

**EN1 - Argyle Street – London Plane Trees**

**ENVIRONMENT**

**EN1 Argyle Street – London Plane Trees**

1028

TRIM 260

**EXECUTIVE SUMMARY**

- The purpose of this report is to report back to Council regarding the Picton Plane Trees in Argyle Street Picton.
- This report reviews the Risk, Health and Community expectations regarding the trees. This report relies on three other reports (attached) and a workshop with Councillors which has informed this report.

This report recommends that:

1. An additional budget allocation of \$50,000 be made for the 2016/17 financial year for the engagement of a suitable specialist to undertake an intrusive investigation of the Argyle Street plane trees and the development of a management plan to reduce risks to acceptable levels with the outcomes of this investigation to be reported to Council.
2. \$5,500 be allocated from the existing 2016/17 budget to undertake initial tree maintenance works such as crown pruning.
3. Council note that should the tree management plan not result in a satisfactory reduction in risk exposure, that the removal of the plane trees may be required.
4. Council note that the additional cleaning along Argyle Street due to the plane trees results in the diversion of Council staff from other duties in Picton with an equivalent value of approximately \$7,000 p.a.
5. Participants in the community consultation process that lodged their contact details be made aware of Council's decision.

**REPORT**

**BACKGROUND**

The Picton Plane Trees located along Argyle Street Picton Central Business District has attracted much interest from the public. There have been issues raised by residents regarding public risk and safety with the amount of detritus that falls in the autumn months creating slip and trip hazards in the main street.

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At its Ordinary Meeting of 18 May 2015; Council considered a report about ongoing concerns regarding public safety and damage to private and public infrastructure attributed to the street trees, London Plane trees, along Argyle Street in the Picton town centre.

Given the risks identified, the May 2015 report identified that only options that resulted in a reduction in Council's risk exposure could be considered and as such that a "do nothing" option could not be considered.

Following consideration of the report of 18 May 2015, Council resolved:

***82/2015** That a stakeholder consultation process be undertaken to garner views on the acceptable options, i.e. Option 1 - retain and increase maintenance and monitoring, Option 2 - Remove and Replace with more suitable species and Option 3 - Remove and not replace; with the results of the consultation being reported to council for final determination on this matter.*

This report brings together the results of the community consultation in 2015 and an additional Arboriculture Assessment Report to allow a determination on this matter.

**REPORT**

Overall street tree amenity is important to the general public and irrespective of the street tree choice, precinct amenity is a value shared amongst residents and users or visitors to the Argyle Street precinct of the Picton Town centre.

There are two contemporary technical reports on the Argyle Street Plane Trees as well as the 2015 Community Consultation Report. These reports, copies attached, are summarised below:

*Community Consultation 2015* - community consultation undertaken in late 2015 found that the majority of the community would like Council to retain the Plane Trees in their current state.

It should be noted that the consultation process records a desire for retention amenity; however, it provides little insight into the appreciation of the public for the existing and ongoing public and private risks or cost implications of retaining the plane trees.

*2011 Risk Assessment* – the 2011, *Risk Assessment – London Plane Trees Argyle Street, Picton* (Jones Nicholson), suggests that London Plane Trees are not suitable in a narrow streetscape and that they will continue to require ongoing tree maintenance, cause pavement damage and a potentially high risk damage to structures long term.

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The plans within this report erroneously identified the presence of a gas main along Argyle Street; however, the infrastructure risk assessment only dealt with the public and private infrastructure along Argyle Street and made no recommendations regarding gas infrastructure.

The risk assessment identifies Extreme and High risk for a range of public and private infrastructure attributed the street trees; however, it does not recommend a specific risk management approach but notes that unacceptable risk may require removal of the trees and provides a removal method.

2015 Arboriculture Assessment - *The Arboriculture Assessment Report Argyle Street Main Street Tree Assessment* (CPE Tree Services) concluded that that the trees are generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infection. They are also in good structural condition and the canopy is in good health and vigour. However, this report also noted that the current tree species are known to cause allergies and asthma as well as eczema and the report does provide information on the issues associated with these trees in pavement due to the size and vigour of such a species.

This report assessed each individual tree and recommends the removal and replacement of each tree with an appropriate species given the ongoing infrastructure and public risks to Council.

The consultant reports, the community consultation report and other correspondence received by Council all confirm officer observations that the amenity provided by deciduous street trees along the Picton Town Centre is an important contributor to the ongoing success and vitality of the town centre.

However, the consultant reports consistently advise that the risks that Council is exposed to due to the current tree species is unacceptable and must be managed. The risk issues are elaborated on in the Risk Management section below.

**CONSULTATION**

The full Consultation report is attached (Attachment 1) and a summary is provided below.

The options Council was consulting the community about were:

- Option 1: Retain the Plane Trees in their current state
- Option 2: Remove the Plane Trees and do not replace them
- Option 3: Remove the Plane Trees and replace with an alternative species over time

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When respondents were asked to rank the three options being considered in order of preference the results indicated that 76.40% of respondents preferred Option 1; followed by 20.22% preference for Option 3 and 3.37% preference for Option 2.

The outcomes of the community consultation undertaken in late 2015 highlight that the large majority of the community would like Council to proceed with **Option 1: Retain the Plane Trees in their current state.**

Respondents were also asked what alternate tree species they would like to see in the main street of Picton if Option 3 was to proceed. 65 people responded to this question and the Lipstick Maple was identified as the preferred option for an alternate species with 29.23% support from respondents.

Comprehensive engagement was undertaken and this is also outlined in the attached consultation report.

The consultation was considered successful and the outcomes of the community consultation are found in the attached report.

Should Council choose to accept this then there would be financial implications and these are outlined in the financial section of this report.

**Results from consultation**

Overall it is very clear that street tree amenity is important to the general public and that irrespective of the street tree choice precinct amenity is a value shared amongst residents and external users of the area.

- The outcomes of the community consultation undertaken in late 2015 highlight that a majority of the community would like Council to precede with Option 1: Retain the Plane Trees in their current state.

For Further Detail please refer to Attachment 2 of this report:

**Risk Management**

The 2011 *Risk Assessment – London Plane Trees Argyle Street Picton* was commissioned in response to complaints and concerns raised about the trees and the pavement assets in the area.

This report used a risk assessment based approach which is based on the likelihood and consequence to identify the impact from the trees on services through the main street.



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The report determined the following:

Element	Risk Score	Risk Classification
Buildings located within the 'Zone of Upheaval' of a London Plane Tree	125	EXTREME
WSC Kerb and Gutter Infrastructure	100	EXTREME
Buildings located within 15m of a London Plane tree	80	HIGH
WSC Footpaths	75	HIGH
WSC Road Pavement	75	HIGH
WSC Drainage Infrastructure	75	HIGH
Sydney Water - sewerage infrastructure	45	HIGH
Sydney Water - water supply	25	MODERATE
Telstra infrastructure	25	MODERATE
Integral Energy Infrastructure	25	MODERATE

The 2011 report suggests that London Plane Trees are not suitable in a narrow streetscape environment and that they will continue to have ongoing tree maintenance issues and cause continued pavement damage.

The *2015 Arboriculture Assessment Report Argyle Street Main Street Tree Assessment* assessed each individual tree using a Safe Useful Life Expectancy (SULE) approach that takes into account the health of the tree, size, maturity and general risk to provide an overall assessment.

The “risk” assessment in the SULE analysis resulted in a lower specific risk value based on a simpler all-encompassing risk (as distinct the asset by asset assessment of the 2011 report) ; however, the aggregate risk assessment for each tree was Major presenting an unacceptable risk to council without risk mitigation works that would result in a lower risk value. The report specifically recommends the removal and replacement of each tree with an appropriate species given the ongoing infrastructure and public risks to council.

The report also observes that the risks already exist and will only increase with the continued growth of the trees.

It should be noted that neither report provides recommendations for an in-situ management regime that has been assessed as satisfactorily reducing council’s risk exposure. Officers have only been able to describe a potential scope of works that may in some way minimise increases in risk beyond existing levels, noting that consultant arborists have not recommended this approach.

**Health and maintenance of the trees**

The arborist report was prepared by CEP Tree Services (2016), concluded that that the trees are generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infection. They are also in good structural condition, and the canopy is in good health and vigour.

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The Arborist report also provided information on the health effects of plane trees which are allergies, asthma and eczema.

The report recommends removal for these trees due to the long term issues presented by them.

For further detail please refer to attachment 3.

**Internal staff consultation**

The Infrastructure Planning Section, Environmental Services and Works Sections have been consulted.

Engagement with the Councillors has been through a Councillor workshop and Report to Council.

**Options**

Officers remain concerned about the implications of ongoing costs, risk and liability for both public safety and infrastructure damage with the unmanaged retention of the Plane Trees. There are also concerns about the impacts on the built environment and damage to assets and building in this locality.

There are also concerns about the ongoing maintenance costs and these need to be addressed as currently additional servicing of the detritus is done within existing budgets but does take staff off other duties and does not fully minimise the risk.

However, it is acknowledged that the amenity provided by the trees is a valuable part of the fabric and ongoing success of the Picton Town Centre.

Accordingly, the only options presented involve the retention of street trees in some form.

Given neither of the consultants reports recommended an in-situ management regime that has been assessed as satisfactorily reducing Councils risk exposure, retention of the trees would require an tree specific intrusive assessment and development of a maintenance and management regime that reduces risk exposure.

Based on the need to reduce Council and the community's exposure to unacceptable risk the only options considered are:

Option 1 – Engagement of a specialist consultant to undertake an intrusive tree specific assessment to develop a maintenance and management plan that results in a reduction in the risk assessment to an acceptable level. This would be reported to council along with recommendations for budget and other resource allocations. Estimated cost \$50,000 with completion in the first half of the 2016/17 financial year.

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Option 2 – Development of a master plan for the staged removal and replacement of the trees along with the renewal of Council’s public infrastructure and an initial maintenance action to manage risk exposure until the works are funded for implementation. Estimated total cost (excluding works) \$55,500 with completion of the master planning to be completed in Q3 of the 2016/17 financial year and the intrusive maintenance works being undertaken during the winter season and additional cleaning in the autumn of 2017.

**FINANCIAL IMPLICATIONS**

Some costs can be absorbed and managed within existing budgets; however, in the period of time (generally autumn) when there is fruit fall and leaf fall, additional sweeping and maintenance is required.

There are current arrangements existing which provide extra resourcing to assist with the leaf fall but this does remove staff from undertaking other routine tasks and duties in the Picton Town Centre and the nearby Hume Oval/Botanic Garden precinct.

It is estimated that the current cost would be approximately \$7,000 per annum in labour which is presently absorbed in existing budgets. This: however, only covers the cost of applying an additional staff for the period of the leaf fall and does not include any works that may be required for footpath maintenance or root management. These works have to be undertaken periodically and on a specific needs basis such as preparation for the IlluminARTE Festival in May.

The trees would benefit from pruning and some maintenance and this be funded from the general tree maintenance budget, as this would be considered routine tree works. The expected cost of pruning is \$5,500.

Option 1 – Engagement of a specialist consultant to undertake an intrusive tree specific assessment to develop a maintenance and management plan that results in a reduction in the risk assessment to an acceptable level. This would be reported to council along with recommendations for budget and other resource allocations. Estimated cost \$50,000 with completion in the first half of the 2016/17 financial year.

Option 2 – Development of a master plan for the staged removal and replacement of the trees along with the renewal of council’s public infrastructure and an initial maintenance action to manage risk exposure until the works are funded for implementation. Estimated total cost (excluding works) \$55,500 with completion of the master planning to be completed in Q3 of the 2016/17 financial year and the intrusive maintenance works being undertaken during the winter season and additional cleaning in the autumn of 2017.

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The financial implications of a tree management plan or the master plan would be the subject of a future report; however, initial order of magnitude costs are of the order of:

Implementation of a Tree Management Plan.

- initial urgent works in the order of \$100,000
- annual costs \$7,000. (2016\$)
- additional five yearly costs \$5,500 (2016\$)

Argyle Street public domain works including replacement of trees - >\$1.5 million (2016\$) in stages.

For comparison only, the 2015/16 Bargo Streetscape Project has an estimated cost of \$1.35m (excluding additional asphalt works) for a more accessible site.

**ATTACHMENTS**

1. Consultation Report (2015)
2. Risk Assessment – London Plan Trees Argyle Street, Picton (2011)
3. Arboriculture Assessment Report Argyle Street Main Street Tree Assessment (2016).

**RECOMMENDATION**

1. That an additional budget allocation of \$50,000 be made for the 2016/17 financial year for the engagement of a suitable specialist to undertake an intrusive investigation of the Argyle Street plane trees and the development of a management plan to reduce risks to acceptable levels with the outcomes of this investigation to be reported to Council.
2. That \$5,500 be allocated from the existing 2016/17 budget to undertake initial tree maintenance works such as crown pruning.
3. That Council note that should the tree management plan not result in a satisfactory reduction in risk exposure, that the removal of the plane trees may be required.
4. That Council note that the additional cleaning along Argyle Street due to the plane trees results in the diversion of council staff from other duties in Picton with an equivalent value of approximately \$7,000 p.a.
5. That participants in the community consultation process that lodged their contact details be made aware of Council's decision.

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**Picton Plane Trees – Community Consultation Report**

Wollondilly Shire Council resolved in May 2015 to consult the community about the Plane Trees planted along Picton's main street. This was due to the fact that the Plane Trees have created differing views within the community. Some in the community have raised concerns about the Plane Trees and would like to see them removed, as they have caused damage to the footpath, have created trip hazards at certain times of the year and can cause allergies. While, others want to keep the trees because they are seen as a valuable asset within the community that provide shade and are visually appealing.

Council is committed to understanding the varying views of the community on this important topic, and as a result consulted the community about the Plane Trees from the 26<sup>th</sup> October – 20<sup>th</sup> November 2015.

The options Council was consulting the community about included:

Option 1: Retain the Plane Trees in their current state

Option 2: Remove the Plane Trees and do not replace them

Option 3: Remove the Plane Trees and replace with an alternative species over time

**Community Engagement**

Council employed a number of engagement methods to consult the community during this period. Including:

- Detailed information on Engage.Wollondilly
- Flyer distribution to businesses in Picton
- Posters displayed in various locations in Picton
- Letterbox drop to surrounding residential properties
- Posts on Council's Social Media platforms
- Information distribution to Picton Chamber of Commerce
- Radio coverage
- Information included in The Bush Telegraph
- Media releases distributed
- Newspaper coverage
- Online community survey
- 2 x information kiosks

The outcomes of the community consultation are as follows:

- 33 people in total attended the two information kiosks held
- 90 online surveys were completed over the engagement period
- 2 comments were made on the Engage.Wollondilly project page
- 9 people submitted feedback via the contact us form on Engage.Wollondilly



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Online survey results:

- 100% of respondents identified that they use the main street of Picton and 44.94% of respondents use the main street 5 or more times a week.
- Additionally, 84.27% of respondents believed the street trees are “very important”
- In regards to safety concerns, 15.73% of respondents identified that they have experienced safety concerns relating to the street trees; while 84.27% did not identify having experienced safety concerns or issues.
- The main safety concerns identified by respondents included:
  - o Slipping on seed pods
  - o Being hit from above by birds dropping fruit
  - o Finding it hard to navigate around the leaves and seedpods on the ground when using a walking aid such as a walker or walking stick
  - o Allergy concerns such as breathing issues and skin irritation
  - o Trip hazards from seed pods and leaves on the ground, as well as the tree roots uplifting the footpath
- When respondents were asked to rank the three options being considered in order of preference the results indicated that 76.40% of respondents preferred Option 1; followed by 20.22% preference for Option 3 and 3.37% preference for Option 2.
- Respondents were also asked what alternate tree species they would like to see in the main street of Picton if Option 3 was to proceed. 65 people responded to this question and the Lipstick Maple was identified as the preferred option for an alternate species with 29.23% support from respondents.

