



Tree Protection Protocol

Content

| | |
|---|----|
| 1. Purpose of the Protocol | 1 |
| 1.1. Tree Protection Approval Departments | 3 |
| 2. Tree Protection Protocol | 4 |
| 2.2. Tree Protection Agreement | 12 |
| 2.2.1. Security for Tree Protection Agreement | 12 |
| 3. Technical Requirements | 14 |
| 3.1. Arborist Report | 14 |
| 3.1.1. Tree Protection Plan | 15 |
| 3.1.2. Tree Protection Zone | 16 |
| 3.1.3. Tree Protection Barriers | 16 |
| 3.2. Landscape Plan | 18 |
| 3.2.1. Landscape Cost Estimate | 18 |
| 4. Compensation | 19 |
| 4.1. Tree Replacement Requirement (For Private Trees) | 20 |
| 4.2. Tree Valuation Formula (For Public Trees) | 20 |
| 5. Specifications | 21 |
| 5.1. Timing of Planting | 23 |
| 5.2. Tree Locations and Utilities | 23 |
| 5.3. Soil Quality | 23 |
| 5.4. Soil Volume | 24 |
| 5.5. Spatial Requirements | 25 |
| 5.6. Species Specification | 25 |
| 5.7. Tree Damages | 26 |
| 6. By-Law Enforcement | 28 |
| 7. Resources | 28 |
| 7.1. Streetscape Plans | 28 |
| 8. Glossary | 29 |
| 9. References | 32 |
| Appendix | 34 |

The City of Vaughan recognizes the significant role that the urban tree canopy plays in providing an improved quality of life. Preserving and protecting healthy trees will help the City of Vaughan achieve its commitment to maintain and enhance the urban forest and the environment. Considering tree protection in the initial stages of planning will result in the enhanced protection of trees and where trees are removed provide for a clear replacement strategy. The Tree Protection Protocol (hereinafter referred to as the “Protocol”) will implement procedures to maintain and enhance the public’s tree canopy through the development approval process.

1. Purpose of the Protocol

The purpose of the Protocol is to identify the procedure and standards required by the City to protect public and private trees through the development review processes. These procedures and standards also apply to public and private tree removal permits administered by Urban Forestry¹. Higher standards of tree protection may be imposed where warranted by the City’s Urban Forestry staff having regard to the size, species, location and health of the tree, and any circumstances surrounding the ensuing construction which requires additional tree protection measures. Also, the Protocol provides a framework to address requirements of new legislation (BILL 68), which requires amendments to the Municipal Act.

The Protocol provides the following:

1. The Parks & Forestry Operations department is under the supervision of the Deputy City Manager of Public Works. It is divided into two division: Park and Road Division and Forestry and Horticulture Division has the responsibility for maintaining the urban forest, street trees, and shrub beds, as well as overseeing the contracted works throughout the City.

- identifies the roles and responsibilities of City Departments regarding tree protection, specifically Department protocols for tree protection, and removal permitting;
- provides direction on the technical report contents required for staff to assess how proposed development will impact the viability of existing trees in the landscape, and preservation methods;
- establishes a “Tree Protection Agreement” that will allow for greater standardization of tree preservation, tree removal, and proposing new landscape; and,
- creates a resource for both City staff and external stakeholders on how to manage the preservation, removal and replanting of trees City-wide.

The Protocol is intended to achieve the following:

- Maintain and re-establish the public tree canopy;
- Provide an opportunity to align internal processes to ensure consistency in the application of Tree Protection Zones;
- Increase public awareness about the benefits of the preservation of mature trees; and,
- Promote public education and investment in the protection of the City’s urban tree canopy.

1.1. Tree Protection Approval Departments

Individual tree and group of trees are managed by the following Departments:

- The Transportation Services, Parks, Forestry Operations Department, in particular the Forestry and Horticulture Division (Forestry) issue Tree Removal Permit (dead or hazardous tree -residential - construction (infill)) for private projects (not associated with a developing application. Currently, Forestry also reviews and provides comments on some Committee of Adjustment, Cultural Heritage, Fill Permit and Draft Plan of Subdivision application.
- Once this Protocol is implemented, Forestry will review all Arborist Reports submitted as part of the development application review processes.
- The Development Planning Department, in particular the Urban Design and Cultural Heritage Division, provides approvals under the development application review, Committee of Adjustment, Cultural Heritage and Fill Permit processes. The Parks Development Department have an interest in applications where Public trees, within public open spaces or parks may be impacted by proposed development.
- The Policy Planning and Environmental Sustainability Department review and provide input on applications that contain natural heritage features. Where applicable, this is undertaken in consultation with the

Toronto and Region Conservation Authority. The Policy Planning and Environmental Sustainability Department also review and comment on applications that have potential impacts on Species at Risk (as defined by the Endangered Species Act, 2007).

Detailed information regarding the City of Vaughan Departmental approval authorities for the individual tree and group of trees removals as per the private property tree protection permitting processes and the development review processes are provided in Appendix A.

NO TREE REMOVALS ARE PERMITTED WITHOUT THE APPROVAL FROM THE APPROPRIATE DEPARTMENTS.

2. Tree Protection Protocol

The following sections outlines the approval processes for the three categories (processes) identified Table 1.

Category A: Private Tree Removal Permit (not associated with a developing application)

Category B: Draft Plan of Subdivision, Zoning By-law Amendment, Official Plan Amendment, Site Development and Cultural Heritage Permit

Category C: Committee of Adjustment, Building Permit, Fill Permit

The Protocol does not apply to woodlands and Toronto and Region Conservation Authority regulated or owned lands.

Table 1: Tree Permitting Categories and Responsible Approval Departments

| Category | | Application Type | Managing Department | Technical Approval Department |
|--------------------------|---|---|---|---|
| Non-Planning Application | A | Private Tree Removal Permit | Forestry and Horticulture Division | Forestry and Horticulture Division |
| Planning Application | B | - Draft Plan of Subdivision - Site Development - Zoning By-law Amendment - Official Plan Amendment | Development Planning Department, Urban Design & Cultural Heritage Division | Urban Design & Cultural Heritage Division + Forestry and Horticulture Division |
| | | Fill Permit | Development Engineering Department | Urban Design & Cultural Heritage Division + Forestry and Horticulture Division |
| | | Site Development | Development Planning Department, Urban Design & Cultural Heritage Division | Urban Design & Cultural Heritage Division + Forestry and Horticulture Division |
| | C | Cultural Heritage Permit | Urban Design & Cultural Heritage Division | Urban Design & Cultural Heritage Division + Forestry and Horticulture Division |
| | | Building Permit | Building Standards Department | Forestry and Horticulture Division |
| | | Committee of Adjustment | Office of the City Clerk | Urban Design & Cultural Heritage Division + Forestry and Horticulture Division |

Category A (Non-planning application): Forestry receives an application directly from managing Department or applicant.

Category B (Planning application): Tree Protection Agreement is required.

Category C (Planning application): Tree Protection Agreement is not required.

Category A: Private Tree Removal Permit (not associated with a development application).

Forestry and Horticulture Division issues 3 types of Private Tree Removal Permits¹ :

1. Private Tree Removal – dead or hazardous tree: Private Tree Removal Permit (dead or hazardous tree): In the case of removing dead or hazardous tree(s) the applicant must directly contact Urban Forestry Department. There is no charge for this type of Permit and it will be issued after the Urban Forestry Department's arborist conducts a site inspection and confirms that the tree(s) is dead or hazardous.

2. Private Tree Removal (Residential): In the case of removing a healthy tree not because of construction, the applicant must directly contact Urban Forestry Department. Urban Forestry staff will provide applicant with the technical requirements that may include an Arborist Report (based on number of different factors, such as number of tree removals, their size ...), a Tree Protection Plan and a Replanting Plan/ Landscape Plan to support the Tree Removal Application.

Tree Removal Permit (Residential) costs \$60 plus administration fee plus a \$100 environmental fee for a tree(s) over 20cm. Tree Removal Permit will be issued after the arborist from Urban Forestry Department conducts a site inspection and confirms that authenticity of the arborist report information.

¹ Urban Forestry also issues Tree Removal Permit for Public Trees. Refer to the Appendix.

