A CRITICAL ANALYSIS OF CTLA'S DEPRECIATION FACTORS – DO INHERENT INCONSISTENCIES OF METHOD COMPLICATE THE SIMPLICITY OF PROCESS?

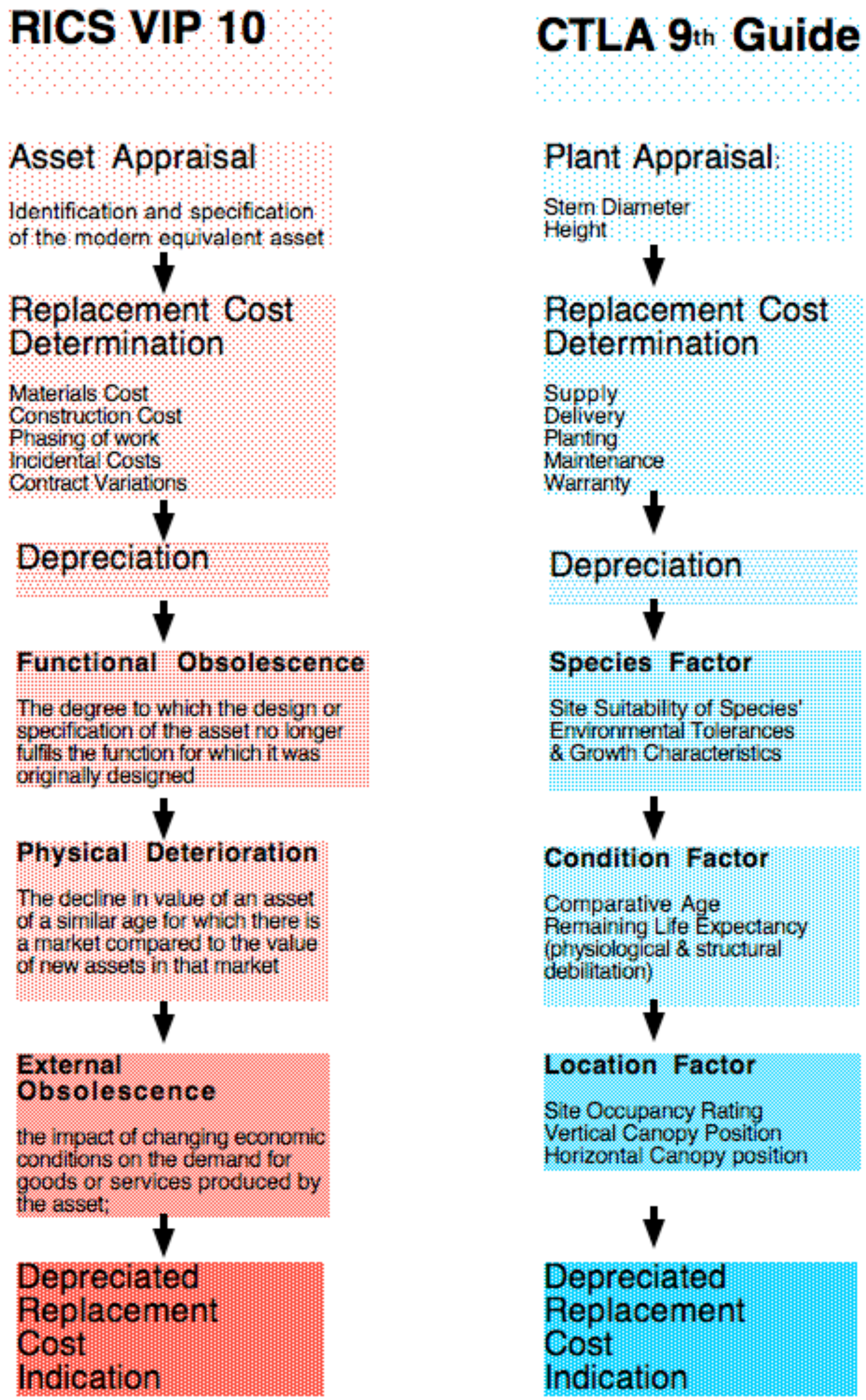
ABSTRACT

CTLA methods follow a cost approach to value. Their adherence to DRC * methodology is perhaps fortuitous, but nonetheless confers authenticity to the method, in so far as it is grounded upon universal valuation principles. Strength lies in the closeness of fit. However, because CTLA methods were not designed specifically for this purpose, there are anomalies in the system that warrant reconsideration. A common criticism of CTLA methods is that they are overly complicated. DRC theory is complex, but essentially simple by comparison: the lines of process are clean and uncluttered. It is the anomalies within the CTLA methods that complicate matters; stricter realignment with DRC theory could achieve greater simplicity without sacrificing complexity. Specifically, the efficiency of a tree's function (its site suitability) should be considered under the Species factor, not Location, and the Site Rating, within the Location factor, should be altered to Site Occupancy Rating.

INTRODUCTION

*Depreciated Replacement Cost (DRC) methodology is a means of estimating the current cost of replacing an asset with a modern equivalent asset less deductions for physical deterioration and all relevant forms of obsolescence and optimization (RICS 2006). CTLA methods (Replacement Cost and Trunk Formula Methods) follow this methodology after a fashion (see Table 1).

All relevant tree installation costs are calculated and then depreciated to *Species, Condition* and *Location* factors. Broadly speaking, *Species* depreciates for genetic fitness, *Condition* for physiological and structural defects, and *Location* for site contribution and placement (Hollis 2007).


RICS VIP 10
CTLA 9th Guide
Asset Appraisal
Identification and specification of the modern equivalent asset
Plant Appraisal:
Stem Diameter
Height
Replacement Cost Determination
Materials Cost
Construction Cost
Phasing of work
Incidental Costs
Contract Variations
Replacement Cost Determination
Supply
