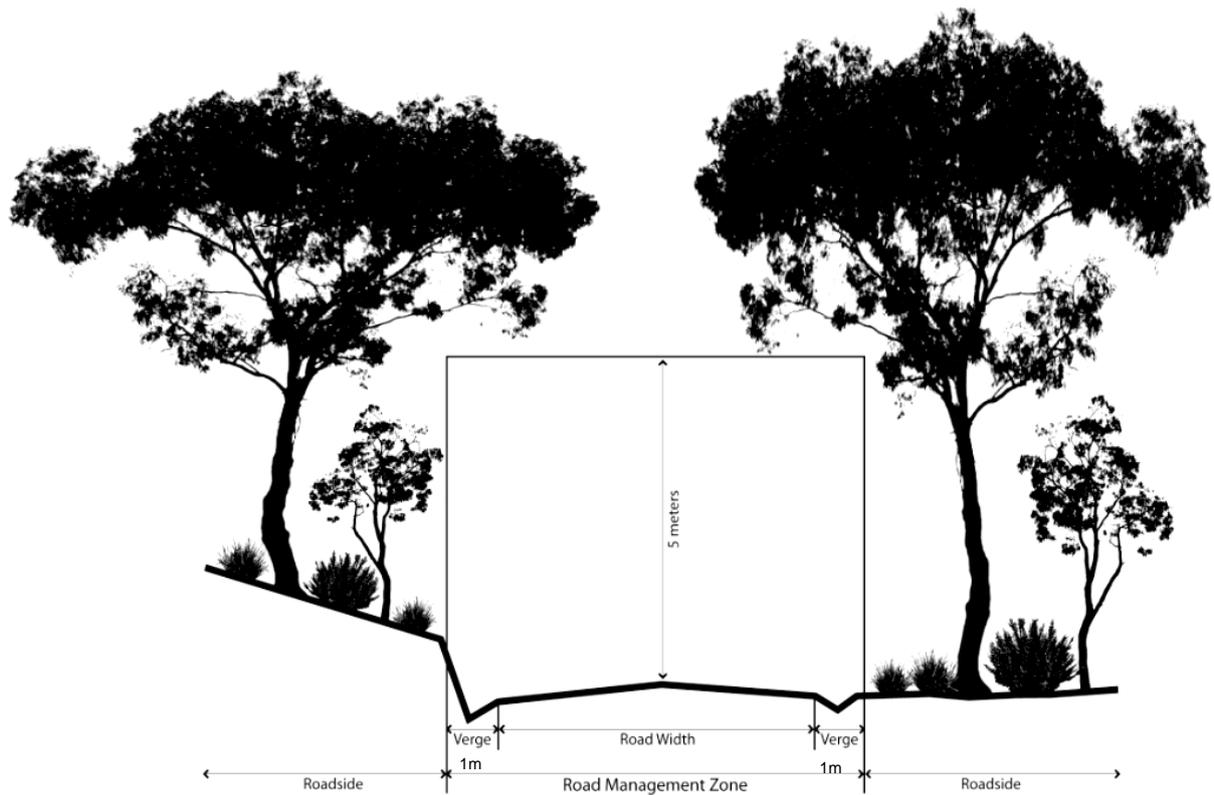
3.1.3 Clearance spaces

When delivering clearance works the tree crew or contractor should apply the clearance requirements specified in Table 4 when pruning trees and other vegetation to maintain appropriate electric line clearances, box clearances and sightlines. Safety of road users is the key determining factor in the management of roadside vegetation. The amount cleared should take into the requirements and an estimate of regrowth before the next pruning cycle to try to maintain clearance spaces at all times.

Table 4: Clearance Requirements

Access Type & Clearance Location	Clearance
Electric line clearance	Refer to Electric Line Clearance Regulations
Pedestrian Over footpaths, driveways, walkways, nature strips, vehicle cross overs, trails	Height of 2.5 metres
Vehicular Over roadways	Height of 5.0 metres and 1 metre either side of road edge (see Figure 5)
Motorist / Pedestrian visibility Along road user sight lines	Height of 1.5 metres
Street Lighting Around lighting tube Streetlight cables / from cable	Distance of 1 metre Distance of 600mm
Road Signage From signs	As required to maintain visibility
Traffic Control Devices From control devices	As required to maintain visibility
Lines of sight	(see Figure 6)

Figure 5: Road box clearances

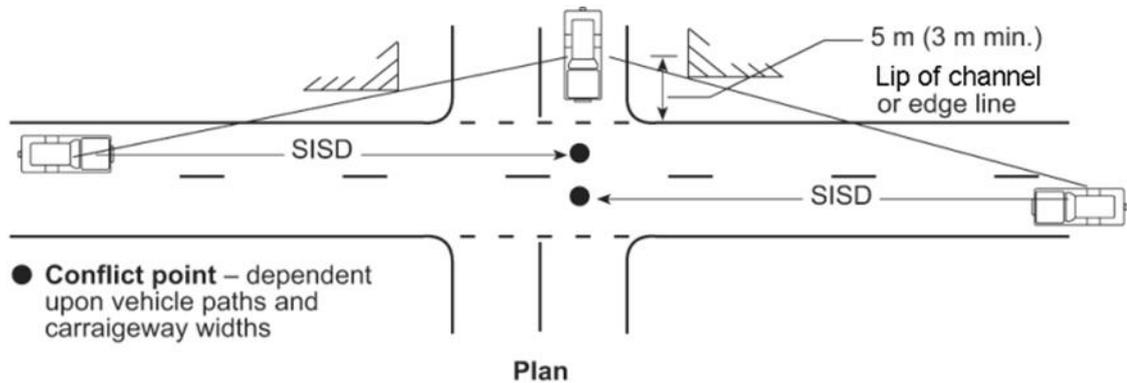


Manage vegetation at intersections and around curves to provide safe sight distance for approaching traffic depending on the road design and category, speed limits, topography and the type of vegetation present.

- Use the Austroads Standards for intersections (see Figure). There is no standard for road curves so clearance must be determined on a case-by-case basis

- Only remove vegetation that impedes visibility, retaining low lying shrubs and ground covers that do not impact lines of site.

Figure 6: Austroads Standards for Safe Intersection Sight Distance (SISD). Adapted from the Austroads Guide to Road Design (2010).



Design Speed (km/h)	40	50	60	70	80	90	100	110	120	130
SISD (m)	73	97	123	151	181	226	262	300	341	383

3.2 Tree pest and disease control

Pest and diseases are a normal part of a tree's lifecycle and may vary in intensity due to changes in environmental such as drought and site conditions such as a change in hydrology. Plants are adapted to cope with seasonal pest and diseases and under normal circumstances will not require intervention. However, when an infestation is severe and outside of the normal then treatment will be considered. Treatment should only occur if it can be done efficiently, effectively, at a reasonable cost and using a licensed pest controller. If Council determines that a severe pest and disease infestation should not be treated they will prepare communications to notify the public of the issue. See Table 5 for advice about specific pests and diseases.

Council may treat pests and diseases that are affecting the lifespan of a listed significant tree identified through a service request on a case-by-case basis.

Table 5: Advice about specific pests and diseases

Pest / Disease	Description
Lerps, Sawfly and other sap sucking insects	These insects are a natural part of the native and indigenous vegetation community. These insects will rarely cause the death of a tree alone. Insect numbers are seasonal; therefore broad scale control is unnecessary. In situations where insects are significantly damaging a listed significant tree or trees to the point where the

Pest / Disease	Description
	damage may lead to the premature decline and senescence, consider the use of chemical controls to reduce the insect population.
Elm Leaf Beetle	There are two avenues of Elm trees in the Shire. Elm Leaf Beetle skeletonises the leaves, leading to defoliation of the tree in severe infestations. The skeletonising of the leaves reduces the photosynthetic ability of the tree, reducing its capacity to generate food. Continued Elm Leaf Beetle predation can cause the premature decline and senescence of elm trees. Elm Leaf Beetle control is only practical through the use of systemic insecticides which are injected into the tree and translocated to the leaves. Foliar application of insecticides is not practical. Elm Leaf Beetle control via use of a systemic insecticide would need to be undertaken on a regular basis (every 3-5 years) to maintain the health of the avenues of Elm trees in the Shire.
Myrtle Rust	Myrtle Rust poses a real threat to a strong majority of the Shire's canopy and understory. This is a fungus species that spread easily affecting plants in the Myrtle family (Myrtaceae) including <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Callistemon</i> (amongst others). As there are Myrtle family species across the Shire in very high numbers, this fungus has the ability to devastate the vegetation structure Shire-wide. From a biosecurity perspective, Council should monitor trees for the presence of Myrtle Rust and seek further advice and assistance from relevant authorities if there is a suspected infestation. Council should be notified if residents or visitors to the Shire have identified the presence of Myrtle Rust.
Termites	Investigate requests for termite treatment only in situations where a landowner can provide evidence from a licenced pest controller that termites on their property have originated from a specific tree on Council land. The residents would also need to provide evidence of termite treatment and prevention on their property.

4 Tree Planting

Council run a number of tree-planting programs on Council owned and managed land based on community and environmental need.

Council use predominantly indigenous tree species with some non-local natives and exotic tree species where appropriate. The work involves the initial supply and planting of trees and tree establishment works (mulching, watering, weed control, formative pruning).

Planting will be done in consideration of existing bushfire mitigation treatments including designated Neighbourhood Safer Places - Places of Last Resort.

The quality of the planting stock is a vital factor contributing to the longevity of the tree in the ground. Council should be sourcing planting stock that meets the AS 2303:2015 Tree stock for Landscape Use, and require this standard of developers when planting trees in new developments.

