



# Precinct Tree Assessment Program



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## Overview:

The Penrith City Councils Tree Asset Management Team (TAMT) are responsible for developing and implementing plans, policies, and procedures for the management of Council's Street, Park and Property trees. The Team focuses on the assessment of the risk associated with trees in public spaces, and the implementation of strategies to reduce unacceptable risk. The TAMT will also create a Tree Inventory that will inform Council on how to best manage the tree canopy. The TAMT have developed a Street and Park Tree Management Plan to guide this process. This document forms part of that plan.

## 1. Brief

This document sets out the Precinct Tree Assessment Program that is to be implemented by the Tree Asset Management Team at Penrith City Council. The Tree Assessment Program forms part of the Street and Park Tree Management Plan and reinforces Council's commitment to properly manage its tree population as assets.

The Precinct Tree Assessment Program aims to identify the location and condition of all trees growing on Council managed land.

### 1.1. Objectives

Below is a list of the primary and secondary objectives of the Precinct Tree Assessment Program. These objectives are paramount in creating a thriving urban forest that serves the greater community.

#### 1.1.1. Primary Objectives

- Identify public trees that are of high risk to the general public - this will be achieved by conducting tree assessments in areas of the LGA that have occupancy rates that are considered to be either Very High, High, Moderate and Low. The Hierarchy of assessment areas begins with Very High being the highest priority (must be completed first), then High, Moderate and Low being the lowest priority (should be completed last).
- Create a Tree Inventory – This will enable Council to record tree numbers, heights, species, condition, health, defects, canopy sizes and diseases. The trees will be captured either as individuals, stands, or edge trees depending on their location, cultural, social, scientific, landscape, amenity and historical significance. The tree inventory will enable Council to better understand the health and condition of the Urban Forest and will influence future decision making. Detailed information can guide management to direct resources for a healthier and more robust Urban Forest with more efficient maintenance costs.

## 1.1.2. Secondary Objectives

- Create and identify Habitat for fauna – By identifying trees that have habitat or that are suitable for habitat creation may help to protect and increase the biodiversity of the area.
- Increase canopy cover – A tree inventory can identify potential planting sites.
- Promote the benefit of trees – Comprehensive data can be used to inform the community about the status of the Urban Forest and benefit of trees.
- Create a high standard of tree maintenance and pruning Techniques – Audits of work requests and of the work carried out in order to ensure the work complies with the Specifications for Pruning Public Trees.
- Compliance – An inventory can assist with providing evidence that Council is compliant with its policy when it comes to legal claims such as, tree or branch failures, or trip hazards.
- Identify and implement pest and disease management programs – The Tree Inventory will help to identify and place maintenance tasks on trees that require treatment for pests or disease.
- Managing a budget – Details of the cost required to maintain different areas will allow better forecasting of future expenditure.
- Reporting – Capability to report on all aspects of the program to other stakeholders on a regular basis.

## 2. Background

Trees under the control of Council are considered assets. To properly manage assets detailed information about those assets is required.

Information can help form proactive programmes to reduce problems before they arise. This will reduce reactive requests and more efficiently and effectively utilise resources.

Council has not had any kind of proactive Tree Assessment Process. The need for a formal, documented program has been recognised.

### 3. Usage Service Zones

The Tree Asset Management Team have created Usage Service Zone<sup>1</sup> (USZ) criteria for all areas of the Council Local Government Area (LGA) based on the amount of use<sup>2</sup> an area receives. With these categories we are able to implement an assessment program that focuses on the highest target areas first. These areas have the greatest likelihood of impact with a target if a tree or tree part were to fall.

Usage Service Zones (USZ) have been classified into the following categories:

<b>TABLE 1 CATEGORISING COUNCIL ASSETS AND OTHER PRECINCTS INTO USAGE ZONES</b>			
<b>USAGE SERVICE ZONE CATEGORY</b>	<b>Parks, Reserves and Bushlands</b>	<b>Council Road Listing</b>	<b>Properties &amp; Precincts</b>
<b>LOW USAGE SERVICE ZONE</b>	<ul style="list-style-type: none"> <li>• Low use public areas</li> <li>• Natural Reserves</li> <li>• Walkways</li> <li>• Easements</li> <li>• Vacant Land</li> <li>• Open areas</li> </ul>	<ul style="list-style-type: none"> <li>• Rural Roads Except- high pedestrian usage with schools and shopping precinct</li> <li>• Local Roads with dead ends</li> </ul>	<ul style="list-style-type: none"> <li>• Heritage Museums</li> <li>• Waste transfer stations</li> </ul>
<b>MODERATE USAGE SERVICE ZONE</b>	<ul style="list-style-type: none"> <li>• Moderate-use parks, playgrounds and picnic areas.</li> <li>• Neighborhood parks and reserves.</li> <li>• Memorials (with adjacent trees)</li> </ul>	<ul style="list-style-type: none"> <li>• Local Roads Except - roads around high pedestrian activities</li> </ul>	<ul style="list-style-type: none"> <li>• Carparks servicing moderate use public areas.</li> <li>• Place of worship</li> <li>• Community Buildings</li> <li>• Cemeteries</li> <li>• Libraries</li> <li>• Sporting Clubs</li> </ul>
<b>HIGH USAGE SERVICE ZONE</b>	<ul style="list-style-type: none"> <li>• High-use parks, playgrounds and picnic areas.</li> <li>• Sports grounds and reserves with pavilions and sporting clubs</li> </ul>	<ul style="list-style-type: none"> <li>• Major Collector Rd</li> <li>• Regional Rd                             <ul style="list-style-type: none"> <li>- Glenmore Parkway</li> <li>- Jamison Rd</li> <li>- Russell St</li> <li>- Old Bathurst Rd</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Car parks servicing high use public areas</li> <li>• Swimming Pools</li> <li>• Aged accommodation</li> <li>• Day Care Centers</li> <li>• Council depots</li> <li>• Caravan parks</li> </ul>
<b>VERY HIGH USAGE SERVICE ZONE</b>	<ul style="list-style-type: none"> <li>• High public use areas.</li> <li>• Tench Reserve</li> <li>• Regatta Park</li> <li>• Werrington Lakes</li> </ul>	<ul style="list-style-type: none"> <li>• State Road</li> <li>• Major Collector Rd                             <ul style="list-style-type: none"> <li>- GT Western H'way</li> <li>- The Northern Rd</li> <li>- Mulgoa Rd</li> <li>- All Roads around Properties as listed</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Schools</li> <li>• Child-care Centres</li> <li>• Preschools</li> <li>• Health Centres</li> <li>• Hospitals</li> <li>• Shopping Centres</li> </ul>

<sup>1</sup> **Usage Service Zone** a predetermined zone that defines the target (people, vehicles, infrastructure) and level of usage and occupancy of that area for the purposes of assessing risk.

<sup>2</sup> **Use:** The average number of people and vehicles expected to occupy a defined area.

## 4. Precincts

The Penrith LGA has been divided into 16 Precincts. These Precincts have been aligned with the Roads Precincts in order to provide continuity throughout Council. Each precinct is a slightly different size. The aim is to complete one to two precincts per month in line with the Assessment Program. This will allow the TAMT to track progress on a monthly basis and ensure the Assessment Schedule is on track.

As the initial tree inventory Assessment<sup>3</sup> is yet to be conducted it is impossible to determine the total number of trees in each precinct. However, it is possible to determine roughly how long a precinct will take to assess by the size of the USZs within the Precincts. The TAMT have created the assessment schedule based on the number of high and very high USZs within each precinct, and the average time taken to carry out a Level 1 Visual Assessment on a tree (and travel time).



<sup>3</sup> Initial Tree Inventory Assessment an audit of trees that have not been previously captured in any database.

## 5. Assessment Program

This Assessment Program is designed to provide a procedure for the areas to be assessed, along with the methods of assessment, and the proposed timeframes in which they are to be assessed. The Assessment Program has three parts. The program will be primarily focusing on assessing the risk of public trees with a hierarchical system of

- The areas of highest usage (potentially highest risk) first,
- Moderate Usage,
- Lowest usage (potentially lowest risk) last.

### 5.1. Usage Service Zone Assessment Program

The following three-year program in terms of USZs has been tabled below:

<b>Year</b>	<b>Assessments to be conducted</b>
Year 1	An initial Tree Inventory will be conducted on the Very high usage, and High usage zones within each precinct. With each precinct expected to take around a month to complete.
Year 2	The Very high usage service zones within each precinct will undertake a level 1 Limited Visual assessment, and an Initial Tree Inventory will be conducted on the Moderate Usage Service Zones. With each precinct expected to take around a month to complete.
Year 3	The Very high usage service zones within each precinct will undertake a level 1 limited Visual assessment, the High Usage Service Zones within each precinct will undertake a Level 1 assessment, and an Initial Tree Inventory will be conducted on the Moderate Usage Service Zones that were not captured in Year 2. Each precinct is expected to take around a month to complete.