Delivery
Planting
Maintenance
Warranty
Depreciation
Depreciation
Functional Obsolescence
The degree to which the design or specification of the asset no longer fulfils the function for which it was originally designed
Species Factor
Site Suitability of Species' Environmental Tolerances & Growth Characteristics
Physical Deterioration
The decline in value of an asset of a similar age for which there is a market compared to the value of new assets in that market
Condition Factor
Comparative Age
Remaining Life Expectancy (physiological & structural debilitation)
External Obsolescence
the impact of changing economic conditions on the demand for goods or services produced by the asset;
Location Factor
Site Occupancy Rating
Vertical Canopy Position
Horizontal Canopy position
Depreciated Replacement Cost Indication
Depreciated Replacement Cost Indication

CTLA's *Species*, *Condition* and *Location* factors are rudimentary equivalents of the Functional Obsolescence, Physical Deterioration and External Obsolescence of International Valuation Standards (Cullen 2000). Although the original similarity was perhaps serendipitous, the legitimacy of that link was further recognised by the Valuation Standards Board of the Royal Institution of Chartered Surveyors (RICS) in their 2007 review (pers. Comm.) of the UKI-RPAC Supplementary Guidance Note 1 (Hollis 2007).

Review by RICS Panel has allowed for further comparisons between methods to be made. The findings below, suggest the divisions between Functional and Environmental Obsolescence have been blurred in CTLA methods. The blurring of distinction gives rise to confusion in the order of process and to a tendency towards double-working. This unnecessary confusion leads to a perception of complication in CTLA methods, where complication in fact, belies a failing in the model. Realignment with the DRC model for a smoother "retrofit" removes the complicated double-working and restores the simplicity of process.

METHOD

This paper will compare each of the CTLA depreciation factors in turn with their parallel DRC obsolescence with a view to removing anomalies and restoring internal coherence.