Compensation for tree loss is based on a sliding scale depending on the size of the tree(s) from 1 tree for 20cm to 4 trees for a 51cm tree or paying a cash-in-lieu (refer to section 4.1). If the tree(s) to be removed is located within the City property a valuation for tree is completed and that cost is added to the permit (refer to section 4.2).

3. Private Tree Removal – Construction or Infill: This Permit is associated with a development application. Refer to CATEGORY C for more details.

Category B: Draft Plan of Subdivision, Zoning By-Law Amendments, Official Plan Amendments, Site Development Application Processes and Cultural Heritage Permit, Fill Permit

STEP 1, Pre-Consultation: Urban Design and Cultural Heritage Division (Urban Design staff) will provide the applicant with the technical requirements for tree protection at the Pre-Application Consultation meeting. The technical requirements may include an Arborist Report, a Tree Protection Plan and a Landscape Plan to support the development application, which must be submitted before an application is deemed complete.

STEP 2, Technical Submission: The Urban Design staff and Forestry and Horticulture Division (Forestry) staff will review the submission. The Arborist Report must include an inventory of all existing trees (refer to Section 3.1 for the requirements). The Landscape Plan must include all trees proposed to be planted (refer to Section 3.2 for Landscape Plan requirements).

STEP 3, Technical Review: Urban Design and Forestry staff will review the Arborist Report and will examine the impacts of the proposed development on existing trees and provide comments on the proposed tree preservation and/or removal. Urban Forestry may conduct a site visit(s) to verify and validate the Arborist Report (i.e., tree significance, species, size and condition, and identify the trees to be preserved (if applicant proposed removal).

Urban Design and Forestry staff will recommend

where the integration of existing trees into the design of the development is appropriate based on the Protocol. Where trees are proposed to be removed and there are no opportunities to replant or replace these trees within the site, monetary compensation will be required. The City's corporate objectives are to maintain and re-establish the urban tree canopy and strive for no-net-loss to the system. Refer to Section 4.1 and 4.2 for Tree Replacement Requirements for privately and public trees. Formal comments from both Urban Design and Forestry staff shall be provided to the Planner managing the development file.

STEP 4, Recommendation Report: The Development Planning Department will prepare a staff report and include recommendations/conditions made during the technical review by Urban Design and Urban Forestry staff. In a case of a delegated approval such as street townhouse development and some employment building applications, the owner will enter into the Tree Protection Agreement and recommendations/conditions made during the technical review by Urban Design and Urban Forestry staff will be part of the Agreement as well.

Draft Plan of Subdivision Conditions of Approval, Site Plan Agreement and Letter of Undertaking will include the following conditions:

- The applicant will be required to enter into a Tree Protection Agreement, prior to the

execution of the Draft Plan of Subdivision agreement which includes a Letter of Credit security for trees to be preserved and protected in accordance with the approved Arborist Report. Refer to section 2.2 for details.

- The Letter of Credit associated with the tree protection agreement is determined, through the tree replacement formula provided in the arborist report based on the City Tree Replacement Requirement.

STEP 5, Implementation: Applicant will implement the recommendations approved in the Arborist Report:

- Implement a Tree Protection Zone (TPZ) for all neighbor (that locates within the 6 meters of the owner property boundary), owner and Public trees to be preserved based on the approved Arborist Report. Urban Forestry staff will verify the TPZ for all trees. Refer to section 3.1.2 for instructions.
- The applicant will provide compensation for all tree removals (cash-in-lieu or replanting)

based on the approved Arborist Report.

- Follow all the recommendations made in the approved Arborist Report.

STEP 6, Inspection: Urban Forestry staff will conduct the following inspections:

- The first inspection will take place prior to construction to verify the TPZ installation.
- The second inspection will take place after the construction has ended and all the trees have been planted.

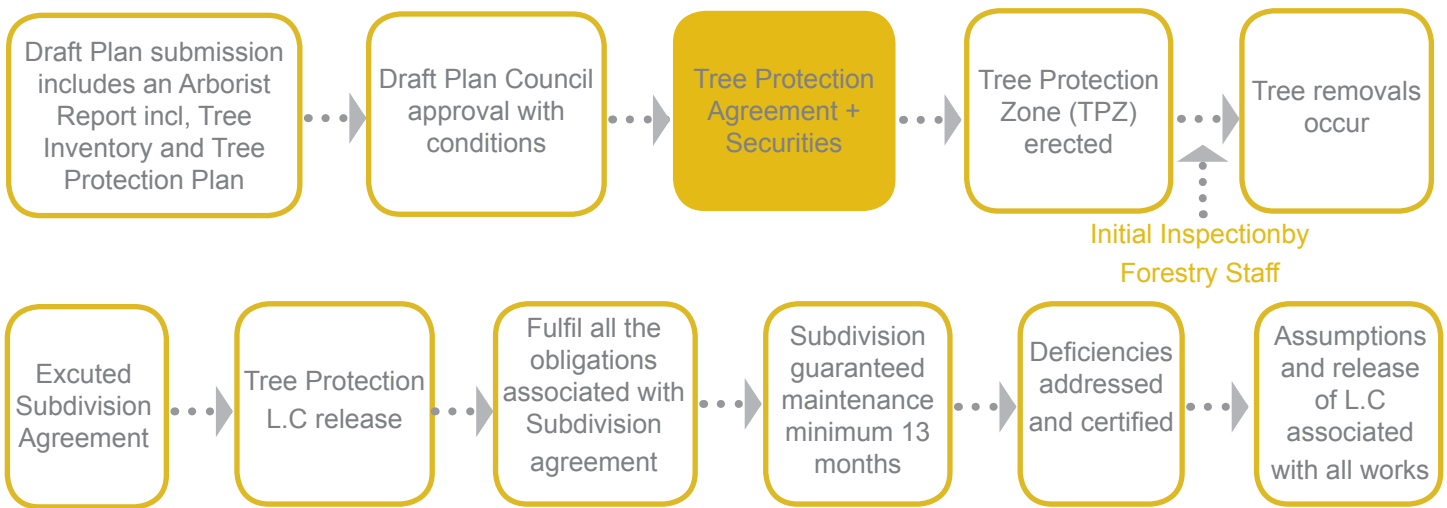
STEP 7, Release of Securities:

The Securities for the Tree Protection Agreement will be released:

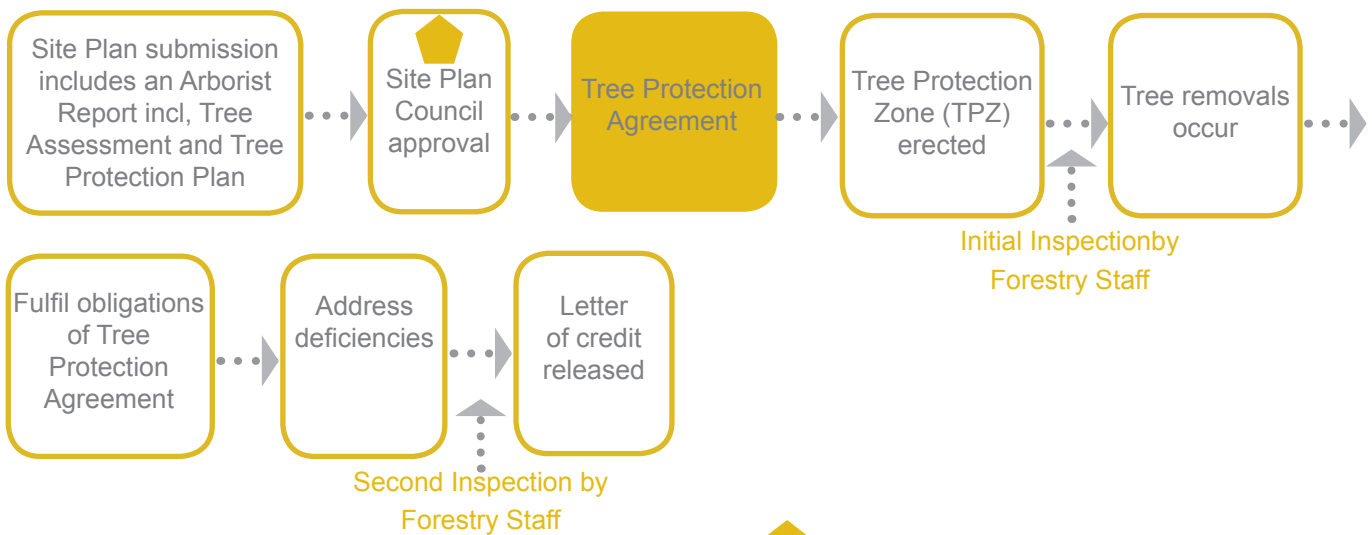
- When the second inspection has been conducted and all the conditions have been cleared. Refer to Sections 2.2.1 for details. The Securities for Landscape Cost Estimate will be released:
- When the second inspection has been conducted and all the conditions have been cleared. Refer to Sections 2.2.1 for details.