4.1 Tree planting programs

4.1.1 Street trees

Street trees have a pronounced positive impact on the landscape. Research has shown that street trees help cool streetscapes in summer, provide character, increase house values (compared to streets that do not have trees) and over-all is one of the most effective ways of improving the liveability of urban areas. Council plants advanced trees in urban nature strips and traffic features (e.g. roundabouts, medians, kerb outstands).

Planting within roadsides with remnant vegetation is not considered as part of this program. Council run programs of infill planting, whole street planting and replacement planting depending on budget and need.

Infill planting is planting to reinforce the existing planting design, generally occurring within an existing street tree theme. Council's infill planting program prioritises the replacement of removed trees, unless site limitations prohibit. The following circumstances may trigger infill planting:

- The need for replacement of tree/s removed as part of normal maintenance
- Resident request for an individual tree planted outside their property, where space permits
- Council officer or resident request to plant available spaces within a street to complete or reinforce a tree avenue or streetscape

Whole street planting

This is planting to implement the Nillumbik Neighbourhood Character Study by:

- Establishing trees in new developments (delivered or funded by the developer)
- Establishing trees in streets with little or no previous planting, identified through resident requests or proactive inspections

- Replacing a street tree where trees are inappropriate or poorly performing, identified through resident requests or proactive inspections

Whole street planting creates significant plantings of continuous species type and size allowing Council to focus resources and standardise management practices.

With the exception of developments, potential streets for planting are identified by requests from residents or group of residents, and from the recommendations of Council officers. If time and funding permit, Council can decide to proactively identify potential streets.

Table 6 outlines the decision guidelines Council use to prioritise streets. The final decision on which streets to include in each financial years planting schedule should be based on the funding available and feasibility of the project (seasonal conditions, number of trees required, and availability of stock). Longer streets may include planting over several years. There is no limit to how long a street can remain under consideration and no preference given to streets based on the age of the request.

Replacement planting

This reinforces the existing street tree theme within a street or Character Precinct by planting the same or similar tree species dominant along the length of the street. There is no requirement for consultation about the selected replacement street tree species. Trees should be planted in favourable planting conditions eg. autumn.

Replacement of inappropriate or poorly performing trees may occur over several years with trees removed as they naturally age and replanting with a more suited species. Tree removal must meet all legislative, assessment and works requirements specified in this document. Trees may be considered poorly performing or unsuitable if they:

- Are in decline
- Pose a high potential hazard (or high potential for litigation from damage or injury)
- Pose a potential for a statutory breach
- Are not growing to expectations
- Are an unsuitable species (e.g. environmental weed or low tolerance for the site)
- Are impacting on adjacent infrastructure.

Table 6: Decision guidelines for including a street in the whole tree planting program

Criteria	Sub-criteria	Score
1. Assessment of necessity of new street tree planting	a. High priority (existing trees senescent (age) & in severe decline; inappropriate species; few existing trees and no limiting factors)	10
	b. Medium priority (Declining or inappropriate species; opportunities for substantial planting)	4
	c. Low priority (existing streetscape reasonable but requires enhancement)	1
	d. No opportunity to plant trees	0
2. Unity of residents to principle of removing	a. Majority of residents included in petition/group letter	5

Criteria	Sub-criteria	Score
existing trees & planting of new trees (deemed from petition or group letter)	b. No united approach from residents	0
3. Road hierarchy (see the Nillumbik Shire Council Road Management Plan for details)	a. Link road or collector road; entrance to Shire or township	5
	b. Local residential / Access street	3
	c. Industrial road / commercial precinct	1
4. Percentage of vacant sites	a. 80% or higher vacant sites	5
	b. 50-80% vacant sites	2
	c. Less than 50% vacant sites	1
	d. Full stocking of street	0
Total		/25

Trees are planted between April to September during months with higher rainfall to allow the trees time to start to establish before summer. Trees are watered throughout summer for the first 1–2 years after planting to assist with establishment.

Council sends a street tree planting notification letter to all residents of a street at least 2 weeks prior to the start of whole street planting. The species, size of stock and location of all street trees planted are documented.

4.1.2 Recreation reserves and Council managed properties

Trees are fundamental for all Nillumbik's parks, reserves and public spaces where shade is particularly important. Council plants trees and other vegetation types to enhance amenity value, increase quality and useability of public spaces for the community and environment. Many of these sites are blends of urban parks and bushland, some more than others. Plants are selected based around the context of the site which maybe for amenity horticulture and/or revegetation sometimes to support remnant vegetation. Often this is a combination of tubestock for, ranging pot sizes to semi-advanced stock. Planting may be triggered by a landscape plan, reinforcement of the existing design, service requests or as identified by a Council officer.

4.1.3 Bushland revegetation and supplementary planting

Council plants indigenous species bushland areas (reserves, wetlands and roadsides) to support biodiversity, buffer and connect indigenous and native vegetation and provide habitat for threatened species. Council also support indigenous revegetation and supplementary planting in Council bushland reserves and on private land through 'Friends of' Groups, Landcare and the Council incentive programs.

The unique environmental landscape of Nillumbik Shire is largely due to challenging topography that has been left undeveloped leaving a large amount of space with remnant vegetation. Tree planting in roadsides with substantial remnant vegetation should adhere to the State Government principles regarding a 'no net loss' of native vegetation.

4.1.4 Offset planting

Under some circumstances Council may need to plant within Council reserves to offset vegetation removal elsewhere. This planting is subject to the requirements of an offset plan. Council has a number of offset sites within the Shire including Professors Hill and other Council reserves that are available for offset works.

4.1.5 New developments

Street tree planting is a condition of new sub division development within the Shire. As part of an application for a subdivision that creates roads or public open space, developers are required to submit a landscape design to meet the requirements of Clause 56.05 (Urban Landscape) of the Nillumbik Planning Scheme in urban areas, or as specified in other Council documents.

Council staff responsible for landscape design, open space maintenance, bushland maintenance and/or arboriculture will approve the landscape design and species selected in accordance with these guidelines. When the developer organises the planting they must also meet Council's minimum requirements specified in this document. New street tree plantings require a minimum of two years establishment period maintenance before they are handed over to Council to maintain. Street trees that do not meet assessment criteria will require replacement by the contractor.

4.1.6 Residents planting on Council land

If a resident wishes to plant trees or other vegetation on Council land (e.g. nature strips, roadsides and reserves), they must seek written permission from Council before doing so. This includes planting for amenity, environmental and memorial purposes. The resident can only use plants listed in the Council publication '*Live Local Plant Local*'. Council may remove such plantings at their discretion and no compensation will be available to residents for the removal of these plants.

4.1.7 Memorial tree planting and plaques

Council receives a small number of requests to plant a tree and plaque in a Council reserve in memory of a deceased person. The approval of these requests is at the discretion of the Parks and Parks and Open Space Coordinator based on the following conditions. Council will advise the resident that a tree can be planted including a plaque based on the following conditions:

- Tree species selection will be at the discretion of the Parks and Parks and Open Space Coordinator in line with these guidelines
- Council require the resident to pay for the purchase of the tree
- The resident can request the reserve in which they would like the tree planted and a preferred area within the reserve. The final location will be agreed between the Parks and Parks and Open Space Coordinator and resident

- Planting will occur in the cooler months of the year
- Plaques can be placed next to the tree. The plaque must be of an approved dimension and the text must only state the name of the deceased person/s
- A memorial tree will be treated as with other trees in reserves, there is no special treatment and no additional maintenance works that will be carried out on a memorial tree
- If for safety reasons or if the tree has died, Council will not notify the resident of the removal of the tree. Council will not replace the tree or plaque if they are removed or if the tree dies.

4.2 Design considerations

The design of plantings considers:

- Character precinct
- Zone (urban, rural, commercial and industrial)
- Planting style
- Road hierarchy (link, collector, access)
- Site limitations
- Species selection
- Sourcing planting stock
- Habitat
- Visual interest
- Flowering calendar – pollinator attracting

Council may develop a landscape plan or works plan which may include:

- The number of each species
- The locations for planting
- Required site preparation and maintenance.

4.2.1 Character precincts

Nillumbik Shire Council has a diverse range of urban, bush and rural areas with corresponding landscape character. The Nillumbik Neighbourhood Character Study identified seven Character Precincts and design guidelines for each (Table 7) Eltham overlay.

Table 7: Street tree design guidelines for the Character Precincts

Character Precinct	Areas include	Street tree design objective and responses	Street tree selection and design considerations
Garden Court Precincts (GC)	GC1 – Apollo Parkways GC2 – Diamond Creek Road	To continue the native tree canopy as part of a	Mixture of Australian native and indigenous species.

