Guidelines for Evaluation of Trees

OPEN SPACE OPERATIONS - Last Update: October 2019

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 C456B 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 of ornamental trees for equitable compensation. Recovered value is used to replace the City's urban forest canopy in the future and other initiatives, as outlined by the Tree Reserve.

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* in 2020.

The intent of these guidelines is to provide procedural direction to City's urban foresters applying the Corporate Tree Management Policy. The Guidelines are publicly available so that industry and citizens can reference the methodology 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 on an annual basis by the City of Edmonton.

When Will the Guidelines for Evaluation of Trees Apply?

Equitable compensation will be recovered from the civic or private entity causing partial loss (damage) or total loss of ornamental City tree(s), as per the Corporate Tree Policy. Examples of situations where equitable compensation will be sought for damage or loss of ornamental City trees (not limited to) are:

- As a result of not complying with Tree Preservation Guidelines or City bylaws or policies.
- As a result of Live tree removal requests (see *Tree Preservation Guidelines* and *Live Tree Removal Guide* for additional details).
- As a result of vehicle accidents.

How are the Guidelines for the Evaluation of Trees Applied?

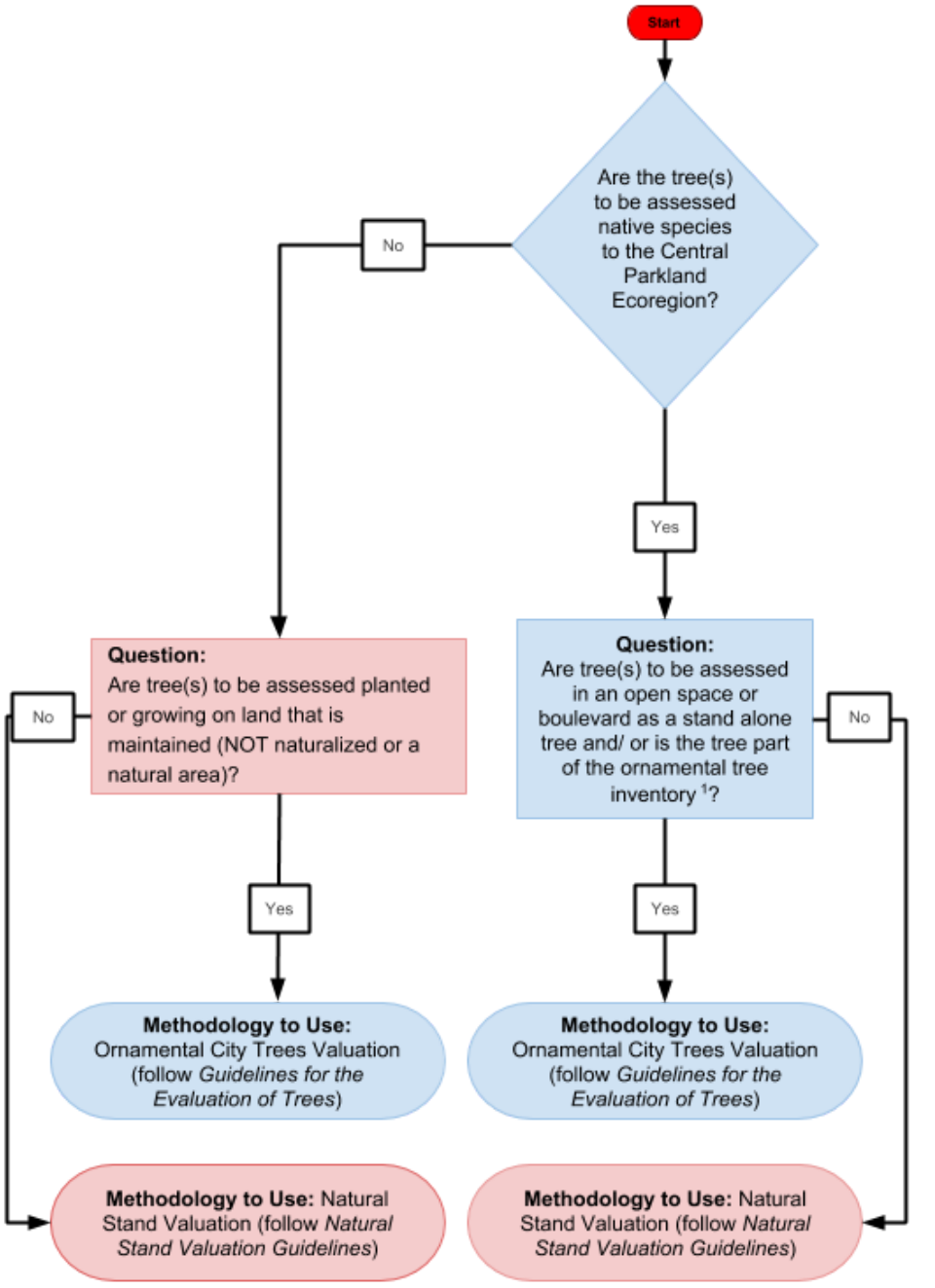
A City of Edmonton urban forester (CoE urban forester) will assess the ornamental City tree(s) for monetary value. If you are requesting tree removal as per the Live Tree Removal Guide or have damaged a City tree you are responsible for the partial or total loss of City tree(s). The CoE urban forester will work with you to explain the tree valuation process.

