

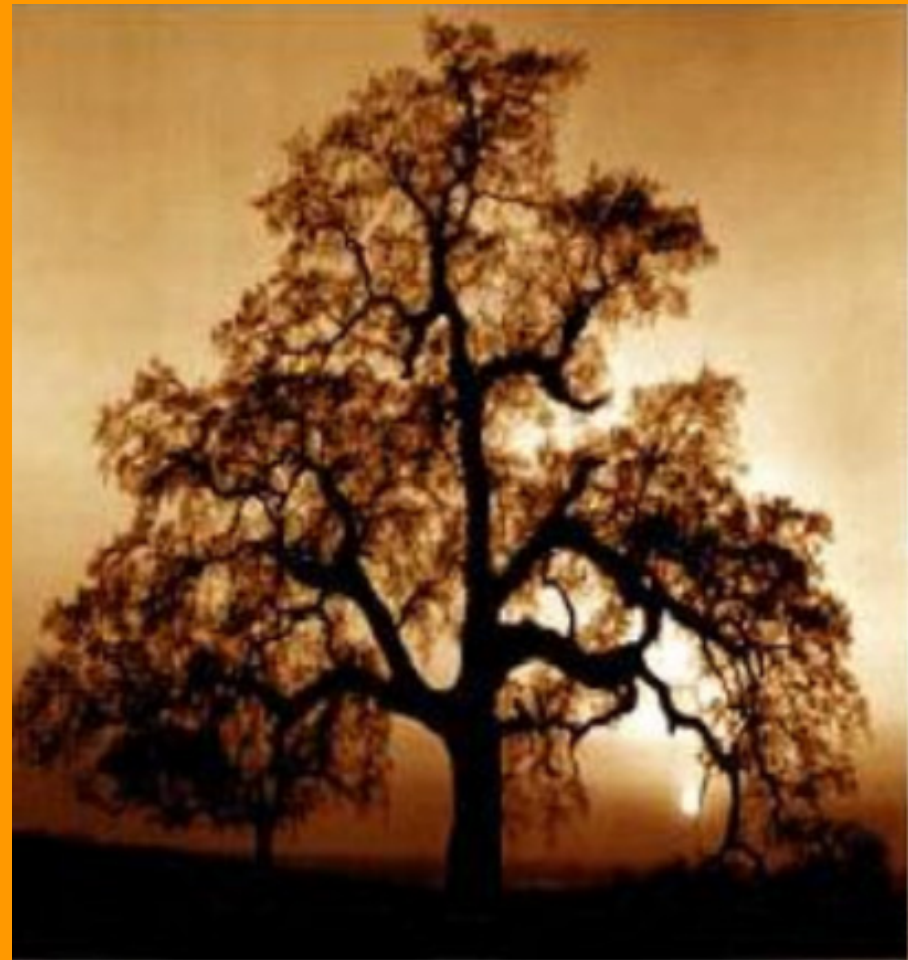
2006 ISA Prairie chapter conference:

*Assigning Monetary Value to Trees
Rationale and Methodology*

MUMBY'S TREE SERVICES LTD.

Verna Mumby
certified consulting arborist
Ph: 877.339.6951
Cell: 250.218.6951
www.treelady.ca

- Tree Appraisals
- Certified Tree Risk Assessor
- By-law Ordinance Preparation
- Tree Care Workshop Facilitator
- Expert Witness
- Tree Inventories & Preservation
- PHC Program Development
- Arboriculture Staff Training



