

Natural Stand Valuation Guidelines

OPEN SPACE OPERATIONS - Last Update: March 2023

Edmonton

The City of Edmonton (CoE) is committed to preserving Edmonton's urban forest for future generations, as it provides many environmental, ecological, economic, and social benefits. With careful stewardship, these benefits can continue for generations, appreciating over time. Proper management and education is crucial for continuous growth and improvement of the urban forest.

[The Corporate Tree Management Policy C456C](#) states that the CoE has a responsibility to protect and preserve all trees on City land from destruction, loss or damage. These guidelines provide detail on monetary valuation used to calculate equitable compensation for loss of natural stand canopy due to damage or removal. This recovered value is used to replace, preserve, and enhance the City's urban forest canopy, as outlined by the [Corporate Tree Management Policy C456C and Tree Reserve Procedure](#).¹ Equitable compensation for trees in boulevards and open spaces is outlined in the *City of Edmonton Guidelines for Evaluation of Trees* and is not part of these guidelines.

When will the Natural Stand Valuation Guidelines apply?

Equitable Compensation may be pursued by the City from the civic or private entity causing partial loss (damage) or total loss of City tree(s) within a Natural Stand, as defined in the Corporate Tree Management Policy.

How are the Natural Stand Valuation Guidelines applied?

A CoE Natural Areas urban forester (CoE urban forester) will assess the Natural Stand for monetary value. If you are requesting tree removal within a Natural Stand or are responsible for the loss of City tree(s) in a Natural Stand, the CoE urban forester will work with you and explain how the value will be determined and billed.

If you are unsure of who is responsible for paying equitable compensation for damage or loss of a City tree(s), please consult with a CoE urban forester *by calling 311*.

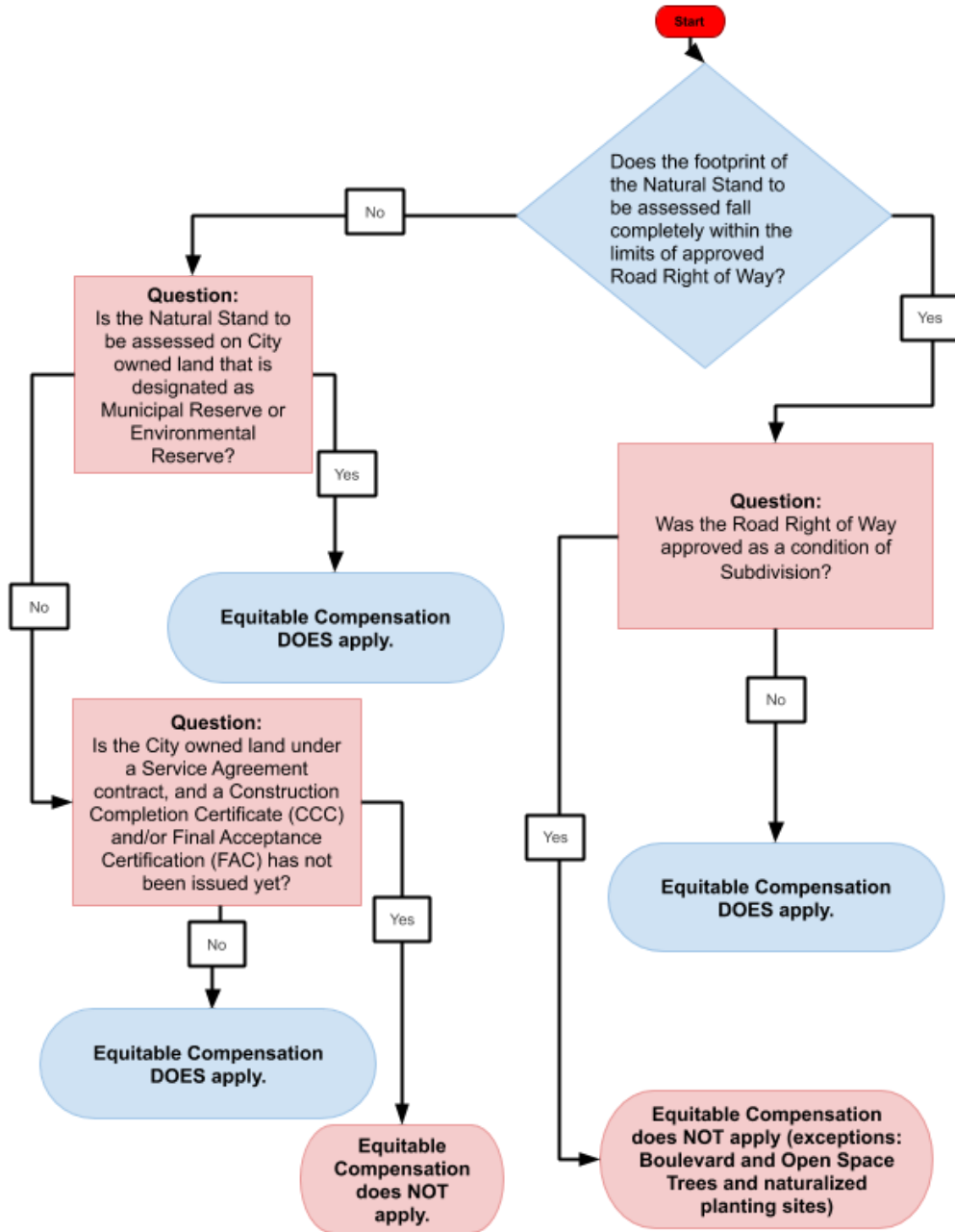
The CoE urban forester will follow these steps to assess the Natural Stand value:

¹ Unit rate costs will be updated annually. CoE will review and update the methodologies as well as guiding documents on an ongoing basis to match the evolving industry standards.

1. Determine if equitable compensation should apply:



Application of Natural Stand Valuation Methodology



City Operations | Parks and Roads Services | Infrastructure Operations

Process to be followed by City of Edmonton urban forester. Unique situations may arise - final decision lies with the City of Edmonton urban forester.

Note: Unique situations may not meet the requirements of this decision tree. The City of Edmonton will make final decisions on when and how equitable compensation is sought.

2. Natural Stand valuation for Total Loss (CoE urban forester to complete assessment):
Determine equitable compensation value: $V = (Pt + Mc) * Sv_f$

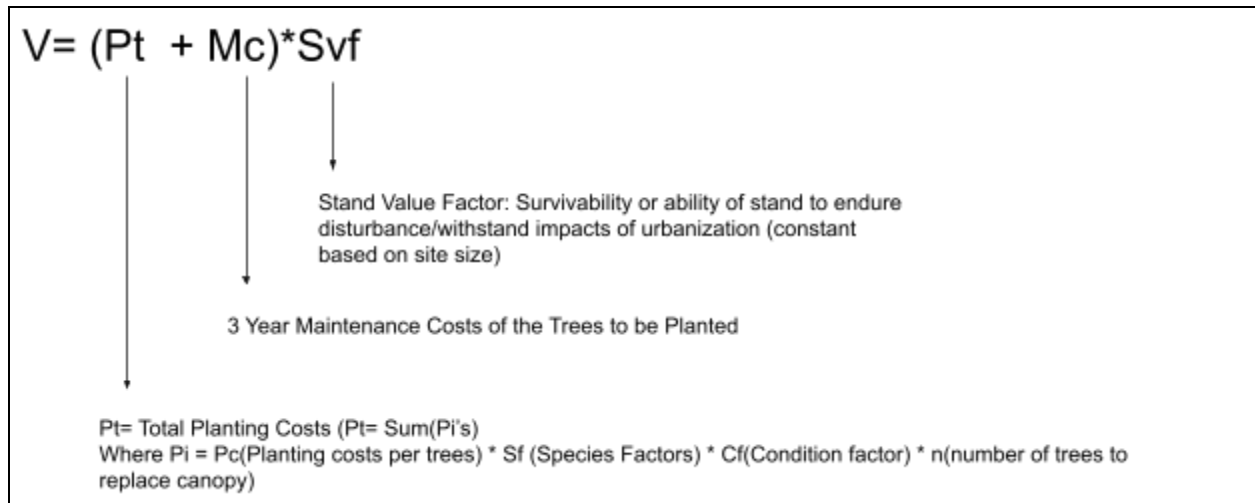


Figure 1: Formula for determining equitable compensation of Natural Stand.

A. Determine total planting costs (Pt)

a. $Pt = \text{Sum}(Pi's)$

Where $Pi = Pc(\text{Planting costs per trees}) * Sf (\text{Species Factors}) * Cf(\text{Condition factor}) * n(\text{number of trees to replace canopy})$

- b. Pi must be calculated for each species in the assessment.
- c. Pc is a unit rate based on the previous years' operational unit rates for planting costs per tree or shrub
- d. Sf is a constant percentage value used as a species rating for each species being assessed (Table 1, Appendix 1).
- e. Cf , the condition factor, assessment value determined by the Forester based on the matrix in Table 2, Appendix 1.
- f. n is the number of trees required to replace the canopy:
Total area being assessed x %canopy cover of the species / canopy area of coverage for the given species
- Total area being assessed to be predetermined
 - Canopy cover (%) of stand: calculate all visible woody species from the bird's eye view perspective (total canopy cover to equal 100%, canopy cover(s) for individual species to be rounded to the nearest 5%).
 - Canopy area of coverage: each species has a theoretical canopy diameter and canopy area of coverage (Table 3, Appendix 1).
 - Site should be staked out in the field by the entity responsible for the loss in tree canopy/damages prior to CoE urban forester's site visit.

