THE LOCATION FACTOR IN EVALUATING SHADE TREES AND THE REPLACEMENT VALUE IN APPRAISING HEDGES: TWO PROPOSALS[1]

by Eric Rey-Lescure

Abstract. A method for quantifying the location factor in evaluating shade trees is proposed. It is based on four criteria, and the total of the points accorded to each, directly yields the location percentage. For the appraisal of hedges, a modification of the replacement value given for shrubs in the ISA Guide is put forth to take into account this particular case of the grouping plants.

The Location Factor

The International Society of Arboriculture's *Guide for Establishing Values of Trees and Other Plants* is particularly useful to all who must appraise certain trees, shrubs, or other plants. This usefulness is evidenced in assessing casualty losses arising from automobile accidents and fires, from bark and branch splits caused by snow throwers; in assessing losses suffered from vandalism, such as the illegal felling of trees on private property; also in making preliminary estimates for real estate transactions or in preparing other expert advice. The end result of all such tasks is tallied in dollars. However, it often happens that two or more estimates of the same situation, carried out by different persons applying the same method will vary widely, at times by as much as 100%. It would seem that this state of affairs, which I have experienced, can also be observed elsewhere and, as d'Ambrosio (1984) makes clear, is somewhat detrimental to the profession.

How can one account for such widely discrepant evaluations? Since it employs a pre-established monetary value per square centimeter, the basic value of a tree will display a strict similarity for all cases. As for the species factor, it is the object of increasing standardization by the Chapters of the ISA. The condition factor is clearly the most demanding; it requires of the appraiser considerable knowledge and ex-

perience. However, the formula worked out by Webster (1978) does allow a less knowledgeable or less experienced person to achieve satisfactory results. By means of a point system, it reduces the possibility of subjective judgment. There remains, then, the location factor which, as the introduction of the ISA Guide well indicates, is a multi-purpose factor. Instances found there of the rating range in percentages refer to well-known usages of land, such as a school campus, a zoo, or a residential street. But the problem is that two suburban streets, two cemeteries, or two residential properties are not identical. Moreover, there is an almost infinite variety in the position of a tree within a given location and, consequently, in its aesthetic and functional value. In addition, it frequently happens that the location at hand is a mixed one with regard to those described in the Guide.

For example, concerning open woods behind a suburban residence, the Guide provides the following indications:

Residential (suburban)	60% to 100%
Woods (open)	20% to 60%

Is the location of a tree in that location worth 60%? To answer that question, I shall consider, following Webster (1978), four criteria whose total points yield the location percentage. Those are: the functional aspects (resistance, availability, and effectiveness), the participation of the tree in the site, and site and the quality of the location.

Functional aspects. They are: the tree's resistance to various stresses found in a given location, the availability of space for normal growth, and the effectiveness of the tree in terms of the desired functions. As a whole, this very important criterion makes up 60% of the total points. The problem is that the three variables:

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1. Presented at the annual conference of the International Society of Arboriculture in Quebec City, Canada in August 1984.

resistance, availability, and effectiveness are not of equal importance in a given location. The appraiser must therefore propose a distribution percentage that is appropriate to the given location. Thus, for a tree next to a sidewalk along a boulevard, consideration should be given primarily to its resistance to de-icing salts in our northern country, and to the availability of underground space for root growth or of overhead space where there are utility lines, whereas its desirable function(s) need only be taken as implied. In this way, the 60 points may be broken down into four groups of 15 points each, and one might, for instance, score resistance on 45 points (3 groups), availability on 15 points (1 group), and leave effectiveness out of consideration. As for the actual grading, it could be effected according to the following scale: very good = 15 points; rather good = 10 points; rather poor = 5 points; and poor = 0 point.

The details of the variables are shown in Figure 1. Here, I would like to comment on some important points:

• On the subject of resistance, one should note the *least resistance* of the species of a tree to be evaluated with respect to the actual or potential stress of the location. Thus, a tree that is located in the vicinity of a source of SO_2, that has, according to our current knowledge, an average resistance to that polluting agent, but that is also very vulnerable to flood waters, for instance, will be evaluated in regard to this last variable if frequent and long lasting flooding is deemed important in the area.

• The availability of overhead and/or underground space in relation to various structures is well-known. It should be noted, however, that availability of space also comprises a tree's relation to *other trees*.

• Effectiveness is the variable that allows one to note the different functions a tree might fulfill, especially its environmental, climatic, architectural, and engineering functions. A tree may, of course, fulfill many functions simultaneously. One has then to recognize, if such be the case, the *particular* importance of one of these functions, and to note the effectivess of the tree or plant in fulfilling it. For example, a deciduous tree providing shade on a patio in the afternoon will be considered in regard to this obvious function in its location, while its function of also producing oxygen or that of filtering dust particles may be neglected.