Other key comments/themes that arouse from the community consultation included:

- If the Plane Trees are going to be replaced it should be with an Australian plant and something that is less root invasive.
- If the Plane Trees were removed you would be taking away from the character of the main street of Picton.
- The Plane Trees provide shelter from the harsh sun in summer and allow sunlight during the colder months in winter.
- Removing and replacing the Plane Trees will be costly and it will take a long time for the new trees to establish properly.
- Traffic lights and better traffic management is needed in Picton.
- Trees are an essential part of the beauty of Picton.
- Why is so much development in Picton being approved when Wilton Junction is coming? The blocks being approved are really small too.
- Would like to see some street trees removed and some saved.
- The Plane Trees should be kept. All trees require maintenance and when Picton Main Street didn't have any trees it was quite uncomfortable in the street.

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**Summary**

Wollondilly Shire Council is committed to understanding the community's perspective on the issues surrounding the Plane Trees in Picton's main street before any decisions are made.

The outcomes of the community consultation undertaken in late 2015 highlight that the large majority of the community would like Council to proceed with Option 1: Retain the Plane Trees in their current state.

Based on this information Council officers will undertake some further investigation into the costing's associated with Option 1 including increased maintenance and managements of the Plane Tree root system. These findings will be presented to Council for a decision to be made in 2016.



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**ATTACHMENT 2 – 260 – 20 JUNE 2016**



AAA Advanced Tree Surgery



## RISK ASSESSMENT

### London Plane Trees

### Argyle Street, Picton



Date of Issue: 28<sup>th</sup> April 2011

Our Reference: CRPT20100328.11.04.28

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Argyle Street, Picton Risk Assessment

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Risk Assessment

**1. Introduction**

Jones Nicholson has been engaged by Wollondilly Shire Council to assess the risk of damage to Council infrastructure, the infrastructure of service providers, and buildings in Argyle Street, Picton from the existing London Plane trees. The London Plane trees form an integral part of the existing streetscape along Argyle Street which was improved in 2006, where the installation of London Plane trees formed part of the scope of works.

The area subject to the assessment extends along Argyle Street, Picton and is bounded by Stonequarry Creek at the south western end through to the intersection of Menangle Street at the north eastern end.

**2. The London Plane Tree - *Platanus × acerifolia***

The London Plane (*Platanus × acerifolia*) is a deciduous tree, typically growing to a height of approximately 15m, and to a width of 10 metres. The bark of the trunk is olive – brown, irregularly flaking off to expose the younger bark which is beige to grey in colour. This creates a mottled appearance to the trunk.

When young, the London Plane has a pyramidal habit, however, as the tree matures this habit changes to a more rounded and open habit.

The large leaves have three to five coarsely serrated lobes, and transform from a green spring and summer foliage to a golden yellow to golden bronze foliage in autumn. Pendulous, bristly balled fruit to 25mm in diameter are produced in groups of two or three. Short, stiff hairs shed by the leaves, fruit and the dispersing seeds have been known to cause irritation if breathed in, and can exacerbate breathing difficulties for people with asthma.

The London Plane is considered highly tolerant of urban conditions and heavy atmospheric pollution. For this reason, it is widely used by many local government authorities as an ornamental tree in streetscapes. The London Plane is also considered tolerant of differing soil conditions.

Generally speaking, the moisture use of tree species that have high wilting points and tolerance to de-oxygenated soil conditions (such as the London Plane tree) can result in the tree species developing deep root systems that can highly influence soil moisture levels and the amount of ground movement in reactive clay soils.

Also, tree species planted in streetscape environments with compacted soils and limited available soil volume need to source favourable soil conditions that can ensure their survival in such a harsh environment. Consequently, there is a high potential for conflict with infrastructure such as sewer reticulation lines and stormwater drainage pipes that can provide a source of nutrients for the tree.

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Risk Assessment

**3. Exclusion Zones around London Plane Trees****3.1 Zone of Upheaval (Clark, 2000)**

The 'Zone of Upheaval' (Clark, 2000) uses the mature size of the tree to estimate the root plate of the tree. The root plate is the area of the tree underground with the primary function of water absorption, absorption of minerals, conduction of nutrients to the stem and anchorage of the plant. This part of the tree contains buttress flare and heavy lateral roots.

In order to estimate the 'Zone of Upheaval' of a specimen, the tree diameter at breast height (DBH) needs to be estimated for the mature tree. The DBH is defined as the outside bark diameter at breast height, with breast height being 4.5 feet (1.37m) above the forest floor on the upslope side of the tree.

Once the DBH for a mature specimen is determined, the 'Zone of Upheaval' is estimated to be 4 to 5 times the DBH. In a presentation to the Municipal Association of Victoria on Tree Risk, Mr Glenn Waters of Treelogic provided guidance on the 'Zone of Upheaval' for a mature London Plane, indicating 5.5 metres was an approximate value. Research on tree policies of other local government authorities in Australia estimates the 'Zone of Upheaval' for the London Plane in the order of 5 to 5.5 metres.

**3.2 AS2870-1996 'Residential slabs and footings – Construction'**

Australian Standard AS2870 sets out the requirements for the design and construction of footing systems for single dwelling houses, townhouses, or the like and includes buildings classified as Class 1 and Class 10a under the Building Code of Australia.

Appendix B of AS2870 provides an informative guide on foundation maintenance. Included within the document under Clause B.2.3 (c) is 'Restrictions on trees and shrubs'. While this standard has been written for applications of a residential nature, it provides guidance on the influences trees and shrubs can have on the foundational conditions of any building or structure.

Clause B.2.3(c) provides guidance that trees should be restricted a distance of:

- 1 x the mature height of a tree for Class H reactive clays; and
- $\frac{3}{4}$  x the mature height of a tree for Class M reactive clays;

from a building structure to reduce but not eliminate the risk of structural damage. Class H and Class M clays are classified under Section 2 of AS2870.



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To the area of Argyle Street under this risk assessment, foundational soils are generally considered as reactive clay sites, and typically Class H in classification under the provisions of Section 2 of AS2870-1996. In light of this, adopting the guidelines of Clause B2.3(c) of AS2870, it is recommended that for a London Plane tree of 15 metres mature height, a buffer of 15 metres be allowed to reduce but not eliminate the risk of structural damage to buildings.

**3.3 Sydney Water**

**3.3.1 Sewerage Reticulation Infrastructure**

Sydney Water has a publication 'Tree planting and the sewer system' that can be accessed via the Sydney Water website. This document provides guidance on what trees should be avoided planting near sewers – one of which is Plane trees (Platanus species).

This publication recommends that Plane trees not be planted within six metres of a sewer system.

**3.3.2 Water Supply Infrastructure**

An investigation of the Sydney Water website found no publication addressing the influence of trees on water supply infrastructure.

A telephone enquiry made to Sydney Water revealed that no document exists addressing the influence of trees on water supply infrastructure as it is not considered a problem. The incident of tree root damage on water supply infrastructure is extremely low.

**3.4 Telstra**

An investigation of the Telstra's website found no publication addressing the influence of trees on communication infrastructure.

A telephone enquiry made to Telstra's policy section revealed that no document exists addressing the influence of trees on underground communication infrastructure as it is not considered a problem. The incident of tree root damage on communication infrastructure is extremely low.

**3.5 Integral Energy**

An investigation of the Integral Energy's website found publications addressing the influence of trees on electrical infrastructure. However, these publications predominantly related to the management of trees in relation to above ground services. The Integral Energy 'Tree Management Plan' states that consideration

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should be given to how tall, wide and deep a tree will grow, and how it will impact on underground services such as power lines, service pillars or other energy infrastructure.

A telephone enquiry made to Integral Energy's field inspectors referred Jones Nicholson to Integral Energy's 'Tree Management Plan' document for guidance.

**3.6 Wollondilly Council Infrastructure**

Currently, Wollondilly Council has prepared a DRAFT 'Street Tree and Vegetation Risk Management Procedure' that, once endorsed by Council, will:

- Outline the responsible sections of Council in dealing with trees and vegetation on roadsides and parks;
- Identify assessment criteria used by Council staff working with tree complaints;
- Identify the correct procedure flow paths within the organization; and
- List a proposed selection of species for use as street trees.

The DRAFT procedure provides the following guidelines for planting trees near Council infrastructure:

- No tree to be planted closer than 1000mm from the face of the kerb or further than 1200mm from the kerb;
- No tree is to be planted on footpaths less than 3.0m wide;
- A tree should be 2.5m from either side of a driveway or vehicular crossing;
- A tree should be 2.5m from either side car/bus parking bay
- A tree should be 2.5m from any power pole or telephone pillar;
- A tree should be 20m from either side of pedestrian crossings; and
- A tree should be 12m from the apex of street corners.

The DRAFT procedure does not provide guidelines for planting trees near stormwater infrastructure.

It is also noted that the London Plane (*Platanus × acerifolia*) is not contained in the 'Street trees of Wollondilly' or the 'List of species unsuitable for planting in Wollondilly Shire Council' in Appendix 2 of the DRAFT procedure.



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**4. Risk Matrices - Services**

Risk Matrices have been prepared to consider the risk level associated with damage to the infrastructure of service providers such as Telstra, Integral Energy, and Sydney Water. A risk score system has been developed to assist in ranking those assets and infrastructure at a higher and lower risk within a particular risk classification.

Table 1 outlines the assessment of consequence and corresponding risk score. Table 2 outlines the assessment of likelihood and corresponding risk score. Table 3 details the risk matrix and from the determination of consequence and likelihood, a risk score is obtained for the element in consideration. Table 4 provides a risk classification based upon the risk score calculated from Table 3.

**Table 1 – Consequences**

Level	Descriptor	Examples	Score
1	Insignificant	No impact on services	5
2	Minor	Minor impact on service performance	10
3	Moderate	Impact on services requiring repair. Services still capable of meeting demand.	15
4	Major	Services compromised in performance and/or capacity,	20
5	Severe	Services damaged and extensive repairs required to reinstate service capability/performance.	25

**Table 2 – Likelihood**

Level	Descriptor	Examples	Score
1	Almost Certain	Is expected to occur in most circumstances	5
2	Likely	Will probably occur in most circumstances	4
3	Possible	Could occur at some time	3
4	Unlikely	Not likely to occur in normal circumstances	2
5	Rare	May occur only in exceptional circumstances	1

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**Table 3 – Risk Matrix**

Likelihood	Consequences				
	Insignificant (5)	Minor (10)	Moderate (15)	Major (20)	Severe (25)
Almost Certain (5)	25	50	75	100	125
Likely (4)	20	40	60	80	100
Possible (3)	15	30	45	60	75
Unlikely (2)	10	20	30	40	50
Rare (1)	5	10	15	20	25

**Table 4 – Risk Score**

Score Range	Risk Classification	Colour Reference
100-125	Extreme	
41-99	High	
11-40	Moderate	
1-10	Low	

**4.1 Telstra Infrastructure**

As documented in section 3.4 of this report, the incidence of tree root damage on communication infrastructure is extremely low, and hence no policy or publication exists to provide guidance on addressing the influence of trees on underground communication infrastructure.

However, in discussions held with a Telstra representative, it was outlined that if it was determined that a tree root did impact upon Telstra’s infrastructure network, then it is likely that Telstra would pursue reimbursement of costs to reinstate the network from the body responsible for the tree.

Therefore, given the scale of the Telstra communication infrastructure network and the low incidence of root damage, the likelihood of a damage to the Telstra communication infrastructure is considered Rare (risk score 1).

The consequence of root damage to Telstra’s infrastructure is considered Severe (risk score 25). This is due to the possible fracturing or breaking of communication cabling such as optic fibre cabling which is present in Argyle Street, requiring extensive repair work.

Therefore, a risk score of 25 is attributed to the Telstra communication infrastructure, representing a MODERATE risk classification.

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**4.2 Integral Energy**

As documented in section 3.5 of this report, the Integral Energy 'Tree Management Plan' states that consideration should be given to how tall, wide and deep a tree will grow, and how it will impact on underground services such as power lines, service pillars or other energy infrastructure. No specific guidance on buffer distances for trees to Integral Energy's infrastructure was provided.

Considering the scale of the Integral Energy infrastructure network and the low incidence of root damage, the likelihood of a damage to the Integral Energy infrastructure is considered Rare (risk score 1).

The consequence of root damage to Integral Energy infrastructure is considered Severe (risk score 25). This is due to the possible disconnection of electrical services, effort in locating the breakage point and extensive repair work required to reinstate an electrical main and electricity supply.

Therefore, a risk score of 25 is attributed to the Integral Energy infrastructure, representing a **MODERATE** risk classification.

**4.3 Sydney Water**

**4.3.1 Sewerage Reticulation Infrastructure**

The Sydney Water publication 'Tree planting and the sewer system' recommends that Plane trees not be planted within six metres of a sewer system.

Sewerage Reticulation infrastructure is present at the south western end of Argyle Street, aligned parallel to Stonequarry Creek. The nearest London Plane tree is approximately 18 metres to the east of the sewerage infrastructure on the southern side of Argyle Street. On the northern side of Argyle Street, the nearest London Plane tree is approximately 20 metres from the infrastructure.

Considering:

- The impervious areas around the London Plane trees in Argyle Street;
- The need for the root system to develop into areas that can provide sufficient nutrients for the survival of the tree;
- The high nutrient levels in sewerage that can sustain plant life;
- The guidelines of AS2870 recommending a clearance distance of 1 times the mature height of the tree for a Class H foundation soil (i.e. 15 metres) to reduce the likelihood of influence from trees;

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the likelihood of damage to the Sydney Water sewerage infrastructure is considered Possible (risk score 3).

The consequence of root damage to Sydney Water's sewerage infrastructure is considered Moderate (risk score 15). This is due to the consistent pattern of tree roots found within sewerage infrastructure across Australia compromising the performance of the infrastructure and requiring repair. However, considering the distance from the stem of the tree, the infrastructure is considered capable of meeting the sewerage demand in a somewhat diminished capacity.

Therefore, a risk score of 45 is attributed to the Sydney Water's sewerage infrastructure, representing a **HIGH** risk classification.

**4.3.2 Water Supply Infrastructure**

As documented in section 3.3.2 of this report, the incidence of tree root damage on water supply infrastructure is extremely low. Hence, no policy or publication exists in Sydney Water to provide guidance on addressing the influence of trees on water supply infrastructure.

Therefore, given the low incidence of root damage to water supply infrastructure, the likelihood of a damage to the water supply infrastructure is considered Rare (risk score 1).

The consequence of root damage to Sydney Water's infrastructure is considered Severe (risk score 25). This is due to the possible fracturing or breaking of water supply pipes resulting in possible damage to pathways, road pavements, and buildings, as well as the risk of injury to the general public. This would result in extensive repair and reinstatement works.

Therefore, a risk score of 25 is attributed to the water supply infrastructure, representing a **MODERATE** risk classification.