Draft Plan of Subdivision



Site Plan and Cultural Heritage Permit



 *If delegated subject to a Tree Protection Agreement is subject to delegated approval (i.e. approval at a staff level) this step shall not apply.*

Category C: Committee of Adjustment, Building Permit

STEP 1, Complete Application: Urban Forestry staff will provide applicant with the technical requirements for tree protection at the pre-application submission stage of the development review process. These technical requirements may include an Arborist Report, a Tree Protection Plan and a Replanting Plan/Landscape Plan to support the Private Property Tree Removal Permit.

STEP 2, Technical Review: Urban Forestry staff will review the submission and provide comments. Urban Forestry staff may conduct a site visit(s) to verify and validate the Arborist Report, and identify trees to be preserved (i.e., tree significance, size, species and condition). Where trees are proposed to be removed and it is determined by Urban Forestry staff, (based on the arborist report submitted and site visit) there are no opportunities to plant replacement trees within the property, monetary compensation

will be required. The City's corporate objectives are to maintain and re-establish the urban tree canopy and strive for no-net-loss to the system. Refer to Sections 4.1 and 4.2 for Tree Replacement Requirements for private and public trees.

STEP 3, Reporting: Urban Forestry will provide approval or not on the proposed tree removals for the noted above applications to Development Planning Department. The comments and/or recommendations will vary based on the nature of the proposal. The final/approved Arborist Report will include:

- Number of replanted trees and their species;
- Amount of cash-in-lieu;
- Consent letter from the neighbor in a case that a neighbor's tree(s) will be injured by the proposed; development;
- Removal Permits for public trees; and
- A certification from an arborist to confirm



supervision of the project prior to and during construction to verify all the TPZ installation prevent any damages to neighbor, public and private trees.

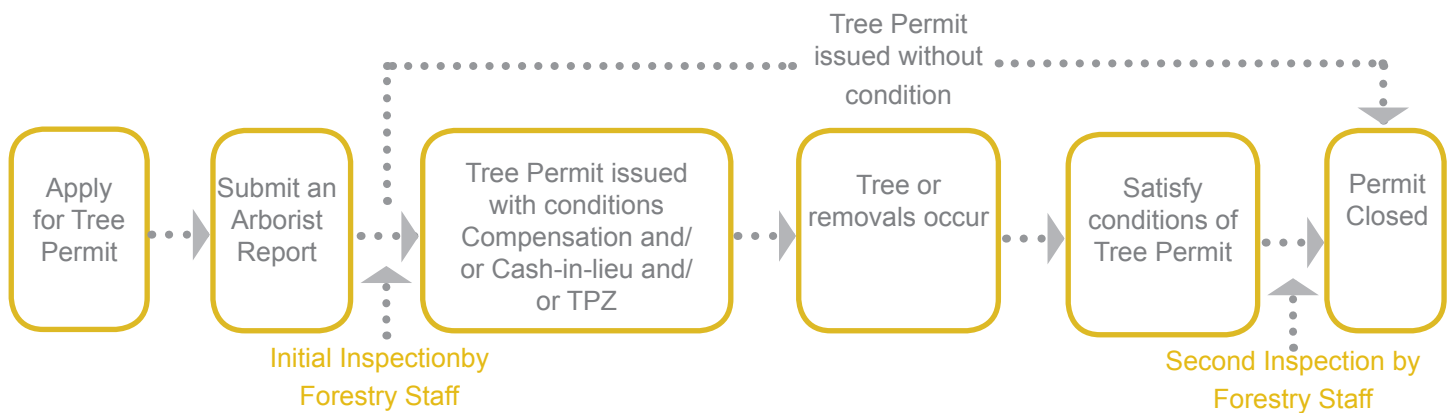
STEP 4, Implementation: Applicant will implement the recommendations approved in the Arborist Report:

- Implement a TPZ for all privately-owned and public trees, and trees in close proximity to the development (owned by neighboring landowners), to be preserved based on the approved Arborist Report. Urban Forestry will verify the application of the TPZ for all trees. Refer to Section 3.1.2 for instructions.

- The applicant must provide compensation for all tree removals (cash-in-lieu or replanting) based on the approved Arborist Report.
- Follow all the recommendations made on the approved Arborist Report.
- The Urban Forestry will issue Private Tree Removal – Construction or Infill from prior any tree removals. This permit costs \$115 plus administration an environmental fee of \$120.

STEP 5, Inspection: Urban Forestry staff will conduct one inspection prior to alteration/ construction to verify the TPZ installation.

Tree Removal Permit



2.1. Tree Protection Agreement

Following table 1, that divides the City's application to two categories of Planning and non-planning application, the Tree Protection Agreement ("Agreement") only applies to Category B which includes Draft Plan of Subdivision, Zoning By-law Amendments, Official Plan Amendments, Site Development and Cultural Heritage Permit applications. The Tree Protection Agreement will secure the protection of both public and privately-owned trees that may be impacted by proposed development, also the applicant must satisfy all conditions of the permit issuance that includes, but not limited to, the amount of the cash-in-lieu payment for a dollar value equal to the cost of planting, TPZ installation and maintenance for two (2) years in order to ensure compliance with approved landscape or replanting plans. The tree protection Letter of Credit held by the City shall only be released by the City upon completion of all construction activities, compliance with all permit terms and conditions have been verified, there has been no encroachment into the minimum TPZ and the trees are healthy and in a state of vigorous growth. The City shall apply a Tree Protection Agreement to the applicant in accordance with the in-effect User Fees & Charges By-law No. 022-2018.

2.1.1. Security for Tree Protection Agreement

Financial Securities must be in the form of a certified cheque or an irrevocable letter of credit, from a financial institution acceptable to the Financial Planning and Development Finance Department. The Security shall be based on cost estimate for each of the individual trees to be preserved using the Tree Replacement Requirements for private and public trees, in Section 4.1.

Securities will be released upon full compliance with the terms and conditions of the Tree Protection Agreement" this occur when the Financial Planning and Development Finance Department has been notified by the inspecting Department, that there are no outstanding deficiencies, and all conditions pursuant to the Tree Protection Agreement have been met.

- 3. Technical Requirements
 - 3.1. Arborist Report
 - 3.1.1. Tree Protection Plan
 - 3.1.2. Tree Protection Zone
 - 3.1.3. Tree Protection Barriers
 - 3.2. Landscape Plan
 - 3.2.1. Landscape Cost Estimate
- 4. Compensation
 - 4.1. Tree Replacement Requirement (For Private Trees)
 - 4.2. Tree Valuation Formula (For Public Trees)
- 5. Specifications
 - 5.1. Timing of Planting
 - 5.2. Tree Locations and Utilities
 - 5.3. Soil Quality
 - 5.4. Soil Volume
 - 5.5. Spatial Requirements
 - 5.6. Species Specification
 - 5.7. Tree Damages

3. Technical Requirements

The Tree Protection Protocol is supported by technical requirements materials that contain relevant standards, specification and guidelines for arborist reports and studies that are required as part of a complete development application. These technical requirements materials are subject to change over time.

3.1. Arborist Report

An Arborist Report must be submitted as part of the Development Planning application(s) and Tree Permit application (Based on Table 1 Category A, B and C). The Arborist Report must be prepared by a certified arborist or landscape architect. An arborist or landscape architect can advise on current tree maintenance requirements and determine the impact a development proposal will have on trees and the surrounding natural environment. The Arborist Report may include the following, although not all the following listed information shall be included on every report as each individual situation warrants an individual level of detail:

Contact Information: The company name, address, telephone and fax number, and e-mail of the arborist/landscape architect.