Species factor

This factor considers the climatic adaptability, growth characteristics, soil adaptability and tolerances of a species to its environment. Although growth characteristics are included in the definition, it is generally interpreted in terms of species tolerance of regional geography: within the US, Regional Plant Appraisal Committees (e.g. Alberta RPAC) publish lists of species rated for their areas (e.g. Alberta Species Rating Guide, 2003). Thus, the assessment is essentially independent of site specifics, which are considered latterly, under the *Location* factor. A UK equivalent might be the new website, The Right Trees for a Changing Climate (www.right-trees.org.uk), launched to recommend suitable species for future planting in London and other urban areas.

The *Species* factor relates to RICS/IVS Functional Obsolescence or *comparative functionality* and *efficiency*. This obsolescence determines the degree to which the design or specification of an asset no longer fulfils the function for which it was originally designed (RICS 2006); in other words, is the asset fit-for-purpose in its current situation.

The design or specification of an asset clearly relates to the botanical species of a tree (or cultivar, variety etc.). Such a specification will not only consider the environmental tolerances of a tree as listed by the RPAC, but of necessity its growth characteristics (size, habit, growth rate, wood strength, rooting depth etc.). Again these considerations of comparative functionality are largely meaningless without consideration in relation to site; i.e. of comparative efficiency. Such site considerations need to include more than just climate and soil assessment at the macro scale: the appraiser needs to assess micro details, such as local infrastructure, ambient design and traffic circulation. It is within these limitations that the species will deliver its design function efficiently or not. The comparative efficiency of retaining a large, fast-growing species with weak branch attachments, such as silver maple, will depend entirely upon its situation or placement.

CTLA methods do consider the micro-site suitability of a tree under the *Placement* sub-factor, within *Location*. However, this artificial separation across two depreciation factors of micro and macro site considerations complicates the appraisal with an unnecessary element of disjointedness, rendering the *Species* factor dysfunctional.

To be consistent with DRC methodology, *Comparative Functionality* and *Comparative Efficiency* should be considered within the same factor, not separated between *Species* and *Location*. The separation inevitably creates the possibility of double-counting in the depreciation process. Recombining *Species* and relevant *Placement* considerations under *Comparative Functionality* and *Efficiency* within the common *Species* factor (as *Functional Obsolescence*) makes for a smoother and authentic retrofit of International Valuation Standards.

Thereafter, the issue is rightly, no longer whether the species is hardy for the region as proposed by most RPAC's, but whether it is *fit-for-purpose* in its current situation: does it fulfill the putative design brief. That design brief may have evolved since the original design: magnificent Victorian avenues may no longer fit the dizzy proliferation of street infrastructure and usage. The DRC aim is to determine the degree to which the design or specification of an asset no longer fulfils the function for which it was originally designed.

Occasionally functional obsolescence is absolute, i.e. the asset is no longer fit for purpose (e.g. severe post-development pressure). At other times, the asset will still provide utility but at a lower level of efficiency than the modern equivalent, or may be capable of modification (e.g. utility pruning) to bring it up to a current specification. The depreciation adjustment should reflect either the cost of upgrading, or if this is not possible, the financial consequences of the reduced efficiency when compared with the modern equivalent (RICS 2006).

Condition

Condition relates to Physical Deterioration which has already been discussed in 'Can trees be depreciated like plant?' Hollis (2008). The conclusion of that paper was that *Condition* should consider the comparative age of a tree as well as its current life expectancy to be consistent with IVS.

Location

Location is divided into 3 sub-factors in the guide: *Site Rating, Contribution* and *Placement*. Site Rating is considered in CTLA methods in terms of real estate value and its associated effect on tree value. The effect of trees as a percentage influencing property prices is well established (e.g. Laverne & Geideman 2003). Supporting research is also emerging in the UK: the amenity value of woodlands was assessed by Willis & Garrod (1993). Does money grow on trees? (CABE Space, 2005) showed how well-planned and managed parks, gardens and squares can have a positive impact on the value of nearby properties and can attract inward investment and people to an area.