Character Precinct	Areas include	Street tree design objective and responses	Street tree selection and design considerations
	GC3 – Diamond Creek North & West GC4 – Diamond Creek East GC5 – Lower Diamond Creek GC6 – Eltham North and Research GC7 - Riverview	flowing tree dominated landscape. Retain and replant Australian native canopy trees within the street verge in informal avenue layouts.	Use indigenous trees to link or reinforce private and public open space. Informal planting style. Powerline plant where required with smaller species.
Bush Garden Precincts (BG)	BG1 – Woodridge BG2 – Eltham – Bolton Street BG3 – Hurstbridge BG4 – Main Road Grid	To continue the native tree canopy as part of a flowing bush garden landscape. Retain and replant Australian native and indigenous trees within the street verge. In BG4 introduce consistent bush avenue with single theme species along all streets.	Primarily indigenous with some Australian natives. Informal planting style. Powerline plant where required with smaller species.
Semi Bush Precincts (SB)	SB1 – Research SB2 – South Eltham SB3 – Eltham, Eltham North SB4 – Wattle Glen, Lower Hurstbridge	To continue the indigenous tree canopy as part of a flowing bushland landscape. Retain and replant indigenous canopy trees within the street verge in an informal layout.	Primarily indigenous species. Bushland/Indigenous grouping. Include understorey species where appropriate and space allows. In-fill planting only.
Bush Precinct (B)	North Warrandyte (reserve planting only)	No street tree planting	Indigenous species only. Include understorey species where appropriate and space allows, e.g. <i>Bursaria spinosa</i> .
Rural Precinct (R)	Diamond Creek, North Research	To continue the indigenous tree canopy as part of a flowing bushland landscape. Retain and replant indigenous canopy trees within the street	Primarily indigenous species. Bushland/Indigenous grouping. Include understorey species where

Character Precinct	Areas include	Street tree design objective and responses	Street tree selection and design considerations
		verge in an informal layout.	appropriate and space allows. Infill planting only.
Settlement Precinct (S)	St Andrews, Panton Hill (township area and reserves only)	To continue the indigenous tree canopy as part of a flowing bushland landscape. Retain and replant indigenous canopy trees within the street verge in an informal layout.	Indigenous species only. Bushland/Indigenous grouping. Include understorey species where appropriate and space allows, e.g. <i>Bursaria spinosa</i> . Infill planting only.
Eltham Central Precinct (EC)	West of Bible Street	To continue the native tree canopy as part of a flowing tree dominated landscape. Retain and replant Australian native canopy trees within the street verge in continuous avenue plantings.	Mixture of Australian native and indigenous species. Exotics could be incorporated in commercial areas and to replant existing avenues. Formal avenues. Single species avenue plantings.

4.2.2 Zones

Urban zones

Council aims to plant trees in urban streets at regular intervals and at a density that will provide continuity and a sense of scale to the streetscape. The growth characteristics of the tree and the capacity of the street will also determine spacing. This generally means planting one tree in front of each property. Long nature strips or corner allotments may allow for more than one tree per property.

The types of urban open space will determine the landscape design and plant selection. Types can include regional parks, small parks, active and passive recreation areas, trails, waterways and bushland. Other influential factors are the amount of use a site receives, what type of use.

Commercial zones

Research has found a number of benefits to consumer experiences in business districts with trees (Wolf, 1998a; Wolf, 1999; Wolf, 2003). Consumers reported a willingness to pay more for parking in landscaped car parks and on average reported a willingness to pay an average of about 11% more for goods in a landscaped business district than a non-landscaped district, with this figure being as high as 50% for convenience goods. Both the business

community and consumers were found to favour business districts with good landscaping (Wolf, 1998b). Wolf (2000) also found the quality of landscaping along approach routes to business districts positively influences consumer perceptions.

Commercial areas often have limited space. Conflicting interests and demands between shop owners, pedestrians, traffic and cyclists are prevalent. Footpaths are busy with pedestrians, outdoor dining areas, street furniture, and shops spilling out onto the sidewalk. Main roads that pass through often have high volumes of traffic.

Street trees are not always present due to the existing streetscape quality or lack of space. Council will integrate trees into township main streetscapes where possible and space allows. Trees make an enormous difference to the absorbed heat these areas. As they are often largely composed of hard surfaces, trees cool the immediate area and reduce radiating heat at night. Where street trees cannot be integrated, an aesthetic can be created through the distinctive character of buildings, awnings, street furniture and contributions of local businesses placing, goods for sale signage and outdoor eating areas on the footpath.

Industrial zones

Despite often being neglected, there is a potential to expand the urban forest into industrial zones through street tree planting. However, planting space is limited and hostile for tree growth. These zones are likely to be mostly hard surfaces with the combination of large building footprints, extensive paved areas for parking and storage, and heavy traffic reducing the number of trees that can be planted.

Commercial and industrial zones

Trees in both industrial and commercial zones need to be able to tolerate and thrive in a harsh landscape that includes the following conditions:

- increased level of pollutants
- increased urban heat island effect due to heat absorption and reflection from hard surfaces
- a modified hydrology due to hard surfaces limiting the available water
- soil compaction and reduced oxygen levels in the soil
- modified soil nutrient levels and a modified soil structure, in many cases the top soil is absent and only the nutrient poor sub-soil remains for planting
- reduced soil microbial activity
- increased wind speeds due to the tunnel effect between buildings

This can limit the ability to plant only indigenous species as these sites are so highly modified. In these cases, Council will plant a variety of indigenous, non-local natives and exotic species that are best suited for quality plant performance.

Rural and bushland zones

Trees along rural roadsides play an important role in connecting indigenous bushland, providing important pathways for movement for native plant and animal species throughout the Shire. Where trees are absent or scattered, a process of encouraging natural

regeneration combined with strategic indigenous revegetation is more appropriate than street tree planting. Refer to the Nillumbik Roadside Management Plan for more information.

Bushland reserves are managed for the purposes of nature conservation. Planting within these reserves may include broader scale revegetation of a variety of lifeforms (trees, shrubs, herbs and grasses) to restore the indigenous vegetation or strategic supplementary planting to fill gaps or reintroduce missing species. Natural regeneration is encouraged where possible.

4.2.3 Planting style

Planting style is dictated by the context of the immediate area which needs to consider the Character Precinct design guidelines, street type, dominant land use and planting space:

- **Formal:** Usually a homogenous avenue with regular and equidistance spacing of trees. Usually one species, but can also incorporate more than one species of tree, as long as they are similar in size, form and texture
- **Informal:** Combination of native or indigenous tree species at irregular numbers and spacing
- **Group trees & shrubs:** Grouping either trees or mixed vegetation (trees & shrubs) together at irregular numbers and spacing
- **Bushland/indigenous grouping:** Groups of indigenous vegetation. Can be in continuous sections along street
- **Electric line planting:** Using taller growing species on non-electric-line side of the street and smaller growing species on the electric-line side to negate the requirement to prune trees for clearance. This can also be used in situations where there is footpath only on one side of the road leaving a narrow planting site, with a wider planting site on the other side of the street.

4.2.4 Road hierarchy

Council's Road Management Plan identifies three hierarchies of road in addition to the VicRoads managed Declared Main Roads:

- **Link:** Roads that supplement the Declared Main Road network in providing for through traffic movement
- **Collector:** Important local roads whose function is to distribute traffic between arterial roads (Declared Main Roads and Link Roads)
- **Access:** Roads that provide direct access for abutting land owners or occupiers

Planting link and collector roads is one of the most effective ways of improving the image of a municipality. Planting on these roads reinforces the Shire's identity and landscape character for the local community and visitors travelling through. The landscape character of link and collector roads will vary depending on the area. Plantings along these roads should be designed to link individual townships and enhance Shire entrance sites. As link and collector roads may move through rural and/or bushland areas, natural regeneration and

indigenous revegetation techniques may be more appropriate (refer to the Nillumbik Roadside Management Plan for more information).

4.2.5 Site limitations

Factors which limit tree placement and species selection include:

- Existing vegetation (including vegetation on adjoining land)
- The presence of electric and telecommunication lines
- The presence of footpaths and trails
- The size of the planting area eg. nature strip depth
- Clearance and visibility requirements
- Proximity and design of structures
- Soil type and modifications

Trees pose a potential for direct mechanical damage and upheaval. The further a tree is away from infrastructure the less likely obscuring or damage will occur or maintenance will be required. Council seeks to reduce the requirement to maintain trees under electric and telecommunication lines at every opportunity through species selection and appropriate placement.

Trees should be placed according to the following criteria (if the criteria cannot be met, Council will not plant a tree):

- Minimum of 15.0 metres from intersection in residential streets and further in residential streets where visibility may be a problem
- Minimum of 20.0 metres from intersections with signals, pedestrian signals and school crossings
- Minimum of 20.0 metres from streets intersecting with a main road
- Minimum of 10.0 metres from a Stop or Give Way sign
- Minimum of 2.5 metres from laneways, bus stops/shelters.
- Minimum of 2.0 metres from vehicle crossings
- Minimum of 3.0 metres from electricity poles
- Minimum of 2.0 metres from hydrants or drainage pits
- Minimum of 2.0 metres from beneath service wires
- Not above house connections to gas and water services
- If there is no existing footpath make allowance for pedestrian access and a potential future footpath
- Not where nearby trees will significantly reduce the tree's health, vigour or shape
- Not where foliage from the mature street tree will impinge upon traffic signals
- Not where the planting site is less than 1.0m wide, except for replacement plantings or when a special engineering solutions is used to mitigate root conflicts with infrastructure and increase the volume of soil available for tree root growth
- Not within the street pavement, except where Council adopts a designed solution
- Considering the impact of the tree at maturity on street and reserve lighting
- In reserves; - plant at a distance from an asset (playground, seating or structure), so that at tree maturity a possible falling branch would not impact on the asset. For

example an *Acacia melanoxylon* has a height at maturity of 8-10 metres; therefore the tree should be planted no closer than 8 metres from an asset

- minimum of 4 metres spacing between trees to enable mower access and a fuller canopy structure at maturity. Closer spacing may occur in mulched garden beds.

4.2.6 Species selection

Council seeks to select the right species for a location. Indigenous plants are preferred however Council also acknowledges that in some cases native (to Australia) and even exotic species can be more successful choices for the long-term. Council will choose non-indigenous species when:

- There is an established landscape/streetscape character
- Localised point of difference using street tree planting that is distinct from surrounding vegetation eg. to assist in way finding
- The planting site is so highly modified from development that indigenous species would be unlikely to perform strongly
- An indigenous species will not provide the amenity value and traits for a specific site, eg. shade
- An indigenous species would pose a risk to people or property
- Vegetation has heritage value.

