CITY OF SYDNEY
TREE VALUATION METHOD 2003

1. Introduction

This tree valuation method was developed in November 2003 for use in the City of Sydney, Australia.

The method was designed to calculate tree value in two situations:

1. Value to the community of trees growing on public land
2. Value that the community may claim, of trees growing on private land.

The intended purposes of the tree valuation method are:

1. Tree asset valuation to assist with management of trees on public land
2. Tree value calculation for inclusion in contract documents for public land
3. Tree value calculation for compensation when trees are damaged on public land
4. Valuation to set tree protection bonds for trees on private land
5. Valuation to set compensation to the community for trees unlawfully damaged on private land.

It is assumed that trees on public land in the City are suitable for their purpose, are maintained in acceptable safety and form (shape), and are regularly seen by many people. It is expected that calliper, condition and remaining useful life expectancy will be recorded on a tree database during regular inspections of City trees. Tree age and heritage status should also be on that database. In most cases it should be possible to value a tree growing on public land using information in the City records. It should be possible to estimate the value of a tree on private land when only a stump remains, if there is evidence of its previous size and condition.

The method uses a single formula with measures or scores being assigned to the following nine factors:

P = Planting cost of 200 litre NATSPEC grown tree in the City, with re-used paving

S = Size of plant specified by the City for new planting in the location (200 litre or 75 litre soil volume)

A = Age of the tree since planting

D = Diameter of the tree trunk

C = Condition of the tree (Tree health)

L = Life expectancy of the tree (Useful remaining life)

V = Visibility of the tree from public areas

H = Heritage status of the tree

O = Ownership of land where the tree is growing.

The tree valuation formula:

Tree Value = $ P/6 x S x [{(A + 6)/3}+4] x [D/(42x2)+0.5] x C x L/30 x V x H x O

It is recommended that the computer spreadsheet provided be used for tree value calculations. Tree values may be updated easily if the tree database is kept on a spreadsheet.

2. How to use the valuation method

Measures or scores should be established for each of the nine factors in the valuation formula. The factors and methods of measurement are explained below. The scores should be entered on Table 1. (Preferably on the spreadsheet version) and the tree value calculated.

Table 1. Tree value calculation table

Factor	Summary of Factor	Measure / Score
P	Planting cost of 200 litre tree with re-used paving (Obtain current costs)	
S	Specified size for planting in the location (Score: 200 litre = 1.0 75 litre = 0.7)	
A	Age in full years since planting	
D	Diameter of trunk (Calliper in mm at 1.0 metre height)	
C	Condition of the tree (Score: 0=Unacceptable to 1.0=Excellent)	
L	Useful remaining life of the tree in years	
V	Visibility of the tree from public areas (Score: 0.4 to 1.0)	
H	Heritage status of the tree, or the land where it is growing (Score: 1.0 to 2.5)	
O	Ownership of land where the tree is growing (Score: Public=1.0 Private=0.1)	
Value	**P/6 x S x [{(A + 6)/3}+4] x [D/(42x2)+0.5] x C x L/30 x V x H x O = $**	

3. Tree valuation figures produced by this method

Sample tree valuation figures using this 2003 method in a 200 litre size planting area:

Species and notes	Age	Calliper	Condition	Useful life expectancy	Valuation $
New 200 litre tree	0 - 1	42	1.0 Excellent	30	**7,566**
Jacaranda	15	200	0.9 Very Good	15	**18,000**
Plane tree	20	300	0.8 Good	20	**35,000**
Flindersia	45	400	0.8 Good	30	**111,000**
Celtis	60	450	0.4 Fair/Poor	15	**38,000**

The formula has been calibrated to give tree valuation figures which reflect the opinions of the consultants and staff project team members involved in its development during 2002-3.

Initial input came from consultants preparing the Street Tree Master Plan & Management Policy. A sample set of tree values was presented as a draft to Council's PCG meeting on 27 November 2002. The present method delivers figures within reasonable proximity to those of the 2002 draft formula.

The formula gives a value equal to the cost of planting and initial establishment when applied to a 200 litre tree in a normal situation during the first year after planting i.e. if the planting and establishment cost is $7,566 the formula will also calculate a value of $7,566 for up to one year after planting if the tree remains in excellent condition but does not increase calliper. A decline in condition of the tree would reduce the calculated value.

4. Explanation of the Factors

P. Planting cost

This is the current cost (calculated by the City) to supply, install and establish a 200 litre size, NATSPEC grown street tree in the City. The dollar amount of the planting cost is to be entered as the score.

The 'Planting cost' in 2003 is $7,566. If a current cost for other years is not available, the 2003 planting cost should be adjusted by the appropriate Consumer Price Index (CPI) provided by the Australian Bureau of Statistics (ABS). The formula divides the planting cost by 6 to give an indication of the average value of each year of tree growth at the time of planting.

Summary of planting costs in 2003:	
Supply tree, prepare planting pit, install tree, maintain until established	$5,500
Paving of tree surround (re-using pavers)	$ 755
Job design, administration, and supervision, record keeping	$1,261
Total (2003)	**$7,566**

Specification for 200 litre NATSPEC grown tree:	
Average height	4.0 metres
Average calliper at 1.0 metre above soil level	42 mm
Average age	6 years

S. Specified planting size

This is the plant size specified by the City for new tree planting in the location on public land. Current specification is for 200 litre size in prominent locations, and for 75 litre size in less prominent locations.