However, these examples are largely valuations in their own right rather than pieces within a Cost Approach to value. In essence, they relate to a Market Approach to value: they use comparable sales of an asset (houses) to ascribe value to the asset under consideration (tree). In this light, their use spoils the rhythm and line of a smooth cost approach to value. They also introduce a strong element of the unknowable into the system, which CTLA otherwise eschews (Hollis 2007). The beauty of CTLA methods is that they avoid calculating the elusive benefits stream or market contribution of trees to property: using replacement tree costs as the starting point of valuation helps to capture the wider basket of benefits attributed to the appraised tree by replacing them without specifically isolating or quantifying those benefits (ibid). Depreciation makes the connection to the value of the appraised tree (Cullen 2000).

Employing a Site Rating also undermines the DRC retrofit, where Location would otherwise logically conform to the remaining, External Obsolescence in IVS terminology. This latter obsolescence emerges from the impact of changing economic conditions on the demand for goods or services produced by an asset (RICS 2006). In other words, it relates to supply and demand for the good or in arboricultural terms, population dynamics – how many other similar trees are on the site:

"A common example of external obsolescence is where there is over capacity in a particular market that would reduce the demand and therefore value for the actual asset, regardless of how modern or efficient it may be." (ibid)

RICS (2006) states that care has to be taken to distinguish these factors, which are due to external factors, from factors that are specific to the entity. In the author's view, this statement further supports the stripping down of the Placement sub-factor from within the Location factor and a corresponding augmentation of the Species factor, for it is the inherent growth characteristics and susceptibilities of a tree species (its specification, in IVS terms) that determine the suitability of its placement (within the design, in IVS terms). Obviously, there is an ineluctable reciprocity between species and site as internal and external dynamics of nature, but double-working in the appraisal is more readily avoided, if the juxtaposition of trees and infrastructure is considered principally under Species/Functional Obsolescence, leaving questions of economic capacity to Location/External Obsolescence.

Although population dynamics are hard to apply to small land areas in urban situations, Coder (1995) introduced the concept of Site Occupancy Rating to address the issue. The principle is that only a given amount of leaf area can be maintained on a site, providing a similar contribution of benefits. This leaf area can be concentrated on a few large trees or on many small trees. There is a trade-off between the number of trees and their sizes for similar site occupancy. Coder considers a site over-stocked, if basal area is greater than 70 sq ft per acre, and under-stocked, if basal area is greater than 35 sq ft per acre.

An alternative approach may be to consider the relative frequency of other trees in the area on a visual basis, as described in the Helliwell (2003) system (<10%,

>10%, >30%, >70% of the visual area covered by trees). This approach was advocated by Hollis (2007) in the first UKI-RPAC Supplementary Guidance. The four categories within each descriptor were ascribed proportional percentage ratings.

The purged Contribution and Placement sub-factors would now principally relate to a tree's vertical and horizontal position relative to that population density: its *market penetration*, in economic terms. Contribution represents the vertical component of canopy position (dominant, co-dominant, sub-dominant, suppressed) with a strong correlation to canopy spread, crown density, architecture and form (Hart 1995). These characteristics may affect a tree's ability to deliver a wide basket of benefits from the purely visual to environmental and engineering functions (Hollis 2007). The four categories of canopy class can be ascribed proportional percentage ratings, which may vary in order of precedence relative to the dynamics of a given site and user preference.

Correspondingly, Placement would now relate to the horizontal components of site competition: whether a tree is free-standing or within a group. A further refinement of this consideration would be whether or not that group was a formal collection or an informal medley.

DISCUSSION

Species

On analysis, publication of arbitrary species lists by RPAC's falls short of the wider definition of Functional Obsolescence, which should be considering more comprehensively, the suitability of the species to its placement. Even the environmental tolerances considered in such lists are rarely macro site considerations alone: certainly, tropical species should not be grown as street trees in arctic regions, but few appraisals will involve such considerations as the nursery trade largely filters out such unsuitable species from its supply lists. Most trees sold in the UK are suitable for most urban sites with the exception of exposed coastlines. The real issues for species environmental tolerance are site drainage, soil texture and compaction, which all need to be assessed locally. Again, pest and disease susceptibility is rarely an exclusively, regional issue, at least in the UK, where the spread of Dutch Elm Disease (DED) alone is determined by regional geography: the spread of the disease in southern England is strongly limited by the geography of the South Downs. On a day-to-day basis though, the greater concern is likely to be the prevalence of disease and inoculum on a given site relative to species' susceptibility, such as honey fungus in an old orchard, where one is appraising a cherry tree.