These species have been listed as they show traits to perform in the Shire. Nillumbik (with the exception of Kangaroo Ground) typically has very shallow soil with low oxygen and is highly compacted and modified. Species need to be selected that can tolerate these conditions without high levels of inputs. Species need to be relatively drought tolerant as only a small number of sites receive regular supplementary irrigation. Any trees planted need to be able to adapt with climate change and Council is working to manage trees in the landscape to the canopy can continue well into the future.

Council only plants indigenous (local native) species in bushland of local provenance. This may include species not listed in Appendix 6.6.

The following is considered when selecting species:

- Landscape context eg. streetscape, parks, traffic treatment, bushland etc.
- Guidance from the Nillumbik Neighbourhood Character Study (2000) and the Nillumbik Neighbourhood Character Policy
- Existing landscape plans/designs or exiting street tree theme. Council will consider the appropriateness of continuing the existing street tree theme within the site limitations or choosing an alternative preferred species which can uphold street character and encourage canopy longevity
- Community desires
- Habitat for locally specific endangered wildlife
- Site conditions
 - success of previous plantings
 - soil type

- hydrology
- existing vegetation
 - existing street tree species
 - the pre1750s ecological vegetation class (EVC)
 - presence of remnant vegetation
 - vegetation structure
 - plant diversity and abundance
- space available (refer Table 8)
 - width of the nature strip and road width
 - location of electric lines
 - proximity of other vegetation
 - proximity and design of structures
 - potential for direct mechanical damage and upheaval
 - potential for using engineering solutions to support larger trees (commercial and industrial zones)
 - proximity to assets and buildings including the presence of existing solar systems on buildings
- threats
 - weed competition
 - potential for soil erosion – species with substantial root systems can stabilise the soil
 - pressure from herbivores (rabbits, kangaroos, wallabies, deer, etc)
- Species characteristics
 - size and habit
 - longevity
 - tolerances
 - potential maintenance requirements (fertilising, watering, pruning)
 - potential weediness
 - biodiversity benefit
 - aesthetic value
 - ability to be pruned to a single trunk or have a clear trunk to minimum height of 1.5m for visibility (street trees only)
 - resistance to pest and disease outbreaks
- Availability of plant stock.

Table 8: Planting area guidelines (Adapted from Gilman, 1997)

Total Planting Area (Lawn, island, or soil strip)	Planting strip width	Distance from trunk to pavement or wall	Maximum tree size at maturity
Less than 9.5m ²	1.0m to 1.3m	0.6m	Small (Less than 9m tall)
9.5m ² to 18.5m ²	1.3m to 2.5m	1.2m	Medium (Less than 15m tall)
More than 18.5m ²	> 2.5m	> 1.5m	Large (Taller than 15m)

4.2.7 Sourcing planting stock

Plants should be ordered well in advance to give nurseries sufficient time to produce plants. Availability will vary depending on the number of plants and the species chosen. The size of planting stock varies depending on the planting site and stock availability. Seedlings (tubestock, hikos and cells) are best for bushland and rural road reserves and can be for recreation reserves and garden beds, however in some cases slightly more established stock can be advantageous. Advanced trees (20-40cm containers) are appropriate for the majority of street tree planting and high visitation areas of recreational reserves and Council properties. More advanced tree stock (1.5m and 2.8m tall) may be appropriate for higher profile sites (e.g. commercial areas). Larger stock often takes longer to establish in the landscape however the advantage of larger stock is the habit or form of the tree is more apparent. Tube stock can sometimes reveal trees with forms unable to be sustained in the landscape. The quality of the planting stock should be in line with AS2303:2015 Tree stock for landscape use.

Individual plants should be:

- healthy
- display structural integrity/be self-supporting
- not root-bound (roots circling in pot)

In addition, street trees should:

- have good structure in relation to the site
- be one main central stem/trunk (apically dominant)
- provide good canopy coverage

Bushland plants must be indigenous to the area and of known local provenance.

4.3 Preparation, planting and maintenance specifications

4.3.1 Advanced trees

Council use advanced trees for all street tree plantings and some recreation reserve and property plantings. Street tree planting should occur during spring and autumn when the temperatures are the least extreme.

Planting

When planting, the works crew or contractor should (see Figure 7):

1. **Dig a hole.** Dig the hole as deep as the root ball (no deeper or shallower) and no less than 2-3 times as wide with sloping walls –‘wok shaped’. In heavy clay soils ‘rough-up’ the sides of the hole to allow for root exploration.

The root ball must not sink too much when the tree is watered. However, planting too high is also an issue if the root ball is exposed it will dry out more rapidly affecting tree establishment. Wider planting holes provide more aerated soil for tree root exploration.

Roots spread laterally from the root ball, not vertically so width in a planting hole is important for anchorage and overall stability.

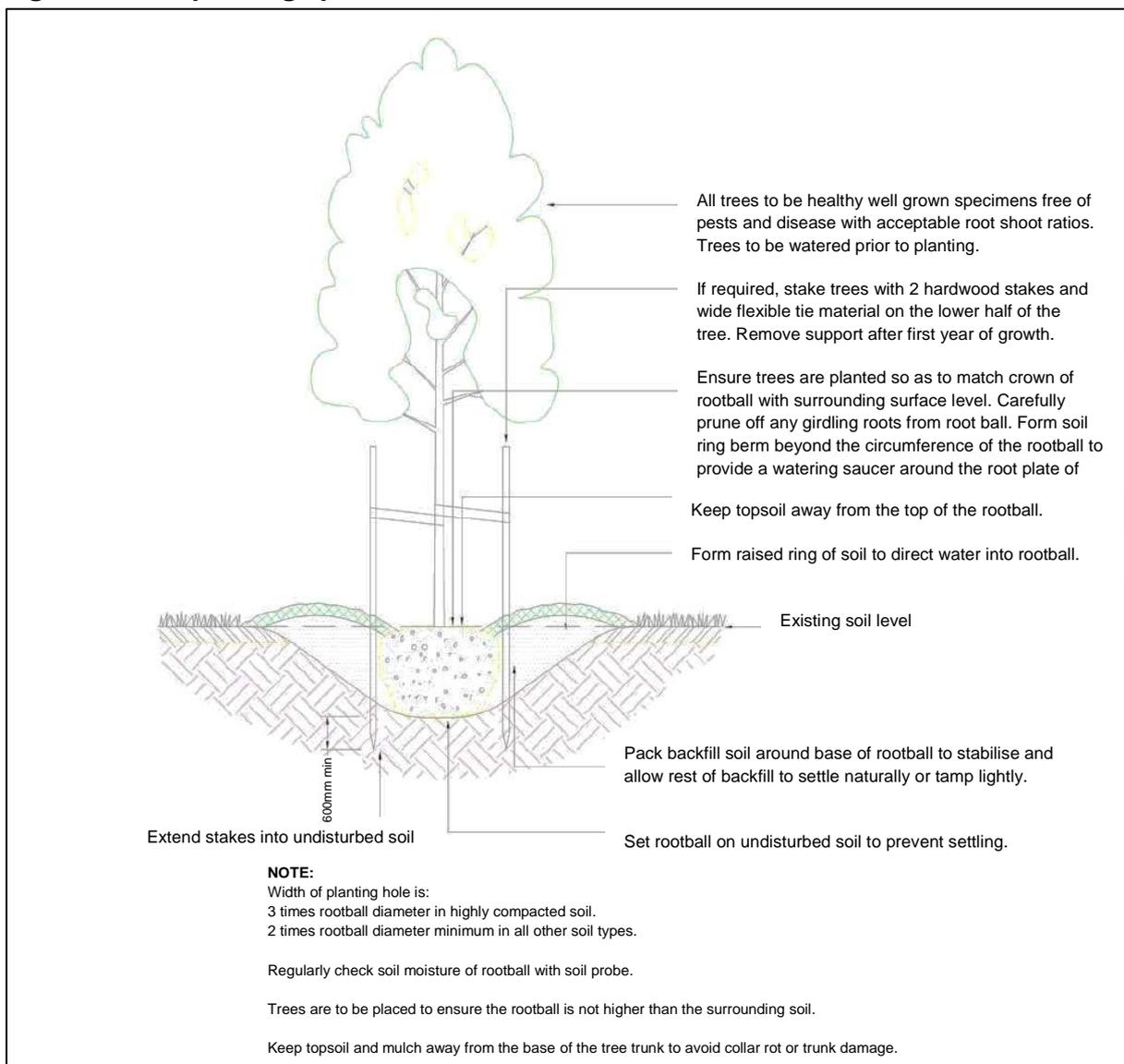
2. **Prepare the tree and hole.** Fill a bucket with water that is larger than the tree in the container. Place the tree (still in the container/pot) in the bucket of water – water must be deep enough to cover the top of the root ball by about 3cm. Air bubbles will rush to the surface. Once the air bubbles have completely stopped the tree can be removed. Allow all free-draining water to drain before planting. This is the 'dunking method' as air pockets in the root ball can over time end up becoming pressurised, water repelling (hydrophobic) pockets. Root can be teased slightly however avoid damaging the root system as this is cause further transplant shock. If the root ball comes out of the pot root bound then this tree will never be successful in the landscape and should be returned to the nursery and replaced. Trees have the potential to become liabilities as they age so it is paramount that the stock to begin with is high quality. Ensure stock is thoroughly checked for quality prior to planting by an Open Space Officer.
3. **Plant the tree.**
 - a. Lift the tree by the root ball or otherwise support the root ball, to minimise root damage, and place it in the hole. The hole depth should be checked (in the above steps) when preparing by placing the tree while in its container into hole.
 - b. The base of the root ball needs to be on complete contact with the base of the planting hole eg. no voids or spaces for air pockets
 - c. The leading stem must be straight – do not accept stock with crooked leading stems as these will never be successful in the long-term
 - d. Ensure the tree in positions according to the above then backfill with the soil dug out of the hole. Avoid backfilling with mulch as the root ball will dry out and nitrogen drawdown can occur. Evenly and flatly, slightly firm down the backfilled soil with hands. Avoid stamping down using feet as this will compact the immediate root zone and cause root damage and reduce water infiltration.
4. **Water the tree.** Form a temporary basin (berm) around the outside edge of the root ball and make the wall of the berm about 5-7.5cm, firming the soil with hands your hands. This will decrease run-off and assist with keeping water localised at the root zone. Water the plant so that water reaches all parts of the planting hole. Allow for gravitational drainage to occur and repeat. This can be done multiple times depending soil moisture to begin. Once the drainage rate slows, it is most likely enough – large stock could take a number of litres until this occurs.
5. **Pruning - if required.** Formative prune to improve the structure of the tree – only do this if instructed by a team leader, as most plants from the nursery do not require immediate pruning. Select species and stock that fits the site requirements rather than making a tree fit the site – this will reduce long-term maintenance.
6. **Stake if required.**
 - a. Protective staking: For sites where lawn mower damage, vandalism, or windy conditions are concerns. Stakes are more often an indicator that new plantings have occurred to identify for establishment watering and increased visibility for

mower drivers and site users. Proactive staking can also be to vandalism and wind damage