Location: Provide the municipal address of the site, and the location of the tree(s) in relation to existing and/or proposed structures and/or lot boundaries, and/or relative proximity to other

tree(s), e.g.

Inventory Chart: An inventory chart will identify the trees on the subject and adjacent properties if they fall within 6 m of the site boundary. Also, within this chart the following information must be included:

- Species;
- Size: Diameter at Breast Height (DBH), measured in centimeters at 1.37 meters above ground level;
- Crown spread (Drip Line), measured in meters;
- Tree health/disease;
- Soil volume inside the TPZ using methods approved by the City;¹
- Tree risk assessment for trees deemed hazardous (as assessed by the arborist) must be provided in accordance with “Best management Practices, Tree Risk Assessment, International Society of Arboriculture” as revised from time to time, including a photographic record of each tree, as required by the City; and
- The decision for each tree (e.g. protecting, injuring, and removing): For each tree identified as being preserved and each tree recommended for removal, the valuation as determined by the most recent City of

¹ Refer to the City-wide Urban Design Guidelines Volume 2 for the full detail:

https://www.vaughan.ca/services/business/urban_design/General%20Documents/20180111%20UD%20DESIGN%20STANDARD%20DETAILS%20ALL.PDF

Vaughan Tree Replacement Requirement (Section 4.1).

Tree Protection Plan: A tree protection plan prepared by a certified arborist or landscape architect will identify the location, species, size and condition of all trees within the Tree Protection Zone, identify the extent of injury where applicable and outline proposed tree protection measures for the trees identified for protection. Refer to section 3.1.1 for details.

Nature of Work: Explain what arboricultural work is to be undertaken on the tree(s), e.g. pruning, tree removal, root pruning, tree protection measures required for construction, etc. If it is applicable, explain the silvicultural effect of the proposed work, e.g. disturbing the natural edge, thinning, creating a canopy opening to provide better light conditions, slope destabilization, etc.

Arborist or Landscape Architect

Recommendation: An arborist or landscape architect's recommendation is required for treatment of the existing tree(s), including removal, replacement, and the holistic determination of TPZs for all private, neighboring and Public trees.

Tree Replacement Requirements: Include tree replacement requirements based on Tree Replacement Requirements identified in section 4.1.

3.1.1. Tree Protection Plan

All construction related applications must include a Tree Protection Plan that shows the details of tree protection, prepared in conjunction with an arborist report or in consultation with a certified arborist or landscape architect, when protected trees are in proximity to the proposed work. All Tree Protection Plans must be legible, prepared at a usable metric scale and include the following information:

- Show all existing buildings, structures, hard surfaces and all existing trees within the area of consideration. Depending on the extent of site disturbance, trees on neighboring properties may need to be included if they fall within 6 m of the site boundary. Note that the area of disturbance must include all areas that will be disturbed by the proposed work, including the areas required for over-dig, stockpiling, construction traffic, vehicular access and construction staging;
- The extent of the crown (drip line) or the extent of minimum TPZ (whichever is greater) of each existing tree. Refer to Section 3.1.2 for details;
- Proposed changes on the site, including all proposed structures, services, hard surfaces and grade changes;
- Indicate vehicular access and construction staging areas. Areas proposed for temporary stockpiling of fill or excavated material shall be fenced with sediment control to prevent sediment runoff;

- Indicate the location of any excavation(s) that requires tree root pruning;
- Indicate trees proposed to be removed and/or injured; and,
- Identify and label tree protection barriers and the proposed tree protection zone(s). (See Table 1 to determine size of tree protection zone. Distances are to be measured from base of tree)
- The extent of proposed tree injury, where applicable; and,
- Include a comprehensive legend.

3.1.2. Tree Protection Zone

The TPZ is the minimum setback required to maintain the structural integrity of the tree's anchor roots, based on generally accepted arboricultural principles. If trees are protected to the TPZ then the tree's anchor root structure is expected to be maintained.

No unauthorized activities may take place within the TPZ of a tree covered under any municipal permit process or agreement. The following chart provides the required distances for determining a minimum TPZ for trees located on a City street, in parks and on private property subject to Private Tree By-law. The minimum TPZs are based on the DBH of the tree. Some trees and site conditions may require a greater

setback at the City's discretion.

Figure 1: Tree Protection Zone Model (in meter)

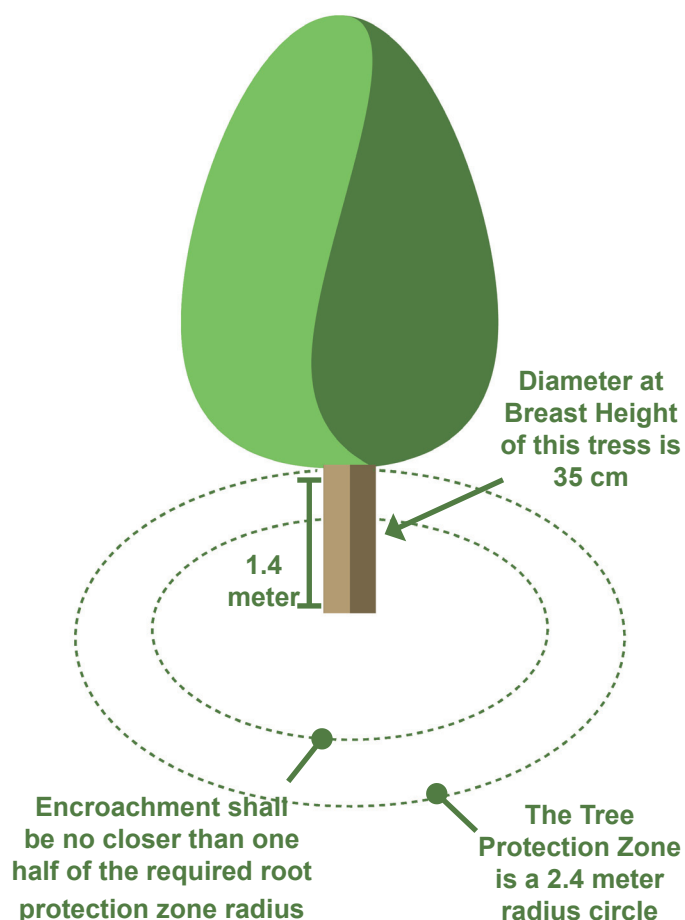


Table 2: Minimum Tree Protection Zone Determination

| Diameter at Breast Height ¹ in centimeters | Minimum Protection Distances Required ² (Public and Private Trees) | Minimum Protection Distances Required Trees in Naturalized Areas |
|--|---|--|
| <10 | 1.2 | The drip line ³ or 1.2 m |
| 10-29 | 1.8 | The drip line or 3.6 m |
| 30-40 ⁴ | 2.4 | The drip line or 4.8 m |
| 41-50 | 3.0 | The drip line or 6.0 m |
| 51-60 | 3.6 | The drip line or 7.2 m |
| 61-70 | 4.2 | The drip line or 8.4 m |
| 71-80 | 4.8 | The drip line or 9.6 m |
| 81-90 | 5.4 | The drip line or 10.6 m |
| 91-100 | 6.0 | The drip line or 12.0 m |
| >100 | 6 cm protection for each 1 cm diameter | 12 cm protection for each 1 cm diameter or the drip line |

1. Diameter at breast measurement of tree trunk taken at 1.4 meters (m) above the ground.

2. Minimum Tree Protection Zone distances are to be measured from the outside edge of the tree base.

3. The drip line is defined as the area beneath the outer most branch tips of a tree

4. Converted from ISA (International Society of Arboriculture) Arborist Certification Study Guide, general guidelines for tree protection barriers of 0.3 meters of diameter from the tree stem for each centimeter of tree trunk diameter.

3.1.3. Tree Protection Barriers

Trees within or adjacent to a construction site, that have been selected for preservation by an arborist or City staff, must be protected during pre-development construction by means of a barrier installed in accordance with the Table 2 and meet the following specifications:

- Tree protection barriers must be erected prior to the commencement of any grading activity, development, site alteration and/or construction activity that may injure a tree on the site and must remain in place throughout the duration of the construction of the project. The applicant shall notify the Urban Forestry division of the City of Vaughan in writing prior to commencing any such activities to confirm that the tree protection barrier(s) is in place;
- The tree protection barriers specified herein must remain in a condition satisfactory to the City until all site activities including landscaping are complete;
- Authorization from the Urban Forestry Department must be obtained prior to the removal of tree protection barriers;
- If some fill or excavated material must be temporarily located near the tree protection barrier, a wooden barrier (See the link below) must be used to ensure no material enters the TPZ.

