

**Tree risk mitigation guide** August 2023

# Contents

#### Introduction

Glossary

### Local government duties

- Duty of care
- Duty of care in the context of site circumstances
- Legal framework
- Risk management
- Suitable policy and procedures
- Risk allocation: insurance, indemnity and hold harmless clauses
- Record keeping
- Community communication and consultation

#### **Tree risks**

- New trees
- Existing trees

#### **Tree risk mitigation**

- Active tree risk management: understand your own area
- Tree risk assessment
- Tree inspection
- Roots inspection
- Tree maintenance
- Who can carry out risk assessment and inspection?
- Complaint about a tree
- Other risks considerations

#### Appendices

- Appendix 1 Most common claims against local governments
- Appendix 2 Tree management plan framework

03 04 05



30

17

# Introduction

Every local government has a significant tree population in its area. Trees provide an important benefit to the community.

Preserving and increasing tree population is part of most local governments' policies and plans and reflects the broad desire of a majority of ratepayers.

The many benefits urban trees provide to communities makes establishing and preserving them high priorities to local governments. Their capacity to provide shade, reduce the incidence and severity of human physical and mental health issues, manage stormwater, conserve biodiversity and serve many other functions simultaneously makes them wise community investments.

Approximately one third of all claims made to LGIS Liability involve trees. Although the value of most claims is relatively small, collectively they are considerable. Trees, if not managed and resourced appropriately, can also present reputational risk for local government. Additionally, claims management may require resources for investigations, case administration, court appearances and related expenses.

This Tree risk mitigation guide (the guide) is a publication of LGIS and provides a general guide to effectively manage tree-related risks and associated costs. It is anticipated that this approach will assist local government members of LGIS to address a range of common issues associated with treerelated claims.

For a useful 'quick reference', please view: Appendix 1 – Most common claims against local government

We wish to thank the Arbor Centre for their review and input into this second version of the guide along with the various local governments who contributed including members of the WALGA Local Government Urban Forest Working Group.

# Glossary

To assist with the contents of this guide, we have provided below, details of the most commonly referred-to professional job roles, relating to the management of trees in WA.

Role	Qualifications	Experience	Competencies
Arboricultural Consultant	<b>Minimum AQF 8</b> Graduate Certificate in arboriculture	10 or more years of field and industry experience. Often have complimentary training and experience or degree in an allied discipline such as landscape architecture, horticulture, planning, engineering etc.	Urban development, planning, construction, interpreting trees, their field conditions (above and below ground) and analytical data related to them; implementing all associated Australian Standards; environmental awareness; statutory tree law and regulation
Consulting Arborist	<b>Minimum AQF 5</b> Diploma in arboriculture	3 or more years of field and industry experience.	Legally able to report on tree matters, undertake tree audits and provide direction or opinion on tree matters to AS4373-2007, AS 4970, AS2303-2018
Tree Manager	<b>Minimum AQF 4</b> Level 4 in arboriculture or equivalent. There a no prerequisites for this qualification (i.e., May not have AQF 3 training in arboriculture)	Some level of industry experience in overseeing, managing and supervising field operations. Involvement in community engagements, canopy cover issues etc.	Administration, management of field operations, community engagement and urban environmental matters to AS4373-2007, AS 4970, AS2303-2018
Urban Forester	Minimum AQF 4 Level 4 in arboriculture or equivalent (including ISA certification). May not have AQF 3 training in arboriculture	Some level of industry experience in overseeing, managing and supervising field operations. Involvement in community engagements, canopy cover issues etc.	Administration, management of field operations, community engagement and urban environmental matters to AS4373- 2007, AS 4970, AS2303-2018
Qualified Arborist	<b>Minimum AQF 3</b> Level 3 (trade certificate) in arboriculture	2 or more years of field experience including OHS&E training, tree access and certifications for operating equipment.	Accessing trees and carrying out all forms of pruning to AS 4373-2007
Arborist	Field operator Certification in using field equipment (e.g. chainsaw, EWP, chipper, climbing etc.)	A person that works in the tree industry and has basic level training in using field equipment.	Carry out field operations under supervision to AS4373-2007
Tree Specialist / Expert	No formal credentials other than specialised experience or expertise with trees at some level	Usually has extensive experience and tertiary level training in an allied discipline such as plant pathology, horticulture, agronomy etc.	Usually limited to being within their band of expertise
Tree Lopper	Field operator an arborist with no formal training in arboriculture	Limited relevance to modern tree management and maintenance practices.	Not applicable

# Local government duties

This section of the guide provides insights into the framework and protocols involved in successfully carrying out the formal obligations and duties of local government, in relation to tree risk.

## **Duty of care**

Under common law and relevant legislation, local governments owe a duty of care to the community and persons entering and using the land under their control. For this reason, local governments should make good decisions and implement reasonable measures to mitigate the risks associated with the land, ensuring the risk is as low as reasonably practicable. Trees in local government-controlled land may pose various levels of risk, including property damage, injury, and in extreme circumstances death; therefore, it is crucial that local governments have appropriate controls in place to manage and mitigate such risks, these include:

- Compliance with relevant legislation
- Alignment with relevant Australian standards and codes of practice
- Policies
- Tree management programs and a regular review of these programs
- Reasonable and comprehensive awareness of the risks that trees may pose to people and property

## Example considerations around duty of care and breach of duty

## Does this tree create a foreseeable risk?

- Is the tree healthy?
- Is there a foreseeable risk of falling limbs?
- Do the roots create a foreseeable risk to neighbouring properties?

# What measures should my local government implement to reduce or eliminate the risk?

- Do we adhere to best practice sourcing, planting, and aftercare?
- Are our trees assessed and pruned by suitably qualified arborists?
- Should we consider removal only on evidence-based recommendations?
- Do we embrace root barrier measures?
- Do we restrict access to the hazardous areas?

## What is the likelihood of the risk materialising?

- Is the risk likely to occur?
- How likely-what is the probability?

## What are the consequences of the risk?

- Injury or catastrophic injury?
- Damage to property?
- What is the extent of the damage?

#### What resources are required to implement risk mitigation measures?

- Qualified personnel (e.g., arborist)
- Financial resources
- Any other resources

## Is it reasonable to implement these measures?

- Does my local government have the required resources?
- Can my local government afford the costs involved?
- Can/should my local government implement interim measures?
- What would a reasonable local government do?

**C** DECISION-MAKING: WHEN DECIDING WHICH MEASURES TO MITIGATE TREE RISK, LOCAL GOVERNMENTS SHOULD CONSIDER THE LIKELIHOOD AND SEVERITY OF THE RISKS, MAKE EVIDENCE-BASED DECISIONS THAT MINIMISE LIKELY FUTURE RISK AND CONSIDER THE COSTS OF THE MEASURES REQUIRED AND THE RESOURCES AVAILABLE. IT IS CRUCIAL LOCAL GOVERNMENTS RECORD THE DECISION-MAKING PROCESS.

#### Some exemptions may apply to local governments' duty of care, for example:

- If local government was not aware of the risk:
  - It was not reasonably expected for the local government to know about the risk; e.g., local government does not have available resources (e.g., financial and personnel) to inspect or assess the tree. For example, tree stock prior to planting; or the location of the tree such as a remote area or bushland reserve).
- If local government was aware of the risk:
  - Local government engaged a suitably qualified person, assessed the risk and based on expert advice decided that no measure was required.
  - Local government implemented reasonable measures to mitigate the risk.

## For trees or developments approved by local governments

An exposure arises from local government's role as an approval authority for land development.

This could be the case where new developments retain mature trees, or in redevelopments of high-density areas, where local government allow the construction of private property in proximity to trees.





## Legal framework

The legal framework on local government's duty of care and the management of trees includes:

Document	Scope
Local Government Act 1995	Local governments' powers and obligations
Civil Liability Act 2002 Occupiers Liability Act 1985	Local governments' duty of care
Local laws Local policies	Tree management, planning policies, other provisions concerning local government's particular circumstances.
Energy Operator (Powers) Act 1979	Obligations of the power operators
Environment Protection Act 1986 Environmental Protections (Cleaning of Native Vegetation) Regulations 2004	Environmental matters and native vegetation
Planning and Development Act 1986	Planning and development matters
Standards and guidelines	Road guidelines, verge vegetation, risk management, pruning and other relevant matters.

To support decision making, local governments should engage a suitably qualified arborist with a minimum AQF level 3 (refer Glossary) to inspect trees when reasonable to do so.

Relevant case law (precedent) may also apply in negligence and nuisance cases concerning trees where the claimant seeks to evidence that:

- 1. The local government owes a duty of care
- 2. The local government breaches its duty of care
- 3. The breach was material to the damage

HI PAL

## **Risk management**

Risk management is essential in mitigating local governments' liability exposure. Local governments should develop and implement their risk management strategy according to their particular circumstances, namely, the applicable legislation, their capabilities, financial and human resources, expertise, goals and strategic plans.