This factor is entered as a score:

200 litre = 1.0

75 litre = 0.7

(Modelling of values for equivalent mature trees showed those in locations specified for 75 litre new planting to have values on average 70% of those in 200 litre locations.)

The City may choose or require a tree of different size to be planted.

When valuing trees on private land, the score used is for the adjacent public land (or when directed by the City, the nearest appropriate public land).

A. Age of tree

This is measured as the age of the tree in full years since planting. Planting dates should be found in the City tree database, or other source when necessary and available.

Examples:

Tree planted in **April 1980** will have Age score in **March 2003** = **22.**

Tree planted in **April 1980** will have Age score in **July 2003** = **23.**

If the month of planting is not known, use June as the planting month.

The formula adds 6 years to the score because the average 200 litre tree is 6 years old when planted.

The total tree age is then divided by three, and four added to the result. That function allows a recently planted tree to be given its true age, but the Age function falls progressively behind true age as the tree becomes older. That function is applied so that age does not become a dominant control of the tree valuation.

D. Stem Thickness of tree

Stem thickness (calliper) of the tree is measured at 1.0 metre above ground. (Measurement at that height is used to allow comparison of growth with 200 litre nursery stock which have calliper of 42 millimetres measured at 1.0 metre above soil level.)

The measure in millimetres is entered directly as the score.

The formula divides this score by 42 x 2, and adds 0.5 to the result. That function is applied so that growth in the tree calliper will increase tree value, but more slowly than with a simple division by 42.

The function is applied so that stem increase does not become a dominant control of the tree valuation.

C. Condition of tree

This is an assessment of the general condition / health of the tree. The assessment should be made by a qualified arborist. It is entered as a score according to the following key:

Condition / health		Score
Excellent	=	1.0
Very Good	=	0.9
Good	=	0.7
Fair	=	0.5
Poor	=	0.3
Very Poor	=	0.1
Unacceptable	=	0

L. Life expectancy (remaining useful life) of the tree

This is an assessment of the remaining useful life expectancy of the tree, measured in years. The assessment should be made by a qualified arborist.

Example:

In 2003, a tree with expected useful life of **20 years** to 2023 would have **score = 20**.

The end of useful life is defined as the time when a tree would need to be removed because it no longer safely and attractively fulfils its amenity purpose. For the purposes of calculating tree value, the measured life expectancy is not reduced by proposals to replace the trees, or by recent damage.

The formula divides the life expectancy by 30. Thirty years is an estimated average current life expectancy of new trees planted in the City.

V. Visibility of the tree from public areas

This is an assessment of the Visibility of the tree from public areas. A tree, or portions of it, are considered visible if they can be seen from public areas at a distance of more than 20 metres from the trunk of the tree.

Visibility is entered as a score according to the following key:

	Accessibility of area surrounding the tree at more than 20 metres distance: > 270° to 360°	Accessibility of area surrounding the tree at more than 20 metres distance: > 90° to 270°	Accessibility of area surrounding the tree at more than 20 metres distance: 90° or less
Visible portion of tree canopy height >0.7 to All	**1.0**	**0.9**	**0.7**
Visible portion of tree canopy height > 0.3 to 0.7	**0.9**	**0.8**	**0.6**
Visible portion of tree canopy height 0.3 or less	**0.7**	**0.6**	**0.4**

Examples:

A single specimen tree in a park, with public access all round (**360°**) for a distance of 25 metres so that the **whole of its height** is visible, would have a **score = 1.0**.

A private backyard tree, visible from the road for approximately **20°** between buildings, and for **half of its canopy height** would have a **score = 0.6**.

H. Heritage status of the tree

A tree with no recognised heritage listing is given score = 1. Listing of the tree, or the property where it is growing, on a heritage register will produce a higher score according to the following key:

Heritage listing of the tree or property where it is growing	Score
None	**1.0**
Suitable tree growing on property listed in the City of Sydney LEP as Conservation Zone or Foreshore Protection Zone	**1.25**
Suitable tree growing on property listed in the City of Sydney LEP as a heritage item	**1.5**
Suitable tree growing in gardens listed in the City of Sydney LEP as a heritage item	**1.75**
The tree is listed in the City of Sydney LEP as a heritage item or Significant tree	**2.0**
Suitable tree growing on property listed on the State Heritage Register	**2.25**
The tree is listed on the State Heritage Register	**2.5**

O. Ownership of land where the tree is growing

This tree valuation method was primarily designed to value trees growing on public land, therefore the score for a tree on public land will be 1.0 in order to have no change in the value calculated by the rest of the formula.

Clause 8 ï Preservation of Trees, of the *Environmental Planning and Assessment Model Provisions 1980* made under the *Environmental Planning and Assessment Act 1979* allows trees on private property to be retained and protected, and for new trees to be planted, for the benefit of the community. This legislation therefore recognises some right of the community to trees on private land.

This tree valuation method adopts the age old tithing principle of giving one tenth, and therefore calculates the value that the community may claim, of trees growing on private land, to be one tenth what it would be if the land was public property.

This factor is entered as a score:

Public land = 1.0

Private land = 0.1

There has been much debate about what right the community has to the value of trees growing on private land. That debate is likely to continue.