For the details regarding Tree Protection Barriers Standards refer to the City-wide Urban Design Guidelines Volume 2:

https://www.vaughan.ca/services/business/urban_design/General%20Documents/20180111%20UD%20DESIGN%20STANDARD%20DETAILS%20ALL.PDF

3.2. Landscape Plan

The landscape plan shall provide opportunities for the creation of dynamic and well-defined public spaces. Public spaces include, but are not limited to, public squares, public courtyards, and public commons. The landscape plan shall be prepared by a certified Landscape Architect and shall include the following:

- location of existing trees 20cm in caliper or greater and proposed method(s) of preservation;
- boundary lines of the property with dimensions;
- existing site features, retention/preservation areas;
- surrounding streets and sidewalks;
- contour lines and spot elevations (ghosted lines or separate grading plan);
- existing and future building setbacks, easements, and rights-of-way;
- existing natural features, open space, water bodies, and preservation areas;
- vehicular and pedestrian paving;

- existing and proposed plant materials at installed sizes, location and spacing and dimensions of planting areas in metric;
- plant list naming all recommended plant material and size specifications;
- location and detailed drawings of fences and retaining walls;
- locations of buildings and structures;
- location of all engineering services (e.g. overhead, underground, light standards), which may affect landscaping;
- adjacent landscape/development features, where applicable;
- area of site to be landscaped;
- parking and loading spaces;
- curbs, parking facilities and driveways with dimensions and widths;
- existing and proposed walkways and bikeways; and
- planting details should conform with the City of Vaughan standards.

For the details regarding Landscape Plan Standards refer to the City-wide Urban Design Guidelines Volume 2:

https://www.vaughan.ca/services/business/urban_design/General%20Documents/20180111%20UD%20DESIGN%20STANDARD%20DETAILS%20ALL.PDF

3.2.1. Landscape Cost Estimate

The landscape cost estimate includes detailed costing/pricing information on the hard and soft landscaping elements specifying quantities, areas, sizes, equipment, labor and material costs, required for the total cost of the construction of the plan, including fencing, sidewalks, decorative hard service areas, retaining walls, recreation equipment, plant material, fine grade and sod, irrigation system where applicable, cost of one year maintenance, actual current market price, and cost for municipal streetscape works (applicable in some areas). For phased projects, a detailed landscape cost estimate indicating the area and work to be undertaken for each phase must be provided. The landscape cost estimate shall be provided by a fully certified Landscape Architect.

4. Compensation

4.1. Tree Replacement Requirement (For Private Trees)

Replacement Trees are required as a condition of all Individual tree removals. This does not apply to Woodlots, Edge Restoration plans and Public lands (such as parks and open space lands). In this case, Parks Development Department will review the application.

The number of replacement trees required will be determined by the DBH of the removed tree, as outlined in the following table:

Table 3: Ratio of Tree Replacement for Private Trees

| DBH of Tree to be Cut or Removed | Number of Replacement Trees Required |
|----------------------------------|--------------------------------------|
| 20cm to 30cm | 1 |
| 31cm to 40 cm | 2 |
| 41cm to 50cm | 3 |
| 51cm or greater | 4 |

The scaled tree replacement ratio acknowledges the increased environmental and community benefits provided by larger trees, and enables a more rapid recovery of the City's net tree canopy after a permitted tree removal. The City specifies whether the replacement tree(s) should be deciduous or coniferous. The following specifications apply to replacement trees:

- Evergreen (coniferous) trees must be at least 200 cm tall;

- Leafy (deciduous) trees must have a caliper of at least 60mm;
- If fruit-bearing trees are desired, two trees must be planted to substitute each evergreen or leafy tree replacement;
- Must be planted within one year of the issuance of the tree removal permit;
- Must not be a shrub or a low growing tree;
- Must not be an invasive species;
- Must be good quality, number one (1) grade, nursery-grown stock and installed as per City approved details and standards; and
- Shall meet the highest horticultural standards of the Canadian Nursery Trades Association with respect to grading and quality, and shall be in strict accordance with the approved Plant List and Specifications.

Notwithstanding the above specifications, replacement trees for removed fruit-bearing and ornamental trees may be of a similar species. Replacement tree species are to be selected by the project arborist from a list of recommended replacement tree species available from the City, or as recommended by the arborist, provided the recommended species are non-invasive to the satisfaction of the City. The City encourages replacement trees that are of a species that will not block desired views or otherwise negatively impact neighboring properties.

4.2. Tree Valuation Formula (For Public Trees)

Cash-in-lieu Contribution

In instances where more replacement trees are required than can reasonably be accommodated on the development site, a 'cash-in-lieu' payment may be made to the Forestry Tree Reserve Fund to fund tree planting on public properties in the same community.

Note: Cash-in-lieu payments can only be made if all the required replacement trees cannot be planted on the development site; City staff will determine if the site can or cannot accommodate all of the required replacement trees and if a cash-in-lieu payment is appropriate in each case. The amount of the security (Letter of Credit) for the provision and maintenance of replacement trees or cash-in-lieu of planting replacement trees shall be:

- \$550 per replacement tree where the replacement tree is a deciduous tree in 2018.
- \$550 per replacement tree where the replacement tree is a coniferous tree in 2018.

The replacement rate for deciduous and coniferous trees will be reviewed annually every spring.

The Tree Valuation Formula is a tool that considers the operational, environmental and social costs of trees based on the tree species, size and overall condition. The formula uses the costs for tree removal and planting to ensure that values are current. The Forestry and Horticulture Division use this formula to calculate the compensation for Public trees. The formula estimates how many newly planted trees will be required to replace the existing tree to be removed. This Tree Value Multiplier is then multiplied by the planting cost (Installation Costs) and then further modified by multiplying the product by the species type (Species Rating) and the condition of the tree (Tree Quality Rating). The Tree Removal and Tree Cost is then added to determine the Total Cost. In the example below, a 25-centimeter Silver Maple is considered equivalent to 5 newly planted trees in terms of canopy replacement. This value is then multiplied by the Installation Costs (\$ 356.00), the Species Rating (56%) and the Tree Quality Rating (90%) to determine The Total Opportunity Cost (\$ 1077.31). This value will be added to the Tree Removal (\$ 330.54) and the Tree Costs (\$ 550.00) to arrive at The Total Cost (\$ 1,764.10).

The tree costs will be updated annually also the cost for public tree(s) in soil cell (strata) will be calculated in a same manner as a public tree.

Table 4: Tree Replacement Formula for Public Trees

| Tree Description | | | Standing Tree Value- Opportunity Costs | | | | Operations Costs | | | |
|------------------|-----------------|------------------|---|------------------------------------|--------------------------------|--|------------------------------|------------------------------|----------------------------|---------------|
| Tree# | Species | Diameter (cm) | Tree Value Multiplier ¹ | Installation Costs ² | Species Rating ³ | Tree Quality Rating ⁵ | Total Opportunity Cost | Tree Removal ⁴ | Tree Costs ² | Total cost |
| Ex. | Silver Maple | 25 | 5 | \$ 356.00 | 56.00% | 90.00% | \$ 1,077.31 | \$ 330.54 | \$ 550.0 | \$1,764.10 |

1. The multiplier divides the basal area of the proposed tree by that of a 50 mm tree (20) and then by four ($Y=(T1/ta)/4$, $ta=50$ mm tree)
2. The installation costs is the average contracted planting cost of the most recent contract, plus 15% administration costs.
3. The species rating is based on the latest Ontario tree rating and used as a value qualifier.
4. The tree removal cost is based on field data from Vaughan forestry operations.
5. The tree quality value is based on the health of the tree and is a modifier between zero and one.

5. Specifications

5.1. Timing of Planting

Deciduous trees can be planted in the spring, as soon as the frost is out of the ground or in the fall, from leaf-fall until freeze-up. Poplars, willows, ash, elms, and birches tend to overwinter better if planted in the spring. Evergreens can be planted early in the spring until four weeks after deciduous trees have opened their leaves or in the fall, from about the first week of August to the end of October.