Participation of the tree in its location. This criterion allows one to assess the contribution of the tree to the aesthetic value of the location. If the tree happens to be the focal point because of its remarkable characteristics, it scores the highest number of points, that is, 20. A fairly remarkable tree is one whose removal would destroy symmetry or continuity, which would be the case for a row tree. An ordinary tree is one that does not satisfy the two preceding definitions, but whose removal would nevertheless make the location less attractive from an aesthetic or functional point of view. A very ordinary tree means one whose location would lose none of its attractiveness should the tree be removed. A cumbersome tree is one whose removal would enhance the location.

Site. This criterion expresses the "social" importance of the location. It is generally agreed, all things being equal, that a tree in an urban setting is of greater social value than its congener farther removed from populated areas. By the same token, it is logical to accord a superior value to a tree that is situated on a busy thoroughfare or in a busy place.

A distinction is drawn between public places and private grounds. In the case of a multipurpose location such as a street, one must assess how busy the particular location of a tree on a given street is with respect to other streets of the same city. As for a very large tract of land (for example, a golf course) or a unique one (for example, a shopping center), the amount of traffic in the immediate vicinity of the tree will be judged in relation to that of other areas in the same location.

On private land such as a residential property, a higher score will be accorded to a tree located near an outdoor living area like around a patio than to one situated, say, away from that area or at the property's edge.

The quality of the location. Here, the quality of a location's landscaping is assessed. This criterion gives more value to well-landscaped and well-kept properties than to similar ones that are of average quality, poorly-kept, or run-down. It is a criterion of real importance. In fact, the method

CRITERIA	VARIATION OF THE CRITERION		POINTS ALLOTTED	
FUNCTIONAL ASPECTS	GRADING: the maximum number of points accorded to this criterion is 60, divided into 4 groups of 15 points each. The relative importance of resistance, availability of space, and effectiveness of a tree or plant on a location will be reflected in the number of groups of points retained (not important = no group; extremely important = 4 groups). Also, these variables will be marked on the following scale: very good = 15; rather good = 10; rather poor = 5; poor = 0.			
A	RESISTANCE of tree to stress caused variously by: salt, pollution, drought, flooding, earth overfill... Score least resistance of species in relation to actual or potential sources of stress on the location.	Score on 15	Number of groups	
			X	
B	AVAILABILITY of overhead and/or underground and/or lateral space for growth of tree in relation to nearby structures: utility lines, pipes, and poles, traffic signs, buildings or to other trees, etc.			
			X	
C	EFFECTIVENESS of tree in terms of desirable function(s) such as those of vertical screen (shade/summer, sun/winter) and of lateral screen (privacy, screening of unpleasant view, protection from noise and snow...), or in terms of other known functions. Score function(s) that is (are) most essential to the site.		X	
			Total = 4	
PARTICIPATION OF TREE IN LOCATION	Remarkable tree: size, focal point, historical tree...		20	
	Fairly remarkable tree: its removal would destroy symmetry, balance, or continuity...		15	
	Ordinary tree: its removal would render location less attractive from an easthetic point of view.		10	
	Very ordinary tree: its removal makes location as attractive as previously.		5	
	Cumbersome tree: its removal would render location more attractive than previously.		0	
SITE	Thoroughfare or busy place in public, industrial, or other location...	VERY MUCH SO	10	
	(e.g., street, golf course, shopping center...)	MODERATELY	5	
	Exposed place (i.e., outdoor living area) on private property (e.g., patio)	VERY LITTLE	0	
QUALITY OF LOCATION	Landscaped commercial, residential, or industrial area or other location.	SUPERIOR	10	
	In a natural setting (e.g., bankside, woodlot, open land, cliff...),superior is replaced by well-preserved, within average by fairly well-preserved, and poor by détériorated	WITHIN AVERAGE	5	
		POOR	0	
	TOTAL points score equals location factor in percentage		%	

Figure 1. Criteria for appraising the location factor and number of points allotted to each.

that has been adopted by the Ontario Shade Tree Council (1972), and which is very similar to that of the ISA, includes a land value correction factor. Based on an average land value, properties that sell at a higher price confer a plus-value on their trees, while the inverse is true of the less expensive lots. Even if the market value of a developed plot of land involves numerous factors, the quality of its landscape is weighted in the balance. Moreover, trees, which are often associated with landscaping, enhance residential property value (Payne, 1973; Morales et al., 1983). As regards natural sites like bankside, woodlot, open land, or cliff, the appraiser will give a maximum number of points to a well-preserved site, and a proportionate number to one of average upkeep or in a deteriorated state. To evaluate property on this criterion requires an adequate grasp of land ecology.