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**5. Risk Matrices – Wollondilly Shire Council Infrastructure**

Risk Matrices have been prepared to consider the risk level associated with damage to Wollondilly Council infrastructure. A risk score system has been developed to assist in ranking those assets and infrastructure at a higher and lower risk within a particular risk classification.

Table 1 outlines the assessment of consequence and corresponding risk score. Table 2 outlines the assessment of likelihood and corresponding risk score. Table 3 details the risk matrix and from the determination of consequence and likelihood, a risk score is obtained for the element in consideration. Table 4 provides a risk classification based upon the risk score calculated from Table 3.

**Table 1 – Consequences**

Level	Descriptor	Examples	Score
1	Insignificant	No impact on asset/infrastructure	5
2	Minor	Minor impact on asset/infrastructure	10
3	Moderate	Impact on asset/infrastructure requiring repair. Asset/infrastructure is still capable of performing its function.	15
4	Major	Asset/infrastructure is compromised in performance and/or capacity. Repairs are required.	20
5	Severe	Asset/infrastructure is damaged and extensive repairs required to reinstate service capability/performance.	25

**Table 2 – Likelihood**

Level	Descriptor	Examples	Score
1	Almost Certain	Is located within the Zone of Upheaval of the London Plane tree	5
2	Likely	Is located within 15m of the London Plane tree (clearance distance recommended by AS2870)	4
3	Possible	Is located within 25m of the London Plane tree (further root travel due to high impervious area in streetscape and need for tree to source nutrients)	3
4	Unlikely	Is located within 35m of the London Plane tree	2
5	Rare	Is located further than 35m of the London Plane tree. May occur only in exceptional circumstances	1



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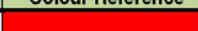



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**Table 3 – Risk Matrix**

Likelihood	Consequences				
	Insignificant (5)	Minor (10)	Moderate (15)	Major (20)	Severe (25)
Almost Certain (5)	25	50	75	100	125
Likely (4)	20	40	60	80	100
Possible (3)	15	30	45	60	75
Unlikely (2)	10	20	30	40	50
Rare (1)	5	10	15	20	25

**Table 4 – Risk Score**

Score Range	Risk Classification	Colour Reference
100-125	Extreme	
41-99	High	
11-40	Moderate	
1-10	Low	

**5.1 Roads**

Following a site visit to view the existing infrastructure of Wollondilly Shire Council above ground, it was observed that the London Plane trees have already impacted upon some of Council's assets. In particular:

- Sections of kerb and gutter displayed signs of cracking and lifting;
- Pavement damage in close proximity to the London Plane trees were observed, with some repair works observed to have been completed in the past;
- Sections of footpath displaying signs of differential movement between sections, creating a trip hazard for the general public; and
- Cracking to the replaced sections of footpath.

**5.1.1 Kerb and Gutter**

Damage to kerb and gutter construction is expected to occur to a higher degree closer to the London Plane trees and decrease in magnitude and frequency as the distance from the London Plane tree increases.

In the worst case, the likelihood of damage to the kerb and gutter infrastructure is considered Almost Certain (risk score 5).

The consequence of root damage to kerb and gutter infrastructure is considered High (risk score 20). This is due to the capacity of the kerb and gutter to accommodate stormwater flows and conveyance to drainage pits is compromised.

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Also, the kerb and gutter damage represents a trip hazard risk to the general public. This has not been factored in to the asset risk assessment.

Therefore, a risk score of 100 is attributed to the kerb and gutter infrastructure, representing an **EXTREME** risk classification in the worst case.

**5.1.2 Footpaths**

Damage to footpaths (like kerb and gutter infrastructure) is expected to occur to a higher degree closer to the London Plane trees and decrease in magnitude and frequency as the distance from the London Plane tree increases.

In the worst case, the likelihood of damage to the footpath infrastructure is considered Almost Certain (risk score 5).

The consequence of root damage to kerb and gutter infrastructure is considered Moderate (risk score 15). The footpath will still be able to perform its function, with repairs required upon deterioration of the footpath.

Once again, the footpath damage represents a trip hazard risk to the general public. This has not been factored in to the asset risk assessment.

Therefore, a risk score of 75 is attributed to footpaths, representing a **HIGH** risk classification in the worst case.

**5.1.3 Road Pavement**

Damage to the road pavement is expected to occur to a higher degree closer to the London Plane trees and decrease in magnitude and frequency as the distance from the London Plane tree increases.

In the worst case, the likelihood of damage to the road pavement is considered Almost Certain (risk score 5).

The consequence of root damage to the road pavement is considered Moderate (risk score 15). The road pavement will still be able to perform its function, with repairs required upon deterioration of the road pavement.

Once again, the road pavement damage represents a trip hazard risk to the general public. This has not been factored in to the asset risk assessment.

Therefore, a risk score of 75 is attributed to the road pavement, representing a **HIGH** risk classification in the worst case.

**5.1.4 Stormwater Pits and Culverts (Drainage Infrastructure)**

Damage to drainage infrastructure is expected to occur through the root system of the London Plane trees penetrating through the pipe joints, and reducing the capacity of the drainage infrastructure to convey stormwater flows into Council's stormwater drainage network.



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In the worst case, the likelihood of damage to the drainage infrastructure is considered Almost Certain (risk score 5).

The consequence of root damage to the road pavement is considered Moderate (risk score 15). The drainage infrastructure will still be able to perform its function, but in a reduced capacity. Repairs will involve tree root removal or pipe repairs/replacement as required.

Therefore, a risk score of 75 is attributed to the drainage infrastructure, representing a **HIGH** risk classification in the worst case.

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**6. Risk Matrices – Damage to Buildings**

Risk Matrices have been prepared to consider the risk level associated with damage to buildings along Argyle Street. A risk score system has been developed to assist in ranking those assets and infrastructure at a higher and lower risk within a particular risk classification.

Table 1 outlines the assessment of consequence and corresponding risk score. Table 2 outlines the assessment of likelihood and corresponding risk score. Table 3 details the risk matrix and from the determination of consequence and likelihood, a risk score is obtained for the element in consideration. Table 4 provides a risk classification based upon the risk score calculated from Table 3.

**Table 1 – Consequences**

Level	Descriptor	Examples	Score
1	Insignificant	No impact on building structures	5
2	Minor	Minor impact on building structures and unlikely to require repair	10
3	Moderate	Impact on building structures requiring repair. Buildings require aesthetic repairs	15
4	Major	Building structures requiring major repairs (such as maintaining weather tightness).	20
5	Severe	Building structures structurally compromised with major rectification works required.	25

**Table 2 – Likelihood**

Level	Descriptor	Examples	Score
1	Almost Certain	Is expected to occur in most circumstances	5
2	Likely	Will probably occur in most circumstances	4
3	Possible	Could occur at some time	3
4	Unlikely	Not likely to occur in normal circumstances	2
5	Rare	May occur only in exceptional circumstances	1

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**Table 3 – Risk Matrix**

Likelihood	Consequences				
	Insignificant (5)	Minor (10)	Moderate (15)	Major (20)	Severe (25)
Almost Certain (5)	25	50	75	100	125
Likely (4)	20	40	60	80	100
Possible (3)	15	30	45	60	75
Unlikely (2)	10	20	30	40	50
Rare (1)	5	10	15	20	25

**Table 4 – Risk Score**

Score Range	Risk Classification	Colour Reference
100-125	Extreme	
41-99	High	
11-40	Moderate	
1-10	Low	

**6.2 Existing Building Construction in Argyle Street**

During the site visit undertaken to view the existing conditions in Argyle Street, it was observed that the majority of buildings appear to be of masonry construction. The building housing Teres’s Fashion and Gifts was observed to have a timber clad façade, but the remaining external walls to the building appeared to be of masonry construction.

Masonry wall construction is less tolerant of foundational influences on the building structure and is more prone to visible signs of crack than a timber framed building. This fact will be built into the risk assessment, using Table C1 of Appendix C in AS2870 as a reference.

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**Table C1 of Appendix C (AS2870) – Classification of Damage with Reference to Walls**

Description of typical damage and required repair	Approximate crack width limit	Damage category
Hairline cracks	< 0.1 mm	0
Fine cracks which do not need repair	< 1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	< 5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weather tightness often impaired	5 mm to 15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15 mm to 25 mm but also depends on number of cracks	4

**6.2.1 Buildings Located within the ‘Zone of Upheaval’ – Existing and Future**

The likelihood of damage to masonry buildings located within the ‘Zone of Upheaval’ is considered Almost Certain (risk score 5).

The consequence of root damage to masonry buildings located within the ‘Zone of Upheaval’ is considered Severe (risk score 25), particularly for heritage listed buildings. The masonry building will likely be subjected cracking classified as Damage Category 3 or 4.

Therefore, a risk score of 125 is attributed to masonry buildings within the ‘Zone of Upheaval’, representing an **EXTREME** risk classification.

**6.2.2 Buildings Located within 15m of London Plane tree (recommended restriction from AS2870) – Existing and Future**

The likelihood of damage to masonry buildings located within the recommended restriction area outlined in AS2870 Appendix B is considered Likely (risk score 4).

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The consequence of root damage to masonry buildings located within the recommended restriction area outlined in AS2870 Appendix B is considered Major (risk score 20). The masonry building will likely be subjected cracking classified as Damage Category 2 or 3.

Therefore, a risk score of 80 is attributed to masonry buildings located within the recommended restriction area outlined in AS2870, representing a **HIGH** risk classification.

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**7. Summary of Risk Assessment**

The following summary table is provided for all building assets, services infrastructure and Wollondilly Shire Council (WSC) infrastructure, rank from highest risk score to lowest risk score.

Element	Risk Score	Risk Classification
Buildings located within the 'Zone of Upheaval' of a London Plane Tree	125	EXTREME
WSC Kerb and Gutter Infrastructure	100	EXTREME
Buildings located within 15m of a London Plane tree	80	HIGH
WSC Footpaths	75	HIGH
WSC Road Pavement	75	HIGH
WSC Drainage Infrastructure	75	HIGH
Sydney Water - sewerage infrastructure	45	HIGH
Sydney Water - water supply	25	MODERATE
Telstra infrastructure	25	MODERATE
Integral Energy Infrastructure	25	MODERATE

Drawing 100328, Sheets C01, C02, and C04 to C08 have also been prepared to provide an indicative risk boundary plan for building assets, services infrastructure and Wollondilly Shire Council infrastructure. These risk boundary plans provide guidance for both existing and possible future assets, services and infrastructure.

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**8. Removal of London Plane Trees**

Advice obtained from Mr Greg Conlon on the management of the root system of the London Plane trees revealed the following:

“The root system from my experience, having stump ground, dug out & investigated many over the past twelve years is substantial. Having such a large leaf & dense crown requires the tree to develop a compatible root system which is conversely large & dense to gather the water & nutrients to sustain this crown. Herein lies the problem. If we retard the root system to protect the surrounding structures we will in turn retard the growth & health of the trees. So, in fact, if the installation of root control methods such as root barriers do work & stop the root spread we will not end up with the beautiful, elegant trees that were first envisioned but rather stunted & misshapen trees that do not reflect the original streetscape proposal.

In my opinion London plane trees are not suitable as a street tree. Large trees require space to reach their full potential. These are large trees. They create great shade due to their broad branch spread. Once mature, besides the root problems, the trees would require annual pollarding to keep the branches off of the surrounding buildings & this is never a good look.

The London Plane tree was selected because they look impressive, give great shade, are long lived & low maintenance. This is all true when the trees are unrestricted i.e. Belmore Park, Central Station. But these particular trees will need to be significantly restricted to fit into the space & budget given by Council. The trees will not achieve their potential & the eventual annual expense could be prohibitive. If the trees are retained be prepared for ongoing tree maintenance & pavement damage.”

---

Following a review of this risk assessment, should Wollondilly Shire Council determine that the London Plane Trees pose too great a risk to existing assets and infrastructure in Argyle Street and require removal, then it is recommended that a tree removal specialist be engaged to undertake the removal of the trees.

Advice obtained from Mr Greg Conlon of AAA Advanced Tree Surgery in relation to the London Plane trees in their current state revealed the following methodology for removal:



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- The trees would need to be cut down to just above ground level;
- Once the trees are cut down, it is recommended that the stumps be poisoned and remain in-situ for approximately one month; and
- Following the one month period, a stump grinder would remove the tree stumps to a level approximately 250mm below ground level.

Mr Conlon advised that given the size of the existing roots and the height of the existing trees, it would not be necessary to remove every root of the London Plane tree.

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**9. References**

The following documents have been used as reference material in the preparation of this Risk Assessment:

- Integral Energy – 'Tree Management Plan'
- Sydney Water – 'Tree planting and the sewer system'
- 'Tree Root Management. City of Unley' prepared by Kym Knight of Tree Environs Pty Ltd – June 2007
- 'Mature Trees Within Pavements, Design Recommendations' prepared by pba consulting – January 2007
- Presentation by Glenn Waters of Tree Logic Pty Ltd to the Municipal Association of Victoria
- Britannica Online Encyclopaedia
- Flemings Nurseries – online catalogue of trees.