© V. Mumby

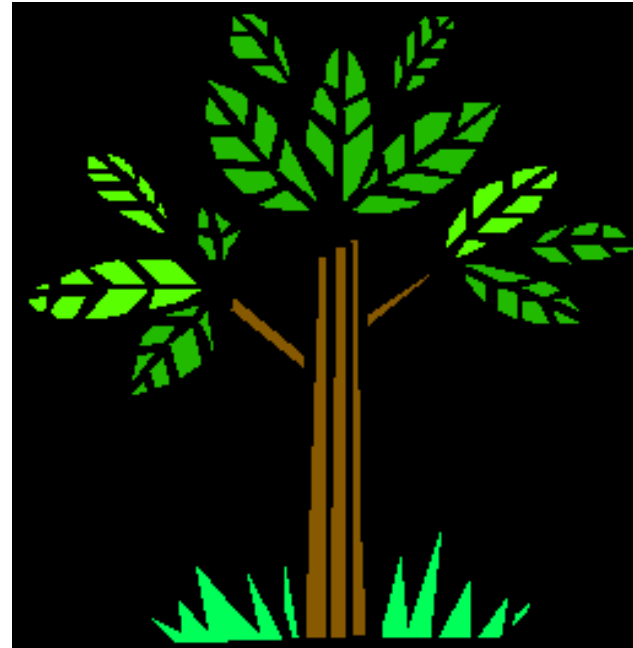
Brief History of Tree Appraisal

- Europeans began assessing and assigning a monetary value to their trees in the 1800's.
- The first record of a tree valuation was from University of Michigan in 1905. Trees were valued at \$5 plus compounded interest at 5% for 25 years.
- Between 1905 and 1938 Dr. Stone from U of Massachusetts and Dr. Felt from Barlett Tree Research Laboratories developed the first valuation format.

© V. Mumby

1938 formula

- Tree size @ 4.5 ft
- Tree location (%)
- Tree condition (%)
- Tree species (%)
- Residential land values (%)



© V. Mumby

In 1947 the formula was improved with the assistance of:

National Shade Tree Conference

National Arborist Association

In 1957 land values were removed from the formula and placed into the location rating.

Basic Value of \$5 / inch² or \$0.78/cm² was established.

© V. Mumby

In 1975 the 4th edition was written and titled

*'A Guide to the Professional Evaluation of Landscape trees, Specimen Sh
and Evergreens'*

- American Association of Nurserymen (AAN)
- American Society of Consulting Arborists (ASCA)
- International Society of Arboriculture (ISA)
- National Shade Tree Conference
- National Arborist Association (NAA)

© V. Mumby

1979 Council of Tree & Landscape Appraisers (CTLA)

- American Association of Nurserymen (AAN)
-
- American Society of Consulting Arborists (ASCA)
-
- International Society of Arboriculture (ISA)
-
- National Shade Tree Conference
-
- National Arborist Association (NAA)
-
- Association of Landscape Contractors of America (ALCA)



© V. Mumby

1979 - 1992

From 1979 to 1988, three more editions were published. 1992 the 8th edition was written and titled 'Guide for Plant Appraisal' and the workbook was developed.

*Basic Value had increased over
the years from \$5 to \$27 / in²
to
(.78 to \$4.19 /cm²)*

© V. Mumby

1995

- Field Report Guide was developed for the Trunk Formula method
- Cost of Cure Field Report was developed



© V. Mumby

1997

Council of Tree & Landscape Appraisers (CTLA)

- American Association of Nurserymen (AAN)
- American Society of Consulting Arborists (ASCA)
- International Society of Arboriculture (ISA)
- National Shade Tree Conference
- National Arborist Association (NAA)
- Association of Landscape Contractors of America (ALCA)

- Association of Consulting Foresters
- American Society of Landscape Architects

© V. Mumby

Guide for Plant Appraisal

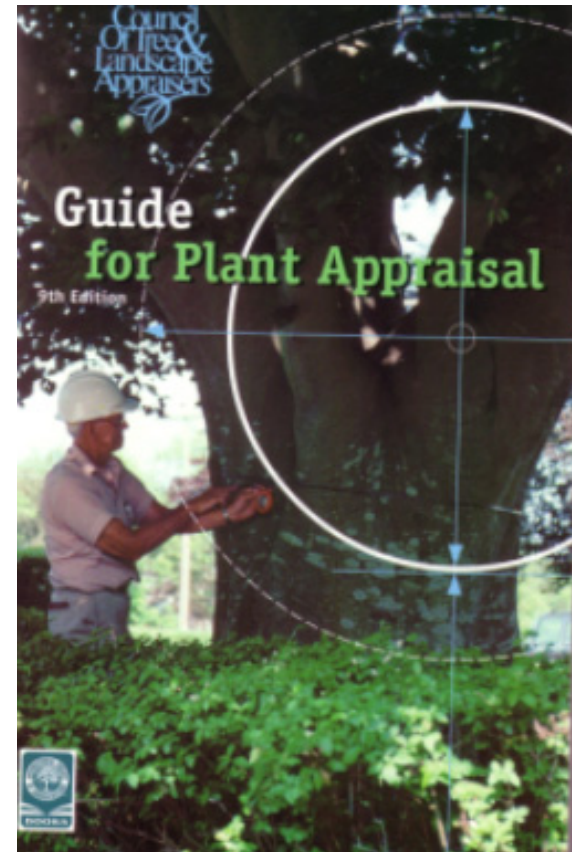
Since 1997 the Guide has expanded the methodology for:

- Cost of Cure
- Replacement Cost Method
- Trunk Formula Method
- Cost of Repair
- *The 9th edition (2000) has added new approaches to appraisal.*

Cost Approach

Income Approach

Market Approach



© V. Mumby

The Objectives of Evaluation for Trees

- **To provide a disciplined and objective way of examining a tree or woodland, point by point, and to assess its visual merit within its context. Such a method has wide application and affects management considerations (pruning, planting, etc.).**
- **To give arborists, surveyors and others a system for assessing the damage done when trees are accidentally or maliciously mutilated or destroyed.**
- **To give planners a means of including trees and woodlands in their calculations with the precision, objectivity and consistency that they apply to other aspects of landscape engineering.**

Methods of tree appraisal used by the Council of Tree & Landscape Appraisers & the International Society of Arboriculture

1. Replacement Cost

Determine the value of transplantable- size plants based on the cost of replacement of the **same** size and species plus a monetary settlement.

2. Trunk Formula

Utilize this method when **appraising a tree that is too large to replace**. The cost for the largest available tree is added to the difference in size between the replacement tree and the appraised tree. This is calculated a cost per unit of trunk area.

© V. Mumby

3. Compounded Replacement Cost

Determining the replacement cost and its maintenance costs plus the compounded interest for an estimated number of years until the tree reaches parity

4. Cost of Repair

Determining the costs to repair a tree. These costs could include cabling, bracing, pruning, fertilization, watering, aeration, wound treatment and plant health care.

© V. Mumby

5. Cost of Cure

- The treatment necessary to return the property to a reasonable level of its original condition where there has been damage to or loss of trees.
- **This method is divided into 3 phases :**
 1. Remove debris, stumps and clean the site.
 2. Replace the trees and restore the property to its pre-casualty condition.
 3. Calculate post restoration maintenance.

© V. Mumby

6. Crop value

This method is used for plants that yield a single harvest (nursery or Christmas trees) or annual crop such as fruit or nuts.

7. Timber/Cordwood value

Trees grown for lumber or firewood should be evaluated in terms of saleable wood.

In 2000 three new methods introduced by CTLA; Cost Approach, Income Approach and the Market Approach.

© V. Mumby

Saanich goes after tree-cutting culprit

Compensation to be sought over illegal felling on public parkland that improved ocean view

Matt Hartley

Times Colonist

Wednesday, August 23, 2006

Portions of newspaper article
Victoria Times Colonist

The report states that the five Douglas firs, three arbutus and a willow tree were on municipal property. Applying an international ranking standard used by the International Society of Arboriculture (ISA), parks staff determined the dollar value of each tree. Esthetics, health, location and contribution to the community are taken into account.

Nation said the municipality would seek the full ISA value for each tree as well as an undetermined amount of punitive damages. He would not release the names of those the municipality believes are responsible until he speaks with them directly.

© V. Mumby

Other methods available for valuation calculation:

In Alberta the provincial government published a booklet in 1979 called

“Determining replacement value of trees & shrubs in Alberta .”

Windbreak/ Shelterbelt evaluation

- This method establishes the value of newly planted shelterbelts plus the estimated value of the crop that is being protected.

Natural treed areas

- This method determines the value of the trees that have been destroyed or damaged. Accrued costs are included. Intrinsic or sentimental values are not considered.

© V. Mumby

Farm woodlots

- Trees grown for lumber or firewood should be evaluated in terms of saleable wood.

Municipal tree stands

- This method values the trees in accordance with the amount of cooling they provide, the species grown, condition of the trees, future value, maintenance costs, land rehabilitation costs and unit planting cost.