## **Risk management stages**



### **Risk identification**

Risk identification involves the compilation of possible risks, their likelihood, consequences, possible causes and scenarios.



### **Risk analysis**

Risk analysis involves the understanding of the risk. During this stage, local government should decide the appropriate response to the risk based on the likelihood, consequence, risk appetite, and resources available.

Existing controls and pastexperience with similar risks are important factors in the risk analysis.



### **Risk treatment**

Risk treatment involves the implementation of control measures to modify risk and achieve an acceptable level of risk. That is a level of risk as low as reasonably practicable.

## Suitable policy and procedures

With any area of risk mitigation, it is essential that local government have a set of suitable policies and procedures in place which provide a well-defined framework for the management of tree risks. Alongside this, such policies and procedures should be shared and communicated clearly with all relevant parties within a local government and also with relevant external suppliers. Further information on this topic is covered off in the tree risks section that follows.

A policy will not only guide decision making regarding tree risk but providing the policy and decisions that stem from the policy are reasonable, this may also assist with defending liability in certain circumstances.

Procedures can adopt the individual local government's general risk approach or include tools to assist with risk based decision making targeted at trees. As an example, matrices can be used to assist staff with prioritising actions according to the severity of the defect presented by a tree.

The following figure represents a general example of how the traffic light approach can be used as a simple tool to decide on the most appropriate action. How the criteria for defect categories and response times relate to risk can be adjusted to accommodate a local government's risk appetite and available resources.

Defect category	Response time
1.0	Rectify defect <b>within 48 hours</b> . The consequences of the defect are likely to necessitate immediate safety measures, i.e. prior to rectification works. The attending officer will need to phone in the hazard, immediately close/cordon off the affected area or remain on-site until the area is made safe.
2.0	Rectify defect <b>within 7 days.</b>
2.1	Rectify defect <b>within 28 days.</b>
2.2	Complete professional inspection within 28 days and/or rectify defect <b>within 180 days</b> (6 months).
2.3	Monitor defect, revisiting at the time of next inspection. Where resources permit, review and programme works where appropriate.
2.4	Monitor defect, revisiting at the time of next inspection. Where resources permit, review and programme works where appropriate.

This figure provides a general example how priority of response can link back to the assessed level of risk.

	Severity of harm/damage				
		Minor	Moderate	Major	Catastrophic
d of harm	Almost certain	2.1	2.0	1.0	1.0
	Likely	2.2	2.1	2.0	1.0
ihoo	Possible	2.3	2.2	2.1	2.0
Likel	Unlikely	2.4	2.3	2.2	2.1
	Rare	2.4	2.4	2.3	2.2

Concepts such as these can provide an easy mechanism to communicate important risk information to a variety of local government stakeholders involved in tree risk management. For consistency, the categories used and their associated criteria or values can be aligned with the local government's existing risk framework.

You can find a template of a 'Tree management plan framework' in Appendix 2.

**C** REMEMBER: TREE RISK MITIGATION POLICIES SHOULD NOT BE REGARDED AS A HANDBOOK ON TREE MANAGEMENT OR MAINTENANCE; TECHNICAL AND OPERATIONAL INFORMATION SHOULD BE INCLUDED IN SEPARATE OPERATIONAL PROCEDURES.

## **Risk allocation**

#### Insurance, indemnity and hold harmless clauses

It is important to consider the allocation of risk when local governments engage contractors to carry out tree risk assessment or implement risk mitigation measures. Local government should not bear risks that it cannot manage, and the agreements with contractors should clearly provide for the parties' rights, obligations and risks. Risk allocation and transfer mechanisms, e.g., insurance, indemnity and hold harmless clauses, are important risk management tools. Indemnities should be constructed according to the scope of the agreement and the services being rendered by the contractor. Local governments must require that contractors have public liability insurance and, where applicable, professional indemnity insurance.

## **Record keeping**

Local government must keep accurate and comprehensive records. The information recorded will assist local governments to monitor, study the trends and challenges of tree management, and investigate complaints.

#### **Record keeping should capture:**



Written complaints or reports from any source, including from neighbouring property owners to the tree. This might consist of:

- Description and/or validation of complaints also indicating the timeframe.
- The decision-making process and actions taken (if any).

Description of events that create hazards, e.g., storm, vandalism, vehicle impact including:

- Actions taken (if any) to address the hazard.
- Decision making process concerning the actions (if any) to address the hazard.



Photos – of any defect in the tree and alleged damages caused. If available, historical images of the tree and site may be helpful for evidentiary purposes.



Information about the tree and site circumstances above and below ground, including any assessment undertaken.



All correspondence relating to a tree request or issue.

## **Community communication and consultation**

Local governments should consult and communicate with the community before deciding on matters that may affect their interests.

Communication includes the education of the public and stakeholders in their responsibilities including:

- Requirement to provide notification of hazards and information to their local government.
- Obligation to treat risks in local government's area of control and interest, e.g., verge gardens, and other areas of shared responsibility under agreements or local laws.

For this reason, local government should promote the community benefits of a formal tree management process encouraging their support of local policies.



This section outlines some of the common reasons why new trees and existing trees pose risks, where such risks are seen through LGIS claims experience. This section also explains some of the new and innovative thinking required to reduce risk whilst achieving the desired canopy coverage for a given local government.

# Tree risks

## New trees

#### Planning and strategy

Successful new tree planting initiatives require a number of important considerations to be factored-in during the early planning stages of projects.

Typically, these initiatives should be within the context of an urban forest strategy, be compliant with your own tree, fire, environmental and other policies and regulations and the conditions imposed on individual developments. Failure to do this, increases the potential for future risk in terms of:

- Safety
- Reaching canopy cover targets
- Impacts on habitat & environment
- Increased maintenance costs
- Community health and wellbeing

## The project delivery process

In order to both manage the risk and achieve the intended outcome of successful new tree plantings, it is important to examine current practice and processes, and whether or not these are conducive to meeting the desired outcomes and minimising lifecycle costs.

Current practice commonly includes the breakdown of project delivery tasks such as; planning/sourcing tree stock, site preparation, tree planting etc. across multiple suppliers through a multi-tendering exercise. Whilst this practice may seem to align with driving costs down and attention on individual tasks, increased risk often arises from the focus on the contractual obligation of each task, rather than the critical dependency between and across all tasks. By segmenting tasks and contracts in this way, it presents challenges for local government in terms of project accountability and the delivery of the intended objectives and outcomes. Some of these challenges may include:

- Increased tree failure rates
- Compromised tree health and safety
- Increased complaints
- Higher ongoing maintenance
- Increased lifecycle costs and associated repairs

By examining opportunities to integrate more of these tasks through increased collaboration with tree specialists, greater control (administrative, operational and financial) and certainty can be achieved for local government with corresponding reductions in the associated medium to long term risks.

## Site circumstances

Crucial to risk mitigation, is an appreciation of the site conditions into which trees are planted.

In order to start visualising this, the diagrams on pages 7 and 8 along with the table on the following page, help illustrate the broader considerations that influence good decisions that underpin successful outcomes with reductions in risk.

## Site specific considerations

- Soil type for your local government area:
- Depth, composition, pH, salinity, permeability
- Width of planting areas on nature strip, tree pit opening, verge/road shoulder or median strip
- Surface treatment (area wholly or partly paved, sand/limestone bedding, non-reinforced concrete, grass)
- Built environment (including building/structure; setbacks, age, design)
- Previous land use (e.g., industrial chemical contamination)
- Water table (depth)
- Water availability & quality (bore/scheme/tank etc. and pH, salinity EC)
- · Site drainage and stormwater management
- Ground slope (steep to flat)
- Aspect/relationship to compass points for shade and sun
- Overhead obstructions or constraints (including power lines high to low voltage)
- Underground services and utilities (including fibre optic cables, high voltage power, water, gas mains and stormwater)
- Climate (prevailing wind exposure, coastal salt air, rain shadow)

Trees also require space to develop their structural root system and canopies. Being able to capture light and having access to uncompacted soil with good availability of water and nutrients is significantly important. Proper consideration for the species characteristics and available space makes a valuable contribution to reducing conflict with buildings, power lines or underground services, reducing the need for branch or root management.

## Tree selection - appropriate to site circumstances

Central to successful tree selection is the important consideration of the site circumstances from which to develop a palate of suitable species for locations within your town, city or region.

The risks associated with the selection of tree species for planting into road reserves, parks and public open spaces, are mitigated through collaborative inputs from appropriate professions (horticulturists, landscape architects, local knowledge resources) including tree specialists. Such professionals are able to help reduce risk by correctly interpreting site circumstances as a key stage in the process of species selection. Reversing this process to lead with species inherently increases risks associated with trees.

Other considerations include:

- Roots blocking and damaging sewer/storm water systems.
- Lifting and damaging pavements and roads
- Damaging building foundations

Future growth and form contributing to:

- Poor traffic visibility.
- Pedestrian access problems.
- Interruption to power supply and other services.