Consider the differing species requirements of a prestigious avenue along a coastal promenade below the South Downs and a super market car park on an ex-woodland site above the South Downs: the former would suit an elm species well, but not a tightly fastigiate hornbeam cultivar and the reverse would apply on the latter site. A retained, maturing elm in the new car park, would be stressed and susceptible to DED, with a ready inoculum in the remnant woodland. Its large limbs and acute branch angles would make it a liability next to frequently parked cars. Its roots might also disturb paving and cause tripping hazards to the constant pedestrian traffic. By contrast, a hornbeam would not be susceptible to either DED or honey fungus from the woodland soil and, as a tightly fastigiate cultivar, would grow sustainably within a high density car park with minimal maintenance or branch shedding. It would have a similar appearance or texture to the local elm, but would grow to a suitable size for the scale of the design. In other words, a smaller, cheaper tree would deliver its benefits more efficiently than the larger more expensive elm. Therein, the maturing elm could be optimized by a semi-mature hornbeam.

On the other hand, when transposed to the costal promenade, the tightly clipped hornbeam, would lack grandeur in a prestigious avenue and succumb to saltladen coastal winds. The maturing elm by contrast, would be in its element, defining the visual character of the area and by no means replaceable with a semi-mature hornbeam cultivar.

Thus, the consideration of relevant *Placement* factors of micro-site suitability here allows for both a fuller assessment of the *Species* factor and also a single assessment of Functional Obsolescence. The twin elements of Comparative Functionality and Comparative Efficiency become rightly combined in one place and complication and double counting is avoided. The factor has a more defined purpose, where it had appeared to be increasingly anachronistic.

Condition

Failure to consider comparative age under this factor omits a significant aspect of obsolescence that otherwise has to be resolved through the somewhat artificial Adjusted Trunk Area Formula (CTLA 2000).

Location

Usage of the term Site Occupancy Rating maintains terminological continuity with the original Site Rating, a continuity that is not entirely superficial. Research supports the influence of site occupancy ratings on market value: Payne (1973) showed that a 7% premium on domestic property value was dependent on there being < 30 trees on a “lot” and Laverne & Geideman (2003) concluded that density of screening affected rental rates. Similarly, market value (site rating) tends to influence site occupancy rates with more trees being planted and maintained in areas of higher value.

Thus, Site Occupancy Rating encompasses a number of the Site Rating criteria, without specifically making market judgments (which are better left to other professionals) or determining intangible benefit contributions. Furthermore, it sidesteps the issue of whether the tree at the rich man's gate is worth more than a similar one in the ghetto. The assumption of Site Rating alone is that this is indeed the case. In fact, the former tree may be one of many and be barely missed in the instance of loss and the latter may be unique to the area.

CONCLUSION

Under the Species, Condition and Location factors, the appraiser should fully consider the suitability of the species to its designed environment, the comparative age and condition of the specimen, and the supply and demand for other trees in the area. Questions of suitability and demand should also be tailored to the preferences of the client/end user and to the type of value in question (market value, use value, devastation value etc.) A local authority may achieve best value for its stakeholders by managing a tree population as close as possible to a normalised forest with a balance of age classes and variety of species. A private landowner may have a preference for a more even aged, uniform structure with mostly evergreen species. These individual concerns notwithstanding, a smoother DRC "retrofit" for CTLA methods offers a simple and streamlined approach to efficiently respond to the complex demands of any appraisal question within a systematic, internally coherent process.

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