© V. Mumby

Replacement Cost Method (RCM)

- *The value of a plant considered to be of replaceable size should be determined by the Replacement Cost Method.*

It should be replaced with:

- *a plant of the same or a comparable species*
- *Of the same size*
- *Planted in the same place*

© V. Mumby

Steps in determining value using Replacement Cost Method (RCM)

Installed Plant Cost
x Species %
x Condition %
x Location %
+ Removal & Cleanup Costs
= APPRAISED VALUE

- ID Species & record species rating
- Record size (DBH)
- Record condition rating
- Record location rating

© V. Mumby

Alberta Tree Species Rating Guide

Official publication of the Prairie Chapter
International Society of Arboriculture

2003

© 2003 Prairie Chapter International Society of Arboriculture

This publication may not be copied, reproduced, or established in an electronic format without the written permission of the Prairie Chapter International Society of Arboriculture.

This Guide does not include the provinces of Saskatchewan nor Manitoba.

SPECIES RATING IN ALBERTA		Calgary	Red Deer	Edmonton
Range 40% - 100%		Region	Region	Region
Species	Common Name	%	%	%
Juniperus scopulorum cvs.	Rocky Mountain Juniper ✓	80	80	80
Larix decidua	European Larch ✓	80	80	
Larix gmelinii (dahurica)	Dahurian Larch ✓	80	80	
Larix laricina	Tamarack ✓	80	80	100
Larix lyallii	Alpine Larch ✓	80	80	100
Larix sibirica (russica)	Siberian Larch ✓	100	100	100
Maackia amurensis	Amur Maackia ✓	60	60	
Malus baccata cvs.	Siberian Crabapple cvs. ✓	80	80	80
Malus X adstringens cvs	Rosybloom Crabapples cvs. ✓	80	80	80
Phellodendron amurense	Amur Corktree ✓	80	80	
Phellodendron sachalinense	Sakhalin Corktree ✓	80	80	
Picea abies	Norway Spruce ✓	90	90	100
Picea engelmannii	Engelmann Spruce ✓	100	100	100
Picea glauca	White Spruce ✓	90	100	100
Picea glauca 'Densata'	Black Hills Spruce ✓	100	100	100
Picea mariana	Black Spruce ✓	60	60	100
Picea omorika	Serbian Spruce ✓	100	100	100
Picea pungens	Colorado Spruce ✓	100	100	100
Picea pungens cvs	Colorado Spruce cvs. ✓	100	100	100
Pinus albicaulis	Whitebark Pine ✓	100	100	100

Pacific Northwest Chapter ISA

Picea pungens 40% BC

60% Washington

80% Oregon



American Elm 100%



Siberian Elm 70%



Tree Costs

- Wholesale costs from three nurseries
- Average the cost

Installation Costs

- Transporting the tree
- Planting the tree
- Monitoring the tree during its establishment
- Guarantee
- Profit Margin



© V. Mumby

Steps in determining value using Replacement Cost Method (RCM)



- ID Species & record species rating
- **Record size (DBH)**
- Record condition rating
- Record location rating

© V. Mumby

DBH / DSH

diameter at breast height / diameter at standard height



© V. Mumby

Steps in determining value using RCM



- ID Species & record species rating
- Record size (DBH)
- Record condition rating
- Record location rating