## Tree procurement – quality control

Poor quality stock, species that are unsuited to the soils, the aspect and water availability or pruning regime are more likely to develop defects. The result can be subsequent failure or poor performance as they mature.

It is important therefore to consider the standards of practice associated with tree production and some key indicators that highlight likely future increase in risk.

**AS 2303-2018; Tree Stock for Landscape Use** is the Australian Standard for the production of trees. Sourcing trees from suppliers adhering to these standards is preferable.

During the growing process, it is beneficial for local government representatives to periodically examine the integrity of tree roots development, prior to accepting delivery. This is best achieved through independent arboriculture support during the production or procurement process. Compromised root integrity is likely to lead to poor performing trees, increased maintenance/repair or replacement costs, with inherent future risks.

It is important to note here that a combination of compromised root integrity, poor planting and poor maintenance practice only increases the maintenance/ repair or replacement costs and the likelihood of risk transpiring in the future.

# Tree planting and maintenance standards

Standards of planting practice form an integral part of managing risk in terms of new tree plantings. Central to this, is the choice of contractor/employee to execute the planting process. Earlier in this section, we outlined the benefits of moving towards a more integrated approach to the stages of the new tree planting process. If site circumstances are known and factored in to the preparation for planting, this contributes to a reduction in risk.

The suitability of the contractor/employee to identify key standards of practice in the planting and maintenance process for tree establishment is important. For example, validating and/or exercising the adequacy of root development for ongoing tree health and stability, along with the ability to perform formative pruning of the stems and branches, both ensure that the tree has structural integrity above and below ground. The greater the structural integrity, the lower the likelihood of risk exposure to incidents involving limb failures or total tree failures. The tree also becomes more resilient to weather events such as storms and cyclones.

## Other general guidance for the selection of tree species

## **General considerations**

- Consider lessons from past events
- Existing and potential conflicts with other trees and structures
- Existing policy and procedures in place to guide staff
- Existing theme/character for area (e.g., heritage value)
- Associated building types, such as hotels or schools
- · Pedestrian and vehicle use and need for visibility
- Access for street cleaning equipment and garbage collection vehicles
- Feedback from community consultation (community expectation)
- Street lighting (over pedestrian crossings, traffic intersection)
- Traffic type (heavy vehicles, public transport, and high-volume traffic)
- Proximity (obstruction line of sight/signal/signs)
- Habit and rate of growth
  - Canopy spread
  - Mature height
  - Root system (localised, invasive)
  - Longevity (useful life expectancy)

- Physical form:
  - Weeping
  - Spreading
  - Upright
- Site lines for safety near intersections (trunk and canopy)
- Tolerance considerations:
  - Drought
  - Climate
  - Pollution
  - Root zone disturbance
  - Pruning
  - Salinity
  - Wind
  - Salt air
  - Shade
  - Compacted soils with low aeration or drainage (waterlogging)
- Weed potential for urban bushland & private property
- Maintenance/creation of habitat and promotion of species diversity (including benefit to fauna)
- Flowering and/or fruiting (potential for excessive drop/litter)

## **Existing trees**

#### A) Above ground issues

#### Whole tree failure

This can present significant liability as well as reputational risk for local governments. The wider causes of whole tree failure can be a result of one or more of the following:

- A lack of regular auditing/monitoring/communications of site circumstances (in particular root loss that may have occurred).
- Installation/modification/upgrades of below ground services.
- Street refurbishment of roads/paths/cycle ways/ signage etc.

#### **Tree growth impacts**

These risks can arise from damage to trees and change of circumstances relating to the expansion of tree canopies or root systems into private property. This expansion can also result in conflict with other structures, overhead services or signage.

#### **Falling branches**

Falling branches are common and pose a risk of injury to persons, and property damage. The likelihood of the risk depends on a number of factors, including the health or condition of the branch or tree, and the location of the tree.

#### Natural and seasonal tree habits

Local governments are subject to claims related to falling leaves and twigs, which can collect in roof gutters or spread onto paths requiring extra maintenance for property owners. Leaves, nuts and flowers also create slip and trip hazards when they fall onto pedestrian surfaces.

Generally claims involving private property will arise if a community member is of the view a tree is creating an issue within their property and that local government did not meet their request to remove branches or indeed the tree. These types of claims are more likely to represent reputational risk for local governments. The risk of a successful liability claim is more likely to arise in situations where the seasonal habits of the tree have created a persistent and unreasonable risk to users of public pedestrian areas.

Local government may also be aware that claims for allergies and similar issues may arise from the pollens and micro particles (expressed from flowers, leaves and bark). Although this process is part of a natural lifecycle that is predominantly beneficial to human health and wellbeing, to some it may present air quality risk.

#### **B)** Below ground issues

#### Extended root growth into private property

Risks can arise where root growth extends beyond the public realm into private property. This may result in root occupying spaces that impact services and structures within a private property.

#### Drought and waterlogging

Risks can arise from waterlogging that compromise the health of trees in the natural realm and from perched water bodies that can result from urban development.

Overall, a lack of water or a surplus of water can have a strong influence on the health and safety of existing trees. This can bring potential risk implications including limb failure and ultimately whole tree failure.

#### Infrastructure damage

Municipal footpaths, cycle ways, roads, kerbs and drainage can all be impacted by tree roots which in turn can result in trip hazards and potential damage to below-ground services. The lack of regular management/assessment of current and potential tree root impacts can increase risk. Similarly, increased risk can result from a failure to embrace innovative interventions that exist from arboriculture service providers and associated engineering.

It should also be noted that many of the so-called physical 'root barrier' products (marketed as a product to remove below-ground root encroachment), can fail to perform to expectations or to advertised claims in our typical urban soil environments. Furthermore, these products – when applied in sandy/urban soils – activate condensation which in turn attracts and encourages root development.

To ensure a manageable outcome, once the risk is quantified it is best to seek arboriculture advice as to the best methods of preventing future infrastructure damage.

#### C) Storm damage

Local governments may be subject to property damage claims caused by trees following a storm event. Local governments are unlikely to be found liable for losses caused by trees following a storm providing the local government has acted reasonably when implementing measures to mitigate the risks and in turn have discharged its duty of care.



### Areas of risk exposure - In summary

#### New trees

Risk exposure related to new trees arises where local government process does not; encourage accountability for performance, include a quality control process and/or properly consider site specific circumstances applicable to all species. Additionally, where consideration was not given to where the area of placement would have created or aggravated a risk.

#### **Existing trees**

Risk exposure above ground occurs through a lack of auditing/monitoring/communication regarding a change or otherwise to site circumstances, for example; installation/modification/upgrades of below ground services and/or street refurbishment of roads/paths/cycle ways/signage etc.

Below ground risk has similarities to the above with additional risks associated with the failure to implement root zone management planning in a timely manner, a lack of provision for infrastructure protection from tree roots, and a failure to seek professional arboriculture input where applicable.

# Tree risk mitigation

A comprehensive understanding of the existing trees within the local government area is crucial to demonstrate reasonable decision making on managing risks associated with trees. This section of the guide provides insights into some of the key areas for consideration along with suggestions to adopt both innovative and 'best practice' solutions in order to reduce risk where possible.

## Active tree risk management: understand your own area

Local governments should develop an individual tree management plan and carefully select professional arboriculture support where necessary to produce this. The tree management plan should factor-in the following process in order to properly address the mitigation of tree risk:

- Survey the areas subject of policies and procedures.
- Prioritise areas prone to risks, e.g. areas of high use by the public or areas known to represent risk.
- Carry out regular inspection of trees to identify risks and pro-actively address those risks.
- Keep a comprehensive record of the information concerning the tree population in your area.

The comprehensive record of tree information can take the form of an inventory, and should feature the following key data:





**Location and species** 

Size and age





**C** REMEMBER: MITIGATION **MEASURES SHOULD BE** DECIDED ACCORDING **TO THE SPECIFIC** SITE OR GENERAL CIRCUMSTANCES.



**Health and condition** 





Note: Local governments should act reasonably and according to their available resources and seek external expert resources where appropriate.

## Tree risk assessment

## The fundamentals of new and existing trees and their surrounds

Living trees have above and below ground parts that are inter-dependent on each other for survival and growth, making them dynamic living structures that also rely on their surrounds to provide adequate air, space, water, nutrients and stability. New tree planting can grow and potentially adapt to these surrounds and circumstances and once established, express their species-specific tolerances. This is quite the opposite for existing (mature) trees that have a low tolerance to 'change', in terms of the local environment that they have had to adapt to.

The site-specific circumstances in urban settings for new trees and existing trees may change and such change can adversely impact these trees. It is this impact that potentially presents a risk to people and property. Therefore in order to be managed the risk needs to be anticipated and this comes from early identification of risk by appropriate and timely assessment.

## Assessments based on local settings and circumstances

Assessment of risk forms part of the broader management of trees in urban and town settings. These settings vary greatly, from the Kimberley's and Pilbara regions of the North of WA, to the Gold fields, the Wheatbelt and more coastal regions of the state's south west.