5.2. Tree Locations and Utilities

The contractor is responsible for all services and utilities in the planned work area. The contractor responsible for the activity in the Municipal Right-of-Way shall be responsible for obtaining all necessary information regarding the exact location of utilities, including service connections. The contractor completing the work will be held responsible for the protection of all services, whether aerial or underground, during the time of construction and will be held liable for any damage.

5.3. Soil Quality

The functional relationship between tree roots and the characteristics of the soil in which they grow has the greatest influence on tree health. When poor soil quality limits growth, it increases maintenance requirements and the likelihood of tree failure. Laboratory testing and appropriate specifications are important tools for improving control over the quality and quantity of the growth medium for tree survival. The quality and integrity of the subsoil is equally as important as the organic layer of topsoil. An ideal medium for tree growth can be modelled after forest soils. Ideal soils are comprised of 45% mineral materials (sand, silt and clay), 50% open pore space, and 5% organic matter and organisms. The soil profile is normally made up of four major horizons developed as a result of rainfall, heating and cooling, chemical reactions and biological activity.

Typical unaltered soil horizons:

- Thin layer of decomposing organic material
- Contains most absorbing roots
- Fine textured material from a horizon and particles from parent material
- Subsoil composed of rocky parent material

Roots grow where soil conditions are favorable. Absorbing roots are most frequently in the upper 15-25cm of soil and tree roots are not usually found deeper than 1-1.5m. Soil texture (sand, silt, clay) affects the soil's ability to hold water and provide oxygen to the roots. Bulk

density measures the soil's porosity, or airspace between particles. Reduced bulk density resulting from compaction restricts root growth, reduces water infiltration and availability, and limits the movement of oxygen and carbon dioxide in the root zone. Soil pH affects which tree species will grow based on the availability of minerals. Soil pH is difficult to alter and therefore species should be selected based on existing soil.

5.4. Soil Volume

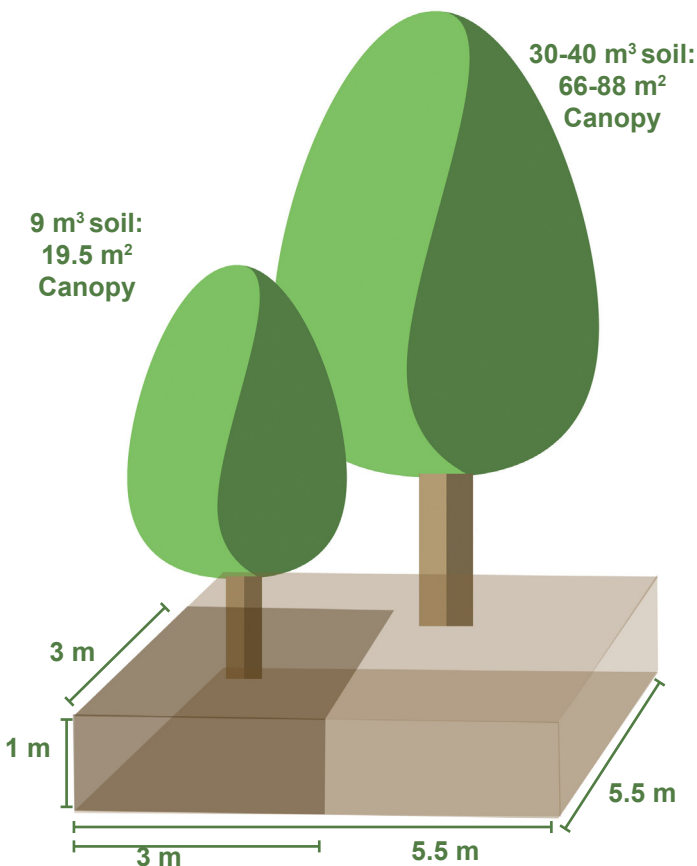
More soil volume will yield larger, healthier trees. Each cubic meter of soil volume will support approximately 2.2m² of tree canopy area (canopy area is defined as the area on the ground directly under the canopy). Accommodations must be made laterally, as trees roots run laterally rather than vertically down. A single, mature tree with a canopy diameter of 4m requires 30m³ of soil volume. Street trees that share soil resources in a continuous trench or planting bed require 20m³ of soil volume per tree to achieve a healthy, mature size. In places where especially large, long-lived trees are essential to the streetscape, such as important boulevards and promenades, shared soil volumes of 40m³ per tree should be provided, if space allows.

Further specifications include:

- Individually-planted trees each need a minimum of 30m³ of soil;
- A grouping of ≥ 2 trees in a soil bed need a minimum of 20m³ of soil per tree;
- Adequate soil depth is 1m; greater depth if available is better; minimum soil depth is the depth of the tree's root ball;
- Where existing soil resources are available, they should be used; and
- An approach that prioritizes total tree canopy size over quantity of trees, should be used (for trees in a strata park or road the soil volume standards are still the same).

For the details regarding Soil Volume Standards (this includes Soil Cell as well) refer to the City-wide Urban Design Guidelines Volume 2: https://www.vaughan.ca/services/business/urban_design/General%20Documents/20180111%20UD%20DESIGN%20STANDARD%20DETAILS%20ALL.PDF

Figure 2: Tree Soil Volume



5.5. Spatial Requirements

Within the limitations of the streetscape environment, materials and methods for tree planting can be determined and variations to the standard road cross section can be considered to accommodate tree growth and associated spatial requirements. In order for trees to sustain their health and growth potential, and consequently provide the most benefits, trees must have as much space as possible. There is a balance that a tree maintains between the surface leaf area for photosynthesis and the area of absorbing roots for water and nutrient uptake. A soil volume criterion is based on the expected size and stature and life span of a particular tree species. Where soil volume space is limited, site specific enhanced planting strategies should be designed to extend the root zone under hard surfaces. Above ground tree parts must also be considered to reduce conflicts between trees and surrounding infrastructure, to minimize maintenance, and to increase benefits and survivability.

5.6. Species Specification

Different species of trees are suited to different planting typologies, and vary with regard to a number of factors including, among others:

- General physiological requirements;

- Soil moisture and nutrient requirements;
- Adaptation to local climate and microclimates;
- Long-term maintenance requirements (e.g., pruning);
- Root system characteristics;
- Canopy form;
- Pest and disease susceptibility;
- Pollution tolerance;
- Fruit and seed production;
- Invasive potential and 'weediness';
- Biogenic volatile organic compound (VOC) emissions; and,
- Salt tolerance.

Refer to the Appendix for the general characteristics of tree species suitable for establishment within one or more of the tree planting typologies within the City of Vaughan.

5.7. Tree Damages

Physical injury to the trunk, crown and roots of a tree will occur if construction equipment is permitted too close to trees or if structures are built into the growing space of a tree. Inappropriate pruning may also result in tree injury. Physical injuries are permanent and can be fatal.

Root cutting is a type of physical injury that can significantly impact the health of a tree. The

majority of tree roots are found in the upper 15 -25 cm of soil. Excavation for foundations or utility installation may cut roots if the excavation is too close to trees. Trees can become destabilized and may fall over if anchor roots are severed and may result in safety concerns.

Compaction of the soil in the tree root zone is one of the leading causes of tree decline. Soil compaction occurs primarily from vehicles and equipment moving across the root zones. Piling or storing materials or debris on top of the root system can also result in soil compaction. Soil compaction causes a reduction in the pore spaces in the soil, which contain air and water necessary for root growth. Without space available for oxygen and water, tree roots will suffocate and a decline in tree health will follow. With rutting, a form of intense compaction, roots are severed by the tires of equipment. Root destruction can also be caused by changes to the existing grade. Adding soil on top of tree roots can smother them by reducing the amount of oxygen and water they can receive. Only a few centimeters of added soil can have a detrimental impact on tree health.

6. By-Law Enforcement
7. Resources
- 7.1. Streetscape Plans
8. Glossary
9. References

6. By-Law Enforcement

The role of the By-law & Compliance, Licensing & Permit Services Department, Enforcement Service Unit is to enforce the regulatory requirements prescribed within the appropriate tree protection by-laws, as passed by City Council. Tree related matters are brought to the attention of Enforcement Services primary through two sources 1) public complaint, 2) referral from internal/external Departments/agencies. All tree related calls are taken as priority and normally attended too with 24 to 48 hours.