© V. Mumby

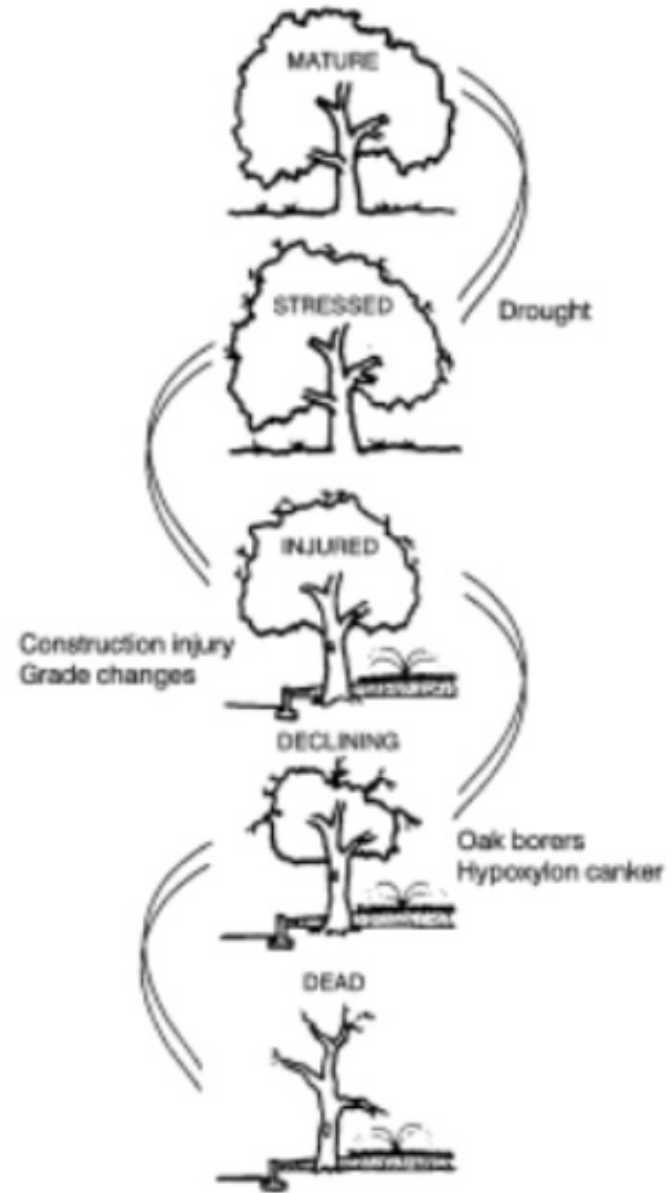
Tree Condition Rating

Evaluate and record the structure and health (condition) of the plant

If a tree's structural integrity poses a unreasonable risk (hazard), the tree will be a liability and its value will be a negative number.



© V. Mumby



© V. Mumby

Scoring system 0-5

roots →

trunk →

Scaffold branches →

Smaller branches & twigs →

Foliage &/or buds →

GUIDE FOR JUDGING THE CONDITION OF LANDSCAPE TREES

(Refer to Chapter 6 of the Guide for Plant Appraisal)

Note: A separate hazard tree evaluation may be required for trees in poor condition.

SCORING SYSTEM	
No problem(s)	5
No apparent problem(s)	4
Minor problem(s)	3
Major problem(s)	2
Extreme problem(s)	0 or 1

Factors*	TREE NUMBER									
	1	2	3	4	5	6	7	8	9	10
ROOTS	POINTS									
Root anchorage S										
Confused relative to top S										
Collar soundness S,H										
Mechanical injury S,H										
Girdling & knotted roots S,H										
Compaction or water-logged roots H										
Toxic gases & chemical symptoms H										
Presence of insects or diseases H										
TRUNK	POINTS									
Sound bark & wood, no cavities S,H										
Upright trunk (well tapered) S										
Mechanical or fire injury S,H										
Cracks—frost, etc. S,H										
Swollen or sunken areas S,H										
Presence of insects or disease H										
SCAFFOLD BRANCHES	POINTS									
Strong attachments S										
Small diameter than trunk										
Vertical branch distribution										
Free of included bark										
Free of decay and cavities S,H										
Well-proportioned, no severe heading back S,H										
Well-proportioned—upward, laterals along branches S										
Wound closure H										
Absence of dead wood or fire injury S,H										
Presence of decay, insects or diseases H										
SMALLER BRANCHES & TWIGS	POINTS									
Vigor or current shoots, compared to that of 3-5 previous years H										
Well-distributed through canopy H										
Normal appearance of buds—color, shape & size for species										
Presence of weak or dead twigs H										
Presence of insects or diseases H										
FOLIAGE AND/OR BUDS	POINTS									
Normal appearance—size & color H										
Nutrient deficiencies H										
Herbicide, chemical or pollutant injury symptoms H										
Withed or dead leaves H										
Presence of insect or diseases H										
TOTAL POINTS										
CONDITION %										

* Give one rating for each factor. The items listed under each factor are to be considered in arriving at a rating for that factor.
 S = item is primarily structural
 H = item is primarily health
 S,H = item may involve both structure and health

* A rating of "5" indicates no apparent problems. Inspectors having done a check-off in question and/or climbing the tree to inspect the trunks and major limbs.