Given the diversity of locations, environment, soils and site circumstance across WA, there are many practices that can be applied to identify risks associated with existing trees, as well as measures that can be incorporated to avoid future risks from new tree plantings.

A first step towards tree risk assessment is to determine the preferred methodology. The methodology should be recognised and broadly adopted by the arboriculture profession. We have listed the two most recognised standards in tree assessment as outlined below;

- 1. Quantified Tree Risk Assessment (QTRA) developed in the United Kingdom by Cheshire Woodlands Arboriculture Consultancy; and
- 2. Tree Risk Assessment Qualification (TRAQ) developed by the International Society of Arboriculture and adopted by Arboriculture Australia.

Both methods have been developed and progressively refined by industry experts. It should be recognised however, that both systems of assessment only provide data on potential risk identified of the above ground parts of the tree at the time of inspection. This assists tree managers in determining mitigation measures and priorities in developing their tree canopy works schedules.

Alternatively, a qualified arborist (Min. AQF Level 3) may be required to carry out tree risk assessments outside of QTRA and TRAQ methodologies.

It is important also to recognise there may be circumstances where the investigation, assessment, and interpretation of below ground parts (tree root systems) and their influence on site specific tree performance may fall outside of the available skillset. This may require independent review via experts, e.g. qualified arborist or higher (Minimum AQF Level 3). Arboriculture inputs in this area will enable tree managers to have a full appreciation of where risks are for trees in public areas and for those that encroach into private property<sup>1</sup>. Such assessment does not form part of the tree risk assessment models referred to above.

## Risk assessment measures /inspections, required to inform the tree management plan.

The following items are examples of the common factors that feature within a risk assessment 'profile' for a site-specific tree.

- Site history including:
  - Site structures such as building footprints, roads, carparks etc., that strongly influence where roots grow.
  - Recent changes in circumstances such as soil levels, below ground services, watering regimes.
  - Past drainage and stormwater flows. In many cases, associated changes can take some years to express themselves in terms of how the tree presents.
- Existing tree circumstance within a max. 15m radius of the tree (includes soil types, topography, drainage and stormwater flows, other vegetation types, environmental factors etc.).
- Existing site circumstances (relating to 'target' values, occupancy rates for people/vehicles and alike).
- Above ground assessment (tree health, canopy structure, habitat etc.).
- Below ground assessment (root bole and distribution, water-table, watering regimes, soil compaction etc.).
- Proposed site circumstances; i.e., known changes that may occur within a 15m radius of the tree (such as below ground services, construction of paths, roads or hardstand, watering regimes etc.).

The collection of relevant data from an assessment, its analysis and the interpretation of the forecasted tree response, all require specialist<sup>2</sup> expertise often beyond what is reasonably anticipated from a person with AQF 5 Level training in arboriculture. In these instances, an AQF level 8 consultant is recommended.

## **Tree inspection**

Local governments must carry out tree inspections according to its particular circumstances, namely, to address the level of perceived risk posed by trees under its care, the available financial resources, and staff expertise or through relationships with arboriculture professionals.

Tree inspections can produce valuable information about the tree risks and treatment options. It is crucial that tree risk information is accurate to enable the best identification and management of the risks exposing local governments to liabilities.

It is recommended, that aside from the assessment details outlined in the previous section of the tree risk mitigation section, that local governments produce a framework for tree inspections based around a suitable schedule and one that is fit for purpose. This tree inspection framework should form part of the local government tree management plan.

<sup>1</sup> A mitigation strategy may be required to avoid a tree that is located in the public realm, from becoming dependent on roots that have developed within private property. Again this may require input from experts, a qualified Arborist or higher (Minimum AQF Level 3).

<sup>2.</sup> Refer to the Glossary earlier in this document for job titles, found in the management of trees, along with a description of the areas of responsibilities and skill sets normally associated with them. The schedule could be dictated (for example) by the volume of trees at locations, the occupancy of the spaces beneath them and the propensity of species to adapt to a change of circumstances (above and below ground). The change in circumstance that will inevitably arise as infrastructure and surrounds are upgraded or modified.

Local governments should consider the importance of implementing effective and efficient inspection programs. A reasonable system of inspection comprises:

- A thorough appreciation of the condition of local government's assets, and the appropriate management requirements.
- Processes to identify trees risk.
- Processes to implement risk mitigation measures.

Note: The assessment methodology used by the local government will indicate the process and mitigation measures required (if any).

REMEMBER: THE COURTS ARE LIKELY TO CONSIDER INSPECTION PROGRAMS AND THE COMPLIANCE WITH THESE PROGRAMS AS A REASONABLE MEASURE TO ADDRESS/ PREVENT TREE RISKS.

> NOTE: LOCAL GOVERNMENT SHOULD ALSO DEMONSTRATE IT COMPLIES WITH THE INSPECTION PROGRAM, AS PART OF ITS TREE MANAGEMENT PLAN.



## Inspection outcomes and assessment

Provided that the tree inspection schedule within a tree management plan is adhered to, the resulting list of activities/outcomes should be factored as an integral part of the tree risk mitigation process.

The inspection outcome is a result of the analysis of the conditions of the tree and the site in light of the risk of harm derived from the assessment methodology. The inspection will indicate the required measures (if any) to reduce the risk to an acceptable level. For example:

- No action required the tree has no obvious defect, or no other condition that requires works at the time of the inspection.
- **2. Monitoring** the tree requires further inspections and information over a longer period, such as: changing seasons and weather patterns, assessment of tree growth response and response to treatment (if any).
- **3.** Advanced assessment the tree requires a detailed and further assessment, which may include an aerial inspection, tissue and soil analysis, resistance drilling or sonic tomography to allow local government to make an informed decision. In the absence of qualified personnel, local government should engage a qualified arborist to provide specialist advice.
- **4. Reduce the target area** restrict access to an area around the tree (where the area presents risk of harm to people or damage to property).
- 5. Tree risk assessment a detailed and qualified tree risk assessment needs to be conducted providing an assessment report to assist with decision-making around the required actions.
- 6. Target pruning the tree poses a risk, and pruning by a suitably qualified person (see Glossary) is recommended to mitigate the risk.
- **7. Removal** Pruning may not be sufficient to treat the risk, e.g., the tree is dead, diseased, presents with significant structural issues, or if the tree is causing significant damage to infrastructure. (Note: this is not an exhaustive list).

Throughout any of the above activities/outcomes, local governments are encouraged to seek professional arboriculture advice wherever necessary to support sound decision making.

## **Roots inspection**

Where local governments have responsibility for the control of vegetation, it is recommended that tree audits are undertaken as part of mitigating risk. Importantly, these audits should also include data relating to roots and any consequences that are likely to arise. This kind of data/assessment is best determined by a suitably qualified person (preferably with minimum AQF Level 5 in arboriculture). Local governments are also encouraged to include a root inspection program within their tree management plan.

Unlike above ground parts of trees that can be more easily verified, inspecting roots below ground requires more specialist investigation (and often technology) in order to verify their location and status in terms of stability and health. The following points list some of the core principles for below-ground tree assessments:

- 1. Inspections require **evidence** and the interpretation of evidence as part of an assessment undertaken by a consulting arborist (min. AQF level 5).
- 2. In cases where structural engineers are deployed to assess structural damage associated with trees, local governments should ensure that a consulting arborist (min. AQF level 5) has participated in the assessment in collaboration with the structural engineer. This will assist with arriving at an evidence-based conclusion.
- 3. Local governments consider moving towards a more evidence-based approach with processing inbound complaints and in dealing with potential risk where an awareness of risk already exists.

The recommendations below provide considerations for an improved framework of handling inbound requests whilst reducing time and effort in proofing the validity of the claim.

In order to avoid the perpetuation of unfounded claims and the operational costs associated with them, local government is encouraged to filter and better validate inbound enquiries by creating a template-based questionnaire which places the onus on the complainant to submit a range of details (including photographic evidence) in order to substantiate their initial claim. Using this approach, no claims would be processed unless this submission is completed satisfactorily. Once local government has received the submission, the following criteria can be applied for assessment based on the three categories identified below;

#### Category 1

Perceived tree root damage: where a request for action cannot be substantiated at all.

#### Category 2

Observed presence of tree roots: where the request is based on observable root presence and the potential for tree root intrusion or damage to property. In this instance, the complainant is encouraged to seek an independent arboriculture assessment in order to provide an evidence-based report for submission and consideration.

#### Category 3

Intrusion of tree roots: where there is concern regarding tree root intrusion into private property. In this instance, local government actions an independent arboriculture assessment in order to provide an evidence-based report for internal consideration.

The above approach reduces the onus on local government to invest time and resources into validating every claim, and/or the need to respond to a perceived or unfounded risk.

