

# AMENITY TREE EVALUATION: A REVISED METHOD

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## ABSTRACT

Amenity tree evaluation systems have been widely used, not only in Australia but around the world. They place a monetary value on trees, usually for the purposes of insurance, compensation and litigation. However, the major significance of placing such a value on trees is that they are then recognised as assets. The recognition of trees as assets has major implications, not only for their management, but also for the decision making processes that involve trees. No method has received widespread support or acceptance in Australia and the Burnley Method was developed in 1988 to meet local needs. This method was intended to be easily used and to minimise operator error. Criticism of the original method has led to a modification that has resolved most of these criticisms.

## INTRODUCTION

In 1988 a method of placing a monetary value on amenity trees was developed at the Victorian College of Agriculture and Horticulture Limited, Burnley Campus (McGarry and Moore, 1988). The method was developed in response to a perceived need by those involved in Australian arboriculture and those responsible for managing trees in public open space (Moore, 1991) for matters relating to compensation and litigation, insurance, and policy and decision-making.

Although other methods have been tried in Australia, none has received universal support. Furthermore, when valuations were placed before courts of law, the massive discrepancies in values placed on trees placed the whole concept and acceptance of tree valuation at risk. Accordingly, a method was developed which was designed for use in the Australian context, and which attempted to deal with further concerns, such as placing a realistic dollar base value on the specimens and allowing for rapid rates of inflation, which required a constant updating of values if they were to be of any relevance.

The various evaluation techniques available from overseas (Helliwell, 1967; Anon, 1974) for valuing trees were often tried in Australia, but often failed because of species limitations, historical components or inappropriate growth rate data for the Australian environment. It is worth noting that these overseas methods are widely used and are routinely recognised by courts, and in some instances, have statutory or regulatory status. It is unfortunate that in Australia, despite the hope that the Australian Institute of Horticulture Method (Anon, 1974) would be widely accepted, methods have not achieved appropriate recognition.

It is to be hoped that in the not too distant future a method will be accepted by Australian arborists and open space managers. Failure to do so will continue the situation where trees are not recognised as assets, are not valued and not recognised in the decision making process. Sadly, the real currency of decision making is money and until trees are given an appropriate monetary value, they will not be managed properly and may receive harsh treatment in the expediency of decision making.

## THE BURNLEY METHOD

The Burnley method has as its focus two simple elements. The first is the establishment of tree size. Initially, this was determined using the formula for a cylinder ( $\frac{1}{4}\pi r^2 h$ ), which requires the simple measurements of height and canopy spread. The second element of the method involved establishing a dollar base value for the tree. This was achieved by obtaining the retail price from appropriate nurseries for purchasing a specimen with a volume greater than  $1\text{m}^3$ , using the formula for a cylinder. The base value calculation was expressed as  $\$/\text{M}^3$ . The calculation was done by determining an average value for at least three specimens from different nurseries.

In developing the Burnley method, it was intended that by multiplying the size and value components together a basic tree value would be established, which would then be modified to allow for the peculiarities of the tree and its location. The modifiers to be used were:

1. TREE SIZE (V) : With large trees, the values determined by the formula were unrealistically high. Accordingly, a modifier was developed (Table 1) to reduce the value.
2. USEFUL LIFE EXPECTANCY (E) : This modifier took into account the projected useful life expectancy of the specimen (Table 2).
3. FORM AND VIGOUR (FV) : This factor was used to assess the form and vigour of the tree (Table 3).
4. LOCATION (L) : This modifier was used to assess the tree's suitability for its particular location (Table 4).

The modifier tables were used to minimise the risk of significant discrepancies in tree values made for the same tree by different arborists. The value of an amenity tree was then determined using the formula:

$$\text{VALUE (\$)} = \text{TREE VOLUME} \times \text{BASE VALUE} \times (E) \times (V) \times (FV) \times (L)$$

The formula developed is consistent with the mathematical principles proposed by Helliwell (1967) where related variables are multiplied.