Need more details or clarity to determine if you or your project are responsible for paying equitable compensation? Call 311. The CoE urban forester will contact you and provide you with next steps as needed. Any time work is planned within 5 metres of a city 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 ornamental City tree(s) value:

1. Determine which type of equitable compensation methodology is applicable:

Equitable Compensation Methodology Determination

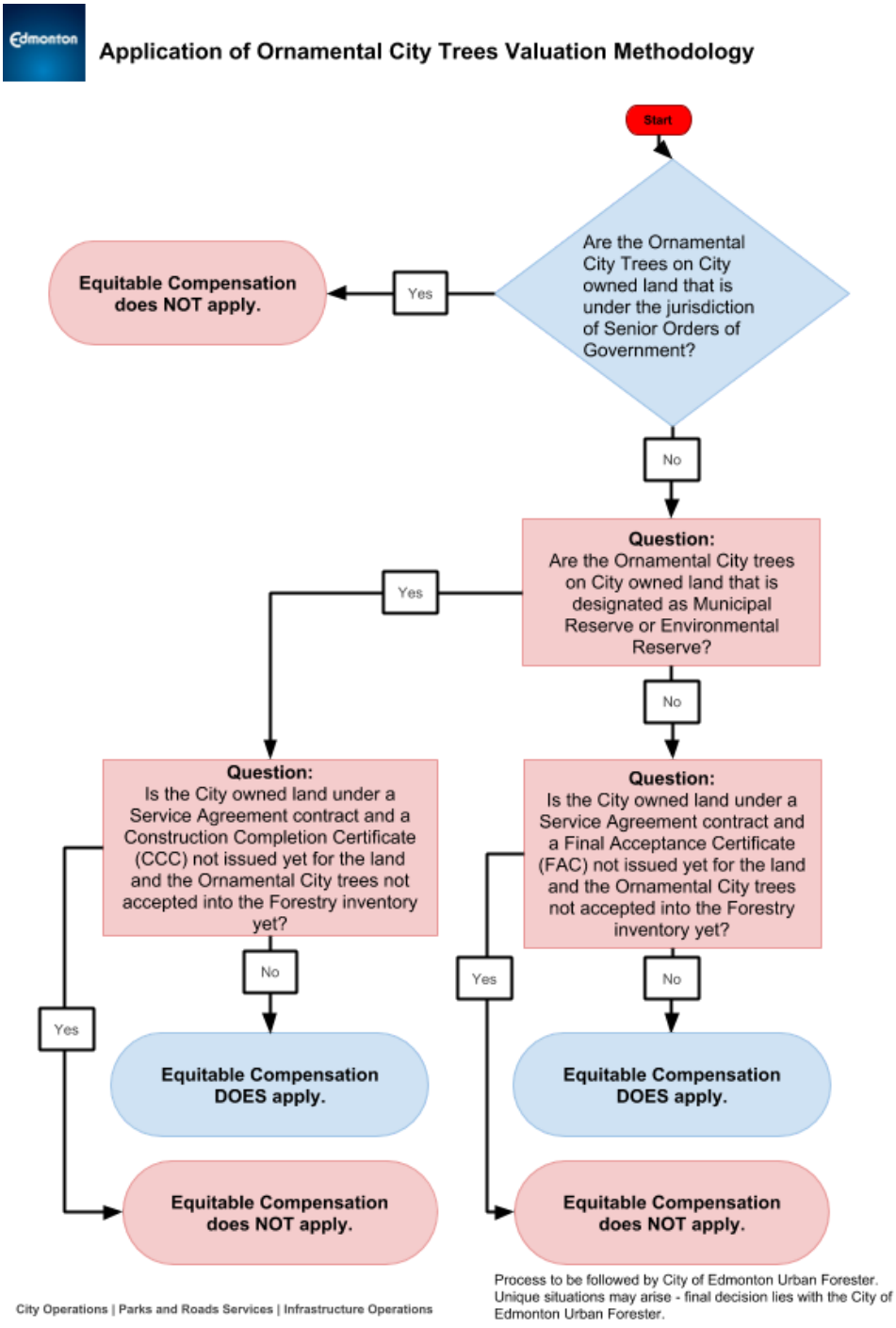


[1]To view the CoE Ornamental City Tree inventory visit: https://www.opentreemap.org/edmonton/map/. Note: this website may not contain all updated details-call 311 to verify any City tree inventory).

City Operations | Parks and Roads Services | Infrastructure Operations

Process to be followed by City of Edmonton Urban Forester. Unique situations may arise - final decision on methodology to be used lies with the City of Edmonton Urban Forester.

2. Determine if equitable compensation should apply (based on the scenario):



Exceptions to the procedure may apply. The CoE urban forester has the final approval to determine when equitable compensation for ornamental City trees will be sought.

