DRAFT Guidelines for Evaluation of Trees

OPEN SPACE OPERATIONS - Last Update: March 2020

The City of Edmonton is committed to preserving Edmonton's urban forest for future generations and to ensure Edmonton remains an attractive, liveable city. The City of Edmonton Corporate Tree Management Policy states that the City has a responsibility to protect and preserve all trees on City land from destruction, loss or damage. The *Guidelines for Evaluation of Trees* provide details on monetary valuation used to calculate equitable compensation for loss of canopy. This recovered value is used to replace, preserve, and enhance the City's urban forest canopy, as outlined by the Corporate Tree Management and Tree Reserve Procedure.

The methodology outlined in these guidelines has been adapted from the *Guide for Plant Appraisal 9th Edition* (equitable compensation for natural treed areas is outlined in the *Natural Stand Valuation Guidelines* and is not part of these guidelines). This methodology will be updated to reflect the *Guide for Plant Appraisal 10th Edition* following formal review.

The intent of these guidelines is to provide procedural direction to City's urban foresters applying the Corporate Tree Management Policy. These Guidelines are available online so that the public can reference the methodology that the City follows.

Unit rate costs will be updated annually by the City's Urban Forestry team. As industry best management practices and corporate processes evolve, this methodology and guiding documents may be reviewed and updated by the City of Edmonton.

When Will the Guidelines for Evaluation of Trees Apply?

Equitable compensation may be pursued by the City from the civic or private entity causing partial loss (damage) or total loss of Boulevard and Open Space Tree(s), as per the Corporate Tree Management Policy.

How are the Guidelines for the Evaluation of Trees Applied?

A City of Edmonton urban forester (CoE urban forester) will assess the Boulevard and Open Space Tree(s) for monetary value. If the applicant is requesting tree removal as per the Live Tree Removal Guide or has damaged a City tree, the applicant is responsible for the partial or total loss of City tree(s). The CoE urban forester will work with the applicant to explain the tree valuation process and provide with costs associated with tree loss and/or damage.

If more detail or clarity is required to determine if an applicant or project is responsible for paying equitable compensation, call 311. The CoE urban forester will be in contact to outline the next steps, as required. Any time work is planned within 5 metres of a Boulevard and Open Space Tree, contact 311 to set up a consultation with a COE urban forester (see *Tree Preservation Guidelines).*

The CoE urban forester will follow these steps to assess the Boulevard and Open Space Tree(s) value:

1. Determine if equitable compensation should apply by ensuring that the Boulevard or Open Space Tree is on City of Edmonton land and not under any existing servicing agreement.

   The CoE urban forester has the final approval to determine when equitable compensation for Boulevard and Open Space Trees will be sought.

2. When City tree(s) are eligible for equitable compensation, the CoE urban forester will assess the Boulevard and Open Space Trees for monetary value using the trunk formula method (this procedure determines the monetary value to be recovered for a complete loss of Boulevard and Open Space Tree(s):

Monetary Value	=	Cross Sectional Area	x	Basic Unit Value	x	Species Rating %	x	Condition %

   a. Determine the diameter at breast height (DBH) of the tree in cm. DBH is the diameter of the tree measured at 1.2 metres above the ground.

   b. Determine the cross-sectional area of the tree at 1.2 metres above the ground. Cross sectional area in $cm^2 = (DBH / 2)^2) \times \pi$

   c. The current City of Edmonton basic unit value of all Boulevard and Open Space Tree(s) is $11.01 per square centimetre at 1.2 metres and is adjusted annually for inflation.
      The tree's base value is determined by multiplying the basic unit value by the cross sectional area from 3b.

   d. Determine the **species** rating percentage for the tree species. Each tree species has an associated percentage that is determined from the Regional Tree Species Rating Class and Percentage (Table 1, Appendix).

Note: This is a working document and the guidelines are subject to change.

e. The **condition** of the tree is determined by a CoE urban forester by considering the various components of health, structure and form as outlined by the ISA guide in the 9th edition (Table 2, Appendix).
    i. *Note:* a **location factor** may be considered during the tree's condition calculation. Location can influence the condition calculation up to a plus or minus 10 percent (a 10 percent premium or a 10 percent penalty). Location rating can be applied to the condition factor if the CoE urban forester determines if it is required. The location rating considers the **site** of the property, the plant's functional and aesthetic **contributions**, and the **placement** of the plant in the landscape.

f. Determine the total monetary value by multiplying the values in steps 3b to 3e together.

Note: In the event that the calculated monetary value is less than the City's replacement cost of a tree, the replacement cost will be used.

3. For calculation of partial loss of a tree, the CoE urban forester will assess the Boulevard and Open Space Tree(s) for loss of associated monetary value using the following methodology:

    a. Determine the **condition of the tree prior to damage** (assumption of pre-condition) as described in step 3.

    b. Determine the **percentage of tree crown that is above the damage**. For example, if the damage occurred at the base of the tree trunk the value would be 100 percent.

    c. Determine the percentage of radial damage.
        i. Measure the circumference of the tree (centimetres) at the site of the wound.
        ii. Measure the width of the wound (centimeters) at the widest point. If there is more than one wound, add the width of the wounds together to get a total width effected.
        iii. Divide the width of the wound by the circumference of the tree at the height of the wound.

    d. Determine the **percentage of the tree that is unaffected by the damage** using the formula:
        i. 1 - (100% x Circumference of Tree at Wound Site)