- b. Supportive staking: Not often required. If a plant requires staking for structural purposes then poor stock has be selected. Staking often prevents trees from developing their own support, strength and flexibility
- c. Generally not required in most landscaping situations with good quality tree stock. Studies have shown that trees establish more quickly and develop stronger trunk and root systems if they are not staked at the time of planting. If staking is necessary for support, choose from the staking (most common), guying, and ball stabilizing methods. For staking, use two stakes with a wide flexible tie material on the lower half of the tree to hold it upright, provide flexibility and minimise injury to the trunk. Remove staking and ties after the first year of growth.

7. **Mulch around the tree.** Apply mulch 50-75mm on 1m diameter at the base of the tree.

Figure 7: Tree planting specifications



Maintenance

For two years after planting advanced trees, Council has a program of tree establishment maintenance including watering, mulching, weed control and formative pruning. Depending on the seasonal conditions and the tree's establishment, this period may need to be extended. After care maintenance is very important as it can increase the success of the planting if carried out rigorously. When maintaining advanced trees the work crew or contractors should:

- **Mulch**
 - Mulching reduces weed competition, prevents soil compaction (improved aeration), protects root zone and reduces evaporation that regulates soil moisture content
 - Use mulch with a large particle size (20mm or greater). Apply mulch 75mm and to a radius of 1m around the tree. Mulch should avoid building up at the trunk base to prevent Collar Rot.
- **Water**
 - Monitor the site to determine watering requirements and frequency. This will depend on the species, climatic and site conditions and current water restrictions. Specific recommendations are impractical because even within individual road sections requirements are likely to vary.
- **Control weeds**
 - Control weeds on and around the mulched area of the plant (correct site preparation and mulch application should slow down weed growth).
- **Formative prune** (if necessary)
 - Formative pruning is pruning a tree to provide good branch structure, to direct growth to a desired shape, accommodate site constraints and reduce encroachments on utilities, buildings, pedestrian and vehicular clearance spaces. Formative pruning also removes structural defects that can cause branch and stem failures in the longer term. Tree defects include co-dominate stems and dead, broken, split, rubbing and duplicate branches
 - Clause 8.5 of Australian Standard AS 4373-1996 – *Pruning of amenity trees* recommends formative pruning for young trees of up to 6m high and 4m crown width. Currently, Council formative prune for the first year following planting. In the future, there is a potential to formative prune at 3 years and then again at 6 years if funding allows. Post establishment, formative pruning is done as deemed necessary through the tree maintenance program
 - Where possible and having regard for the aesthetic amenity of the individual tree and streetscape, prune trees to a single trunk, clear of branches to a height of 1.5m above ground level
 - It should be noted that tree forms should be selected with regards to the site context – planned tree selected that considers the site should require little pruning. If a tree will require a large amount of pruning, it should be reconsidered if another species is more suited.

4.3.2 Bushland revegetation and supplementary planting

Council plant seedlings (tube stock, hikos and cells) in bushland areas. Contractors planting in bushland reserves have specific requirements under the *Environmental Works Contractor Specifications*.

Preparation

Planting can proceed only in sites that have been suitably prepared. Contractors or works crews should:

- Select planting locations so as not to form a regular pattern. When planting single/scattered trees into areas that will be regularly mown, leave enough space (minimum of 10m) between plants for tractors and slashers to pass unhindered
- In sites that have existing indigenous vegetation, hand weed around all indigenous plants, to exclude them from treatment before spraying the site with herbicide.
- In sites with no indigenous vegetation, spray with herbicide without hand weeding or brushcut
- For single/scattered planting in non- remnant areas, herbicide spray a 1-2m diameter circle for each tree 3-4 weeks prior to planting
- Unless unsuitable, plant into mulch or jute matting. Areas to be mulched or jute matted should be clear of rubbish and organic debris. Spray out sites with herbicide at least four weeks before mulching or jute matting. If the site is heavily invaded with tall grasses brushcut to ankle height two weeks after herbicide spraying
- If large areas are being planted in rabbit inhabited areas, the construction of a rabbit proof fence around the entire planting may be required
- Where reserves are maintained by multiple teams such as Environmental Works and Open Space, it is recommended that newly planted trees are mulched as an indication for mowing staff to identify planting areas.

Planting

When planting contractors or works crews should:

- Plant in autumn to early winter at least four weeks after weed control
- Plant species according the locations identified in the works plan
- When planting into mulched areas leave plant stems clear of mulch
- Place tree guards around all plants to protect plantings from rabbits and so they are clearly visible to mower and tractor drivers, unless otherwise specified
- Properly water in all plants (except aquatic) with a minimum of 1 litre of water each.

Maintenance

To maintain the revegetated area contractors or works crews should:

- Keep revegetation beds weed free. Hand weed around all indigenous vegetation before spraying with herbicide. Where large amounts of hand weeding occurs, remove all hand weeded material from site and dispose of at an appropriate green waste processing or transfer facility

- Maintain a sprayed border around revegetated beds and single plants (300mm for beds and 1m radius for single plants)
- Council officers will outline which revegetation beds are to be kept mulched. In these beds, the mulch layer should be kept at a uniform depth of 100mm
- Replant plants which have not survived each year in late autumn/early winter, at least four weeks after weed control
- Where tree guards are still protecting plants, maintain them in good condition. Remove all superfluous tree guards and timber stakes and reuse or recycle
- Where revegetated beds are located next to pedestrian pathways, prune low branches on trees and shrubs should so they do not overhang the pathway and pose a safety risk to the public.

4.3.3 Reserve and property planting

Council also plant seedlings and advanced trees in recreation reserves and in the gardens of other Council properties. The specifications for these plantings should meet any landscape designs and where reasonable meet the same specifications as either advanced tree plantings or bushland plantings.

4.3.4 Tree planting consultation

Consultation with the road authority may be required for tree planting within main and collector roads.

Programs of whole street planting can result in the sudden change of visual appearance of the street. This can create community discontent so rigorous community consultation is required.

During replacement tree planting, Council may give residents the opportunity to choose the preferred street tree from a limited selection of trees that are in keeping with the character of the area and appropriate to the size/available space of the planting site. This cannot occur in all cases but in circumstances where there are a number of suitable tree options. If the options are limited then Council will inform the residents of the selected tree species for replacement.

Consultation should include all residents and owners of properties within the affected street, including corner properties. The ward Councillor should be provided with a copy of the information distributed.

Where Council will be planting trees along the majority of a street at the one time, notification is sent to the residents at least 2 weeks prior to the intended planting time. Notification includes:

- An introduction letter that provides a brief description defining the area to be planted and the reason for the planting
- The nominated species and the rationale for selection
- The anticipated timelines associated with the start and completion of works

- Council officers name and contact phone number where they can source additional information if required
- Right to object to the planting of a tree on the nature strip

Residents not wanting a street tree planted out front of their property need to reply to Council in writing stating their reasons. The decision whether to plant a tree will be made by Council and the affected resident notified.

Council officers should provide the ward Councillor with a copy of information distributed.

5 References

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6 Appendices

6.1 Estimating Nillumbik's tree population

Estimates of trees in Nillumbik Shire area based on two methods of calculation

Method 1 based on Jacobs, Mikhailovich and Delaney (2014).

- 49.1% of Shire is covered by trees of varying density. This equates to 21,211ha
- An estimated tree density of 500 trees per hectare = 1 tree/20m²
- This calculates to an estimate of 10,605,500 trees across the Shire
- If 3.8% of the Shire land is managed by Council this would mean that Council is responsible for managing approximately 403,009 trees.

Method 2 based on the Nillumbik Street Tree survey (2007) and the Department of Environment, Land, Water and Planning Tree Density 1:25,000 - Vicmap Vegetation (TREE_DENSITY).