These are some example outcomes following tree root assessments:

- **1. No action required**: there is no evidence of roots causing disruption or damage to infrastructure.
- 2. Mitigation measures: may take the form of works as necessary.
- **3. Tree Removal:** in certain circumstances that include arboriculture evidence, the removal of the tree may be necessary.

## Tree maintenance

Effective tree maintenance includes all aspects of tree care that influence the above and below ground parts of trees and their ongoing health and safety in the public realm. The level of ongoing maintenance afforded to the trees has a direct correlation to the risk associated with their retention.

REMEMBER: WHERE A TREE IS PROVEN TO BE CAUSING DAMAGE TO PROPERTY, REASONABLE STEPS SHOULD BE TAKEN TO PREVENT ANY FURTHER DAMAGE. SHOULD THIS NOT OCCUR AND DAMAGE CONTINUES, LOCAL GOVERNMENT MAY BE EXPOSED TO A PUBLIC LIABILITY CLAIM.

Watering

For both new plantings and existing trees, sudden changes to a watering regime can induce risk. In existing trees (and once new plantings reach a certain stage in their growth), this includes tree branch failure and/or structural tree collapse etc. For new plantings, the risk is that the trees do not mature and deliver the anticipated canopy cover and environmental benefits.

In the case of new plantings, supplementary watering is generally applied as part of tree establishment. The tree establishment period may range from one to three years subject to size and species planted.

Local governments are encouraged to adhere to best practice or recommendations as set out by horticulturists/arboriculturists for the watering of trees during the establishment period. The establishment period being prior to the tree being able to survive independently or alongside the ongoing watering regime as afforded by the particular local government.

## Tree pruning - above ground

The AS 4373-2007 – Pruning of Amenity Trees provides guidelines for the correct pruning of trees. To manage the risk of damaging the tree, which creates risk of harm or damage and in turn a liability exposure, local governments must engage qualified personnel to prune trees. In the absence of qualified personnel, local government should seek specialist advice and assistance.

If local government engages contractors to maintain the trees, they should ensure the risks are allocated to the contractor carrying out the works. Please refer to the sections Duty of care and Risk allocation for more information.

These are some of the risks that may transpire as a result of incorrect pruning:

- Trimming branches:
  - Branches may fall onto pedestrians
  - Poorly formed/deformed tree
  - Weak regrowth
  - Destruction of the natural habitat
  - Reduced lifespan of the tree
  - Branches may fall onto the paths/pedestrian access creating trip hazards
  - Branches may fall onto the road creating traffic hazards
  - Branches may damage property and structures
  - Increased likelihood of pest, disease and fungal pathogens entering a tree
  - Unnecessary and new exposure of the canopy to external loading
  - General structural damage

## REMEMBER: ALL PRUNING SHOULD BE UNDERTAKEN IN LINE WITH THE AUSTRALIAN STANDARD FOR AMENITY PRUNING, AS 4373 – 2007

## Tree pruning - below ground

Pruning of roots may be necessary to manage existing or potential damage to below-ground infrastructure or to remove trip hazards that may have developed.

Root zone management techniques can be employed to control the growth of roots around below-ground infrastructure. In addition, local governments should make themselves familiar with new innovations, products, services and current advice at the time of undertaking projects of this nature. It is useful to note that considering site specific circumstances often dictates the success of the protection of infrastructure or assets such as kerbs, services, surfaces etc., from tree root damage.

The Australian Standards AS4373 states that "detailed guidelines on root pruning are beyond the scope of this standard. However, a general outline is included. Should the need arise, expert guidance should be obtained regarding root pruning and excavation around and near trees"

Whilst the standard also states "specialist advice from a person with a minimum AQF level 4 in arboriculture should be sought before any root pruning occurs", this is a minimum requirement of the standard, recognised as limited in provision of guidance of root pruning. Industry best practice suggests actual pruning specification, advice or supervision should be undertaken by a person with minimum of AQF level 5 qualifications.

This is also consistent with qualification requirements of AS 4970 Protection of trees on development sites, where the project arborist may be relied upon to provide guidance including the pruning of tree roots and the overall protection of the tree.

In combination, inappropriate above and below ground tree pruning may induce risk. Mitigation measures may need to recognise that pruning can:

- Remedy or create an adverse structural condition.
- Necessitate the removal of deadwood.
- Require the removal of parts of a tree affected by a pathogen.
- Provide clear sightlines and safe passage for both vehicles and pedestrians.
- Define the form and structure of a tree.

Pruning should comply with the legal requirements concerning power lines and/or below ground services. Relative clearances should also factor in the potential for re-growth between tree maintenance periods.



The AS 4373 exclusively outlines maintenance practices. An arborist level 5 defines and recommends the required measures. An arborist level 3 is qualified to carry out pruning works above ground.

## **Leaf litter**

The generation of leaf litter is a naturally occurring process, which cannot be stopped or prevented. Common mitigations measures include:

- Avoiding selecting trees that will drop fruits.
- Placement of new trees should consider the 'Utility Providers Code of Practice' which outlines tree planting alignment.

It is not uncommon for private property owners to act and prune overhanging branches that encroach on their property regardless of whether this is permissible, advisable or indeed reasonable. This can occur where the property owner is unfamiliar with applicable local laws that prohibit such interference, or in some cases where the property owner is of the view that local government did not meet a request to address a complaint involving the tree.

Local governments should ensure their policies are well communicated to property owners and the community in general.

In general, where a complaint is received by a local government they should inspect the tree and discuss options, including the advantages/disadvantages of certain actions as well as the operation of relevant policies and local laws. If remedial action such as pruning is necessary, we advise that this is organised by the local government to ensure that the subject tree is pruned correctly.

### Tree removal

Generally, local policies govern the removal of trees. However, other circumstances may require the removal of a tree, e.g., unacceptable risk.

Local government should engage a suitably qualified arborist (AQF level 5 or higher) to determine if indeed a tree represents a risk, and if so the level of risk, and to approve or justify the removal of a verge tree should other mitigation measures not suffice.

It's important to consider that tree removal should be undertaken having examined all other tree retention options (in keeping with AS 4970\*). Tree removal should occur where the tree poses an unacceptable level of risk that can't otherwise be reduced.

If local government has knowledge of a tree that presents an unacceptable risk, and fails to address the risk, they could be found liable for harm or damage caused by that tree. The decision-making process about the removal of a tree should consider specific circumstances, including community expectations and consultation.

#### **Decision Making Process**

- Informed decision: consider all data available about the circumstances of the tree.
  - History of the tree.
  - Tree management plan/urban forest strategy.
  - Arboriculture report (evidence based).
  - Local government tree policies.
  - Community expectations.
- Impartial and unbiased decision.
- Keep record of the whole process.

Trees and private land: if the tree is located in private property, it may require the property owner to obtain an examination and report. This should be produced by a qualified arborist visiting the property and at the owner's expense (reporting standards may apply). Local governments are encouraged to filter and better validate inbound enquiries by creating a template-based questionnaire which reasonably places the onus on the complainant to submit a range of details (including photographic evidence) in order to substantiate their initial claim. Local government could be liable where actions are not deemed reasonable. Therefore. it is important to seek appropriate advice from an arboriculture professional and implement associated recommendations.

## Who can carry out risk assessment and inspection?

The use of any risk assessment method requires training and knowledge of the tree species, failure characteristics, tree body language and other arboriculture principles and teachings. Whilst experienced local government staff may carry out an initial inspection, we recommend all tree assessments be undertaken by an arborist who holds an AQF level 5 (Diploma). The arborist should also be capable of providing advice on appropriate mitigation solutions. (Refer Glossary).

If a local government does not have qualified and experienced personnel, it may from time to time engage a suitably qualified consulting arborist to undertake large scale or individual tree inspection and risk assessment as part of its tree management plan.

These assessments will assist the local government in the decision-making process of how to address the risk (if any) posed by a tree.

A consulting arborist should have experience to plan, consult and determine the required level of tree assessment, write reports and give legal testimony. (Refer Glossary).

A consultant arborist report should, include the following:

- Address of the site containing the tree(s).
- Botanical name of the tree.
- Measurements of the tree, including: height, diameter at breast height and width of canopy.
- Risk assessment using an accepted methodology (i.e., QTRA or TRAQ).
- Age classification.
- Observations on the tree's health and condition.
- Supporting photographs.
- An aerial photograph showing the location of the tree.
- Contact details of the arborist.
- A summary of their qualifications and training.
- Risk mitigation measures or recommendations for the management of the tree.
- Clinometer height reading.

**Importantly,** the consulting arborist should be able to demonstrate a track record of being able to interpret future change to the current tree circumstance. This could be through consideration of previous works or resulting from the execution of planned works.

A consulting arborist should hold appropriate levels of public liability and professional indemnity insurances.

**CALE OF SET OF A STATE OF A STAT** 

Protected trees: AS4970:2009 Protection of Trees on Development Sites, and should be used as a guide for assessment of tree retention options.

