Critical Tree Risk 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.

The TAMT have created two separate Tree Assessment Programs to achieve this task.

1. The Precinct Tree Assessment Program
2. The Critical Tree Assessment Program

This document outlines the Critical Tree Assessment Program and will focus on areas with very high occupancy rates that have vulnerable targets such as people and vehicles.

A Program that can be implemented at any time to ensure the risk associated with these designated areas are assessed accordingly and within a short period of time.

These areas include:

- Major collector roads;
- Playgrounds;
- Council owned Childcare Centres;
- Schools; and
- Shopping centres
- Hospitals.

The TAMT have developed an overarching document named the Street and Park Tree Management Plan. This document forms part of that plan.

As Council has no official record of tree risk assessments across all these areas, this Assessment Program will be implemented in conjunction with other assessment programs taking place.

Once the initial Critical Tree Assessment is completed, the subsequent Critical Tree Assessment Program will align with the 'Tree Assessment Program' and be carried out or re-inspected once every 12 months.

The Initial Critical Tree Assessment is expected to take a total of Eight weeks, with each Precinct taking between one day to a week to complete.

1. Brief

This document forms the basis for the Critical Tree Assessment Program that is to be implemented by the Penrith City Council Tree Asset Management Team.

The Critical Tree Assessment Program is guided by the Street and Park Tree Management Plan and reinforces Council's commitment to managing its responsibilities in regard to potential risk relating to the public tree population.

The Critical Tree Assessment Program aims to:

- Assess the risk associated with public trees growing in areas with very high occupancy rates within the Penrith Local Government Area (LGA);
- Put actions in place to reduce unacceptable risk through removal and pruning programs;

2. Purpose

The Critical Tree Assessment Program has been designed to be implemented as an efficient and accurate method for assessing the potential risks associated with trees located in Very High Usage Service Zones (See Section 4.1), in order to meet Council's obligations around the risks associated with Council owned trees. These zones have been defined by areas of the Penrith LGA that are considered to have very high occupancy rates, combined with vulnerable targets such as people and vehicles.

This program will focus solely on managing the potential risks of trees in these Very High Usage Service Zones (VHUSZs). Tree Inventory Assessment will be excluded due to the urgency around the VHUSZs.

As Council has no official record of tree risk assessments in these areas. This Assessment Program will be implemented prior to any other assessment programs taking place.

Once the initial Critical Tree Assessment is complete, the subsequent Critical Tree Assessment Program will align with the 'Tree Assessment Program' and as such will be inspected once every 12 months. However, the Critical Tree Assessment Program has the ability to be accelerated if circumstances dictate or after severe weather events.

3. Precincts

The Tree Asset Management team have broken the Penrith LGA into 16 precincts. These Precincts have been created to be able to assess one Precinct per month.

As the initial tree inventory audit is yet to be conducted it is impossible to determine the total number of trees in each precinct. However, it is possible to map the different USZs within the precincts using data previously gathered for traffic volumes. The TAMT have created this Critical Assessment Program based on the amount of VHUSZ's within each precinct.

4. Assessment Program

This Assessment Program is designed to provide a system for the areas to be assessed, along with the method of assessment, and the timeframes in which they are to be assessed in. The Assessment Program will allow the TAMT to work through each Precinct systematically to ensure an efficient use of available resources. The program will be primarily focusing on assessing the risk related to public trees in the VHUSZs but will also capture some other data such as number of trees assessed and a ratio of good and defected trees per area. The program may require grouping of assets if practicable.

4.1. Usage Service Zones

These Usage Service Zones (USZ) are Zones that define the amount of time a target (Person or other valuable object) is expected to occupy the area. These USZs have been classified into four categories. This Assessment Program focuses solely on the VHUSZs. The USZ categories are tabled below:

TABLE 1
CATEGORISING COUNCIL ASSETS AND OTHER PRECINCTS INTO USAGE ZONES

USAGE SERVICE ZONE CATEGORY	Parks, Reserves and Bushlands	Council Road Listing	Properties & Precincts
LOW USAGE SERVICE ZONE	• Low use public areas • Natural Reserves • Walkways • Easements • Vacant Land • Open areas	• Rural Roads Except- high pedestrian usage with schools and shopping precinct • Local Roads with dead ends	• Heritage Museums • Waste transfer stations
MODERATE USAGE SERVICE ZONE	• Moderate-use parks, playgrounds and picnic areas. • Neighborhood parks and reserves. • Memorials (with adjacent trees)	• Local Roads Except - roads around high pedestrian activities	• Car parks servicing moderate use public areas. • Place of worship • Community Buildings • Cemeteries • Libraries • Sporting Clubs
HIGH USAGE SERVICE ZONE	• High-use parks, playgrounds and picnic areas. • Sports grounds and reserves with pavilions and sporting clubs	• Major Collector Rd • Regional Rd - Glenmore Parkway - Jamison Rd - Russell St - Old Bathurst Rd	• Car parks servicing high use public areas • Swimming Pools • Aged care centers • Day Care Centers • Council depots • Caravan parks
VERY HIGH USAGE SERVICE ZONE **CRITICAL USAGE SERVICE ZONE**	• High public use • Tench Reserve • Regatta Park • Werrington Lakes • Playgrounds	• State Road • Major Collector roads - GT Western H'way - The Northern Rd - Mulgoa Rd - All Roads around Properties as listed	• Schools • Child–care Centers • Preschools • Health Centers • Hospitals • Shopping Centers

4.2. Assessment Timeframes

The Tree Asset Management Team have assigned assessment timeframes and associated methods of assessment for the VHUSZs. These time frames 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.

4.3. Assessment Schedule

The Initial Critical Tree Assessment is expected to take a total of Eight weeks, with each Precinct taking between one day to a week to complete.