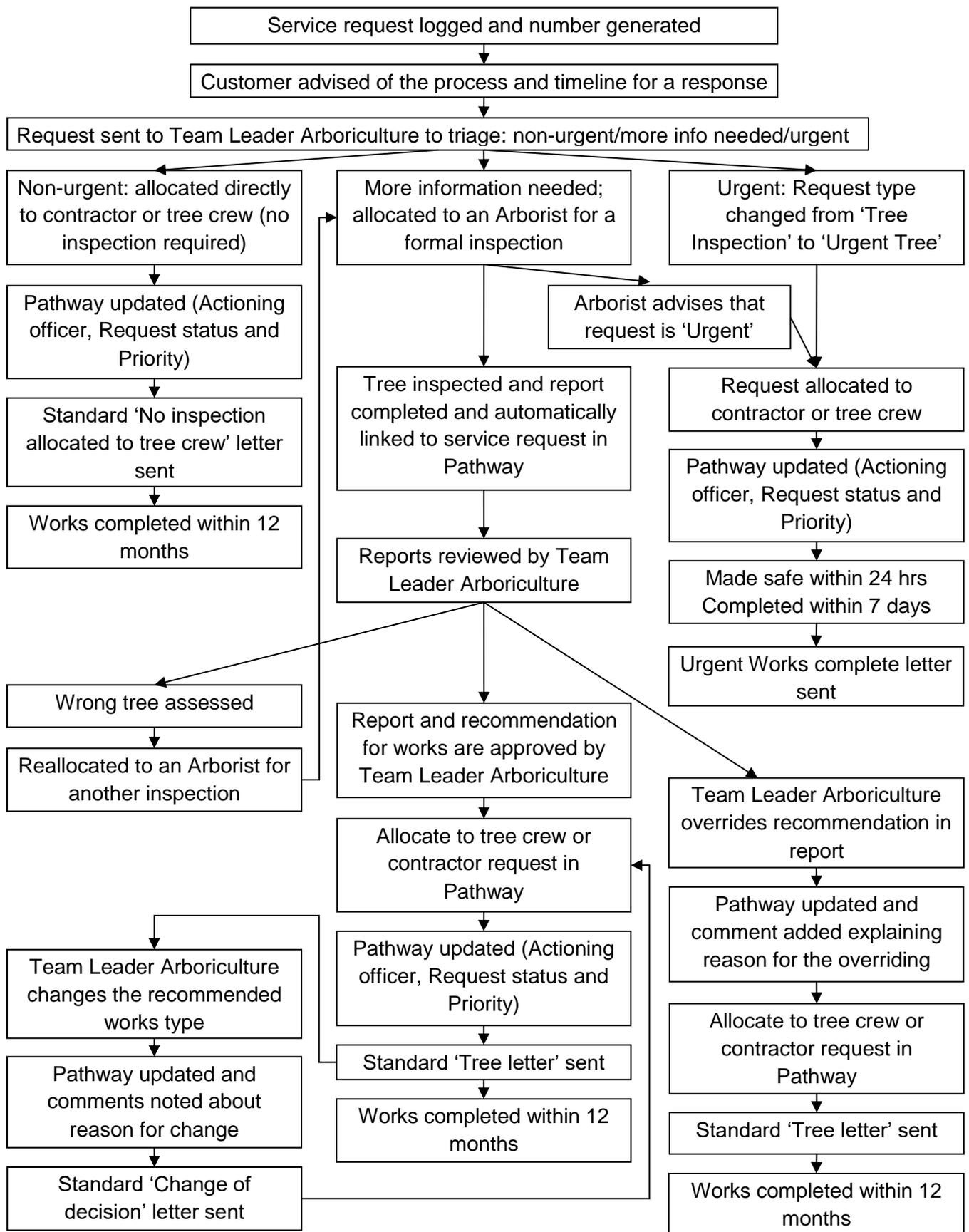
- 55.5% of Shire is covered by trees; 39.1% dense cover, 7.7% medium cover and 8.7% scattered cover.
- An estimated tree cover for dense cover = 1 tree/8m²
- An estimated tree cover for medium cover = 1 tree/20m²
- An estimated tree cover for scattered cover = 1 tree/50m²
- This calculates to an estimate of 9,952,410 trees across the Shire
- If 328.4 ha dense cover, 97.6 ha medium cover and 129.6 ha scattered cover on Council managed land then the total number of trees that Council is responsible for will equate to approximately 485,220 trees.

Of the two methods for estimating the tree population in the Shire, the second method provides a more accurate figure. This data is used to quote tree population estimates.

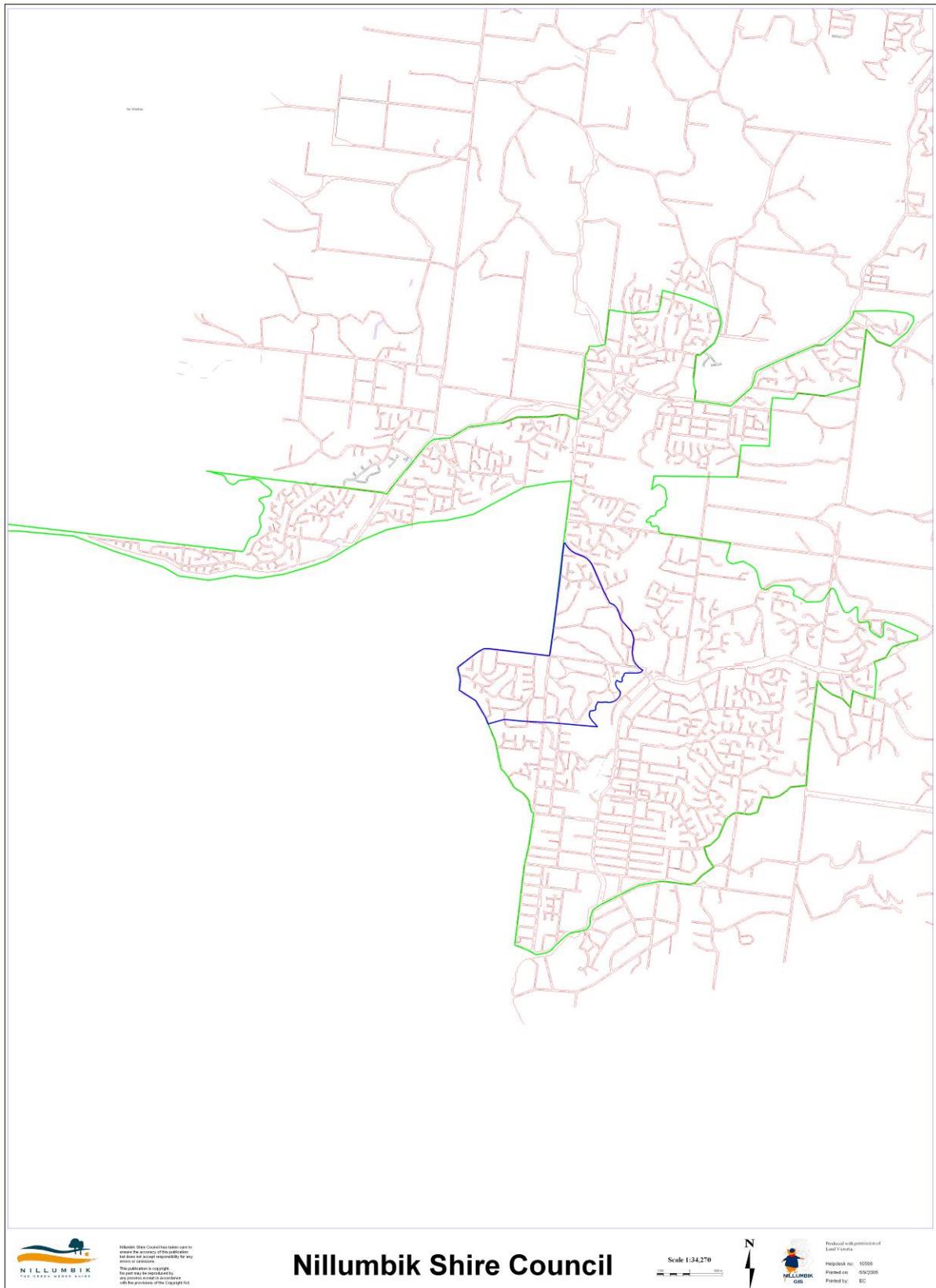
6.2 Estimating tree management costs for all trees on Council owned/managed land

- Arborist inspection and report \$75/tree = 485,220 x \$75 = \$36,391,500
- Based on years of tree inspections approximately 92.5% of inspected trees require some works within a 12 month timeframe
- Based on years of contracted tree works, it costs an average of \$800 per tree to rectify the works identified in the Arborist report.

6.3 Tree service request process



6.4 Declared area for electric line clearance



The area in green is the Declared Area. The area in blue is maintained by Ausnet Services.