## 5.2. Assessment Timeframes

The Tree Asset Management Team have assigned assessment timeframes, and associated methods of assessment for the USZs. These time frames and assessment methods have been calculated taking into account the most efficient usage of available resources. This will allow the TAMT to best manage the risks trees may pose to the public. The time frames and assessment methods can be viewed in the table below:

<b>TABLE 2 PENRITH CITY COUNCIL PROGRAMMED TREE ASSESSMENTS CITY WIDE</b>		
<b>USAGE SERVICE ZONE CATEGORY</b>	<b>SERVICE TIMEFRAMES</b>	<b>TREE ASSESSMENT METHOD</b>
<b>LOW USAGE SERVICE ZONE</b>	Every five years	<ul style="list-style-type: none"> <li>• Digital Assessment</li> <li>• If specified Level 1 Limited Visual Assessment</li> </ul>
<b>MODERATE USAGE SERVICE ZONE</b>	Every three years	<ul style="list-style-type: none"> <li>• Level 1 Limited Visual Assessment</li> <li>• If specified Level 2 Basic Visual Assessment</li> </ul>
<b>HIGH USAGE SERVICE ZONE</b>	Biannual	<ul style="list-style-type: none"> <li>• Level 1 Limited Visual Assessment</li> <li>• If specified Level 2 Basic Visual Assessment</li> </ul>
<b>VERY HIGH USAGE SERVICE ZONE</b>	Annually	<ul style="list-style-type: none"> <li>• Level 1 Limited Visual Assessment</li> <li>• If specified Level 2 Basic Visual Assessment</li> </ul>



## 5.3. Precinct Assessment Schedule

The Council has created an annual Precinct Assessment Schedule in order to track the progress of the overall program. The precincts have been grouped based on the size, location, and occupancy rates of each precinct.

The Preliminary Schedule is currently being developed in line with and subject to resources available, environmental and technical constraints.

Month 2019	Precinct	Suburbs
August	West 14,	Agnes Banks, Londonderry,
September	East 15,	Berkshire Park, Jordan Springs, Llandilo
October	West 11,	Glenmore Park,
November	West 10 & West 9,	Regentville, Emu Heights, Emu Plains, Leonay
December	West 8,	Jamisontown, South Penrith,
January	West 7,	Penrith,
February	East 1 & East 2,	Erskine Park, St Clair,
March	East 3 & East 4,	Colyton, North St Marys, Oxley Park
April	East 5 & East 16,	Caddens, Cambridge Gardens, Cambridge Park, Kingswood, Werrington Downs, Orchard Hills, Luddenham, Mount Vernon, Kemps Creek, Badgerys Creek
May	East 6 & West 13,	Castlereagh, Claremont Meadows, Cranebrook, St Marys, Werrington County, Werrington
June	West 12,	Mulgoa, Wallacia

A more comprehensive schedule with USZs per precinct is being created.

## 6. Assessment Procedure

The Council has designed an assessment procedure for assessing the risks associated with Street, Park and Public Property trees. The procedure has incorporated the Tree Risk Assessment Qualification (TRAQ) method of assessing trees for risk and recording them as defects in Council's Asset Management Database (Tech1) or other suitable software. The assessment procedure also allows for the capturing of other tree related data as part of a Tree Inventory (See Clause 6.2). The data captured as part of the Tree Inventory will allow the Council to make more informed decisions relating to the Urban Forest. Locations where trees can be planted in order to increase canopy cover will also be captured. These defects will then be converted to work orders and sent to the appropriate maintenance teams or contractors for completion. Resources are allocated accordingly to prioritise work as listed in Table 4, Resourcing Risk Levels.

Resourcing Risk Levels	
Low Risk	Consequences are "negligible " and likelihood is "unlikely" or consequences are severe and likelihood unlikely
	Level of Service :Mitigation works if resources allow , monitoring
	Works is of low priority
Moderate Risk	Consequences are "minor and likelihood is "likely"& very likely or likelihood is somewhat likely and consequences are significant or severe
	Level of Service :Mitigation works in line with program maintenance works
	Works are listed to be undertaken in works schedule
High Risk	Consequences are "significant - severe" and likelihood is "Likely, Very Likely or severe" Consequences are severe and likelihood is likely
	Level of Service : Mitigation measures be taken as a matter of high priority
	Works are to be undertaken with a short response time
Extreme	Consequences are severe and failure / impact is imminent, very likely
	Level of Service: Immediate action required
	Works are required to be undertaken as a matter of urgency

## 6.1. Creating Areas

In order to ensure each Precinct has captured every tree within each of the USZs, the TAMT will create 'polygons' for areas within the Precinct for each USZ within the Tech 1 System prior to inspecting that Precinct. The polygons will be coloured for ease of identification. The Polygons follow the criteria set out in section 3 of this document, and they will be inspected as per the Annual Program set out in section 5.3 of this document.