Conclusion. The proposed method does not, of course, eliminate every subjective judgment. It does, however, oblige the appraiser systematically to consider the criteria that, on the present view, constitute the location factor. In addition, it obliges him to verify on site the existence of these criteria as they relate to the functional aspects of the location. Finally, it requires that he systematically weighs the importance of each. The author would appreciate receiving all criticism of experiences using the present method, so as to test its degree of validity and to identify its gray areas.

Hedges

The evaluation of hedges is usually settled by referring to the section on deciduous shrubs and small evergreens in the ISA Guide. The purchasing cost is reduced by the condition and the location factors, then the total cost of planting is added to obtain value of the hedge. One should also note that in the case of transplantable-size trees, however, all of the basic replacement costs are reduced by taking into account the species, condition, and location factors. The difference in approach contained in the Guide is doubtlessly explained by the fact that, when a hedge is partly damaged, one must, in order to reconstruct the whole, remove the dead or damaged specimens

and prepare the planting bed for their replacement. These costs involve labor and machinery, and are estimated in terms of the total number of the plants to be removed and not in terms of each individual. Moreover, even though the newly planted specimens are as tall as the hedge, they probably will not be as thick. This loss of uniformity means a loss of aesthetic value for many years. Besides, it is difficult to put a price tag on aesthetic value. This is undoubtedly why, in many cases, the non devaluation of the cost of planting constitutes an acceptable compromise.

Yet, experience often shows that this formula, if applied by the book, will yield unrealistic results. Such is the case especially:

(1) where the condition and the location factors of the plants are very low and the cost of planting high. Since this cost is not reduced, the estimated value is obviously too high.

(2) since, very often, the local nurseries do not offer plants large enough and/or tall enough to fill the gap in a hedge. It is therefore logical to calculate the cost of pruning, of fertilization, and sometimes that of spraying, since all of these tasks, as a rule, should be performed annually or periodically to restore the hedge.

Sometimes these tasks may extend over many years, even beyond 10 years for wide-spreading hedges. Such work entails considerable costs that logically should be reduced, especially if the condition and/or the location of the hedge are less than perfect.

Principle: our proposal concerning hedges is to *reduce* part of the cost of planting and of subsequent costs in inverse proportion to the quality of their condition and location. The suggested formula in a way would pose as an intermediary between the existing formula for transplantable-size trees, which reduces all of these related costs, and the formula for deciduous shrubs and small evergreens, which does not.

Formula
Purchase cost = A
Cost of planting and of later tasks = B
% of condition = a
% of location = b
Combined % = c = a × b
Part of cost to be reduced = C = B(100% - c%)
Appraisal value of plant = D
D = (A + C) c + B - C

Example 1
A = 90,00$ (purchase)
B = 810,00$ (planting)
a = 70% (condition)
b = 90% (location)
c = 63% (combined)
C = 810,00$ (100% − 63%) = 299,70$
Appraisal value D = (90,00$ + 299,70$) × 63% + 810,00$ − 299,70$ = 755,81$
This amount can be compared to the following calculation based on the existing formula:
(A × a × b) + B = D
(90,00$ × 70% × 90%) + 810,00$ = 866,70$

Example 2
By retaining the same figures for A and B, but with lower condition and location percentages: a = 50% and b = 70%, respectively, one arrives at:
D = (90,00$ + 526,50$) × 35% + 810,00$ − 526,50$ = 499,27$
The existing formula would yield:
D = (90,00$ × 50% × 70%) + 810,00$ = 841,50$

Conclusion. The proposed formula allows one both to take into account all the costs, present and future, of rapidly replacing a damaged hedge, and to work out a *reasonable* appraisal in relation with the condition and location of the existing hedge. In some other cases where damage to trees necessitates long-term repair work, such a formula could be considered. Such would be the case, for example, for a tree whose top has been partially damaged by fire and that would require a number of structural prunings.

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ABSTRACT

CLEPPER, H. 1984. **What's in a tree name?** Am. Forest 90(1): 20-21, 58.

Renowned for its beauty, dogwood is showy in the spring, thanks to its petal-like bracts. Tree watchers may wonder why such a decorative shrub should be saddled with the seemingly inappropriate name of dogwood. The explanation is this: in Britain, the bark of a species of this genus was used to make a chemical infusion. This tincture was said to be a medicinal cure for mange in dogs. American colonists were thus led to adopt the name for our own native dogwood. Common names of other well-known trees are frequently of obsure origin. Consider the attractive horsechestnut. Obviously it is not a horse, and botanically it is not chestnut. But there is an interpretation: when the leaf has fallen off, the twig shows a small scar that resembles a horse's hoof — that is, if you have a good imagination. The list of apparently unsuitable common names could be prolonged. These two are cited to illustrate the often unclear sources of the vernacular. On the other hand, many names are derived from quickly understandable sources.