6.5 Significant trees on Council owned or managed land

6.5.1 Significant tree on Council owned or managed land identified in the Heritage Overlay

Location	Tree of significance
Nillumbik Farm – dwelling, 50 Challenger Street, Diamond Creek	Eucalypt north of dwelling Sugar Gum (<i>Eucalyptus cladocalyx</i>) (1)
Iron bark Hill 50 Couties Road, Panton Hill	Group of four <i>Eucalyptus sideroxylon</i> (Ironbark) (4)
Donaldsons Oak, 35 Eltham-Yarra Glen Road, Kangaroo Ground	English Oak (<i>Quercus robur</i>) (1)
War Memorial Tower, sandstone building & park, 385 Eltham - Yarra Glen Road, Kangaroo Ground	Mature planting including: Monterey Cypress (<i>Hesperocyparis macrocarpa</i>), English Oak (<i>Quercus robur</i>), <i>Eucalyptus botryoides</i> , & <i>Livistona australis</i>
Hurst Family Cemetery, at Hurstbridge Pre-School 4-8 Greysharps Road, Hurstbridge	Atlas Cedar (<i>Cedrus atlantica</i>) (1), Canary Island Pine (<i>Pinus canariensis</i>) (1), Peppercorn Tree (<i>Schinus molle</i>) (1) & Stone Pine (<i>Pinus pinea</i>) (1)
Allwood House 901 Heidelberg -Kinglake Rd, Hurstbridge	Cabbage Tree Palm (<i>Livistona australis</i>) (2), Thread Palm (<i>Washingtonia</i> sp.) (2) & Peppercorn Tree (<i>Schinus molle</i>) (4)
Fire Bell Tree (Yellow box) 832 Heidelberg - Kinglake Road, Hurstbridge	<i>Eucalyptus melliodora</i> (Yellow Box) (1)
Hawthorn hedges & fields Henley Road, Kangaroo Ground	Hawthorn hedges (<i>Crataegus monogyna</i>)
5 Hurstbridge-Arthurs Creek Road, Hurstbridge	<i>Eucalyptus melliodora</i> (Yellow box) x 1
61 Kalbar Road, Eltham	<i>Eucalyptus melliodora</i> (Yellow box) x 1
Wippell's Oak 50 Kangaroo Ground - St Andrews Road, Kangaroo Ground	<i>Quercus robur</i> (English Oak) (1)
624 Kangaroo Ground – St Andrews Road, Panton Hill	<i>Eucalyptus globulus</i> (Blue Gum) (1)
35 Laughing Waters Road, road reserve, Eltham	<i>Eucalyptus melliodora</i> (Yellow box) x 1
Eltham Community Centre & wheel rim (tyring) tool 801 Main Road, Eltham	Peppercorn Tree (<i>Schinus molle</i>) (1) and planting, Bhutan Cypress (<i>Cupressus torulosa</i>) (1)
Shillinglaw Cottage 4 Panther Place, Eltham	Peppercorn trees (<i>Schinus molle</i>) (4)
Tree rows, Diamond Creek Cricket Reserve, 28 Main Hurstbridge Road, and 2 Diamond Street, Diamond Creek	Elms (<i>Ulmus procera</i>), Plane Trees (<i>Platanus xacerifolia</i>), Peppercorn Trees (<i>Schinus molle</i>), Canary Island Pines (<i>Pinus canariensis</i>), Bunya Bunya Pine (<i>Araucaria bidwillii</i>), eucalypts adjacent to creek & Hawthorn hedge
295 Eltham Yarra Glen Road, Kangaroo Ground	Sugar Gum on road reserve - <i>Eucalyptus cladocalyx</i> (1)

Location	Tree of significance
Edendale Farm and The Fences Act, 30-32 Gastons Road, Eltham	Bay tree (<i>Laurus nobilis</i>) (1), Peppercorn Tree (<i>Schinus molle</i>) (4), Monterey Cypress (<i>Hesperocyparis macrocarpa</i>) (2)
4 -8 Greysharps Road, Hurstbridge	London Plane Tree (<i>Platanus xacerifolia</i>) (1)
Entrance to Ferguson's Paddock, 12 Hurstbridge Arthurs Creek Road, Hurstbridge	Monterey Cypress (<i>Hesperocyparis macrocarpa</i>)
Eltham Watering Place Reserve (Wingrove Park), 645 Main Road, Eltham	Manna Gums (<i>Eucalyptus viminalis</i>)
Avenue of Honour, Main Road – Between Brougham Street and Dalton Street and Withers Way, Eltham	London Plane Trees (<i>Platanus xacerifolia</i> and <i>Platanus orientalis</i>) (34)
895 Main Road, Eltham	Italian Cypress (<i>Pinus pinea</i>) (3)
Former Francis McDonald property, 1342 Main Road, Eltham	Monterey cypress (<i>Hesperocyparis macrocarpa</i> (goldern) (1), Canary Island Palm, Cotton Palm,
Lambert house site, 5 Meruka Drive, Eltham	Monterey Cypress (<i>Hesperocyparis macrocarpa</i>) (43) drive & plantings (<i>Cupressus torulosa</i>) x 2, <i>Cedrus deodora</i> (1), <i>Pheonix canariensis</i> (1), <i>Cupressus</i> spp. (2) and <i>Trachycarpus fortuneii</i> (1)
Eltham Central Park, 18 Panther Place, Eltham	Monterey Cypress row (<i>Hesperocyparis macrocarpa</i>) (7) and Monterey Cypress group (3)
Rugby Field end Pitt street, Eltham	English Oaks (<i>Quercus robur</i>) (10)
Batman Apple Tree and Pioneer Graves, 6A Hamish Court, Greensborough	Apple Tree (<i>Malus</i> sp.) (1)

6.5.2 Significant trees on Council owned or managed land identified as part of the Tree Policy and Guidelines consultation process July 2015

Location	Tree of significance
Hurstbridge Avenue of Honour	Remnant Elms (<i>Ulmus procera</i>)
Kangaroo Ground War Memorial	Lone Pine (<i>Pinus brutia</i>)

6.6 Recommended street and reserve tree species

Tree List in alphabetical order with tolerances and recommended placement

Species	Common name	Origin	Lifecycle	Planting area size for streetscapes	Height	Notes
<i>Acacia implexa</i>	Lightwood	Indig	Evergreen	NA	to 10m	Revegetation, bushland reserve, not successful as a street tree.
<i>Acacia melanoxydon</i>	Blackwood	Indig	Evergreen	Medium-Large	12-25m	Revegetation, bushland reserves, street tree but very slow growing, shrubby in habit with low branches, sight line issues.
<i>Acer cappadocicum</i>	Cappadocian/ Caucasian Maple	Exotic	Deciduous	Large	15-20m	Parks, streets, amenity landscapes, Need min. 2 years establishment irrigation, may need some summer irrigation.
<i>Acer xfreemanii</i> 'Autumn Blaze'	Red Maple	Exotic	Deciduous	Medium	10m	Park, streets, amenity landscapes.
<i>Acer rubrum</i> 'October Glory'	Red Maple	Exotic	Deciduous	Medium	10m	Parks, streets, amenity landscapes, can be coppiced, compact tree, not well in excessively dry or alkaline soils.
<i>Agathis robusta</i>	Queensland Kauri	Native	Evergreen	NA	30m+	Parks and large spaces only. Cones are large, tree needs large space to reach potential.
<i>Allocasuarina littoralis</i>	Black Sheoak	Indig	Evergreen	Medium	8-15m, narrow	Revegetation, bushland reserves, streets, little shade provided, forms thickets when planted on mass, good in playgrounds.
<i>Allocasuarina torulosa</i>	Forest Sheoak	Native	Evergreen	Medium	8-15m	Not an indigenous species, parks, playground, windy sites, little shade provided.
<i>Allocasuarina verticillata</i>	Drooping Sheoak	Indig	Evergreen	Small-Medium	5-10m	Revegetation, bushland reserves, street tree, little shade provided.
<i>Angophora costata</i>	Smooth-bark Apple	Native	Evergreen	Large	20m	Parks, streets, amenity landscapes.
<i>Angophora floribunda</i>	Rough-bark Apple	Native	Evergreen	Large	to 20m	Parks, streets, amenity landscapes.
<i>Angophora hispida</i>	Dwarf Apple	Native	Evergreen	Small	5-8m	Parks, street tree, amenity landscape, under powerlines.
<i>Araucaria bidwillii</i>	Bunya Bunya	Native	Evergreen	NA	25-30m	Parks and large spaces only, very large cones when mature (pineapple sized) needs to be fenced off while has cones.
<i>Araucaria cunninghamii</i>	Hoop Pine	Native	Evergreen	NA	30m	Parks, very wind tolerant, large cones when mature, botanical value.
<i>Araucaria heterophylla</i>	Norfolk Island Pine	Native	Evergreen	NA	30m+	Parks, very wind tolerant, large cones when mature, botanical value.
<i>Banksia integrifolia</i>	Coast Banksia	Native	Evergreen	Small	8m, narrow	Parks, streets, under powerlines, good in playgrounds, very wind and salinity tolerant, can be slow to start in heavy clays.
<i>Banksia marginata</i>	Silver Banksia	Indig	Evergreen	Small	5-8m narrow	Parks, streets, under powerlines, good in playgrounds, very wind and salinity tolerant.
<i>Banksia serrata</i>	Saw Banksia	Native	Evergreen	Small-Medium	5-15m, narrow	Parks, streets, under powerlines, good in playgrounds, very wind and salinity tolerant, can be slow to start in heavy clays.
<i>Brachychiton acerifolius</i>	Illawarra Flame Tree	Native	Semi-deciduous	Medium-Large	12-20m	Parks, streets, public spaces, avoid pruning, large fruit, summer deciduous, flowers during leaf-fall.
<i>Brachychiton</i> 'Griffith Pink'	Flame Tree	Native	Evergreen	Medium-Large	12-20m	Parks, streets, avenues, public spaces.
<i>Brachychiton populneus</i>	Karrajong	Native	Evergreen	Medium	5-15m	Parks, streets, public spaces, avenues, large fruit.
<i>Brachychiton rupestris</i>	Bottle Tree	Native	Evergreen	Medium-Large	12-20m	Parks, public spaces, avenues, large fruit, less shade provided than other <i>Brachychiton</i> species.