## **Complaint about a tree**

It is important local government responds appropriately upon receiving a complaint about a tree risk, e.g., carrying out inspection, implement mitigation measures and monitoring the tree.

Earlier in this document (section titled root inspection) we outlined recommendations to provide an improved framework for handling inbound requests, whilst reducing time and effort in proofing the validity of claims.

#### What local governments should do upon receiving a complaint:



#### **Emergency request:**

- Comply with internal procedures.
- Take reasonable action and provide a timely response according to the nature of the issue.
- Record all details of the incident and action taken, photographs, including dates/times.



#### Written or verbal request received:

- All tree requests or complaints (unless in an emergency) should ideally be in writing via:
  - Email
  - After hours communication processes
  - Social media services
- Verbal requests should be recorded in a record keeping system that allow follow up actions.



#### Identify the source of the issue:

- Tree roots
- Falling limbs
- Encroaching vegetation



#### The details of the request:

- Species, height and age of the tree.
- Any other known details investigated, such as:
  - Who manages the tree.
  - Were there signs of any problem.
  - Any previous complaint (details of the complaint: when, who, how, etc.)
  - Response to previous issue(s).
  - Maintenance or other actions taken to mitigate the hazard.



#### Location & description of the tree:

- The exact location of the tree:
  - Private property.
  - Road.
  - Community land.
  - Local government land.

#### **Record keeping:**

- Local government should record all details concerning the risk and actions taken, including photographs and timing.
- Written complaint: all tree complaints (unless in an emergency) must be in writing. This includes all communication channels, e.g., email, after-hours communication processes, and local government's social media.
- Emergency complaints when made verbally, should be recorded at the first opportunity.

**COMPLAINT TO THE PERSON/ENTITY RESPONSIBLE FOR MANAGING THE TREE.** 

\_

## **Other risk considerations**

#### Roads

Local governments are responsible for the management of the vegetation within the roads under its control. The management of vegetation includes keeping the road clear, and also managing the areas within the road. These are some of the requirements:

- Vegetation within the maintenance zone is limited to a height < 200 mm to limit the potential for screening of hidden objects that may reduce the capacity of drains and cause damage to the underside of vehicles leaving the roadway.
- Bush Fire Codes applicable to the region should be adhered to and the compliance requirements understood by local government
- Restrictions apply for all roadside surface treatments. For example, road intersections or entry to roundabouts are paved (in part), maintained clear of vegetation, or planted with grass or low ground covers.
- A 'recovery zone' or safety 'clear zone' adjacent to the road (on both sides of the roadway) is also maintained clear of non-frangible objects to help reduce the severity of accidents if vehicles run off the road. Restrictions apply for trees and fixed objects within this band of variable width.

Main Roads WA provides a supplement to Austroads Guide to Road Design which attempts to maintain a clear zone for traffic on roads. This supplement uses a formula to determine the size of the clear zone based on factors such as speed limit and traffic volume. REMEMBER: PROPERTY OWNERS ARE RESPONSIBLE FOR THE MAINTENANCE OF VERGE GARDENS ATTACHED TO THEIR PROPERTY. THIS CAN BE CONDITIONED BY LOCAL LAW AND POLICY. IN GENERAL, THE COMMUNITY SHOULD BE EDUCATED AND MADE AWARE OF THEIR OBLIGATIONS IN RELATION TO VERGES.

REMEMBER: MAIN ROADS AND AUSTROADS GUIDES SHOULD BE USED AS A REFERENCE AND WHERE REASONABLY PRACTICAL. LOCAL GOVERNMENTS SHOULD DECIDE ABOUT TREE RISKS, INCLUDING THE SELECTION OF NEW TREES IN LIGHT OF ITS PARTICULAR CIRCUMSTANCES.





Figure 2: Example Vegetation Placement Guide for Verges

## **Planning and development**

Local government has the ability to influence the planning of developments with existing vegetation in keeping with statutory obligations. This includes the creation of local structure plans and precinct designs for new developments. During all associated stages and processes of such developments, it is important to include arboriculture considerations so that the appropriate forward planning to mitigate risk can be fully incorporated into tree retention and new tree planting initiatives.

An effective mechanism for successful tree/vegetation outcomes is to encourage collaboration between professional parties to ensure good tree risk mitigation outcomes.

805

756

qr

969

1235

036

1035

1011

1030

1022

222

258

987

984

224

196

768

137

1356

315

317

135

## **Power lines**

Local governments have a statutory duty as the occupier of the land to prevent cultivated vegetation from interfering with the electricity supply system. Some local governments may have agreements with the electricity supplier governing the responsibility for managing trees. In this case, local government must ensure the agreement correctly allocates the risks, is current, well understood and documented.

In the absence of an agreement, local government must ensure staff/contractors carry out pruning of trees in accordance to standards and guidance provided by the electricity supplier and also adhere to the *Code of Practice for Vegetation Worker Electrical Safety*. In this respect, there are 'powerline qualified' contractors available in WA who are accredited to work near the Western Power network.

845

135

<u>330</u>

834

398

# Appendices

## Appendix 1 - Most common claims against local governments



### Example 1:

Falling branches/trees - road reserve

- A local government was alerted to a tree exhibiting signs of possible health issues. This tree was located on a median strip immediately alongside a school crossing.
- The local government engaged an arborist to inspect its tree's periodically.
- At one point the arborist recommended removal of a particular tree because of health defects that would impact structural integrity.
- This recommendation was supported by a quantified tree risk assessment.
- The local government, wishing to retain the tree, engaged a second arborist to continue inspections after providing a verbal opinion the tree could be monitored rather than removed.
  - The tree ultimately fell over onto private property causing damage.
  - Legal advice was sought on the subsequent claim for damages. The chances of a successful defence were thought problematic, given the local government may have breached its duty, as:
    - There was initial evidence the tree was suffering from several adverse health effects that reduced it's structural integrity;
    - It was foreseeable the tree could fail;
    - > The local government was aware of the issues and the risk involved, yet arguably chose to ignore this;
    - With these issues in mind and the fact the tree was located near a vulnerable area of frequent visitation (school crossing), it was unreasonable to adopt a monitor and see approach.

## Observation

Local government could have eliminated the risk (and potential liability) by relying on suitable qualified expertise and implementing evidence-based recommendations (rather than a personal/professional 'opinion').

Monitoring the tree as a means of managing the risk was not a reasonable course of action because of the circumstances, structural status and location of the tree.

NOTE: An evidence-based approach avoids grey areas where recommendations offered to local government may be driven by 'opinion'. Such 'opinion' may reflect an inability to provide an evidence-based recommendation and instead, fall back on more narrow courses of action.



### Example 2:

Falling branches/trees – local government reserve

- Local government's parks and gardens personnel pruned trees as part of the management of the reserve.
- Local government did not have a qualified arborist
- Local government's personnel did not follow any standards.
- The incorrect pruning damaged a tree located next to a seating area.
- Local government did not identify the risks of branch failure.
- Local government did not seek expert advice about the health and integrity of the trees within the reserve.

- A branch hanging over the seated area fell onto persons causing serious injury.
- Local government may have breached its duty of care to the party suffering the loss.

## **Observation**

Local government could have avoided the damage by engaging suitable qualified expertise, capable of providing evidence-based recommendations (rather than a personal/professional 'opinion'). Monitoring the tree was not a reasonable course of action because the circumstances and structural status of the tree in its location, were not adequately verified.

NOTE: An evidence-based approach avoids grey areas where recommendations offered to local government may be driven by 'opinion'. Such 'Opinion' may reflect an inability to provide an evidence-based recommendation and instead, fall back on more narrow courses of action.



#### Example 3:

Tree root intrusion -private property

- A local government receives a complaint about damage caused by roots of a mature tree growing under a private building.
- Upon receiving the complaint, local government inspects the site and identified roots travelling in the direction of and under the building; however local government failed to implement measures to mitigate or prevent further damage caused by the tree.
- After one year, the property owner contacted local government about further damage caused by the tree, and requested local government pays for the repair costs.
- Local government could be found in breach of their duty of care for failing to implement measures to mitigate the risk posed by the tree roots, and to avoid further damage to the private property.

## **Observation**

Upon receiving a complaint about damage to private property caused by tree root invasion, local governments should do what is reasonably practical to prevent future damage to the private property. Local government could be liable if advice is not sought from an expert arboriculture consultant. Recommendations to mitigate risk within the expert advice should be implemented to demonstrate a local government's reasonable response to the risk.

## Summary of Appendix 1

All three above examples illustrate the importance of understanding the credentials and capacity of the arborists engaged to provide scientific evidence-based advice to local government. Therefore, as a risk mitigation measure, serious consideration should be given in the selection of sources of advice.

## **Appendix 2 - Example Tree management plan framework**

### **A) Influencing factors**

There are a number of factors that are inherent in determining the framework of a tree management plan. Some of these are as a result of decision-making that happens in order to influence the nature of the plan itself, its priorities and objectives. Typically, these are undertaken at strategic level within local government.