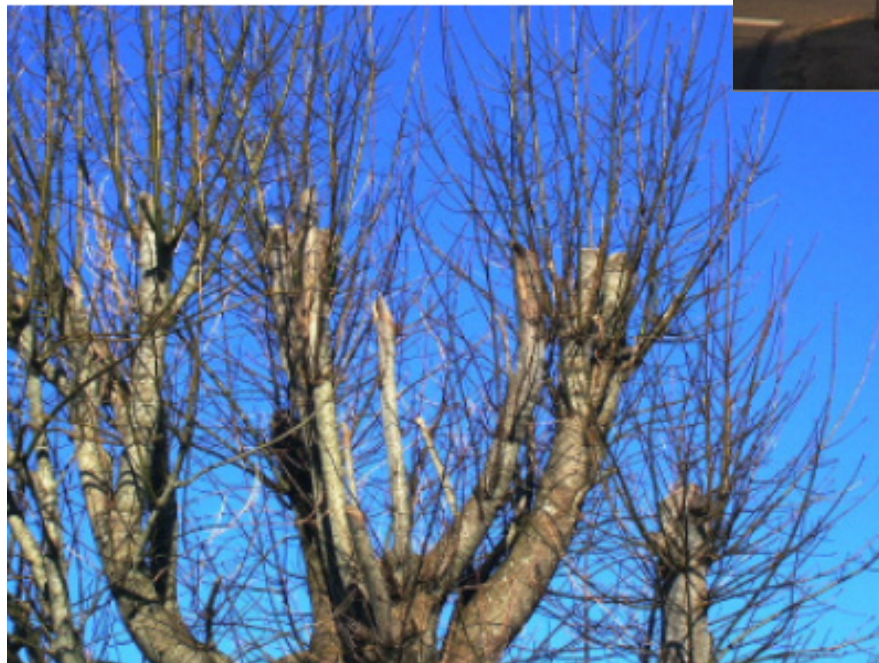
Note: Inspection may require climbing to assess canopy condition.

Condition % = total points divided by 25 possible points.

Evidence of previous care (pruning, cabling, bracing, etc.)
 ADDITIONAL NOTES

Tree Condition

Tree condition can be affected by mother nature.



Tree condition can be affected by people's management practises.

© V. Mumby

Steps in determining value using RCM



- ID Species & record species rating
- Record size (DBH)
- Record condition rating
- Record location rating

© V. Mumby

Location Rating

The Location Rating considers the

- Site of a property,
- the plant's functional and aesthetic Contribution and
- the Placement of the plant in the landscape.

© V. Mumby

SITE RATING

- The quality of development, the general appearance and the intensity of use of the area.
- The design and quality of structures and landscapes in the area, quality of the planting & maintenance of the site.

© V. Mumby

Site Rating

Large mature spruce
at large educational
centre.

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%



© V. Mumby

Site Ratings

**American elm located
under power lines near
house**

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%



CONTRIBUTION RATING

- The functional and aesthetic factors.
- These benefits may be affected by plant size, shape, branch structure, foliage density & distribution.

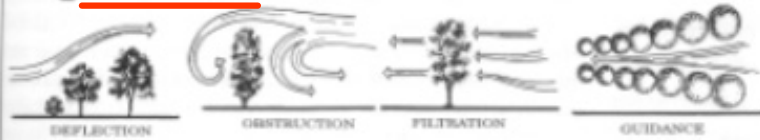
© V. Mumby

TABLE 4.9. Suggested functional (F) and aesthetic (A) contribution factors (rating range 10 to 100 percent).