<i>Brachychiton xroseus</i>	Flame Tree	Native	Evergreen	Medium-Large	12-20m	Parks, streets, public spaces, hostile sites.
<i>Callistemon citrinus</i>	Lemon Bottlebrush	Native	Evergreen	Small	3m	Parks, streets, public spaces, playgrounds, more shrub-like, need uplift works.
<i>Callistemon 'Harkness'</i>	Harkness Bottlebrush	Native	Evergreen	Small	to 6m	Parks, streets, under powerlines, heavy clay soils.
<i>Callistemon 'Kings Park Special'</i>	Kings Park Special Bottlebrush	Native	Evergreen	Small	to 4m	Parks, streets, under powerlines, nice small tree, does well in Eltham, good on heavy clays
<i>Callistemon viminalis</i>	Weeping Bottlebrush	Native	Evergreen	Small	8m	Parks, streets, under powerlines.
<i>Callitris columellaris</i>	Coast Cypress	Native	Evergreen	Large	15-20m	Parks, streets.
<i>Ceratopetalum gummiferum</i>	New South Wales Christmas Tree	Native	Evergreen	Small	6-8m	Parks, streets, public spaces.
<i>Castanospermum australe</i>	Morton Bay Chestnut/ Blackbean	Native	Evergreen	NA	8-20m	Parks, can be established in shaded sites, can get quite large.
<i>Casuarina cunninghamiana</i>	River Sheoak	Native	Evergreen	Large	15-25m	Parks, streets, public spaces, playgrounds.
<i>Cedrus deodara</i>	Himalayan Cedar	Exotic	Evergreen	NA	to 20m	Parks, large public spaces, need irrigation to establish.
<i>Ceratonia siliqua</i>	Carob	Exotic	Evergreen	Small-Medium	8-10m	Parks, streets, public spaces, can be hedged/pleached.
<i>Corymbia citriodora</i>	Lemon-scented Gum	Native	Evergreen	Large	20-35m	Parks.
<i>Corymbia eximia 'Nana'</i>	Yellow Bloodwood	Native	Evergreen	Medium	to 8-12m	Parks, streets, powerlines, public spaces.
<i>Corymbia maculata</i>	Spotted Gum	Native	Evergreen	Large	20-30m	Parks, streets.
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	Native	Evergreen	Medium	10-15m	Parks, streets, public spaces.
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	Indig	Evergreen	NA	to 25m	Revegetation, bushland reserves.
<i>Eucalyptus camaldulensis</i>	River Red Gum	Indig	Evergreen	NA	20m +	Large parks only.
<i>Eucalyptus goniocalyx</i>	Long-leafed Box	Indig	Evergreen	NA	8-16m	Revegetation, bushland reserves.
<i>Eucalyptus kitsoniana</i>	Gippsland Mallee	Native	Evergreen	Small	5-8m	Parks, street, powerlines, public spaces
<i>Eucalyptus leucoxydon</i> subsp. <i>connata</i>	Yellow Gum	Indig	Evergreen	Medium	12m	Revegetation, parks, street tree
<i>Eucalyptus leucoxydon 'Rosea'</i>	Yellow Gum	Native	Evergreen	Medium	15m	Parks, streets, public spaces
<i>Eucalyptus mannifera</i> subsp. <i>maculosa</i>	Red Spotted Gum	Native	Evergreen	Large	to 20m	Parks, streets, public spaces.
<i>Eucalyptus mannifera 'Little Spotty'</i>	Little Red Spotted Gum	Native	Evergreen	Small	~to 8m	Parks, streets, powerlines, public spaces
<i>Eucalyptus macrorhyncha</i>	Red Stringybark	Indig	Evergreen	NA	15-35m	Revegetation, bushland reserves.
<i>Eucalyptus melliodora</i>	Yellow Box	Indig	Evergreen	Large	to 20m	Revegetation, bushland reserves, parks, streets.
<i>Eucalyptus obliqua</i>	Messmate	Indig	Evergreen	NA	10-20m	Revegetation, bushland reserves.
<i>Eucalyptus ovata</i>	Swamp Gum	Indig	Evergreen	NA	10-20m	Revegetation, bushland reserves, needs attention as it ages to maintain safety.
<i>Eucalyptus pauciflora</i>	Snow Gum	Indig	Evergreen	Small	10m	Revegetation, bushlands reserves (as per EVC), parks, streets (select appropriate cultivar)
<i>Eucalyptus polyanthemus</i>	Red Box	Indig	Evergreen	Large	to 20m	Revegetation, bushland reserves, parks, streets.
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint	Indig	Evergreen	Large	to 20m	Revegetation, bushland reserves.

<i>Eucalyptus rubida</i>	Candlebark	Indig	Evergreen	Large	20+	Revegetation, bushland reserves.
<i>Eucalyptus sideroxylon</i> 'Rosea'	Rosea Red Ironbark	Native	Evergreen	Large	20m	Parks, streets, boulevards, public spaces.
<i>Eucalyptus tricarpa</i>	Red Ironbark	Indig	Evergreen	Large	20m+	Parks, streets, boulevards, public spaces, Revegetation, bushland reserves.
<i>Eucalyptus viminalis</i>	Manna Gum	Indig	Evergreen	NA	30m+	Revegetation, bushland reserves, along waterways.
<i>Exocarpos cupressiformis</i>	Cherry Ballart	Indig	Evergreen	NA	4-8m	Revegetation, bushland reserves.
<i>Ficus macrophylla</i>	Morton Bay Fig	Native	Evergreen	NA	30m+	Park, large avenue, large public spaces, Avoid near bushland.
<i>Ficus microcarpa</i> var. 'Hillii'	Hill's Weeping Fig	Native	Evergreen	Medium	to 15m	Parks, street s, public spaces, carparks.
<i>Flindersia australis</i>	Australian Teak	Native	Evergreen	NA	15-30m	Parks with large space only, fruit is large.
<i>Fraxinus pennsylvanica</i> 'Cimmzam'	Cimmaron Ash	Exotic	Deciduous	Medium	to15m	Parks, streets, public spaces, autumn colour, tough once established, seedless in many cases .
<i>Fraxinus pennsylvanica</i> 'Urbdell'	Urbanite Ash	Exotic	Deciduous	Medium	to 13m	Parks, streets, public space, autumn colour, irrigation to establish.
<i>Hakea francisiana</i>	Bottlebrush Hakea	Native	Evergreen	Small	5m	Streets, powerlines, small street tree, height restricted spaces, parks.
<i>Hymenosporum flavum</i>	Native Frangipani	Native	Evergreen	Small-Medium	8-10m, narrow	Parks, streets, public spaces with width restricted spaces, playgrounds, can grow in part shade, moderate drought tolerance once established.
<i>Jacaranda mimosifolia</i>	Jacaranda	Exotic	Deciduous	Medium	12-15m	Parks, streets, public spaces, slow growing, frost sensitive when young, needs irrigation to establish.
<i>Lagerstroemia</i> 'Comanche'	Crepemyrtle	Exotic	Deciduous	Small	5m	Parks, streets, powerlines public spaces, under powerlines.
<i>Lagerstroemia</i> 'Fantasy'	Crepemyrtle	Exotic	Deciduous	Medium	9m	Park, streets, playground, public spaces.
<i>Lagerstroemia</i> 'Natchez'	Crepemyrtle	Exotic	Deciduous	Small	5-8m	Parks, streets, under powerlines, public spaces, playgrounds.
<i>Lagerstroemia</i> 'Tuscarora'	Crepemyrtle	Exotic	Deciduous	Medium	8m	Parks, streets, under powerlines, public spaces, playgrounds.
<i>Melia azedarach</i> 'Elite'	White Cedar	Native	Deciduous	Medium	10m	Parks, streets, public spaces, avenue, low fruiting type.
<i>Pistacia chinensis</i>	Chinese Pistachio	Exotic	Deciduous	Medium	10m	Parks, streets, public spaces, autumn colour.
<i>Platanus xacerifolia</i>	London Plane Tree	Exotic	Deciduous	Large	20m	Parks, streets, large public spaces, avenue, large leaf fall, can be hard to establish in Nillumbik.
<i>Pyrus calleryana</i> 'Capital'	Capital Pear	Exotic	Deciduous	Medium	11m	Parks, streets, public spaces, car parks, colour, width restricted spaces.
<i>Pyrus calleryana</i> 'Chanticleer'	Chanticleer Pear	Exotic	Deciduous	Medium	12m	Parks, streets, public spaces, car parks, autumn colour.
<i>Quercus canariensis</i>	Algerian Oak	Exotic	Semi-deciduous	Large	20m+,	Parks, streets, large public spaces, sprawling habit.
<i>Quercus cerris</i>	Turkey Oak	Exotic	Deciduous	Large	to 30m, sprawl	Parks, streets, public spaces, sprawling habit.
<i>Quercus coccinea</i>	Red Oak	Exotic	Deciduous	Large	20m+	Parks, streets, public spaces, avenue, autumn colour.
<i>Quercus ilex</i>	Holly Oak/ Holm Oak	Exotic	Evergreen	Large	20m+	Parks, streets, public spaces, hard to grow other plants underneath.
<i>Quercus robur</i>	English Oak	Exotic	Deciduous	Large	20m+	Parks, streets, public spaces, avenues.
<i>Quercus robur</i> 'Fastigiata'	English Oak (narrow form)	Exotic	Deciduous	Large	20m, narrow	Parks, streets, public spaces, avenues, narrow.
<i>Quercus suber</i>	Cork Oak	Exotic	Evergreen	Large	20m+	Parks, streets, public spaces, avenues.
<i>Stenocarpus sinuatus</i>	Firewheel Tree	Native	Evergreen	Large	18-20m, narrow	Parks, streets, public spaces, playground, can grow in semi-shade, narrow.
<i>Syzygium smithii</i>	Lilly Pilly	Native	Evergreen	Medium	to 15m	Parks, streets, public spaces.

<i>Ulmus parvifolia</i> (any cultivar)	Chinese Elm	Exotic	Deciduous	Medium	13m	Parks, streets, public spaces, avenue, playground.
<i>Ulmus parvifolia</i> 'Burnley Select'	Chinese Elm (narrow form)	Exotic	Deciduous	Medium	13m, narrow	Parks, streets, public spaces, avenues, playgrounds, narrow.
<i>Waterhousea floribundum</i>	Weeping Lilly Pilly	Native	Evergreen	Large	15-20m	Parks, streets (need regular uplift), needs irrigation, not wind tolerant.
<i>Zelkova serrata</i>	Japanese Elm	Exotic	Deciduous	Large	20m	Park, streets, public spaces, need irrigation to establish.