3. When City tree(s) are eligible for equitable compensation, the CoE urban forester will assess the ornamental City trees for monetary value using the trunk formula (this procedure determines the monetary value to be recovered for a complete loss of ornamental City tree(s)):

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

   a. Determine the diameter at breast height (DBH) of the tree. DBH is the diameter of the tree measured at 1.2 metres above the ground or 4 feet from the ground.

   b. Determine the cross-sectional area of the tree at 1.2 metres (4 feet) above the ground.
   Cross sectional area = $(DBH / 2)^2) \times \pi$

   c. Determine the species rating percentage for the tree species. Each tree species has a value that is determined from the Tree Species Rating Class and Percentage (Table 1, Appendix).

   d. The current City of Edmonton basic unit value of all ornamental City trees is $11.01 per square centimetre at 1.2 metres and is adjusted annually for inflation. The basic value is determined by multiplying the basic unit value by the cross sectional area from 3b.

   e. Determine the condition of the tree. The CoE urban forester will assess the tree condition based on a number of factors to determine a condition percentage (Table 2, Appendix).

   f. Determine if a location factor should 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 feels 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.

   g. Determine the total monetary value by multiplying the values in steps 3a to 3f together (include a plus or minus location factor in the condition percentage value if applicable as explained in step 3f).

   h. Determine the equitable compensation value to be recovered for the complete loss of the tree. If the value from step 3g is greater than or equal to the current

City of Edmonton replacement rate (replanting rate and establishment for a replacement tree), the equitable compensation value will be the value from step 3g. If the value from step 3g is less than or equal to the current City of Edmonton replanting rate for a replacement tree, the equitable compensation value will be the current City of Edmonton replanting rate.

4. If in Step 2 the CoE urban forester determined the ornamental City trees were eligible for equitable compensation due to partial loss, the CoE urban forester will assess the ornamental City trees for monetary value:

   Tree monetary value for partial loss is determined using the formula:

   Total monetary value of tree pre damage (retrospective) - monetary value of tree post damage (current)

   a. Determine the total monetary value of the tree prior to damage. Follow all the methodology in steps 3a to 3g, with exception to condition. The tree condition should be determined as pre-damage condition, not the condition at the time of assessment.

   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. Measure the circumference of the tree (centimetres) at the site of the wound.

   d. Measure the width of the wound (centimeters) at the widest point.

   e. Determine the percentage of radial damage. Divide the width of the wound value (step 4d) by the circumference of the tree at the wound (step 4c).

   f. Determine the percent devaluation of the tree. The formula used to calculate percent devaluation is: 1.1 x % Radial Damage - 6%.

   g. Determine the condition of the affected portion (the damaged area of tree) after damage. The formula to determine this value is:
   Condition before injury % - (condition before injury % x % devaluation).

   h. Determine the percentage of the tree that is unaffected by the damage using the formula:
   1 - (100% x the Circumference of the tree at the damage wound from step 4c)

i. Determine the current condition of the tree using the formula (rounded to the nearest 10%):

$$\left(\begin{array}{l}\text{\% of tree}\\ \text{unaffected}\\ \text{by the}\\ \text{damage}\\ \text{(step 4h)}\end{array}\ \times\ \begin{array}{l}\text{Tree}\\ \text{condition}\\ \text{before}\\ \text{damage}\\ \text{(step 4a)}\end{array}\right) + \left(\begin{array}{l}\text{Tree}\\ \text{crown}\\ \text{above}\\ \text{the}\\ \text{damage}\\ \text{(step 4b)}\end{array}\ \times\ \begin{array}{l}\text{Affected portion}\\ \text{of tree}\\ \text{condition after}\\ \text{damage (step}\\ \text{4g)}\end{array}\right)$$

j. Determine the current tree monetary value post damage using the formula:

$$(\text{DBH (step 3a)} / 2)^2 \times (\pi) \times \begin{array}{l}\text{Species Class}\\ \text{\% (step 3c)}\end{array} \times \begin{array}{l}\text{Current}\\ \text{tree}\\ \text{condition}\\ \text{(step 4i)}\end{array} \times \begin{array}{l}\text{Basic unit value}\\ \text{\$ per cm}^2\text{ value}\\ \text{\$11.01}\end{array}$$

k. Determine the partial loss value:
Total monetary value (step 4a) - monetary value of tree post damage (step 4j)

5. CoE urban forester will recover costs (as per the Corporate Tree Policy) from the civic or private entity responsible for the tree partial loss or total loss and additional maintenance required:
    a. The CoE urban forester will work with the civic or private entity and will provide additional details on the information required to set up invoicing at time of project initiation (i.e. billing advice form or project request form). If the damages are as a result of a vehicle accident an invoice may be sent from City of Edmonton Risk Management directly to the entity who caused the damage.
    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.
    d. The equitable compensation value of tree(s) that were assessed as partial or complete loss will be recovered. This is the tree value determined in either step 3h or step 4k.

Definitions:

All definitions in the Corporate Tree Management Policy apply to this guideline. The definitions listed below also apply to this Guideline.

Senior Orders of Government refers to government level within the Canadian system above the municipality. The senior orders of government to the City of Edmonton would be provincial and federal governments.

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.

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

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”

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: Tree’s 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