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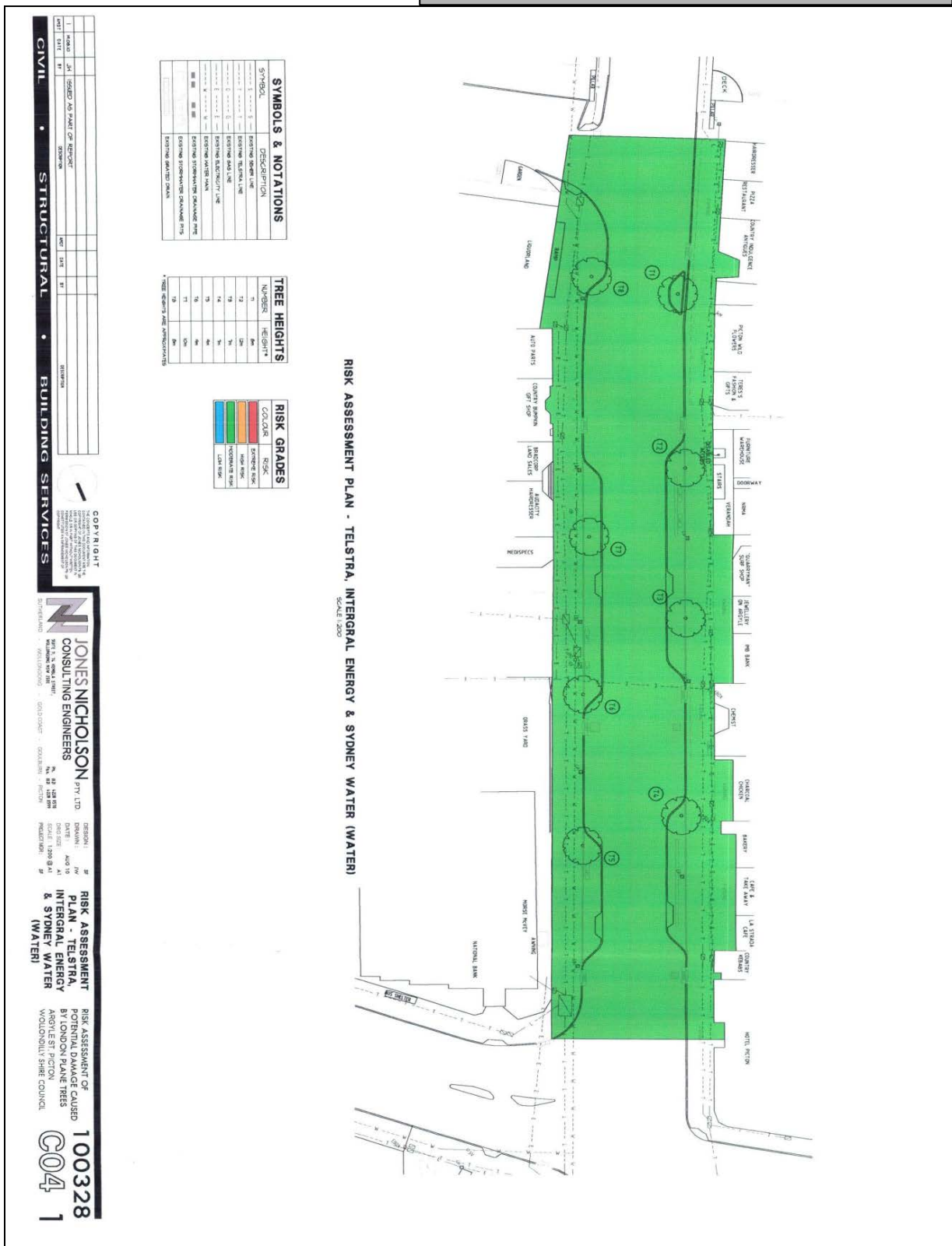
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**10. Drawing 100328, Sheets C01, C02 and C04 to C08**



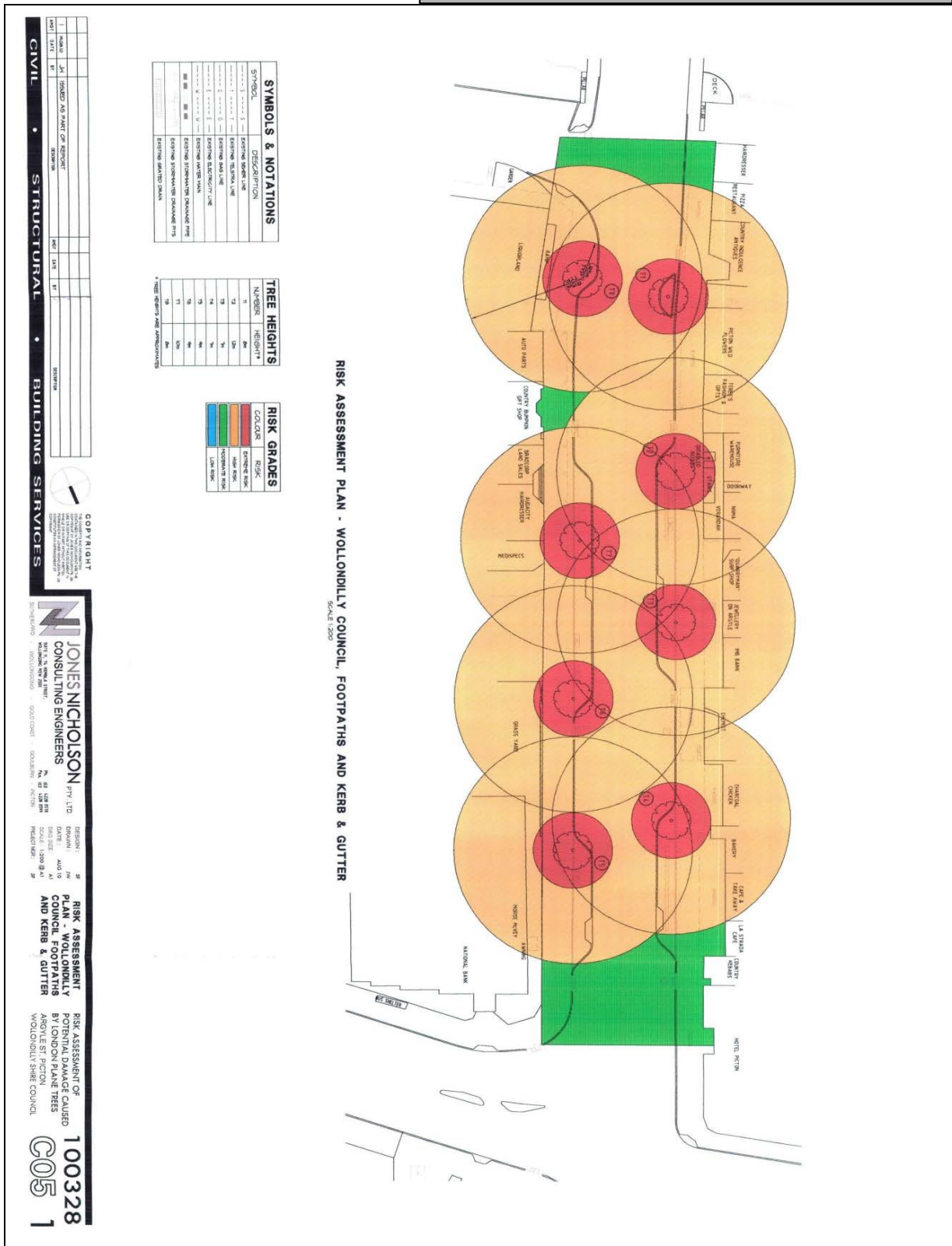


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## ARBORICULTURAL ASSESSMENT REPORT



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15th March 2016



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**DISCLAIMER**

This report has been prepared in accordance with the scope of services described in agreement between CPE Tree Services and the client.

This report relies upon data, surveys and site inspections results taken at or under the particular time and or conditions specified herein.

Any representation, statement, opinion or advice, expressed or implied in this publication is made in good faith but on the basis that CPE Tree Services, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Every effort has been made in this report to include, assess and address all defects, structural weaknesses, instabilities of the subject trees. All inspections were made from ground level using only visual means and no intrusive or destructive means of inspection were used. For many structural defects such as decay and inclusions, internal inspection is required by means of resistograph or similar. No such investigation has been made in this case. Trees are living organisms and are subject to failure through a variety of causes not able to be identified by means of this inspection and assessment.

Information contained in this report covers only the subject tree that was assessed and reflects the condition of the subject tree at the time of inspection. Any finding, conclusion or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client.

There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject trees or the subject site may not arise in the future.

Furthermore, this report has been prepared solely for the use by the Client. The Client acknowledges that this assessment, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the Client and based on the data observations, measurements and analysis carried out or obtained by CPE Tree Services and referred to in the assessment.

CPE Tree Services accepts no responsibility for its use by other parties.



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**1.0 INTRODUCTION AND BACKGROUND**

This Street Tree Assessment, Infrastructure and Tree Conflict Report was prepared for Wollondilly Shire Council.

CPE Tree Services were engaged to conduct an Arboriculture Assessment Report with particular regard to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, with reference made to the Office of Environment and Heritage (OEH) (formerly National Parks and Wildlife Services), Threatened Species Conservation Act 1995, Noxious Weeds Act 1993 and Wollondilly Shire Council, Tree Preservation Order (TPO).

It is understood that this report is to form part of an “Arboricultural Assessment” of Argyle Street, Picton to assess all trees within the streetscape and assess the trees individual health, structural condition and overall integrity regarding potential WH&S concerns and options regarding tree retention verses long term maintenance costings.

This assessment is proposed to provide information to Wollondilly Shire Council following concerns about the costs to repair infrastructure, potential WH&S concerns as the result of street trees, any resultant liability and considered maintenance requirements.

A site investigation was conducted on Tuesday 15<sup>th</sup> March 2016 to determine all the existing trees overall health, structural integrity and identification of other physical conditions that may be present within Argyle Street, Picton.

The purpose of this report is to identify the trees within the site, provide information on their individual current health and condition, determine their remaining life expectancy and significance in the landscape and assess their suitability for retention/preservation.

This assessment takes into consideration the ecological qualities of all trees and other significant vegetation on the site and its biotic, ecological, historical and visual significance.

The scope of this report includes the allocation of SULE ratings (Safe Useful Life Expectancy), identification of arboricultural and recommended work as required.

Information contained in this report covers only the subject trees that were assessed and reflects the condition of the subject trees on site at the time of inspection.



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**2.0 SITE LOCATION**

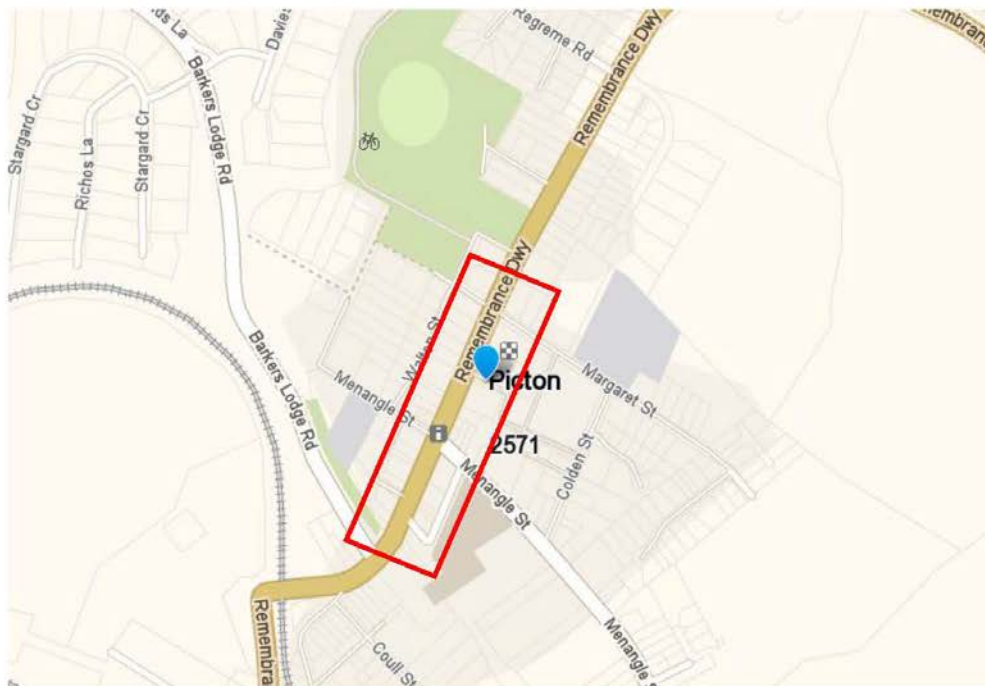


Figure 1 Show's the location of the study site. Source [whereis.com.au](http://whereis.com.au)

**2.1 AERIAL SITE LOCATION**



Figure 2 Show's an aerial location of the study site. Source [nearmaps.com.au](http://nearmaps.com.au)

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**3.0 AIMS AND ISSUES**

To detail the condition of the trees and consider the location and condition of such in relation to their surrounds.

Provide as an outcome of the assessment, the following:

- Carry out an inspection of the subject trees within Argyle Street, Picton and site conditions,
- Assess the condition of the subject tree(s),
- A description of the tree's and other vegetation on the subject site,
- Observations made,
- Discussion on the tree's in their current landscape and,
- Determine the subject trees' Landscape Significance including cultural, environmental and aesthetic values,
- Consider the benefits of retention or removal of the trees for the medium to long-term benefit of the tree's and on-going public safety, and
- Provide recommendations for Tree Management, if or as required, within the context of on-going streetscape and building maintenance,
- Consider Infrastructure and Tree Conflict, as street trees identified in the report, may require removal and replacement in a proactive and prudent manner to avoid future asset damage and any potential litigation this damage may generate.

The report also considers this species of tree to be an unsuitable selection, or planted in a location where they will create future problems with road and footpath assets.

They may be recommended for removal and replacement with a different species subject to Council and public consultation process.

**4.0 BENEFITS OF STREET TREES**

To analyse the cost of any maintenance to assets caused by street trees, we must also consider the benefits of the trees, being environmental, aesthetic, social, cultural and economic. They enhance the streetscape and the suburb, improving the quality of the environment.

All the trees found along Argyle Street are currently being or have been planted in Picton in the past. We felt this was a good reference point to begin investigations as the majority of trees are only considered to be minor in size to their natural large aesthetic form yet reached;

Trees can have the following benefits:

- **Environmental benefits of street trees,**
- **Economic benefits,**
- **Social and Psychological benefits,**
- **Aesthetic benefits,**
- **Cultural Significance,**

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**5.0 METHODOLOGY**

This report was determined as a result of a comprehensive site inspection and investigation conducted on Tuesday 15<sup>th</sup> March 2016 and the subject trees were inspected by CPE Tree Services.

The comments and recommendations in this report are based on findings from this site inspection. Each tree has been provided with identification number for reference purposed denoted on the attached tree location plan and correlating with the Tree Assessment Schedule and as discussed within the report.

The method of assessment applied to the Argyle Street, Picton (the site) is adapted from the principles developed by the Local Government Tree Resources Association (LGTRA). This recognised form of assessment considers the trees health/condition and subsequent stability, both in the long and short term at the time of the assessment and including but not limited to;

- Species identification (botanical and common),
- Height and form,
- Observations made including an evaluation of the tree's health and vigour using Crown spread and cover, foliage size, colour, extension growth, presence of disease or pest infestation, canopy density, presence of deadwood, dieback and epicormic growth as indicators,
- Condition, using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators,
- Suitability of the tree to the site and its existing location; in consideration of damage or potential damage to services or structures and nuisance issues,
- Likely future amenity based on a visual assessment,
- The trees tolerance to development impacts based on surface observations,
- Significance -specific heritage, cultural or intrinsic importance,
- Amenity value -as shade, windbreak etc or subjective, aesthetic values,
- Habitat value -both as an individual tree and as part of an ecological community,
- Observations of soil conditions and likely root spread,
- Overall condition assessment and suitability,
- Hazard/failure potential of tree to damage property or result in death,
- Safe Useful Life Expectancy (SULE) after Barrell (1995),

Retention Value was based on the subject tree's Remaining Life Expectancy Range and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structure and site suitability.

Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject trees. Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the trees. This provides a relative value of the trees' Landscape Significance which may aid in determining their Retention Value. A more detailed explanation is outlined in Section 5.3 Landscape Significance.

Tree height and canopy spread were estimated only. Diameter at Breast Height (DBH) was determined by measuring the main stem at 1.4m above ground. Photos were taken of the subject trees and subject site for the inclusion in this tabled report.

The components of tree risk assessment include the trees failure potential or in the case of the proposed, an environment conducive to tree failure.



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**5.1 VISUAL TREE ASSESSMENT**

The inspection was limited to a visual examination of the subject trees from ground level.

This assessment process is used to determine the sustainability of each tree in the landscape. The assessment of each tree was made using Visual Tree Assessment (VTA).

All trees were assessed from the ground without dissection, probing or coring. No woody tissue testing was undertaken as part of this assessment.