Once the Initial Critical Tree Assessment is complete, subsequent Critical Tree Assessments will be conducted on a 12-month basis or when required in conjunction with the Assessment Schedule laid out in the Precinct Tree Assessment Program.

The Critical Tree Assessment can also be conducted on an ad-hoc basis when the need arises with the full or partial program being implemented to satisfy risk related concerns. Typical examples of this would be: prior to a major event, or after a storm event. This will ensure all trees associated with the locations as identified in the Critical Tree Assessment Program are assessed and allocated works to reduce risk as is practically possible.

The commencement date for the program is February 2019.

The following Assessment Schedule for the initial assessment has been tabled below:

Dates	**Precinct(s)**	**Number of Locations to be Assessed**
Week 1	- East 1 - East 2	- 26 - 12
Week 2	- East 3 - East 4	- 27 - 18
Week 3	- East 5 - East 6	- 32 - 7
Week 4	- West 7 - West 8	- 21 - 31
Week 5	- West 9 - West 10	- 22 - 6
Week 6	- West 11 - West 12	- 29 - 11
Week 7	- West 13 - West 14 - East 15	- 18 - 10 - 6
Week 8	- East 16	- 19

5. Assessment Procedure

The TAMT 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. 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.

Table 4

Resourcing Risk Levels	
Low Risk	Consequences are "negligible " and likelihood is "unlikely"or consequences are severe and likelyhood 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 likelyhood is somewhat likely and consequencesare 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 likely hood 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

5.1. Assessment Methods

Three methods of inspection have been selected as the preferred methods for the Critical Tree Assessment Program. These methods have been tabled below:

Inspection Type	Inspection Method
Level 1 limited Visual Inspection	A limited visual walk or drive by inspection to identify certain obvious defects or specified conditions.
Level 2 Basic Visual Inspection	A ground based detailed visual inspection of a tree and its surroundings. Some simple tools may be used to assist in this level of assessment.
Level 3 Advanced Inspection	Further, aerial, or other inspection based on the outcome of the Level 2 Basic Visual Inspection.

A Level 1 Limited Visual Inspection will typically be used to assess the Major Collector Roads. However, this inspection type may also be used for some public property tree inspections. If a tree is identified as having a defect from a Level 1 inspection, a Level 2 inspection may be carried out. A Level 3 inspection may also be carried out if the results of a Level 2 inspection are inconclusive.

5.1.1. Surrounding areas

Playgrounds - Most playgrounds are located in parks or open space areas that may not be considered Very High Usage Service Zones. In this event the Assessor is to (as a minimum) assess trees within 10 metres of the edge of the playground and or associated infrastructure such as benches, rubbish bins, toilets, and car parks. Any tree that has the potential to fall within 10 metres of the edge of a playground must be assessed along with any tree inside the playground.

Major Collector Roads – Any Council owned tree located inside the road reserve or that has the potential to fall into the road reserve or footpath must be assessed.

Schools and childcare centres - Any Council owned tree that has the potential to fall into a school or childcare centre property must be assessed along with any associated infrastructure. Any tree that has the potential to fall onto a footpath or roadway in a designated School Zone must be inspected.

Shopping centres - Any Council owned tree that has the potential to fall into the Shopping centre area, surrounding carparks and roadways must be assessed along with any Council owned tree inside the Shopping centre or surrounding carpark.

5.2. 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 has been modified in order to ensure efficient assessments are conducted without compromising the integrity of the system. The system has been incorporated into Councils assessment Process. As per Best Practice Management ISA, a qualitative approach to tree risk assessment has been selected, the process of using ratings of likelihood and consequences of an event to determine risk levels.

As per Table 3 trees are risk rated utilising Risk Rating Matrix and resources are allocated accordingly to prioritise work as listed in Table 4, Resourcing Risk Levels.

Table 3

Risk Rating Matrix					
Likelihood of failure and Impact		Consequences			
		1	2		4
		Negligible	Minor	Significant	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

5.3. Training and qualifications

Staff conducting tree assessments must have the following training and qualifications:

- AQF Level 5 Qualification in arboriculture;
- TRAQ qualification; and
- Training in Tech1 or appropriate software.

5.4. Resource requirements

In order to complete the program in a timely manner, two full time Public Tree Assessors will be required for the duration of the project.

5.5. Creating Areas

In order to ensure each Precinct has captured every tree within each of the VHUSZs, 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 of the USZs within each Precinct. The Polygons follow the criteria set out in Table 1 of this document, and they will be assessed as per the Assessment Schedule set out in Section 4.3 of this document.

5.6. Data Capture

The data will be captured in Tech 1. In real time out in the field using iPads. The information that will be gathered will include but not be limited to:

- GIS location;
- Physical Location;
- Suburb;
- Precinct;
- Number of trees; and
- Defects.

Any Tree defects will be raised and recorded against their respective polygons in Tech1.

6. Creating Work orders

Once the defects have been collected, the staff will create work orders in the Tech 1 system and allocate them to the appropriate team for completion.

Any tree removals will have a yellow stripe up the southern side of the trunk to allow for better identification by the field staff.

Any removals are to be slated for planting opportunities and added as work requests. These can be converted to work orders after a planting program is established.

The document defining the pruning specifications that are to be carried out by the appropriate team is the Specifications for the Pruning of Public trees.

7. 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.

8. Completion

Completion of the program will coincide with the commencement of the Tree Assessment Program which is a more holistic and integrated approach to managing the urban forest, both now and into the future.

Review

This document is still considered a pilot.

The pilot will be periodically reviewed on a monthly basis until the pilot is accepted. After which it will be reviewed annually.