Guidelines for Evaluation of Trees

BOULEVARD AND OPEN SPACE TREES, OPEN SPACE OPERATIONS

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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. The *Guidelines for Evaluation of Trees* provides detail on monetary valuation used to calculate equitable compensation for loss of tree 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]

When Will the Guidelines for Evaluation of Trees Apply?

The City may pursue equitable compensation for the loss of canopy from the civic or private entity that causes partial loss (damage) or total loss (removal) of Boulevard and Open Space Tree(s) as defined in the Corporate Tree Management Policy.

How are the Guidelines for the Evaluation of Trees Applied?

A CoE urban forester will evaluate the Boulevard and Open Space Tree(s) for monetary value. If the applicant is requesting tree removal as per the Live Tree Removal Guide, approved development or has damaged a City tree and as a result the tree requires removal, the applicant is responsible for the total loss of City tree(s). The CoE urban forester will work with the applicant and provide costs associated with tree loss or damage. The CoE urban forester will facilitate the operational work required to remove the tree.

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

The CoE urban forester will follow these steps:

[1] Unit rate costs will be updated annually by the City's Urban Forestry team. CoE will review and update the methodologies as well as guiding documents on an ongoing basis to match the evolving industry standards.

Note: The methodology outlined in these guidelines has been adapted from the Guide for Plant Appraisal 10th Edition. This is a working document and the guidelines are subject to change.

1. Determine if equitable compensation should be applied. This will be done by ensuring that the tree(s) is on City owned land, not under any existing servicing agreement and live tree removal guidelines are followed, if applicable. Further, CoE will evaluate the damage and determine if it is a total loss (step 2) or a partial loss (step 3).

2. Assess the monetary value for total loss of the tree(s) 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):

Total Loss:

- Trees will be evaluated as a total loss if the health, structure and/or form is severely impacted.
- CoE has determined that a tree is a total loss if its condition is evaluated at 15% or less.

Monetary Value = Unit Rate Tree Cost x Basic Reproduction Cost x Depreciation Reproduction cost + Replacement Tree Cost

Where,

- *Unit Tree Cost 2022 =$9.87 / cm^2,*
  - *Replacement Tree Cost ($380) previous year / Replacement Caliper Cost*
- *Basic Reproduction Cost = Cross Sectional Area x Unit Tree Cost*
  - *Cost Sectional Area (cm^2) = $(DBH)^2$ x 0.7854*
  - *Diameter at Standard Height or DBH (cm) = measured 1.4 meters above the ground*
- *Depreciated Reproduction Cost = Condition rating x Functional limitations x External limitations x Basic Reproduction cost*
  - *Condition % = Considers various components of health, structure and form as outlined by the ISA guide in the10th edition, revised (Table 4.1, Appendix)*
  - *Functional Limitations % = associated with the interaction of a tree and its planting site and will affect plant condition, limit development, or reduce utility of the plant. These factors include site condition, placements and genetic limitations*
  - *External Limitations % = factors that are outside the control of the property owner that will affect plant condition, limit development or reduce plant utility*
- *Replacement Tree Installation = cost of replacement tree + cost of establishment watering*

Note: If the calculated monetary value is less than the replacement cost, then replacement cost will be used as compensation.

3. Calculate the partial loss of a tree:

   A CoE forester will evaluate the condition of a tree (post damage condition) to determine:
   - parts of the tree that have been affected
   - whether the health, structure and/or form have been compromised
   - extent of the damage i.e. % of trunk girdling, % of root loss or % of crown loss
   - whether a tree can be restored to pre-damage condition by treatment

   The post damage condition will be compared with the pre damage condition of a tree and the differences will be calculated. The value that is obtained from this calculation will be determined as a partial loss of a tree.

   Partial Loss Value = Monetary Value (Pre Damage) - Monetary Value (Post Damage)

   Where,
   - ❖ *Monetary Value (Pre Damage) = Calculated in Step 2, condition prior to damage*
   - ❖ *Monetary Value (Post Damage) = Calculated in Step 2, current condition (considering damage)*
   - ❖ *Current Condition = (% of Tree Unaffected by Damage x Tree Condition Before Damage) + (%Tree Crown Above the Damage x % Affected Portion After Damage)*
     - *% of Tree unaffected by damage = 1 - (100% x %Crown Above Injury)*
     - *% Affected Portion After Damage = % Condition Before Injury - (% Condition Before Injury x % Devaluation current state)*

   CoE will calculate the reductions or changes in the tree condition as below:
   1. Damage to the trunk (tree stem)

      % of Condition Class Loss = ((1.1) x % of Circumference Injury) - 6

      Here, % of Circumference Injury is the circumference of the tree at the location of the injury and the width of the injury at the largest point.

Glossary

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

Crown: The upper part of a tree, measured from the lowest to the highest branch, that includes all branches and foliage.

Equitable Compensation: Costs incurred by the City including labour, material, equipment charges and applicable overheads associated with the value of a City Tree. It can also mean the diminishment of a tree's value. *(Guidelines for Evaluation of Trees, Guide for Plant Appraisal, Council of Tree and Landscape Appraisers, International Society of Arboriculture)*

Partial Loss: A situation in which a damaged tree cannot be fully restored to its pre-damaged condition but is otherwise expected to produce future benefits.

Plant Appraisal or Valuation: The act or process of formulating an opinion of a defined value or a defined cost.

Tree Replacement and Establishment Cost: The cost of replacing a similar tree having equivalent functional utility. CoE charges this cost to replace and establish a caliper tree. It includes plant material, installation, all planning components, watering and young tree maintenance (pruning and stake removal).

Remedial Care: Tree work required after a tree has sustained damages. It might include any one or combination of the following over a period of time: tree surgery, watering, fertilization, aeration or radial trenching for soil compaction and pruning.

Unit Tree Rate Cost: Operational cost to complete tasks. These are based on previous years actuals.

Value: Monetary value of a tree at a given moment in time.

Replacement Tree Cost: Total cost to replace tree, includes tree installation and establishment costs.

DBH (Diameter at Breast Height): Diameter of the tree at 1.4 meters from the ground.

Functional Limitations: Defects caused by a flaw in the materials or design of an element. Restrict or constrain growth or function due to placement, excessive size, or quantity.

External Limitations: Form of depreciation external to the site and outside the control of the property owner that diminishes the trees value

Park/ Open Spaces Tree: All trees on Public property

References

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Council of Tree and Landscape Appraisers. 2019. *Guide for Plant Appraisal 10th Edition. Revised October 2020* International Society of Arboriculture

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

APPENDICES

Table 1: 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

Table 2 Functional Limitations - Restrict or constrain growth or function due to placement, excessive size, or quantity.

Percent	Description
100%	No Limit to Growing Space (park tree)
90%	Enhanced Soil Volumes (soil cells, trenching)
80%	Grass Boulevards (50% root restrictions)
70%	Hardscape (100% root cover in hardscape)

Initial rating is determined by growing location and then reduces 10% additional limitation

Additional 10% Devaluation factors

- Power lines - restricting growth
- Invasive Species
- Species with fruit/litter
- Close to foundation, utilities, driveways, etc.

Table 3 **External Limitations** - A form of depreciation external to the site and outside the control of the property owner that diminishes a plant's value.

Percent	**Description**
100%	Park Tree
90%	Blvd Tree, Large soil volumes, low pollution, Local & Collectors roads
80%	Blvd Tree, High Traffic/Pollution, Arterial Roads