Destructive, resistance testing or aerial inspections have not been undertaken as part of this assessment. The health of the trees was determined by assessing the following:

- a) Foliage size and colour,
- b) Pest and disease infestation noted,
- c) Extension growth,
- d) Canopy density and form,
- e) Percentage of deadwood noted/observed,
- f) Presence of epicormic growth observed,
- g) Visible evidence of structural defects or instability,
- h) Evidence of previous pruning or physical damage, and Observations made including an evaluation of the tree's health and vigour using Crown spread and cover, foliage size, colour, extension growth, presence of disease or pest infestation, canopy density, presence of deadwood, dieback and epicormic growth as indicators,
- i) Condition, using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators,
- j) Suitability of the tree to the site and its existing location; in consideration of damage or potential damage to services or structures and nuisance issues,

**5.2 HERITAGE SIGNIFICANCE**

There are no trees within the site that have been identified as Heritage Items under Wollondilly Shire Council, Planning Scheme Ordinance or identified within a Significant Tree Register, however given Argyle Street (Main street) visual amenity and its assets locations, every effort should be undertaken to ensure their individual health and on-going public safety.

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**5.3 LANDSCAPE SIGNIFICANCE**

The sites Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject trees.

Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the trees.

This provides a relative value of the trees' Landscape Significance which may aid in determining their overall retention value. Generally, the following criteria have been used to determine the Landscape Significance of the subject trees.

LANDSCAPE SIGNIFICANCE	DESCRIPTION
<b>HIGH</b>	The subject tree is listed as a Heritage Item under the <i>Local Environmental Plan</i> with a local or state level of significance.
	The subject tree is listed as a Heritage Item under the <i>Local Environmental Plan</i> with a local or state level of significance.
	The subject tree forms part of the curtilage of a heritage item.
	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree is listed on Council's Significance Tree Register.
	The subject tree is scheduled as a Threatened Species or Threatened Plant Community under the <i>Threatened Species Conservation Act (1995)</i> .
	The subject tree is a remnant tree.
	The subject tree is a locally indigenous species and is representative of the original vegetation of the area.
	The subject tree provides habitat to a threatened species.
	The subject tree is an excellent representative of the species in terms of aesthetic value.
<b>MODERATE</b>	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
<b>LOW</b>	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Preservation Order.
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.
<b>INSIGNIFICANT</b>	The subject tree is declared a Noxious Weed under the Noxious Weeds Act (1993).

\*NOTE: If the tree can be categorised into more than one value, the higher value should be allocated.

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**5.4 IMPACT ASSESSMENT**

Street trees in an urban environment have many benefits but may also present problems, costs and risks, particularly if poorly planned, planted or managed.

The most common problems and concerns with trees are;

- Cracking and lifting of pavements, kerbs and walls,
- Clogging of pipes and services,
- Obstruction of views,
- Obstruction of pedestrian and vehicle access and street signage,
- Dropping of leaves and fruit,
- Attraction of animals and birds that might cause mess and irritation,
- Shedding of larger branches,
- Excessive shading or blocking of sunlight,
- Inappropriate Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) to accommodate potential future growth,

Changing the drainage patterns around a tree by constructing a building, driveways, road and paths etc will alter the amount of water the tree receives and may cause root death or damage. Trenches dug beside or adjoining large trees for water, sewer or services may also damage the roots and will make a tree unstable.

Older trees will tolerate far less stress than younger trees as with age they become less responsive and find it very strenuous to respond to changes in their environment.

The components of tree risk assessment include the trees failure potential or in the case of land clearing/management, an environment conducive to tree failure.

Other factors are also considered related to the site, such as buildings, community land use, soil condition and prevailing winds must be considered in conjunction when assessing the potential of failure for any tree.

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**6.0 PRUNING/REMOVAL STANDARDS**

Any pruning recommended in this report is to be to the Australian Standard® AS4373 'Pruning of Amenity Trees', Amenity Tree Industry "Code of Practise 1998 and conducted in accordance with the NSW Work Cover Authority Code of Practice for Tree Work 2007.

All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO) and applicable consent conditions.

Tree maintenance work is specialised and in order to be undertaken safely and to ensure the works carried out are not detrimental to the survival of the tree or surrounding vegetation, all works should be undertaken by a qualified Arborist with appropriate competencies recognised within the Australian Qualification frame work, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.

Any pruning near electricity wires should be undertaken in accordance with relative Electrical Safety Rules and be performed by persons individually authorised by Energy Australia with a "Work Near Overhead Power Lines" Certificate to undertake this scope of works.

**7.0 UNDERSTANDING TREE GROWTH**

Trees are living organisms and as such will grow, mature and eventually die. Their biological needs to sustain life are oxygen, carbon dioxide, light, water, nutrients and appropriate temperatures. Urban street trees, however face a hostile environment. They will face challenges including competition for street space, both above and below ground, infrastructure conflicts, deliberate and accidental damage, polluted air, temperature extremes and either too little or too much water.

Probably the greatest challenge they will face is "below" ground, with soil compaction and its impact on root growth, this leads to a range of consequences including: lack of adequate rooting volumes beyond the tree pit; decreased soil aeration; water-logging due to poor drainage; inadequate available water due to decreased soil moisture holding capacity; and exacerbated infrastructure conflicts.

Tree roots grow in the top soil profile to a depth of around 800mm on average, where conditions are most favourable for root growth. Trees will develop a root-plate, rather than root ball, spreading 2-3 times the canopy diameter (on average). There is an important correlation between the size of the canopy and the volume of soil required to support growth. This relationship is the most critical factor in determining long term tree health.

As a tree matures it may develop a trunk flare where the trunk joins the ground. This contributes to the trees structural stability. The tree base can expand at more than twice the rate of the main trunk diameter. Any hard surfaces in this zone creates conflicts damaging to both the infrastructure and the tree.

Trees will require maintenance from formative pruning, and will require greater levels of maintenance as they age. They will all eventually require removal and replacement. In an urban environment, aging or hazardous trees must be managed, and cannot be left until they fail, as they would in a natural ecosystem.

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Some trees are labelled aggressive, however roots do not have intentions and do not seek out resources as commonly believed. Roots are opportunistic, growing towards areas of favourable conditions, and they do not act aggressively.

Root growth occurs by the extension at the very end of the root tip, and it can only occur when there is sufficient soil oxygen and moisture. In unconstrained environments, roots will not grow if there is too much water, not enough oxygen, or if the spaces in the soil are small and compacted. Roots need sufficient space for the growth of healthy trees.

In highly modified urban landscapes, roots of the hardiest trees will grow wherever they can absorb sufficient elements for growth.



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**8.0 TREE PROTECTION ZONES AND ROOT SYSTEM**

On average the trees roots will extend to the outer reaches of their canopies, depending on morphology and disposition of the individual trees roots, when known to be influenced by past or existing site conditions including but not limited to;

- The individual tree species,
- Soil type, structure and location,
- Topography and existing drainage,
- Location of either manmade hard structures of group environment,
- Pruning requirements, if required,

These roots have two major functions, which are to obtain water and minerals from the soil and to give anchorage support to the tree.

This area is known as the Tree Protection Zone (TPZ), this is a designated area around tree where optimum protection and preservation efforts are implemented.

No disturbance should occur within this area. It is calculated by using a formula that considers the tolerance level of the species to disturbance, its age class, and its condition and trunk diameter.

The main area for surface feeding roots to occur is from the tree trunk to the outer canopy known as the drip zone. These fibrous roots are less likely to occur under or near other buildings, as there is little surface moisture or soil air presence for root survival. These fibrous roots are those that take up water and nutrients.

While some tree roots will deeply penetrate the soil profile, in search of available water, most will occupy the first 60-70cm of the soil, as to obtain the needed sustenance. At times it will not be possible to retain the optimum TPZ around each tree and any activities proposed within this area must be carefully analysed to minimise any effects on its health and/or stability.

The actual spread of the root system is largely dependent on the particular species involved, and their localised environment. Any work carried out within the TPZ should be reviewed and supervised by an appropriately qualified Arborist.

Construction works proposed to be undertaken around the trees if not correctly assessed may modify the natural water table and reduce the amount of soil air and moisture present/available to the trees and their longevity may be greatly diminished.

If under the course of construction the tree roots are damaged or adversely affected, their demise will cause drought stress; poor uptake of water and nutrients, slower dispersal of gums and resins and could, in the long term, have an effect on the movement of certain compounds which make up the structure of the tree.



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**9.0 TREE PROTECTION ZONE**

A Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk of the tree. The intention of the TPZ is to minimise incursions to the root system and canopy to ensure the long term health and stability of the tree.

A commonly used delineation for the TPZ is the drip-line (extent of the crown spread projected to the ground plane). However, this may not provide adequate protection for trees that have prominent leans or distorted imbalanced or narrow crowns. A more appropriate guideline is the trunk diameter.

The Tree trunk measurement is recorded and known as the Diameter at Breast Height (DBH) at 1.4 metres from ground level using a metric tape measure. The TPZ area is then calculated by X 12, another formula is then applied for the trees Structural Root Zone (SRZ) if the development is proposed to encroach into the TPZ.

Other factors included within the TPZ are the individual tree species, soil type, location and proposed scope of works.

The above criteria also consider the following elements;

- The trunk diameter,
- The sensitivity/tolerance of the species to construction impacts,
- The level of maturity,
- The health, vigour and structural integrity of the tree,
- The trees root and crown formation,

Construction Tolerance considers the following elements,

- Good – Good tolerance to construction impacts,
- Moderate – Moderate tolerance to construction impacts,
- Poor- Poor tolerance to construction impacts,

Maturity class of the tree considers the following elements,

- Over-mature – Greater than 80% of the life expectancy for the species,
- Mature – Greater than 50 – 80% of the life expectancy for the species,
- Immature – Less than 20% of the life expectancy for the species,

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9.1 NORMAL STRUCTURAL ROOT FORM OF A TREE

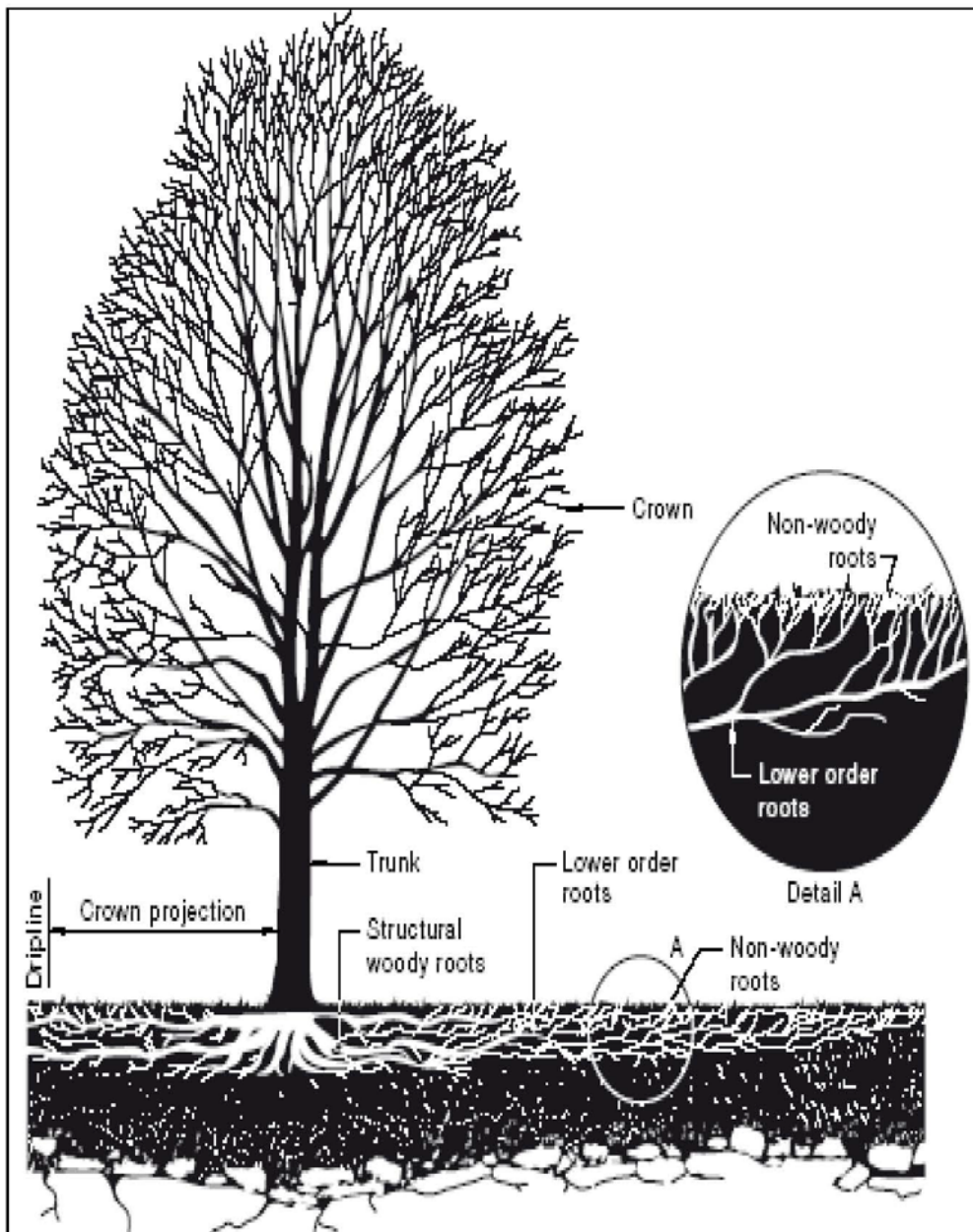


Figure 3 Show's a diagram of a typical tree root structure.  
Source: Australian Standards - AS 4970-2009 Protection of trees on development sites.

Environment

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**9.2 TYPES OF TREE ROOTS**

The trees root system develops in accordance with its pre-determined, height, soil conditions (availability of water and nutrients) and location of the root systems in response to the need to support the tree.

Unless conditions are uniform around the tree, which would be highly unusual, the extent of the root-systems can be irregular and difficult to predict. As tree roots are very opportunistic, they will not generally show the symmetry seen in the aerial parts.

The majority of the root system is in the surface 600mm to 700mm, extending radially for distances which are frequently in excess of the tree height.

**9.3 ROOT PLATE**

This forms the main structural woody roots which provides overall anchorage for the tree. It is this central part of the root-system (large root mass with sub-soil normally attached) which may tilt over or rotates in storm events.

**9.4 WOODY ROOTS**

Beyond the root plate the root system rapidly subdivides into smaller diameter woody roots (hydrotropic) which conduct water and nutrients from the non-woody roots.

**9.5 NON-WOODY ROOTS**

Off the smaller diameter woody root system, a mass of non-woody, fine feeder roots system develops. These are the roots which are active in water and nutrient uptake, are very fine in structure, typically less than 0.5mm diameter, and include mycorrhizal associations with some soil fungi. They are short lived, growing in response to the needs of the tree, with the majority dying back each winter.

Conditions should be conducive for maintaining the growth of these non-woody roots to provide for the water and nutrient requirements of the tree.

Non-woody roots are vulnerable to damage, and once it occurs, water and nutrient uptake will be restricted until new ones are produced. Vigorous young trees will be capable of rapid regeneration, but more mature to over mature trees will respond slowly, if at all.

Any root damage and or demise may cause some drought stress; poor uptake of water and nutrients, slower dispersal of gums and resins and could, in the long term, have an effect on the movement of certain compounds which make up the structure of the tree, resulting in the slow decline to death of the trees.

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**10.0 DEFINITION OF ASSESSED HEALTH AND CONDITION OF TREE**

The condition of each tree has been related in overall terms as one of the following headings and information is presented in section 11.0 Assessment of Existing Trees Identified on Site.