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e. Determine the **affected portion of the tree condition after damage**. The formula to determine this value is: Condition before injury % - (condition before injury % x % devaluation).
   i. Determine the percent devaluation of the tree. The formula used to calculate percent devaluation is: 1.1 x % Radial Damage - 6%

f. Use the following calculation to determine the **post-damage condition of the tree** using the formula (rounded to the nearest 10%):

$$\left(\text{\% of tree unaffected by the damage (step 4.d.)} \times \text{Tree condition before damage (step 4.a.)}\right) + \left(\text{Tree crown above the damage (step 4.b.)} \times \text{Affected portion of tree condition after damage (step 4.e.)}\right)$$

g. Determine the current tree's post damage monetary value using the formula:
   i.

$$(\text{DBH (step 3a)} / 2)^2 \times (\pi) \times \text{Species Class \% (step 3c)} \times \text{Post damage tree condition (step 4f)} \times \text{Basic unit value \$ per cm}^2 \text{ value \$11.01}$$

h. Determine the partial loss value:
   i. Total monetary value (step 4a) - monetary value of tree post damage (step 4g)

4. CoE urban forester will pursue costs (as per the Corporate Tree Management Policy and Procedures) from the civic or private entity responsible for partial or total loss of the trees.
   a. The CoE urban forester will work with the civic or private entity to provide additional details and to collect information required to setup invoicing.
   b. Administrative costs for CoE Urban Forestry personnel time will be recovered.
   c. Costs associated with any required tree maintenance as a result of the damage or loss will be recovered.

Definitions

All definitions in the Corporate Tree Management and Tree Reserve Procedure apply to this guideline.

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References

Bernatzky, A. 1978. *Tree Ecology and Preservation.* Elsevier Scientific Publishing Company.

Council of Tree and Landscape Appraisers. 2000. *Guide for Plant Appraisal 9th Edition.* International Society of Arboriculture.

Council of Tree and Landscape Appraisers. 2019. *Guide for Plant Appraisal 10th Edition.* International Society of Arboriculture

Grainger, G., *Determining Replacement Value of Trees and Shrubs in Alberta*. Alberta Tree Nursery and Horticultural Centre.

Prairie Chapter International Society of Arboriculture. 2003. *Alberta Tree Species Rating Guide.* http://www.isaprairie.com/docs/Alberta-Tree-Species-Rating-Guide.pdf

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APPENDICES

Table 1: Tree Species Rating Classes and Percentages for the City of Edmonton

BOTANICAL NAME	COMMON NAME
Class 1 – 110% (Special Class)	
Picea pungens 'Koster'	Kosters Blue Spruce
Picea spp. (Specialties)	All grafted types of Spruce
Pinus spp. (Specialties)	All grafted types of Pines
Quercus spp.	Oak species
Class 2 – 100%	
Abies spp.	All Firs
Aesculus glabra	Ohio buckeye
Aesculus hippocastanum	Chestnut/Horse Chestnut
Elaeagnus angustifolia	Russian olive
Betula pendula gracilis	Weeping birch
Fraxinus selections	Patmore/Summit/Fallgold/Manchurian
Larix sibirica	Siberian Larch
Larix spp.	Larch Species
Picea spp.	All types of Spruce
Pinus spp.	All types of Pines
Populus tremula 'Erecta'	Swedish Columnar Aspen
Pseudotsuga menziesii	Douglas fir
Syringa reticulata	Japanese lilac tree
Tilia americana	American basswood
Tilia cordata	Little Linden Leaf, Lime (Hybrids)
Ulmus americana 'Brandon'	American elm "Brandon"

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Ulmus americana	American elm
Class 3 – 80%	
Acer ginnala	Amur maple
Acer saccharinum	Silver maple
Betula spp.	All other types of Birch
Crataegus spp.	Hawthorns
Fraxinus spp.	Common Green Ash & Black Ash
Juniperus scopulorum	Rocky Mountain Juniper & Cultivars
Malus baccata	Siberian flowering crab
Malus “Rosybloom Hybrids”	Rosybloom Crabs
Malus spp. Hybrids	Hybrid Apple/Crab
Populus x canescens ‘Tower’	Tower Poplar
Populus x jackii ‘Northwest’	Northwest poplar - cultivar
Prunus padus commutata	Mayday tree
Prunus spp.	Plums and Cherries
Prunus spp. Hybrids	Hybrid Cherries & plums
Pyrus ussuriensis	Ussurian Pear
Sorbus spp.	Mountain Ash Species
Class 4 – 60%	
Acer negundo (upright var. or form)	Manitoba maple (specialty upright forms)
Alnus spp.	Alder
Caragana arborescens	Standard Pea tree
Caragana arborescens vars.	Standard Pea tree – forms
Populus Hybrids	Hybrid Poplars
Salix acutifolia	Sharp leaf willow
Salix pentandra	Laurel leaved willow

Ulmus pumila	Siberian/Manchurian elm
Class 5 – 40%	
Acer negundo	Manitoba maple
Populus X ‘Brooks #6’	Brooks #6 Poplar
Populus X ‘Griffin’	Griffin Poplar (Non-fluff)
Populus spp.	Native poplars
Salix spp.	Native Willows

*Values adapted from *Alberta Tree Species Rating Guide*.

Table 2: Meaning (description) of final tree condition

Percent	Description
100%	Perfect tree or specimen quality
90%	Excellent tree
80%	Very Good tree
70%	Above Average tree
60%	Good or Average tree
50%	Below Average tree
40%	Fair tree
30%	Poor tree
20%	Very poor tree

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