Accent structures (A)	Frames view (A)
Aesthetic values (growth habit, bark texture/color, foliage color/texture, flower odor/ color/size, fruit prominence/duration, fruit size/use, fruit color/odor (A)	Historic, rare, or unusual specimen (A)
Air purification (F)	Light and glare shield (F)
Allergenic properties (pollen and derma toxins) (F)	Noise attenuation (F)
Cleanliness (flowers, fruit, leaves, twigs, duration of leaf fall) (A) (F)	Safety barrier (F)
Creates vistas (A)	Screens undesirable views (A)(F)
Defines space (A)	Sun radiation and reflection control (F)
Dirt and dust adsorption (F)	Traffic control (F)
Erosion control (F)(A)	Transpiration cooling (F)
	Unusually attractive plant features (A)
	Wildlife attraction (F)(A)
	Wind control (F)

D. CLIMATE CONTROL

1. WIND CONTROL



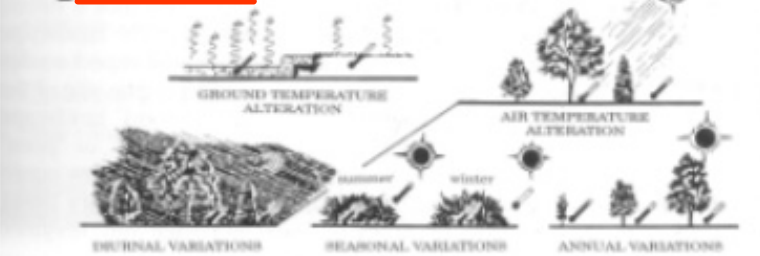
2. SUN CONTROL



3. PRECIPITATION & HUMIDITY



4. TEMPERATURE



5. TOPOCLIMATOLOGY & PLANT MATERIALS



A. ARCHITECTURAL



B. ENGINEERING



C. ESTHETIC



FIGURE 1.1. Functional uses of plant materials (Robinette 1968).

Contribution Ratings

Large poplars on golf course

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%

What are the functional and aesthetic factors?



© V. Mumby

Contribution Ratings

Medium sized
spruce located
at acreage

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%



© V. Mumby

PLACEMENT RATING

- How effective is the tree providing its functional and aesthetic attributes ?
(Remember table 4.9)
- One single tree has a greater value than several of the same type.
- Placement of a tree can have a favourable or unfavourable effect on its contribution.
(e.g. proximity to overhead wires, street lights)

© V. Mumby

Placement Ratings

American elms
located under
power lines
in small town

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%



© V. Mumby

Placement Ratings

Schubert
chokecherry
located in front
yard

- Very high 90 –100%
- High 80 –89%
- Average 70 –79%
- Low 60 –69%
- Very Low 10 –59%



© V. Mumby

Location Rating

The Location Rating considers the

- Site of a property,
- the plant's functional and aesthetic Contribution and
- the Placement of the plant in the landscape.

© V. Mumby

Replacement Cost method formula

Installed Plant Cost x Species % x Condition %
x Location % + Removal and Cleanup Costs
= APPRAISED VALUE

Example: 75 mm Green Ash run over by vehicle.

Three tree nursery wholesale prices averaged \$325.00

Installation Cost: \$1,000.00

Species Rating: 80%

Condition: 70%

Location: 75%

Removal Cost: \$250.00

© V. Mumby

Process in Appraisal

- ANALYSIS
- COLLECT THE DATA CORRECTLY
-
- APPLY THE METHODS OF APPRAISAL

Be Reasonable

© V. Munoy

Chemical trespass damage on willow



Cost of Cure method: calculation of \$105 per willow shrub.

1. Remove debris, stumps and clean the site.
2. Replace the trees and restore the property to its pre-casualty condition.
3. Calculate post restoration maintenance.

© V. Mumby

¼ mile length (26,400 square feet) of native plant material removed

\$205,000.00



Compounded Replacement Cost
Determining the replacement cost and its maintenance costs plus the compounded interest for an estimated number of years until the tree reaches parity.

© V. Mumby

**Mountain Ash:
Death due to chemical trespass.**

**Trunk formula
\$1,339.00**

The cost for the largest available tree is added to the difference in size between the replacement tree and the appraised tree.

This is calculated on a cost per unit of trunk area.



© V. Mumby

Thank you

MUMBY'S TREE SERVICES LTD.

Verna Mumby

certified consulting arborist

Phone: 877.339.6951

Cell: 250.218.6951

www.treelady.ca

- Tree Appraisals
- Certified Tree Risk Assessor
- By-law Ordinance Preparation
- Tree Care Workshop Facilitator
 - Expert Witness
- Tree Inventories & Preservation
 - PHC Program Development
 - Arboriculture Staff Training



ISA Certified Arborist
Member: American Society
of Consulting Arborists



Serving western Canada since 1991