- B. Determine the 3 year establishment costs of the trees to be planted.
 $Mc = (\text{establishment costs} + 10\% \text{ mortality of the costs of planting a tree}) \times n$
Where: Establishment costs for 3 years = watering costs for 3 years based on the previous years' rates, in addition to 10% of Pc value for mortality.
n = number of trees to be planted as outlined in 2Af.
- C. Determine the stand value factor (Svf).
- Accounts for the survivability or the ability of the tree stand to endure disturbance caused by both external and internal factors. It is a measure of the ability of the natural stand to withstand the impacts of urbanization.
 - Value increases with the size of the site.
 - Constant values included in Table 4, Appendix 1.
- D. Determine equitable compensation $V = (Pt + Mc) \times Svf$

Note: Partial Loss will follow the *City of Edmonton Guidelines for Evaluation of Trees* methodology.

CoE urban forester will then recover costs from the civic or private entity responsible for the tree loss. The urban forester you are working with will provide additional details on information required to set up payments at time of project initiation. Administrative costs for CoE urban forestry personnel time will be recovered as well.

Definitions:

All definitions in the [Corporate Tree Management and Tree Reserve Procedure](#) apply to this guideline.

References:

Kupsch, T., France, K., Loonen, H., Willoughby, M., McNeil, R. 2013. *Range Plant Communities and Range Health Assessment Guidelines for the Central Parkland Subregion of Alberta*. Government of Alberta.

Davies, M., *The Tree Evaluation Method for Natural Stands in Our Urban Environment*, 4th edition.

APPENDIX

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

BOTANICAL OR FORM NAME	COMMON NAME
Class 1 – 100%	
Betula spp.	Native Birch
Picea spp.	Native Spruce
Pinus spp.	Native Pine
Larix spp.	Native Larch
Populus spp.	Native Poplar
Salix spp.	Native Willow
Alnus spp.	Native Alder
Shrubs	All types of Native Shrubs
Class 2 - 80%	
Prunus spp.	Choke/Pincherry
Picea spp.	Non Native Spruce
Pinus spp.	Non Native Pine
Larix spp.	Non Native Larch
Populus spp.	Non Native Poplar
Pseudotsuga menziesii	Douglas Fir
Class 3 - 40%	
Caragana arborescens	Standard Pea Tree
Acer negundo	Manitoba Maple
Sorbus spp.	Mountain Ash Species
Malus spp. Hybrids	Hybrid Apple/Crab

Fraxinus spp.	Common Green Ash & Black Ash
Crataegus spp.	Hawthorn Species
Ulmus americana	American Elm
Syringa reticulata	Japanese Lilac Tree
Tilia cordata	Little Linden Leaf, Lime (Hybrids)
Non Native Shrubs	All Types of Non Native Shrubs

*Values adapted from *The Tree Evaluation Method for Natural Stands in Our Urban Environment and Central Parkland Range Plant Community Guide* based on nativeness of the species.

Table 2: Tree/Shrub Condition Rating

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

Table 3: Canopy Area per Tree/Shrub for Species Commonly Found in Edmonton

Species	Canopy Area / Tree (m ²)
Northwest Poplar	176
American Elm	30
Balsam Poplar	82

Manitoba Maple	28
Snowberry	4
Trembling Aspen	18
White Birch	15
Silver Buffaloberry	5
Common Caragana	6
Saskatoon / Cotoneaster / Alder	5
Dogwood / Honeysuckle	4
Scots Pine	10
White Spruce	18
Colorado Spruce	18
Larch	10
Lodgepole Pine	10
Jack Pine	10
Silverleaf Willow	30
Chokecherry	7
Mountain Ash	17
Currant / Gooseberry / Raspberry	3
Seabuckthorn	7
Roses	3

* Adapted from Table I in *The Tree Evaluation Method for Natural Stands in Our Urban Environment* and on site observations. Canopy Area per Tree recorded in this table as median value in range.

**Additional species have been added to this table that are frequently observed in Edmonton's natural areas (canopy area adapted from original table using a value similar to listed species with a similar growing habit).

***Where additional species are observed in the natural area being assessed, this table will be used as a guide to determine the canopy area per tree based on a similar species and its growth habit and size characteristics.

Table 4: Stand Value Factors

Stand Value Factors	Area of the Site being Assessed
1.35	(> 5000m ²)
1.25	(3000m ² to 5000m ²)
1.2	(1500m ² to 3000m ²)
1.15	(500m ² to 1500m ²)
1.05	(< 500m ²)

Adapted from *The Tree Evaluation Method for Natural Stands in Our Urban Environment*.