**Good**, the tree is generally healthy, vigorous, and free from the presence of major disease, obvious structural weaknesses, and fungal or insect infestation and is expected to continue to live in the same condition as at the time of the inspection. Only small recommendations may be required to help continue the trees longevity.

**Fair**, the tree is generally vigorous but has some indication of decline due to the early effects of disease, fungal or insect infestation, or has been affected by physical (storm damage) or mechanical damage (Vandalism or involved in an accident by a vehicle) or is faltering due to the modification of the trees environment essential for its survival.

This tree group may recover with remedial work undertaken by a Qualified Arborist where appropriate or without intervention and may regain some vigour and stabilise over time. Medium recommendations are required to bring this tree up to a satisfactory standard.

**Poor**, the tree is exhibiting symptoms of advanced and irreversible decline due to factors such as fungal infestation, termite damage, ring barking of the trees trunk due to borer infestation, major die-back in branches and the foliage is thinning in the crown due to various effects, epicormic growth is present throughout the inner canopy while the tree is using up its stored sugar and is in a state of stress.

This tree group will decline further to death over a period of time regardless of remedial works or modifications undertaken.

**Dead**, the tree is no longer alive and is in poor structural condition, that may cause damage to people or property and removal is strongly recommended.

**10.1 TREE AGE CLASS TERMINOLOGY**

The following maturity class have been allocated to each tree and considers the following elements,

<b>Immature:</b>	Less than 20% of the life expectancy for the species,
<b>Semi-mature:</b>	Middle age trees, 20% to 50% of life expectancy,
<b>Mature:</b>	Greater than 50 – 80% of the life expectancy for the species,
<b>Over-mature:</b>	Greater than 80% of the life expectancy for the species, senescent tree, or those declining irreversibly to death,

**10.2 SAFE USEFUL LIFE EXPECTANCY (SULE)**

The remaining Safe Useful Life Expectancy of a tree is an estimate of the sustainability of the tree within the site/landscape, calculated based on an estimate of the average age of the species in an urban area, compared with its estimated current age.

The estimated SULE of each tree is discussed with the following values;

- Greater than 40 years (Long),
- Between 15 and 40 years (Medium),
- Between 5 and 15 years (Short),
- Less than 5 years,
- Dead or hazardous,



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**10.3 ASSESSED STRUCTURAL CONDITION**

This refers to the tree's form and growth habit modified by its environment, the state of the trunk and main structural branches.

It includes the presence of defects as decay, weak branch junctions and other visible abnormalities. Although some trees without defects fail in major storms, the presence of any defect will increase the chances of failure.

**Good;** Trees with a single dominant trunk along which evenly spaced branches are spread. Branches have properly formed collars which provide strong attachment to the trunk, and are about 25% of the trunk diameter. Minor structural defects may be present with low failure potentials.

**Average;** Trees with structural defects with low failure potential.

**Fair;** Trees with structural defects with medium failure potentials and require monitoring on an annual basis.

**Poor;** Trees with defects which have failed, or have a high risk of failing soon, and corrective action must be taken soon as possible.

**10.4 ECOLOGICAL VALUE OF TREE**

These categories are based upon the criteria used in the Thyer Tree Valuation Method (1996) to evaluate a tree's ecological benefit.

- |           |           |   |
|-----------|-----------|---|
| <b>0.</b> | None      | Weed species  |
| <b>1.</b> | Low       | Restricts desirable plants or of little benefit to fauna.         |
| <b>2.</b> | Medium    | Beneficial to flora & fauna provides food source and/or shelter.  |
| <b>3.</b> | High      | Remnant /indigenous species of native vegetation.                 |
| <b>4.</b> | Very High | Indigenous species being an integral part of a natural ecosystem. |

**10.5 VISUAL AMENITY PROVIDED-PROMINENCE**

Criteria for the assessment of amenity values are based upon the criteria used in the Thyer Tree Valuation Method (1996) to evaluate a tree's visibility in the local area.

The amenity value of a tree is a measure of its visibility, its overall position within the site, its contribution to the visual amenity and character of the area, its living crown size/spread, visual appearance including natural form/habit and crown density percentage.

As a general rule, a prominent (location) larger and significant subject tree, with good form, habit, density etc will achieve a higher amenity value.

- |           |           |  |
|-----------|-----------|--|
| <b>0.</b> | None      | Seldom/rarely seen (remote location).                    |
| <b>1.</b> | Low       | Seen frequently by private owners or adjacent residents. |
| <b>2.</b> | Medium    | Seen by neighbourhood residents and or passers-by.       |
| <b>3.</b> | High      | Known locally or seen by many passers-by.                |
| <b>4.</b> | Very High | Of local historical importance, or known widely.         |

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**10.6 RETENTION VALUE WITHIN THE LANDSCAPE**

The Retention Values of the trees have been determined on the basis of the estimated longevity of the individual tree with consideration of its landscape significance rating. Together with recommendations contained within this report the information should be used to determine the most appropriate action for protection, retention of trees considered worthy of preservation and or removal.

Retention Value Rating	Landscape/Environmental Significance						
	1- Very High	2- Very High to High	3- High to Moderate	4 - Moderate	5- Moderate to Low	6- Low	7- Nil
<b>HIGH</b> - (H) Greater than 40 Years	High Retention Value						
<b>MEDIUM</b> - (M) 15 to 40 Years			Moderate Retention Value				
<b>LOW</b> - (L) 5 to 15 years					Low Retention Value		
<b>Less than 5 Years</b>							
<b>Dead or Hazardous</b>							

**Table 2 Landscape Significance Value**

**10.7 RISK LEVEL MATRIX- CONSEQUENCES OF EVENT OCCURRING**

Occupational Health and Safety Legislation places a “Duty of Care” on individuals and companies to ensure potential hazards and risks regarding tree management are eliminated as best as possible and develop controls for long term tree management.

Whilst a trees overall health may be hard to determine to a “Lay or Common person” there are some visible signs that may flag potential safety concerns including but not limited to; Limb shedding, poor canopy and foliage colour, major deadwood or die-back of out limbs etc.

The Risk Matrix table below involves determining the potential risk verses the probable consequence of exposure to the hazard and the likelihood of the event occurring.

RISK LEVEL MATRIX – CONSEQUENCES OF EVENT OCCURRING					
LIKELIHOOD	Catastrophic (Fatality)	Major (Serious Injury)	Moderate (Medical treatment)	Minor (First Aid)	Insignificant (No Injury)
<b>Almost Certain</b>	E 25	E 23	E 20	H 16	H 11
<b>Likely</b>	E 24	E 21	H 17	H 12	M 7
<b>Possible</b>	E 22	E 18	H 13	M 8	L 4
<b>Unlikely</b>	E 19	H 14	M 9	L 5	L 2
<b>Rare</b>	H 15	H 10	M 6	L 3	L 1

**Table 3 RISK LEVEL MATRIX**

**Risk Levels are;** **E = Extreme** (18 to 25) – Act Now  
**H = High** (12 to 17) – ASAP  
**M = Moderate** (7 to 11) – Plan, and  
**L = Low Risk** (1 to 6) – Review/assess tree annually

Environment



**EN1 - Argyle Street – London Plane Trees**

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**10.8 ENVIRONMENTAL ZONE DEFINITIONS**

- 1. Landscaped:** Ornamental gardens including managed open lawns, tree/shrub planting.
- 2. Remnant:** Remnant vegetation significant to a local ecological community but managed with hard scaped areas i.e. paved areas, driveways,
- 3. Natural Bushland:** Natural bushland vegetation significant to local and broader ecological Vegetation communities and or identified under the Threatened Species Conservation Act 1995. Natural Bushland can then be defined further subject to ground truthing into the following sub-sections.
- a) Good.** High-quality vegetation and habitat values,
  - b) Medium.** Good quality vegetation with some introduced weed species, and
  - c) Poor.** Low-quality remnant vegetation, high-level weed infestation (and range of weed species), erosion, limited native habitat, requires site specific Vegetation Management Plan.
- 4. Mapped Environmental Constraint Areas:**  
As per Council mapping e.g. Slope constraint (> 18°), watercourse buffer, sensitive vegetation buffer, Flora/Fauna significant/buffer as identified on site.

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**11.0 ARGYLE STREET, PICTON - TREE NUMBERING AND LOCATIONS**

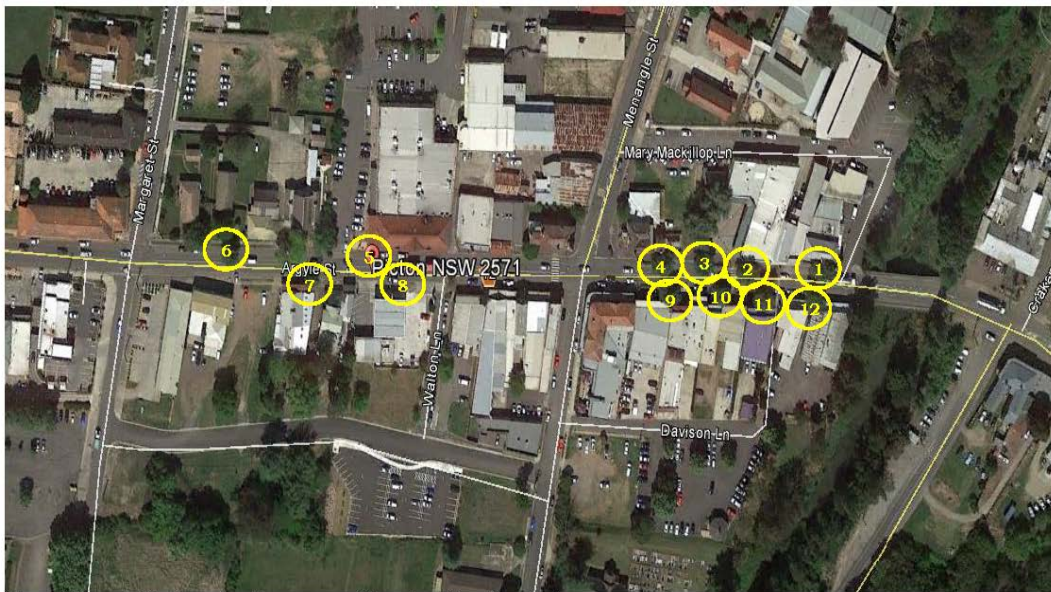


Figure 4 Show's the trees location assessed based on the site aerial

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**12.0 ARGYLE STREET, PICTON RISK MATRIX ASSESSMENT AND SUMMARY SCOPE OF WORKS**

Risk Matrix	<b>1-Catastrophic</b> Urgent- Tree requires immediate removal	<b>2-Major</b> Tree requires removal or corrective action for on-going retention/maintenance	<b>3-Moderate</b> Annual Monitoring with corrective maintenance	<b>4-Minor/Insignificant</b> Annual Monitoring or No Action	<b>5-Negligible/No Risk</b> No Action, Re-Assess in 3yrs
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Tree Number	Tree Species	Height	Spread	DBH @ 1.4m	Canopy %	Tree Age * Young * Semi-mature * Mature * Over Mature	Tree Health * Good * Fair * Poor * Dead	Tree Structure * Good * Fair * Poor	Ecological Significance * High * Moderate * Low * Nil	Landscape/ Visual Significance * High * Moderate * Low * Nil	Risk Matrix * Catastrophic * Major * Moderate * Minor	Defects Observed * Yes * No	Retention Value * High * Moderate * Low * Nil	SULE Rating	Arborist comments
1.	London Plane Tree <i>Platanus x hybrida</i>	12m	10 x 10m	400mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	This street tree is required to be removed now and replaced with an appropriate species in the streetscape.  Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.

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2.	London Plane Tree <i>Platanus x hybrida</i>	11m	9 x 9m	100mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>
3.	London Plane Tree <i>Platanus x hybrida</i>	11m	9 x 9m	350mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>

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4.	London Plane Tree <i>Platanus x hybrida</i>	10m	9 x 9m	390mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>
5.	London Plane Tree <i>Platanus x hybrida</i>	8m	7 x 7m	240mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>



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6.	London Plane Tree <i>Platanus x hybrida</i>	9m	8 x 8m	310mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	This street tree is required to be removed now and replaced with an appropriate species in the streetscape.  Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.
7.	London Plane Tree <i>Platanus x hybrida</i>	9m	8 x 8m	270mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	This street tree is required to be removed now and replaced with an appropriate species in the streetscape.  Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.

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8.	London Plane Tree <i>Platanus x hybrida</i>	3m	3 x 3m	100mm	100%	Semi Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	This street tree is required to be removed now and replaced with an appropriate species in the streetscape.  Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.
9.	London Plane Tree <i>Platanus x hybrida</i>	10m	8 x 8m	340mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	This street tree is required to be removed now and replaced with an appropriate species in the streetscape.  Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.

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10.	London Plane Tree <i>Platanus x hybrida</i>	10m	8 x 8m	310mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>
11.	London Plane Tree <i>Platanus x hybrida</i>	10m	8 x 8m	390mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	3B	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>

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12.	London Plane Tree <i>Platanus x hybrida</i>	10m	9 x 9m	350mm	100%	Mature	Good	Good	Nil	High	Minor to Moderate	No	Low to Moderate	38	<p>This street tree is required to be removed now and replaced with an appropriate species in the streetscape.</p> <p>Whilst it is minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards and or further pavement displacement.</p>
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**Note:** a. The Risk Matrix and Retention Values are subjective and based upon the individual tree assessed, the land usage and frequency of use at that particular time/day etc.  
 b. Trees identified as having an Extreme Value between E 18 to E 25 may be due to the presence of large portions of dead limbs, open wounds, poor health or structural defects, which have the potential to cause serious injuries to a fatality.