## 6.2. Data Capture

A method of capturing the data in the Tech 1 system is currently being developed and is in the trial phase of development. Once developed staff will use the system remotely with the use of an iPad to gather information, including but not limited to:

- GIS location;
- Usage Service Zone;
- Location;
- Suburb;
- Species;
- Age class;
- Structural condition;
- Health & vigour;
- Pest & disease;
- Height;
- Risk rating; and
- Work instruction.

## 6.3. Assessment Methods

Assessment methods detail the different levels of assessment along with how the trees can be grouped for efficiency. The following methods have been created to ensure efficient use of resources.

### 6.3.1. Tree Grouping

Due to the large number of trees in the LGA, limited resources, and Technological limitations. There is a need to group individual tree assets where practicable. The groups have been defined as follows:

- Individual trees - each tree will be individually assessed against one line of the spreadsheet. Therefore, having an individual risk assessment and inventory for individual trees.
- Localised stands – each species will be individually assessed against one line of the spreadsheet. Therefore, having an individual risk assessment and inventory for individual species. Trees that have the potential to fall into a footpath, road, seating, or any other target within a stand will be inspected as an individual tree.
- Bushland areas. – only trees that have the potential to fall into a footpath, road, seating, or any other target will require assessment. Those trees will be assessed individually.

## 6.3.2. Assessment Type

Three methods of assessment have been selected as the preferred methods. These methods have been tabled below:

Assessment Type	Assessment Method
Digital	A Desktop audit using Near maps or equivalent program to identify areas that may need further assessment. Low usage areas.
Level 1 limited Visual Assessment	A limited visual walk or drive by assessment to identify certain obvious defects or specified conditions.
Level 2 Basic Visual Assessment	A ground based detailed visual assessment of a tree and its surroundings. Some simple tools may be used to assist in this level of assessment.
Level 3 Advanced Assessment	Further, aerial, or other assessment based on the outcome of the Level 2 Basic Visual Assessment in order to provide detailed information about specific tree parts. Further assessment methods may be: Drone footage, climbing assessment, Tomograph, resistograph, or pull testing.

## 6.4. Risk Assessment

The Council has adopted the TRAQ method for assessing the risk a tree or trees pose to the urban environment. The TRAQ method is a peer reviewed industry accepted method of assessing trees and providing a qualitative risk rating level to each tree or stand of trees. The TRAQ method has been added to Tech 1 as part of the assessment and incorporates the Risk Rating Matrix per Table 3.

If the risk level is determined to be anything other than 'low' a work order must be placed against the tree asset detailing instructions for remedial action along with a timeframe in which the works will need to be completed as per Resourcing Risk Levels, Table 4.

Risk Rating Matrix					
Likelihood of failure and Impact		Consequences			
		1 Negligible	2 Minor	4 Severe	
A	Very Likely	Low	Moderate	High	Extreme
B	Likely	Low	Moderate	High	High
C	Somewhat likely	Low	Low	Moderate	Moderate
D	Unlikely	Low	Low	Low	Low

Adopted from BMP ISA Tree Risk Assessment E. Smiley 2011

## 7. Creating Work Orders

Once the data has been collected work orders will be created in the Tech 1 system and allocated to City Presentation or Contractor.

Any tree removals will have a physical address, a location, and a picture of the tree in Tech 1. Along with a yellow stripe up the southern side of the trunk and white strip for remedial pruning to allow for better identification by the field staff.

The TAMT are testing methods to create defects in Tech 1 and attach them to the USZ Polygons. This would allow the Inspectors to raise work orders in the field creating better efficiency.

Any planting opportunities will be added as work requests and can be converted to work orders after a planting program is established.

## 8. Performance Audits

Once the work has been completed the TAMT will conduct audits of the work to ensure compliance with the Street and Park Tree Management plan. Audits will be conducted on 10% of the completed work each month, and will be audited based on the Tree Pruning Specifications in the Street and Park Tree Management Plan. The audit is expected to be over 95% compliant. Any non-complying works will be sent back to the responsible party for rectification.

A record of the audits will be kept in order to provide historical data for later comparisons.

## 9. Definition of terms

- Tree, See Definition of terms in the Street and Park Tree Management Plan.
- Target, A person or object of value.

## 10. Review

This document is a pilot program.

It is anticipated that amendments will be required.

The pilot will be periodically reviewed until the process runs efficiently with the available resources.

The program will be reviewed annually.