## MODIFICATION OF THE BURNLEY METHOD

Following the use of the Burnley method, particularly in Victoria, criticism was made of the volume modifier in particular, which was seen by many arborists as little more than a fudge-factor that adjusted values without reason (Wycherley, 1991). This criticism was to be expected because the rationale for use of the modifier had not been clearly identified in the original paper.

**TABLE 1 VOLUME MODIFIER (V) TO BE USED FOR A GIVEN VOLUME OF TREE**

<b>Volume (M<sup>3</sup>) of Tree</b>	<b>Volume Modifier Value (V)</b>
0 - 99	1.0
100 - 249	0.9
250 - 499	0.8
500 - 749	0.7
750 - 999	0.6
1000 - 1499	0.5
1500 - 1999	0.4
2000 -2999	0.3
3000 -3999	0.2
> 4000	0.1

**TABLE 2: VALUES FOR THE LIFE EXPECTANCY (E) MODIFIER**

<b>USEFUL LIFE EXPECTANCY RANGES</b>	<b>MODIFIER VALUE (E)</b>
50 Years	1.0
40 - 49 Years	0.9
30 - 39 Years	0.8
20 - 29 Years	0.7
10 - 19 Years	0.6
< 10 Years	0.5

**TABLE 3: VALUES AND DESCRIPTORS FOR THE FORM AND VIGOUR MODIFIER**

<b>FORM AND VIGOUR DESCRIPTORS</b>	<b>MODIFIERS (FV)</b>
Perfect form and excellent vigour	1.00
Slight imperfections in form	0.90
Slightly reduced vigour	0.90
Slight imperfections & slightly reduced vigour	0.80
Good form with good vigour	0.75
Good form with average vigour	0.70
Good vigour with average form	0.70
Good form with poor vigour	0.65
Good vigour with poor form	0.65
Bifurcation of trunk & excellent vigour	0.60
Bifurcation of trunk & good vigour	0.55
Bifurcation of trunk & average vigour	0.50
Bifurcation of trunk & poor vigour	0.40
Poor form with average vigour	0.30
Poor vigour with average form	0.30
Poor form and poor vigour	0.20
Excessive deadwood, cavities & poor form	0.10
Dead	0.00

**TABLE 4: VALUES AND DESCRIPTORS FOR THE LOCATION (L) MODIFIER**

<b>LOCATION DESCRIPTORS</b>	<b>MODIFIERS (L)</b>
Perfect suitability	1.0
Could be better located but no problems	0.9
Minor problems, e.g. lifting paving	0.8
Species unsuited or causes problems	0.7
Species unsuited and causes problems	0.6
Species unsuited and causes major problems	0.5
Species unsuitable	0.4

Accordingly, in 1991 the method was modified by using the formula for a cone ( $1/3 \pi r^2 h$ ) to calculate tree volume and the use of the volume modifier (V) was discontinued. In the modified method, tree value can be determined using the formula:

$$\text{VALUE (\$)} = \text{TREE VOLUME} \times \text{BASE VALUE} \times (E) \times (FV) \times (L)$$

For consistency, when determining the base value under the modified method, the formula for a cone should be used. The modified method tends to give a lower value for smaller, short-lived or inferior quality specimens.

## CONCLUSION

The modified Burnley method of tree valuation is self-indexing for inflation, will operate in any country, and is sensitive to changes in the value of trees due to changes in consumer preference. The calculations and modifiers allow precise, objective and simple use, which minimises the serious operator errors that befall many of the other techniques.

The Burnley method has been successfully used by open space managers to value their trees, thereby recognising them as assets. It has been tested in the courts and has been accepted as a realistic and well based method of evaluation for use in the Australian context. There is still one remaining criticism of the technique. Many arborists (Yau, 1990; Kenyon, 1990) find the establishment of the initial base value time-consuming and tedious.

The modified Burnley method applies to amenity trees in both urban and rural contexts. It does not attempt to deal with subjective components of tree valuation, such as historical or environmental significance, which have led to the abandonment of other techniques. Whether the method achieves widespread use in Australia remains to be seen. Time alone and the choice of practising arborists and possibly the courts will finally settle the matter.

## REFERENCES

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