**Figure 5 Shows a detailed list of trees observed and assessed in relation to Argyle Street, Picton. All species were identified and assessed and by a Qualified Horticulturist and AQF Level 5 Arborist (Dip Arb).**

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**13.0 ASSESSMENT OF EXISTING TREES IDENTIFIED ON SITE**

<b>TREE NUMBER 1</b> Next to Liquorland store	<b>BOTANICAL NAME:</b> Platanus x hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p data-bbox="272 1160 643 1209">Shows the tree from a distance which in good health and density, however it is lifting pavement and overhanging the awning.</p>	<b>DBH (mm) Diameter at Breast Height</b>	400mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not	
	<b>TPZ Required</b>	Applicable	Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.
	<b>Tree to be retained Yes / No</b>	No	
	<b>Estimated Height (metres)</b>	12m	
	<b>Crown Spread (metres)</b>	10 x 10m	
	<b>Age Class</b>	Mature	
	<b>Canopy percentage</b>	100%	
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.
<b>Ecological Value</b>	Nil		
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		




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<b>TREE NUMBER 2</b> Front of Medi Specs shop.	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree																										
 <p>Shows the tree in a formal garden bed next to Medi Specs shop overhanging the awning.</p>	<table border="1"> <tr> <td><b>DBH (mm) Diameter at Breast Height</b></td> <td>410mm</td> </tr> <tr> <td><b>SRZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>TPZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>Tree to be retained Yes / No</b></td> <td>No</td> </tr> <tr> <td><b>Estimated Height (metres)</b></td> <td>11m</td> </tr> <tr> <td><b>Crown Spread (metres)</b></td> <td>9 x 9m</td> </tr> <tr> <td><b>Age Class</b></td> <td>Mature</td> </tr> <tr> <td><b>Canopy percentage</b></td> <td>100%</td> </tr> <tr> <td><b>Health</b></td> <td>Good</td> </tr> <tr> <td><b>Structural Condition</b></td> <td>Good</td> </tr> <tr> <td><b>Ecological Value</b></td> <td>Nil</td> </tr> <tr> <td><b>Visual amenity</b></td> <td>High</td> </tr> <tr> <td><b>SULE Rating</b></td> <td>3B</td> </tr> </table>	<b>DBH (mm) Diameter at Breast Height</b>	410mm	<b>SRZ Required</b>	Not Applicable	<b>TPZ Required</b>	Not Applicable	<b>Tree to be retained Yes / No</b>	No	<b>Estimated Height (metres)</b>	11m	<b>Crown Spread (metres)</b>	9 x 9m	<b>Age Class</b>	Mature	<b>Canopy percentage</b>	100%	<b>Health</b>	Good	<b>Structural Condition</b>	Good	<b>Ecological Value</b>	Nil	<b>Visual amenity</b>	High	<b>SULE Rating</b>	3B	<p>The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.</p> <p><b>Tree Assessment Summary- Good</b>, this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.</p> <p>Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.</p> <p>Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.</p> <p><b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards from seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.</p>
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<b>Tree to be retained Yes / No</b>	No																											
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<b>Structural Condition</b>	Good																											
<b>Ecological Value</b>	Nil																											
<b>Visual amenity</b>	High																											
<b>SULE Rating</b>	3B																											


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<b>TREE NUMBER 3</b> Near pedestrian crossing	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree																										
 <p data-bbox="272 1160 643 1202">Shows the tree near the pedestrian crossing and open space courtyard near the shops.</p>	<table border="1"> <tr> <td><b>DBH (mm) Diameter at Breast Height</b></td> <td>350mm</td> </tr> <tr> <td><b>SRZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>TPZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>Tree to be retained Yes / No</b></td> <td>No</td> </tr> <tr> <td><b>Estimated Height (metres)</b></td> <td>11m</td> </tr> <tr> <td><b>Crown Spread (metres)</b></td> <td>9 x 9m</td> </tr> <tr> <td><b>Age Class</b></td> <td>Mature</td> </tr> <tr> <td><b>Canopy percentage</b></td> <td>100%</td> </tr> <tr> <td><b>Health</b></td> <td>Good</td> </tr> <tr> <td><b>Structural Condition</b></td> <td>Good</td> </tr> <tr> <td><b>Ecological Value</b></td> <td>Nil</td> </tr> <tr> <td><b>Visual amenity</b></td> <td>High</td> </tr> <tr> <td><b>SULE Rating</b></td> <td>3B</td> </tr> </table>	<b>DBH (mm) Diameter at Breast Height</b>	350mm	<b>SRZ Required</b>	Not Applicable	<b>TPZ Required</b>	Not Applicable	<b>Tree to be retained Yes / No</b>	No	<b>Estimated Height (metres)</b>	11m	<b>Crown Spread (metres)</b>	9 x 9m	<b>Age Class</b>	Mature	<b>Canopy percentage</b>	100%	<b>Health</b>	Good	<b>Structural Condition</b>	Good	<b>Ecological Value</b>	Nil	<b>Visual amenity</b>	High	<b>SULE Rating</b>	3B	<p>The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.</p> <p><b>Tree Assessment Summary- Good</b>, this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.</p> <p>Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.</p> <p>Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.</p> <p><b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards from seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.</p>
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<b>TREE NUMBER 4</b> Along NAB bank	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree																										
 <p>Shows the tree alongside the NAB bank in good health within a formal garden bed.</p>	<table border="1"> <tr> <td><b>DBH (mm) Diameter at Breast Height</b></td> <td>390mm</td> </tr> <tr> <td><b>SRZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>TPZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>Tree to be retained Yes / No</b></td> <td>No</td> </tr> <tr> <td><b>Estimated Height (metres)</b></td> <td>10m</td> </tr> <tr> <td><b>Crown Spread (metres)</b></td> <td>9 x 9m</td> </tr> <tr> <td><b>Age Class</b></td> <td>Mature</td> </tr> <tr> <td><b>Canopy percentage</b></td> <td>100%</td> </tr> <tr> <td><b>Health</b></td> <td>Good</td> </tr> <tr> <td><b>Structural Condition</b></td> <td>Good</td> </tr> <tr> <td><b>Ecological Value</b></td> <td>Nil</td> </tr> <tr> <td><b>Visual amenity</b></td> <td>High</td> </tr> <tr> <td><b>SULE Rating</b></td> <td>3B</td> </tr> </table>	<b>DBH (mm) Diameter at Breast Height</b>	390mm	<b>SRZ Required</b>	Not Applicable	<b>TPZ Required</b>	Not Applicable	<b>Tree to be retained Yes / No</b>	No	<b>Estimated Height (metres)</b>	10m	<b>Crown Spread (metres)</b>	9 x 9m	<b>Age Class</b>	Mature	<b>Canopy percentage</b>	100%	<b>Health</b>	Good	<b>Structural Condition</b>	Good	<b>Ecological Value</b>	Nil	<b>Visual amenity</b>	High	<b>SULE Rating</b>	3B	<p>The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.</p> <p><b>Tree Assessment Summary- Good</b>, this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.</p> <p>Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.</p> <p>Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.</p> <p><b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.</p>
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<b>TREE NUMBER 5</b> Front of Combined real-estate	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree																										
 <p data-bbox="271 1153 638 1207">Shows the tree from a distance overhanging and touching the buildings awning.</p>	<table border="1"> <tr> <td><b>DBH (mm) Diameter at Breast Height</b></td> <td>240mm</td> </tr> <tr> <td><b>SRZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>TPZ Required</b></td> <td>Not Applicable</td> </tr> <tr> <td><b>Tree to be retained Yes / No</b></td> <td>No</td> </tr> <tr> <td><b>Estimated Height (metres)</b></td> <td>8m</td> </tr> <tr> <td><b>Crown Spread (metres)</b></td> <td>7 x 7m</td> </tr> <tr> <td><b>Age Class</b></td> <td>Mature</td> </tr> <tr> <td><b>Canopy percentage</b></td> <td>100%</td> </tr> <tr> <td><b>Health</b></td> <td>Good</td> </tr> <tr> <td><b>Structural Condition</b></td> <td>Good</td> </tr> <tr> <td><b>Ecological Value</b></td> <td>Nil</td> </tr> <tr> <td><b>Visual amenity</b></td> <td>High</td> </tr> <tr> <td><b>SULE Rating</b></td> <td>3B</td> </tr> </table>	<b>DBH (mm) Diameter at Breast Height</b>	240mm	<b>SRZ Required</b>	Not Applicable	<b>TPZ Required</b>	Not Applicable	<b>Tree to be retained Yes / No</b>	No	<b>Estimated Height (metres)</b>	8m	<b>Crown Spread (metres)</b>	7 x 7m	<b>Age Class</b>	Mature	<b>Canopy percentage</b>	100%	<b>Health</b>	Good	<b>Structural Condition</b>	Good	<b>Ecological Value</b>	Nil	<b>Visual amenity</b>	High	<b>SULE Rating</b>	3B	<p>The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.</p> <p><b>Tree Assessment Summary- Good</b>, this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.</p> <p>Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.</p> <p>Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.</p> <p><b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.</p>
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<b>TPZ Required</b>	Not Applicable																											
<b>Tree to be retained Yes / No</b>	No																											
<b>Estimated Height (metres)</b>	8m																											
<b>Crown Spread (metres)</b>	7 x 7m																											
<b>Age Class</b>	Mature																											
<b>Canopy percentage</b>	100%																											
<b>Health</b>	Good																											
<b>Structural Condition</b>	Good																											
<b>Ecological Value</b>	Nil																											
<b>Visual amenity</b>	High																											
<b>SULE Rating</b>	3B																											



**EN1 - Argyle Street – London Plane Trees**


**ATTACHMENT 3 – 260 – 20 JUNE 2016**

<b>TREE NUMBER 6</b> Front of Police Station	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p>Shows the tree from a distance with large leaves, seed pots and fine hairs all over the walk and roadway.</p>	<b>DBH (mm) Diameter at Breast Height</b>	310mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not Applicable	
	<b>TPZ Required</b>	Applicable	<b>Tree Assessment Summary- Good</b> , this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.
	<b>Tree to be retained Yes / No</b>	No	
	<b>Estimated Height (metres)</b>	9m	Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.
	<b>Crown Spread (metres)</b>	8 x 8m	
	<b>Age Class</b>	Mature	Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.
	<b>Canopy percentage</b>	100%	
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.
<b>Ecological Value</b>	Nil		
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		




**EN1 - Argyle Street – London Plane Trees**

**ATTACHMENT 3 – 260 – 20 JUNE 2016**

<b>TREE NUMBER 7</b> Front of Loan Market Shop	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree																										
 <p>Shows the tree within a planter box in the roadway.</p>	<table border="1"> <tr> <td><b>DBH (mm) Diameter at Breast Height</b></td> <td>270mm</td> </tr> <tr> <td><b>SRZ Required</b></td> <td>Not</td> </tr> <tr> <td><b>TPZ Required</b></td> <td>Applicable</td> </tr> <tr> <td><b>Tree to be retained Yes / No</b></td> <td>No</td> </tr> <tr> <td><b>Estimated Height (metres)</b></td> <td>9m</td> </tr> <tr> <td><b>Crown Spread (metres)</b></td> <td>8 x 8m</td> </tr> <tr> <td><b>Age Class</b></td> <td>Mature</td> </tr> <tr> <td><b>Canopy percentage</b></td> <td>100%</td> </tr> <tr> <td><b>Health</b></td> <td>Good</td> </tr> <tr> <td><b>Structural Condition</b></td> <td>Good</td> </tr> <tr> <td><b>Ecological Value</b></td> <td>Nil</td> </tr> <tr> <td><b>Visual amenity</b></td> <td>High</td> </tr> <tr> <td><b>SULE Rating</b></td> <td>3B</td> </tr> </table>	<b>DBH (mm) Diameter at Breast Height</b>	270mm	<b>SRZ Required</b>	Not	<b>TPZ Required</b>	Applicable	<b>Tree to be retained Yes / No</b>	No	<b>Estimated Height (metres)</b>	9m	<b>Crown Spread (metres)</b>	8 x 8m	<b>Age Class</b>	Mature	<b>Canopy percentage</b>	100%	<b>Health</b>	Good	<b>Structural Condition</b>	Good	<b>Ecological Value</b>	Nil	<b>Visual amenity</b>	High	<b>SULE Rating</b>	3B	<p>The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.</p> <p><b>Tree Assessment Summary- Good</b>, this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.</p> <p>Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.</p> <p>Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.</p> <p><b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.</p>
<b>DBH (mm) Diameter at Breast Height</b>	270mm																											
<b>SRZ Required</b>	Not																											
<b>TPZ Required</b>	Applicable																											
<b>Tree to be retained Yes / No</b>	No																											
<b>Estimated Height (metres)</b>	9m																											
<b>Crown Spread (metres)</b>	8 x 8m																											
<b>Age Class</b>	Mature																											
<b>Canopy percentage</b>	100%																											
<b>Health</b>	Good																											
<b>Structural Condition</b>	Good																											
<b>Ecological Value</b>	Nil																											
<b>Visual amenity</b>	High																											
<b>SULE Rating</b>	3B																											


**EN1 - Argyle Street – London Plane Trees**

**ATTACHMENT 3 – 260 – 20 JUNE 2016**

<b>TREE NUMBER 8</b> Front of Mac Credit Union	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
	<b>DBH (mm) Diameter at Breast Height</b>	100mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not Applicable	
	<b>TPZ Required</b>	No	
	<b>Tree to be retained Yes / No</b>	<b>Tree Assessment Summary- Good</b> , this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.	
	<b>Estimated Height (metres)</b>	3m	
	<b>Crown Spread (metres)</b>	3 x 3m	
	<b>Age Class</b>	Semi Mature	
	<b>Canopy percentage</b>	100%	
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	
	<b>Ecological Value</b>	Nil	
<b>Visual amenity</b>	Moderate		
<b>SULE Rating</b>	3B	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.	
Shows the tree within a planter box in the roadway in Front of Macarthur Credit Union.			


**EN1 - Argyle Street – London Plane Trees**

**ATTACHMENT 3 – 260 – 20 JUNE 2016**

<b>TREE NUMBER 9</b> Front of Argyle hair studios	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p>Shows the tree from a distance overhanging Argyle hair studios shop front and awning.</p>	<b>DBH (mm) Diameter at Breast Height</b>	340mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not	
	<b>TPZ Required</b>	Applicable	
	<b>Tree to be retained Yes / No</b>	No	<b>Tree Assessment Summary- Good</b> , this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.
	<b>Estimated Height (metres)</b>	10m	Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.
	<b>Crown Spread (metres)</b>	8 x 8m	
	<b>Age Class</b>	Mature	Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.
	<b>Canopy percentage</b>	100%	
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	
<b>Ecological Value</b>	Nil	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards from seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.	
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		

**EN1 - Argyle Street – London Plane Trees**


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<b>TREE NUMBER 10</b> Garden bed near crossing	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p>Shows the tree near the pedestrian crossing in good health. This tree is less than a quarter of its natural aesthetic size and form.</p>	<b>DBH (mm) Diameter at Breast Height</b>	310mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.  <b>Tree Assessment Summary- Good</b> , this Council street tree is generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.  Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.  Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size. Consideration of replacing it with a more appropriate species should be discussed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard verses replacing with an appropriate species now.  <b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.
	<b>SRZ Required</b>	Not Applicable	
	<b>TPZ Required</b>	No	
	<b>Tree to be retained Yes / No</b>	No	
	<b>Estimated Height (metres)</b>	10m	
	<b>Crown Spread (metres)</b>	8 x 8m	
	<b>Age Class</b>	Mature	
	<b>Canopy percentage</b>	100%	
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	
<b>Ecological Value</b>	Nil		
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		



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<b>TREE NUMBER 11</b> Front of NRMA Office	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p>Shows the tree in front of the NRMA office with raised pedestrian walkway from root mass movement.</p>	<b>DBH (mm) Diameter at Breast Height</b>	390mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not	
	<b>TPZ Required</b>	Applicable	Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.
	<b>Tree to be retained Yes / No</b>	No	
	<b>Estimated Height (metres)</b>	10m	
	<b>Crown Spread (metres)</b>	8 x 8m	
	<b>Age Class</b>	Mature	
	<b>Canopy percentage</b>	100%	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	
<b>Ecological Value</b>	Nil		
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		



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<b>TREE NUMBER 12</b> Front of Living Beautiful Shop	<b>BOTANICAL NAME:</b> Platanus hybrida	<b>COMMON NAME:</b> London Plane Tree	
 <p>Shows the tree from a distance overhanging the Living Beautiful Life Shop front and awning.</p>	<b>DBH (mm) Diameter at Breast Height</b>	350mm	The tree assessed was evaluated on its own merits, health, structure, density, species and age of the specimen, were all taken into consideration as part of the audit process.
	<b>SRZ Required</b>	Not	
	<b>TPZ Required</b>	Applicable	Close and physical examination of the trees, trunk and foliage indicated the tree to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.
	<b>Tree to be retained Yes / No</b>	No	
	<b>Estimated Height (metres)</b>	10m	
	<b>Crown Spread (metres)</b>	9 x 9m	
	<b>Age Class</b>	Mature	
	<b>Canopy percentage</b>	100%	<b>Recommendation:</b> Consideration should be taken to have this tree removed and replaced with an appropriate street tree species, whilst it is juvenile and minor in size it has already caused major damage to pavements, roof awnings, kerb and gutter, underground services and may result in litigation from trip hazards form seed balls or pavement displacement. These trees have no room in their current position to reach maturity without causing many expensive issues.
	<b>Health</b>	Good	
	<b>Structural Condition</b>	Good	
<b>Ecological Value</b>	Nil		
<b>Visual amenity</b>	High		
<b>SULE Rating</b>	3B		

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**13.1 LONDON PLANE TREE USE WITHIN THE CURRENT LANDSCAPE**

The trees used within the existing landscape are London Plane Tree (*Platanus hybrida*), which are as follows;

The London Plane Tree is one of the most widely planted trees in Australia. It is tolerant of harsh city conditions, air pollution, compacted and poor soils. It is very popular shade tree for parks, streets and large gardens.