Actions relating to violations can include:

- Issuance of an Order to Deceased from continuing to injure/damage protected trees;
- Requirement to obtain a permit;
- Prosecution under applicable laws.

The primary intent of the tree protection by-laws is to preserve protected trees, to deter unlawful activity through the appropriate enforcement authority and to encourage compliant public behavior.

7. Resources

7.1. Streetscape Plans

Streets are infrastructure that contains opportunities to serve multiple functions and types of users including public space, pedestrian and bicycle mobility and access, storm water capture and/or filtration, air quality improvement, temporary or permanent art placement, community character, as well as support for many social and business activities, depending on community priorities. Street trees and planting are often associated with streetscape beautification. However, street trees and planting have other functions that contribute to “complete streets” including reducing the heat island effect, storm water management, creating oxygen, barrier protection from vehicles and noise, and protection for pedestrians from the elements including rain, wind and sun. Ecosystem services provided are closely tied to canopy size and therefore planting conditions and techniques should be considered to promote the growth of trees to maturity. Streetscape plans contribute to community building and placemaking and play a significant role in the vitality, livability and character of a city or neighborhood.

The City-wide Streetscape Plans and area-specific Streetscape Plans are available at the Urban Design Webpage:
https://www.vaughan.ca/services/business/urban_design/Pages/URBAN-DESIGN-GUIDELINES.aspx

8. Glossary

APPLICANT means a Person seeking to obtain a Tree Removal Permit and, either in person or through an Authorized Agent, makes such an application. For clarification, an Applicant shall always include the Owner of the property to which the application pertains;

ARBORIST means a person with a diploma or degree involving arboriculture from an accredited college or university, a Registered Professional Forester, an accredited Certified Arborist under the International Society of Arboriculture, or a person with a demonstrated history of tree preservation experience;

ARBORIST REPORT means a report prepared by an Arborist or Landscape Architect which provides details on the species, size and health of a Tree to be Destroyed, Injured or removed;

BASE DIAMETER means the measurement of the diameter of the trunk of a tree from outside the bark at the existing grade of the ground adjoining its base or where there are multiple stems on a tree, means the total of the diameters of the three (3) largest stems measured at existing grade;

CITY means the Corporation of the City of Vaughan, in the Regional Municipality of York and its employees and agents acting on the Corporation's behalf;

CLERK means the Clerk of The Corporation of the City of Vaughan or duly appointed designate;

COUNCIL means the Council of The Corporation of the City of Vaughan;

DEAD means a tree that has no living tissue;

DIAMETER with respect to a Tree, means the measurement of the diameter of the trunk of a tree from outside the bark 1.4 metres above existing grade of the ground adjoining its base or where there are multiple stems on a Tree, means the total of the diameters of the three (3) largest stems measured approximately 140 centimetres above existing grade;

DYING means a Tree that is infected by a lethal pathogen or where 70% or more of its crown is dead;

HAZARD means a tree that is a potential hazard to property or life but not an immediate threat;

INJURE OR DESTROY with respect to a Tree, means the injury or destruction of a Tree by removal, cutting, girding of the tree or roots, interfering with the water supply, application of chemicals, compaction and regrading within the drip line of the Tree, or by other means including irreversible injury which may result from neglect, accident or design, but does not include pruning;

LANDS means a lot only and does not include a building;

LANDSCAPE ARCHITECT means a person registered as a Landscape Architect under the provisions of the Ontario Association of Landscape Architects Act, 1984 S.O. 1984, c. P412;

LOT means a parcel of land having specific boundaries which is capable of legal transfer;

OWNER means the registered owner of a Lot, his/her respective successors and assigns or his/her duly Authorized Agent;

PERMIT Means a permit required by By-law No.185-2007 (as may be amended), to injure or destroy a tree on private property within the City;

PERMIT HOLDER means an Applicant once a Tree Removal Permit has been granted;

PERSON includes a natural individual, a corporation, partnership, proprietorship or other form of business association and the heirs, executors, administrators, successors and assigns, or other legal representatives thereof, or a receiver or mortgagee in possession;

PRIVATE PROPERTY means any property not owned by the City;

PUBLIC PROPERTY means any property owned by the City;

PUBLIC TREE means any Tree which has 50 percent or more of its main stem situated on Public Property;

REGION means the Regional Municipality of York and its employees and agents acting on its behalf;

TREE means a self-supporting woody plant which has reached or will reach a height of at least 4.5 metres at maturity;

TREE PROTECTION AGREEMENT means an agreement made pursuant to:

- (i) a development agreement, site plan agreement or subdivision agreement between the City and a Person; or
- (ii) a permission by the City, including but not limited to a building permit or a cultural heritage permit, that identifies all Trees on a Lot that are to be preserved and sets out any other measures that the City deems appropriate.

TREE PROTECTION ZONE means the minimum setback required, as determined by the Director of Forestry, to maintain the structural integrity of the tree's anchor roots, based on generally accepted arboricultural principles;

TREE REMOVAL PERMIT means a permit required by this by-law to Injure or Destroy or otherwise remove a Tree on Private Property within the Cit.

9. References

- City of Barrie. January 2010. Tree Protection Manual*
- City of Hamilton. December 2009. Tree Protection Guidelines, City-wide*
- City of Kitchener. February 2002. Tree Management Policy - Council Policy Resolution. 38 pgs.*
- City of London. 2005. Tree Preservation Policy.*
- City of Markham. June 2009. Streetscape Manual*
- City of Mississauga. 2002. Tree Protection Measures*
- City of Ottawa. Tree Protection Guidelines. 2 pgs.*
- City of Owen Sound. Tree Preservation Policy. 4 pgs.*
- City of Surrey, B.C. 1997. Developer's Guideline to the Tree Preservation By-law. 4 pgs.*
- City of Thunder Bay. 2005. Tree Protection Standards 1 page.*
- City of Toronto. June 2016. "Tree Protection Policy and Specifications for Construction near Trees". Urban Forestry Services. 8 pgs.*
- City of Vaughan. 2010. City of Vaughan Official Plan.*
- City of Waterloo. 2001. Urban Forest Policy. 32 pgs.*
- City of Waterloo. "Protective Measures for trees during Construction". 6 pgs.*
- Expanding the Urban Forest – one tree at a time. November 2012. Parks & Forestry Operations*
- OMNR. 2000. A Silvicultural Guide to Managing Southern Ontario Forests. Version 1.1 Ont. Min. Nat. Resources. Queen's Printer for Ontario, Toronto, 648 pgs.*
- Matheny, Nelda and James R. Clark, Trees and Development, A Technical Guide to Preservation of Trees During Land Development, 1998, International Society of Arboriculture, ISBN 1-881956-20-2.*
- The Corporation of the City of Cambridge, Tree Management Policies and Guidelines for New Developments, (April 1999)*
- Town of Aurora. June 2015. Tree Protection/ Preservation Policy*
- Town of Newmarket. Tree Preservation, Protection, Replacement, and Enhancement Policy. 8 pgs. Appendix "B" to Report PD02229(c)*
- York Region Forest Management Plan. November 2016.*

Appendix A: Detailed City of Vaughan Departmental Approval Authorities

The authority to allow tree removals as per the private property tree protection permitting process and the development review process are provided below.

City's Private Property Tree Protection By-law #185-2007

The City regulates trees on private property through Private Property Tree Protection (PPTP) By-law #185-2007 and the Property Standards (PS) By-law #231-2011. The intent of PPTP By-law is to provide specific rules that protect trees over a certain caliper size (20 cm), while identifying a permitting process to obtain authorization for their removal. This private permitting tree removal process is administrated by the Transportation Services, Parks and Forestry Operations Department (TSPFO) specifically Urban Forestry.

The TSPFO directly manages the permit process for the majority of circumstances that are outside of the development approval process. However, with development applications, multiple Departments can be involved. The TSPFO Department will not issue a Tree Removal Permit for lands subjects to a planning application infill development that has been submitted to the Development Planning Department. Currently there are four types of Tree Removal Permits (Public and Private):

1. Private Tree Removal Permit for Dead,

Hazardous or Ash Tree: This application for if for anyone who requires a permit to remove a privately-owned tree that is dead, hazardous or an Ash Tree anywhere in the City of Vaughan.