These may include:

- Policies and procedures
  - Applicable local policies
  - Applicable legislation
  - Applicable standards

#### • Master planning

- Urban forest strategic planning.
- Canopy cover planning & targets.
- Ecological & environmental planning & objectives.
- Sub-division development applications.

Other influences of a broader nature may also shape the framework from a strategic level. These include the impact of climate change (for example CO<sub>2</sub> emissions, increased energy usage, elevated storm intensity and rapid rain events etc.). Furthermore, there are manmade influences at a local scale that strongly steer the framework such as heat island impacts, canopy cover, water management, human comfort/health/wellbeing associated with trees etc. In combination, these items can be given a risk rating in terms of:

- Number of claims and how to reduce these numbers.
- The types of claims and how to reduce the cost of processing them.
- The size of potential claim and how to reduce the dollar value of them.

## **B)** Recommended topics for framework development

Listed below are the recommended topics that are commonly found in comprehensive tree management frameworks. This list is not exhaustive and consideration needs to be given to influencing factors such geographical location and local government circumstances with the associated logistics.

It is important to recognise that risk is inherent within all aspects of decision-making within this list, covering both field and administrative responsibilities. Policies & procedures

Tree planting

Sub-contract management

Internal and external reporting

Staffing & recruitment

**Asset register** 

**Tree inspections and audits** 

Managing disputes

**Risk assessments** 

Budgeting

Procurement

Pruning

**Repairs and maintenance** 

**Professional development** 

Complaint/claim management

32 Tree risk mitigation guide 2023

## C) Policies and procedures

Tree management policies steer all activities associated with trees. They are an important tool for local governments' staff to improve and maintain the health of the tree population. It is crucial that policies are developed according to the specific circumstances of each local government, reflecting the availability of resources and capabilities.

#### Some of the policy's key areas of coverage are:



Management of trees:

To ensure local government effectively and reasonably manages trees on roads, and community land.



#### **Procurement:**

To ensure that the right quality of trees is being grown and supplied to avoid high costs of replacement and replanting, and the high cost of maintaining low quality trees.



#### **Maintenance:**

To ensure effective maintenance, replacement and functional programs for planting and preservation of trees.



#### **Resources:**

to coordinate and ensure that resources are allocated so local government meets its strategic and operational obligations.



#### **Compliance:**

To ensure compliance with the relevant legal framework.



#### **Environment:**

provides for amenity, urban ecology/biophilia and environmental sustainability.



#### **Other interests:**

To consider the ongoing impact of external stakeholders, including Western Power, and other utility companies and authorities.



#### Community engagement:

To consult with the community and promote the positive influence trees can provide to the general landscape.



#### Other local government assets:

to minimise and consider conflict issues between trees and local government's infrastructure using the principles of risk management. Although previously we've outlined some of the influencing factors that may comprise part of the tree management plan framework, expressed below is an example of how relevant components - headings and content, may form the tree management policy.

#### Applicable local policy and controls

- Policy identification
- Responsible department
- Related policies
- Related procedures controls
- Date approved
- Last reviewed
- Next review date

#### **Applicable legislation**

- Local Government Act 1995
- Local laws
- Energy Operators (Powers) Act 1979
- Environmental Protection Act 1986
- Planning and Development Act 2005
- Civil Liability Act 2002
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations)

#### **Applicable standards**

- AS 4373 2007: Pruning of Amenity Trees
- AS 4970 2009: Protection of Trees on Development Sites
- AS 2303 2015: Tree Stock for Landscape Use
- Planting

#### **Example policy statement template**

The **(local government)** tree management policy (the policy) is developed in association with other council strategies, and objectives including:

- (local government) Strategic plan
- Other related plans
- Tree management procedures

The Policy is intended to provide guidance in relation to general planting, maintenance and, if necessary, the removal of trees (and vegetation) on local government managed land and roads within the scope of relevant legislation. The policy should be utilised in conjunction with **(local government)**'s tree management procedure/s.

#### Purpose

The policy provides the strategy to manage, develop, protect and conserve the environment of the **(local government)** area, in a manner that is reasonable, consistent, promotes the principles of sustainable development and within the resource allocation provided by [local government].

The Policy will apply to all relevant **(local government)** operations and includes commitment to the following:

• To meet (local government)'s overall obligations in relation to trees pursuant to the strategic plan

To ensure that trees on roads, community land and other landscapes are:

- Planted and maintained in a consistent and reasonable manner underpinned by risk management principles and resources that are made available.
- Planted and maintained in an equitable manner and continue to provide amenity to the local community.
- Are nurtured and protected utilising risk management principles and within the legislative framework.

#### Scope

The policy shall apply to all trees under the care, control and management of the [local government] and within the scope of legislation.

#### **Definitions**

**Tree:** A woody perennial plant, including palms that can have one or more trunks and a distinct elevated crown or lateral branches.

**Significant tree:** A tree declared to be a significant tree, or a tree within a stand of trees declared to be significant trees, by a development plan.

Planting: The installation of a tree at an identified site.

**Road:** Means a public or private street, road or thoroughfare to which public access is available on a continuous or substantially continuous basis to vehicles or pedestrians or both and includes:

(a) a bridge, viaduct or subway; (b) an alley, laneway or walkway.

**Local government land:** means local government land and lands in the Public Realm under the management and control of local government.

**Landscape:** Used to describe a particular piece of geography located in the local government area.

**Strategic plan:** Identifies a local government's objectives for the area over a period of at least four years (the **relevant period).** 

**Reserve:** Includes parks, gardens, reserves, playgrounds, ovals, and other areas such as water retention locations.

**Risk management:** Coordinated activities to direct and control an organisation with regard to risk (AS/NZ ISO 31000).

#### **Key principles**

The key principles of the Policy are:

- 1. To ensure that councils effectively and reasonably manage trees on roads, community land and across the landscape.
- 2. To provide effective maintenance, replacement and functional programs for planting and preservation of trees.
- 3. To coordinate and ensure that resources are allocated so that council meets strategic and operational obligations.
- 4. To ensure the effective and efficient use of resources, reasonably allocated to maintain and manage trees across the local government landscape.
- 5. To manage the requirements related to the legislative framework.
- 6. To focus on the provision of amenity, biodiversity and environmental sustainability.
- 7. To consider the potential for increased storm intensity and higher frequency of rapid rain events.
- 8. To consider the ongoing impacts of external stakeholders, including Western Power and other utility companies, and other authorities.
- 9. To consult with the community and promote the positive influence trees will provide to the general landscape.
- 10. To minimise and consider issues of conflict between trees and local government infrastructure using the principles of risk management.

#### **Supporting documents**

The tree management policy is supported by a tree management procedure, inspection checklist and council risk assessments.

## Highlights of key areas for risk consideration within the overall framework

It is important to note that some of the topics listed within the framework development (previous section in this document) are covered off within the *tree risk mitigation* section of this document. Other key areas are summarised below.

#### D) Inspection programs

#### **Developing inspection programs**

Inspection programs are not one size fits all. Local government should develop its own inspection program by considering the following factors:

- Location
  - Area/scope of the inspection program
  - User frequency of the area
- Resources
  - Level of resources available
  - Competing interests for these resources
  - The allocation of these resources
- Trees
  - Number of trees
  - Size
  - Location
  - Number of people using the area beneath the tree
  - Species
  - Condition of tree; above and below ground

#### Expert advice

 Availability and access to expert advice and assistance.

It is unreasonable to expect that a local government inspects every tree within its jurisdiction. However, it is reasonably expected that local governments maintain a defined management program of their trees.

# Recommended tree inspection focus areas

The following table acts as a recommended guideline to the key focus areas when making inspections of trees. Depending upon the skill level available to a local government, you may need to seek the assistance of a suitably qualified arborist in order to carry out the inspection appropriately.

#### Below ground parts and focus

#### **Base of main trunk**

- Signs of external damage (vandalism, bushfire, etc.).
- Signs of root rot/decay (sound with hammer where required).
- Reaction wood formation.
- Evidence of insect activity.
- Where possible, look at previous root pruning cuts (points of entry for pathogens and rot).
- Signs of bark damage or cracking in trunk (whipper snipper damage, animal grazing, soil build-up etc.).
- Evidence of natural basal flare and elevation.

#### Surface roots

- Evidence of surface roots.
- Proximity of surface roots to the main trunk.
- Evidence of infrastructure conflict with surface roots.
- Validation of surface root distribution.
- Validation of first order (primary) roots within the structural root zone and their condition.
- Evidence of fill.

#### Top soil and subsoil conditions

- Validation of soil types.
- Validation of water table or perched water bodies.
- Validation of the variation of soils and layers within the top profile (typically within 2 meters).
- Drainage and soil permeability.
- Change in soil level and soil conditions.

#### **Site specific factors**

- Proximity and alignment of below ground services.
- Location and alignment or surface treatments that influence root growth and development (hardstand/ roads/kerbs/crossovers etc.).
- Age of infrastructure.