It has light green, maple like leaves with prickly hard fruit. Bark is mottled with patches of silver-grey. This tree species is known to have deep root systems and is commonly known as a nuisance species near concrete, services and buildings.

The trees height and size can vary subject to its environment, subsoil/parent rock and built environment (landscape).

It is known that people who live or work in close proximity to stands of these trees have a less harmonious relationship with Plane Trees. Pollen and hairs from the leaves and seed capsules can cause both physical and allergic reactions and can include headaches, migraines and fluctuating body temperatures and combined can result in a total lack of concentration.

Breathing in the pollen or hairs and getting them in the eyes causes extreme irritation and makes it hard to remove without having close protection on the eyes and over the nose and mouth. There is also no opportunity to have open windows for fresh air or to use indoor electric fans, even car vents become clogged with pollen and hairs.

According to Allergist, Dr. Connie Katelaris, the symptoms of Hay Fever or allergic reactions are very similar to the common cold and it is very difficult to distinguish the difference between them. A running nose, streaming eyes, itching and sneezing are symptoms common to both, although allergies exhibit more predominant symptoms of itching. Many people do not recognise that they have an allergy, until they become aware that the symptoms follow a repetitive pattern at a similar time each year. People living and working around Plane trees in Spain and Turkey are experiencing the same symptoms as people do in Australia.

The World Health Organisation has studied these effects on health, and other worldwide studies have been published in international medical journals. There has been a significant increase in the prevalence of allergic diseases like hay fever, asthma and eczema over one or two generations, and there is unlikely to be a genetic reason for it. It appears that the westernisation of our lifestyle is linked with an increase in a prevalence of allergic disorders.

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**14.0 SITE PHOTOS**



**Figure 6 Shows looking up Argyle Street from the Tahmoor end.**



**Figure 7 Shows seed pods and seed hairs covering everything.**



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**Figure 8 Shows a street drain that would get covered by leaves and seed balls**



**Figure 9 Shows dropping leaves and extra maintenance to remove it.**



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**Figure 10 Shows a car covered from seed hairs parked in Argyle Street.**



**Figure 11 Shows raised concrete that presents a major trip hazard.**

Environment



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**Figure 12 Shows more raised concrete that has been shaved to reduce tripping**



**Figure 13 Shows again trip hazards from lifting concrete.**

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**15.0 ARGYLE STREET, PICTON RECOMMENDATIONS**

After close visual and physical investigation of the various trees conditions within Argyle Street, Picton the results from field investigations are as follows.

These Council Street trees are generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation.

Close and physical examination of the trees, trunk and foliage indicated the trees to be in Good health, structural condition and density. The tree's upper canopy/foliage appeared to be in Good health and vigour.

Based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size, these street trees are required to be removed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard or potential litigation and replaced with an appropriate street tree species.

Tree species that may be considered favourable for street applications, as being; deciduous, 7-15 metres tall, 3 - 7 metres wide, good as a street tree, wind hardy, frost hardy, full sun and water tolerant are;

1. Aristocrat Pear *Pyrus calleryana Aristocrat*

A fast growing and attractive ornamental pear with a superior branching structure. Lovely bright white spring blossoms and excellent autumn colour. Suitable for medium to large sized gardens, streets

2. Chanticleer Pear *Pyrus calleryana Chanticleer*

An upright ornamental callery pear with a dense habit and attractive foliage. Excellent for narrow spaces. Lustrous dark green leaves turning gold to plum in autumn.

3. Japanese Elm 'Kiwi Sunset' *Zelkova serrata 'Kiwi Sunset'*

Medium sized tree with lime green/yellowy leaves that turn yellow in Autumn. New growth is coppery in colour. With an upright growth habit this is a good specimen tree and very hardy.

4. Snow Pear *Pyrus nivalis*

A beautiful medium growing deciduous tree suitable as a lawn specimen. Leaves are silver-grey and 'flutter' in the breeze, colouring beautifully in autumn. White flowers are profuse showy clusters

5. Winter Glow Pear *Pyrus calleryana Winter Glow*

Hardy deciduous medium growing ornamental pear. Holds leaves well into late winter. Beautiful autumn colours of flame red. White blossoms with a pink eye in early spring.

**Source:** <http://www.winterhill.com.au/search/>

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**16.0 ARGYLE STREET, PICTON CONCLUSION**

Consideration of retaining mature significant vegetation to the local area was paramount.

These Council Street trees are generally healthy and free from the presence of major disease, obvious structural weaknesses, fungal or insect infestation. Close and physical examination of the trees, trunk and foliage indicated the trees to be in Good health, structural condition and density. The tree's upper canopy/foilage appeared to be in Good health and vigour.

The London Plane Tree is one of the most widely planted trees in Australia. It is a species known to have deep root systems and is commonly known as a nuisance species near concrete, services and buildings.

Pollen and hairs from the leaves and seed capsules can cause both physical and allergic reactions and can include headaches, migraines and fluctuating body temperatures and combined can result in a total lack of concentration.

Breathing in the pollen or hairs and getting them in the eyes causes extreme irritation and makes it hard to remove without having close protection on the eyes and over the nose and mouth. There is also no opportunity to have open windows for fresh air or to use indoor electric fans, even car vents become clogged with pollen and hairs.

According to Allergist, Dr. Connie Katelaris, the symptoms of Hay Fever or allergic reactions are very similar to the common cold and it is very difficult to distinguish the difference between them. A running nose, streaming eyes, itching and sneezing are symptoms common to both, although allergies exhibit more predominant symptoms of itching. Many people do not recognise that they have an allergy, until they become aware that the symptoms follow a repetitive pattern at a similar time each year. People living and working around Plane trees in Spain and Turkey are experiencing the same symptoms as people do in Australia.

The World Health Organisation has studied these effects on health, and other worldwide studies have been published in international medical journals.

There has been a significant increase in the prevalence of allergic diseases like hay fever, asthma and eczema over one or two generations, and there is unlikely to be a genetic reason for it.

Therefore, based on the trees present minor age, size, form, location within the roadway and predetermined large natural aesthetic size, these street trees are required to be removed due to on-going maintenance costs, damage to Council and private assets, health concerns from seed pod hairs, slip/trip hazard or potential litigation and replaced with an appropriate street tree species.



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**ANNEXURE A: S.U.L.E- SAFE USEFUL LIFE EXPECTANCY (Barrell 1995)**

	1 LONG	2 MEDIUM	3 SHORT	4 REMOVAL	5 MOVED OR REPLACED
	Likely to be useful for over 40 years with acceptable risk and assuming reasonable maintenance	Likely to be useful for 15-40 years with acceptable risk and assuming reasonable maintenance	Trees that appeared to be retainable at the time of assessment for 5 to 15 years with acceptable level of risk.	Tree to be removed within the next 5 years	Tree which can be reliably moved or replaced.
A	Structurally sound trees growing in positions that can accommodate future growth	Trees which may only live 15-40 years	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small tree less than 5m in height.
B	Trees which could be made suitable for long term retention by further care	Trees which may live for more than 40 years but which would be removed for safety or nuisance reasons	Trees which may live for more than 15 years but which would be removed for safety or nuisance reasons	Dangerous trees through instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in height.
C	Trees of special significance for history, commemorative or rarity reasons that warrant extraordinary efforts to secure their long term future	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new plantings	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings	Dangerous trees through structural defects including cavities, decay included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees which could be made suitable for medium term retention by remedial care	Trees which require substantial remediation tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings	
F				Trees damaging Or which may cause damage to existing structures within the next 5 years	
G				Trees that will become dangerous after removal of other trees for reasons given in A) to F)	

**NOTE:** No tree is "safe" i.e. entirely without hazard potential. The SULE rating given to any tree in this report assumes that reasonable maintenance will be provided by a qualified arborist using correct and acknowledged techniques. Retained trees are to have a reasonable setback and be protected from root damage. Incorrect practices can significantly accelerate tree decline and increase hazard potential.

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**ANNEXURE B: DEFINITION OF TREE TERMINOLOGY**

This attachment is to accompany this Arborist Assessment to explain the terminology used and the rationale and assessment of factors used in the Safe Useful Life Expectancy (SULE) method of tree evaluation.

**TERMINOLOGY USED:**

**DBH:** Acronym for trunk diameter at breast height (1.4m from ground level)

**DEADWOOD:** Many trees are noted as having various diameter deadwood over the course of their lifecycle. Deadwood is a normal function for plant growth and development. The trees upper canopy foliage or crown condition is an important indicator of an individual trees health. Dieback is the progressive death of branches or shoots originating from the tips. Dieback and decline are parts of a disease complex that have similar causal agents. Crown dieback is a recognizable, visible symptom of the early stages of decline and potential tree death ([www.fhm.fs.fed.us](http://www.fhm.fs.fed.us)).

The safety of the target, namely pedestrians, is considered the primary basis for deadwood removal. As deadwood has an ecological value, the removal of deadwood is usually only carried where it is a potential hazard to site users. Dead wooding a tree does not increase its life expectancy.

**EPICORMIC GROWTH:** The production of epicormic growth from dormant buds is a response to stress. Epicormic growth may be initiated by various causes such as branch loss, excessive pruning, fire damage, drought, defoliation and/or disease.

Epicormic growth comes from dormant buds held in the cambium. Under normal growth conditions, these buds are held in a dormant state by hormones produced in the canopy. These shoots are often produced by the tree in response to injury or environmental stress. Epicormic growth has implications for tree structure as the attachment of an epicormic shoot is much weaker than that of a 'naturally' developed branch (Fakes, 2004).

**MYCORRHIZAE / RHIZOSPHERE:** Mycorrhizae are fungi that grow in symbiotic association with tree roots (especially the fine root hairs) and are attributed with increasing the uptake of nutrients, particularly phosphorus, and reducing infection from soil borne pathogens. They greatly increase the surface area of a tree's root system. Mycorrhizae require aerobic soil conditions and are reduced in number by compaction, waterlogging and over-use of soil fertilisers. Forest litter or similar mulch provides ideal conditions for the proliferation of mycorrhizae. Rhizosphere is a term describing the peripheral area of a tree's root system where this symbiotic association most commonly occurs.

**CONDITION:** An evaluation of the structural status of the tree including defects that may affect the useful life of an otherwise healthy specimen. Such influencing factors include cavities and decay, weak unions between scaffolds (major branches) or trunks and faults of form or habit.



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**TREE HAZARD POTENTIAL:** An assessment of the risks associated in retaining a tree in its existing or proposed surrounds. Factors to consider are the growth characteristics of the species, tree vitality, condition and the frequency and type of potential targets. The impact the proposed works may have on tree vitality can only be assumed.

**CO-DOMINANT STEMS:** Co-dominant stems were noted on several trees throughout the subject site. The term 'co-dominant' is used to describe two or more stems or leaders that are approximately the same diameter and emerge from the same location on the main trunk. The junction where the two stems meet is a common location of above ground tree failure (Harris, Clark & Matheny, 1999).

The relative size of the two leaders is important to the tree's structural stability. Co-dominant stems split apart more easily than branches that are small, relative to trunk size. This is because the only way trunk xylem can grow around a branch, and form a strong attachment, is for the trunk to be larger in diameter than the branch attachment. If the branch diameters are near the same size, their attachment will be weak because their xylem tissues are essentially parallel and are not able to grow around each other. Co-dominant stems typically lack this overlapping tissue present in a collar, which can lead to possible failure at the point of attachment. Additionally, the weight and leverage of the co-dominant stems will increase with age, intensifying the stress on the attachment (Harris, Clark & Matheny, 1999). Furthermore, co-dominant stems do not have built in protection zones as with normal branches. This is because they are actually extensions of the stem. This enables pathogens and insects to spread downward and upward with little natural protection (Shigo, 1989)

**DOMINANT:** Trees with crowns above the upper layer of the canopy and generally receiving light from above and the sides.

**EDGE:** Trees located on the edge of a more dominant canopy of trees, and frequently possessing asymmetrical crowns, (heavier on the open side) and trunks that may be distorted due to competing with others for valuable nutrients i.e. soil air, water, light.

**FOREST:** Trees that have grown in a forest setting and only have about 1/3 of their canopy located on tall straight trunks.

**INCLUDED BRANCH JUNCTIONS:** Included bark was noted on trees throughout the site. Included bark often forms when two branches or trunks grow together at sharply acute angles, producing a wedge of inward-rolling bark.

Junctions with included bark form weak attachments, as there is little connective tissue between the two stems. Although all co-dominant stems should be considered comparatively weak, co-dominant stems that have bark trapped in the union are significantly weaker than those that do not have bark included (Smiley, 2003).

Tree failure can occur when the strength of wood is exceeded by a mechanical stress and/or is compromised by the presence of defects

**INTERMEDIATE:** Trees that have been overtopped, and become part of the understorey canopy

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**PROJECT ARBORIST:** The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.

**STRUCTURAL ROOT ZONE (SRZ):** The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

**TREE:** Long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

**TREE PROTECTION ZONE (TPZ):** A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

**VIGOUR:** Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.

**VITALITY:** Indicates the energy reserves of the tree and is determined by the observed crown colour and density, the percentage of dead / dying branches and epicormic growth. The vitality of the canopy and that of the root system is interdependent; root damage or heavy pruning draws on a tree's energy reserves. The tree's ability to initiate internal defence systems (compartmentalisation of damage) is reduced and it can also become predisposed to attack by insects and pathogens.

**WORK:** Any physical activity in relation to land that is specified by the determining authority.

**WOUNDING:** Generally, the wounds were located on the lower 2m of trees' trunk or on exposed roots. This suggests that the wounding may be a result of mechanical injury from landscape maintenance equipment. However, wounds were also noted higher up on the trunk and main branches. The likely cause of this wounding is branch failure, splitting or cracking during high wind events.

The primary effect of wounding is reduced translocation of water, minerals and sugars because of loss of bark, cambium and sapwood. Mechanical injury may also have implications for tree structure as the long-term effects of tree wounding is the potential development of decay. The long-term effects of tree wounding are the potential development of decay and loss of wood strength (Harris, Clark, Matheny, 1999).

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**ANNEXURE D: CERTIFICATION**

I certify that the enclosed “Arboricultural Assessment Report” for Wollondilly Shire Council, Argyle Street, Picton” has been prepared by CPE Tree Services.

To the best of my knowledge and professional integrity, it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Qualifications:

- *Diploma of Arboriculture,*
- *Horticultural Certificate,*

*Shane Funnell*

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