#### **External factors**

- Weather factors wind/rain loading.
- Rainfall patterns.
- Lightning.

#### Above ground parts and focus

#### Main trunk

- Signs of external damage (vandalism, borers, etc.)
- Signs of rot/decay (sound with hammer where required)
- Presence of lean
- Reaction wood formation
- Insect activity
- Look at previous pruning cuts (points of entry for pathogens and rot)
- Disturbance, damage or cracking in trunk (depth and layers damaged or cracked, presence of cambium at the bottom of the crack)

#### **Branch unions**

- Condition of unions
- Look for cracking, hollows and cavities
- Reaction wood around union
- Angle of branch attachment to main stem
- Bark ridge and collar area
- Included bark
- Damage by fauna
- Other flora growing within unions

#### Main uprights and laterals

- Response growth
- Signs of pathogen attack
- Cracking
- Damage (storm damage, vandalism)
- Previous pruning (callusing of wounds and possible decay)

- Previous damage
- Size and volume of deadwood
- Angle of branches to stems
- Branch loadings

#### **Overall canopy**

- Health and vigour
- Growth at apical tips
- Deadwood (size and volume)
- Epicormics growth
- Foliage size, shape and colour
- Source of branch failures (resulting from root loss, storm damage, waterlogging etc.)
- · Previous pruning and management

#### **External factors**

- Consider the surrounding environment including: underground and above ground infrastructure
- Areas beneath or adjacent to trees, where people commonly gather or access (e.g., seating, barbeque facilities, paths and walk trails).
- Weather factors wind/ rain loading
- Change in soil level and soil conditions
- Rainfall patterns
- Environmental and cultural value of the trees
- Amenity value
- The effects on the health of the tree from any possible pruning

## Frequency of inspections/inspection intervals

Local governments should regularly review the frequency of tree inspections. The following factors can affect the frequency of inspections for existing trees and new tree plantings:

- Climate
- Growth patterns
- Age of tree population
- Development of areas/service upgrades
- Occupancy around the tree
- Vandalism

- Unforeseeable events:
  - Bushfire
  - Flooding/rapid rain events
  - Storm/extreme wind events
  - Other activities that may affect the health or structure of the tree

REMEMBER: THE COMMUNITY IS A GREAT ALLY OF LOCAL GOVERNMENTS. MEMBERS OF THE COMMUNITY CAN WORK TOGETHER WITH LOCAL GOVERNMENT TO IDENTIFY TREE ISSUES AND REPORT TO LOCAL GOVERNMENT. Inspection intervals can be defined in a management framework document using a similar hierarchy to that described below. Interval periods and priority may vary depending on the level of use for various areas.

- 1. Active reserves sporting ovals (every 12 months)
- Passive reserves neighbourhood or local parks (every 24 months)
- 3. Street trees typically tree assets within local government jurisdictions have inspections carried out every three to five years (commonly referred to as a 'tree audit'). Where a local government does not have the in-house resources to conduct such inspections, expert services should be procured in order to carry this out. Please refer to glossary to identify the appropriate level of expertise required to conduct a street tree inspection/audit.
- 4. Unforeseen events on request, this can have a time frame attributed to it should resources allow; however, it is recognised that where most local governments may not have the appropriate resourcing levels to implement such an inspection, expert services should be procured in order to carry this out. The following reasons may prompt an unforeseen event inspection;
  - Reports or complaints made by the public
  - Internal complaint/compliance
  - Storm damage
  - Bushfire
  - Vandalism etc.

**EXAMPLE**: A remote regional local government has a proactive system of inspection of trees located in parks, areas of recreation and frequent public use. The frequency of inspections is greater in the areas near infrastructure, and where people gather or access (e.g., seating, barbeque facilities, paths and walk trails). Areas with trees away from public access, such as natural bush reserves, may not require regular inspection, if at all.

### **Suitable actions**

Following inspections, different options in the form of suitable actions are likely to exist for each risk. An unacceptable risk may not necessarily require tree removal, alternative suitable actions may also be available.

The table below provides some examples of suitable actions:

#### Example: Suitable actions for the "risk of falling limbs"

Consider altering surrounding area	<ul><li>Prevent persons from entering the hazard area</li><li>Prevent the construction of property within the drop zone</li></ul>
Prune the tree	• Remove defective branches in accordance with AS 4373: Pruning of amenity trees
Maintain the tree	• Create a maintenance program to protect the health of the tree and remove any hazards
Remove the tree	• If the previous options are unsuccessful, tree removal may be necessary

#### E) Risk assessment

**Risk identification** involves the compilation of possible risks, their consequences, and their possible causes and scenarios. Please see the table below:

Structure/ elements of risk	What can happen?	How and why it can happen?
Development and planning	Tree environment changed to the detriment of the tree's health	<ul> <li>Construction activities</li> <li>Adverse weather</li> <li>Trees not adequately accounted for during development</li> <li>Tree protection measures not taken</li> </ul>
	Structure erected within an inappropriate proximity to a tree causing a potential hazard	<ul> <li>Development of non-compliance with planning legislation</li> <li>Inappropriate authorisation to alter a road</li> </ul>
	Inappropriate activity in proximity to a tree	<ul> <li>Lack of consultation and communication within the local government</li> <li>Lack of consultation and communication with tree experts</li> <li>Failure to communicate with relevant stakeholders</li> </ul>

Planting	Inappropriate or unsuitable species planted.	<ul> <li>Lack of a defined planting program</li> <li>Failure to comply with a planting program</li> <li>Failure to consider requirements of legislation</li> <li>Quality of planting stock</li> </ul>	
	Tree planted in an unsuitable manner.	<ul><li>Failure to follow established procedures</li><li>Failure to seek expert advice where necessary</li></ul>	
Consultation	Incorrect advice given.	<ul> <li>Incorrect or incomplete information given</li> <li>Procedures not followed</li> <li>Relevant expert advice not sought</li> </ul>	
	Order making policy inappropriately applied.	<ul> <li>Communication failure</li> <li>Inappropriately trained staff</li> <li>Failure to adequately consider stakeholder's interests &amp; objectives</li> </ul>	
Civil liability exposure	Injury loss or damage from a tree.	<ul> <li>Effects of weather (inclement/extreme)</li> <li>Ineffective maintenance program</li> <li>Other's actions</li> <li>Failure to act reasonably on hazard notification</li> <li>Failure to adapt to changing natural environments</li> </ul>	
	Incorrect advice or decision resulting in further injury or less or damage.	<ul> <li>Failure of risk management process</li> <li>Failure to follow procedures</li> <li>Failure to seek advice from appropriately qualified persons</li> </ul>	
	Failure to take reasonable action.	<ul><li>Failure to establish correct procedures</li><li>Misunderstanding of responsibilities</li><li>Lack of understanding of legislation</li></ul>	
Maintenance	Failure to conduct inspections in accordance with policies and procedures.	<ul> <li>Lack of resources</li> <li>Lack of expertise</li> <li>Inadequate prioritisation</li> <li>Lack of maintenance program</li> </ul>	
	Failure to adopt appropriate maintenance arrangements.	<ul> <li>Failure to consider internal policies</li> <li>Failure to seek and/or consider expert advice</li> <li>Failure to apply reasonable resources</li> <li>Failure to meet strategic objectives of the local government</li> </ul>	

### F) Budgeting

The key point to highlight in terms of budgeting is recognising the level of resourcing associated with the level of maintenance and management required to fulfil local government responsibilities in for their tree population.

Local government are encouraged to seek professional advice on 'best value' solutions that are likely to reduce ongoing maintenance of trees and therefore associated on-costs. Furthermore, local governments are encouraged to examine new innovative approaches for the provision of tree services, be this for tree procurement, installation, the protection of below ground services and ongoing aftercare. By responsibly grouping these things, the full lifecycle costs for trees can be quantified and significantly reduced.

#### G) Monitor and review

Monitoring and reviewing the risk must be a formal part of the risk management process; this involves regular checking or surveillance. The monitoring and review process will:

- Ensure that implemented controls are effective.
- Provide further information to improve risk assessment .
- Allow for the identification of emerging risks.



Disclaimer: The information contained in this LGIS and JLT Public Sector publication provides general information and does not take into account your individual objectives, financial situation or needs and may not suit your personal circumstances. It is not intended to be taken as advice and should not be relied upon as such. For full details of terms, conditions and limitations of any covers and before making any decision about a product, refer to the specific policy wordings and/or Product Disclosure Statements which are available from JLT Public Sector upon request. Please consult risk managers, insurance and/or legal advisors regarding specific matters.

JLT Public Sector is a division of JLT Risk Solutions Pty Ltd (ABN 69 009 098 864, AFSL 226827) and a business of Marsh McLennan.

© Copyright 2023 JLT Risk Solutions Pty Ltd. All rights reserved. S23-0735

Lvl 3 170 Railway Parade, West Leederville WA 6007



lgiswa.com.au