2. Private Tree Removal Permit Residential:

This application is for anyone who requires a permit to remove a total of five (5) or less trees that are privately owned anywhere in the City of Vaughan.

3. Private Tree Removal Permit

Construction or Infill: This application is for anyone who requires a permit to remove more than (5) trees that are privately owned anywhere in the City of Vaughan.

4. Public Tree Removal Permit:

For a City tree removal request, the City Arborist will inspect the tree and its location on the site. The Arborist or Landscape Architect will perform a tree evaluation and the TSPFO Department will approve or deny the permit based on this evaluation and a number of factors including but not limited to health, species, size, and significance of the tree and comments from other Departments. If the application is approved and the tree is healthy the tree is assessed through the City tree valuation process and a cost for the tree is established. The applicant of the permit will then pay for the value of the tree. In order

to enhance the City's tree canopy the funds received from this permit process are held in the City's tree reserve account and within a one-year period the TSPFO Department will plant trees within the proximity of the tree that was removed or in an area of need. The trees will be replanted on Public lands (e.g. boulevards, parks).

In terms of tree preservation, the Transportation Services Parks and Forestry Operations (TSPFO) is responsible for the installation of Tree Protection Zone (TPZ) for Public trees when construction takes place near those trees as well as conducting inspections for the TPZ of private trees. These standards will be applied to projects under the development review processes.

Building Standards

- Although Building Inspectors are not provided with the direct authority to deal with trees, they will advise By-law and Compliance, Licensing and Permit Services if they notice a tree being impacted by construction activity;
- Through an automation system of AMANDA, non-development related Building Permit applications, will send an advisory message to Urban Forestry that a permit has been applied for;
- Buildings Standards staff will affix a notification

stamp on non-development Building Permit drawings advising that a Tree Permit needs to be obtained prior to any tree removals.

- Buildings Standards will provide Building Permit applicants with handouts that provide sufficient information regarding the tree removal process.

Development Planning

For development applications, tree preservation and removal permissions are currently administrated by the Urban Design and Cultural Heritage (UDCH) Division specifically, Urban Design, in consultation with other City Departments such as Policy Planning and Environmental Sustainability and Urban Forestry. The various Development Application processes include:

a. Block Plans

The Policy Planning and Environmental Sustainability (PPES) Department lead the review of the Block Plan process and take into consideration the Vaughan Official Plan 2010 (VOP 2010) Policies and Natural Heritage Network (NHN) Strategy findings and other studies to inform their review and advice to protect trees. Master Environmental Servicing Plan (MESPs) and Environment Impact Studies (EIS) documents are a typical requirement and these studies include information that is

assessed to help inform tree protection. At the early stage of a Block Plan process, PPES Department engage the appropriate city staff in the review and development of the Block Plan as members of the Technical Advisory Committee for the particular Block Plan process.

b. Development Applications (Draft Plans of Subdivision and Site Development Applications)

Draft Plans of Subdivision and Site Development approvals are led by the Development Planning Department. Development Planning staff engage UDCH, PPES, and Urban Forestry staff to review potential tree and natural heritage implications that may result from a development application. At the early stage of a development review process, Urban Design staff provide applicants with tree protection requirements at the Pre-Application Consultation (PAC) meeting including:

- Arborist Report/ Tree Inventory and Preservation Plan;
- Landscape Plans and Cost Estimate;
- Edge Management Plan (if adjacent to woodland feature); and
- Restoration Planting Plan.

As part of the Draft Plan of Subdivision/Site Development application processes, Urban Design and Urban Forestry staff review the

application to ensure that development will not affect any trees or vegetation and provide a recommendation(s) to protect preserved trees prior to the application approval.

When Urban Design and Urban Forestry staff concur with all the proposed recommendations, conditions will be provided to Development Planning to accompany approval recommendations. These conditions will assure that tree preservation and tree compensation will happen based on the recommendations of the technical report.

Development Planning staff will not issue the clearance of any conditions until such time as the conditions are reviewed to the satisfaction of the Urban Design and Urban Forestry staff. Any tree removals for an application are subject to the Urban Design/Forestry Replacement Tree Requirements. Any natural heritage impacts are subject to PPES and the Toronto and Region Conservation Authority approvals.

A Letter of Credit is required for a Plan of Subdivision/Site Development Application and an inspection will be conducted by Urban Forestry staff.

c. Cultural Heritage Permits

Cultural Heritage approval and inspection is led by the Cultural Heritage Division in collaboration with the Development Planning Department.

Cultural Heritage staff engage UD, PPES, and Urban Forestry staff to review tree and natural heritage implications on a property (ies) subject to a Cultural Heritage permit application. Designation of an area as a Heritage Conservation District (HCD) is an important means of protecting a Cultural Heritage Landscape to control new development and site alteration within the district.

As part of the Cultural Heritage permit, the Cultural Heritage Coordinator will review all development applications within an HCD to ensure that the heritage landscape will be protected and conserved through the proposed development as well as ensure that development will not affect any trees or vegetation and provide a recommendation(s) to protect preserved trees prior to approval. Urban Design will request an Arborist Report/ Tree Inventory and Preservation Plan on a property which contains private and/or adjacent public trees to Draft Plans of Subdivision and Site Development application.

The Cultural Heritage Coordinator will consider/ prioritize the merits of the Heritage Permit application based on applicable heritage policies/law and collaborate with the Urban Designer to make sure that Cultural Heritage comments are complementary.

When Urban Design and Urban Forestry staff

concur with all the proposed recommendations, conditions will be provided to the Cultural Heritage Coordinator. These conditions will assure that tree preservation and tree compensation will happen based on the recommendations of the technical report.

Any tree removals for a Cultural Heritage permit are subject to the Urban Design/Urban Forestry Tree Replacement Requirements.

d. Committee of Adjustment Application

Committee of Adjustment (CoA) approval and inspection is led by the Office of the City Clerk in collaboration with the Development Planning Department. Development Planning staff engage UDCH, PPES, and Urban Forestry staff to review potential tree and natural heritage implications that may result from a Minor Variance or Consent application.

As part of the CoA staff review the application to ensure that development will not affect any trees or vegetation and provide a recommendation(s) to protect preserved trees prior to approval. Staff will request an Arborist Report/ Tree Inventory and Preservation Plan on a property which contains private and/or Public trees that were not be subject to a related Plan of Subdivision/ Site Plan application.

When Urban Design and Urban Forestry staff

concur with all the proposed recommendations, conditions will be provided to the Development Planning Department for inclusion in Minor Variance/ Consent application approval recommendations. These conditions will assure that tree preservation and tree compensation will happen based on the recommendations of the staff report.

Development Planning staff will not issue the clearance of any conditions until such time as the conditions are reviewed to the satisfaction of the Urban Design staff. Any tree removals for a Minor Variance or Consent application are subject to the Urban Design/Forestry Replacement Tree Requirements. Any natural heritage impacts are subject to discussions and any conditions provided by the PPES Department.

e. Fill Permit (Site Alteration) Application

Fill Permit (Site Alteration) approval and inspection is led by the Development Engineering (DE) Department. Development Engineering staff engage UDCH, PPES, and Urban Forestry staff to review potential tree and natural heritage implications that may result through a Fill Permit process.

As part of the Fill Permit process staff review the application to ensure that the placement of fill in areas of the City will not affect any trees or

vegetation within the project boundary (within the private and public boundary) and provide a recommendation(s) to protect preserved trees prior to issuance of a Fill Permit. Any tree removals for Fill permits are subject to the Urban Design/Forestry Tree Replacement Requirements.

Policy Planning and Environmental Sustainability
The Planning Act enables the City to protect the City's tree canopy through the development review process, Provincial Policy Statement 2014, York Region Official Plan 2010, City of Vaughan Official Plan 2010, and the City's Green Direction Vaughan. The following provides an overview of tree protection framework and policies.

York Region Forest Management Plan
The York Region Forest Management Plan (Plan) 2016, approved by York Region Council in November 2016, was developed to work towards net gains in trees and woodlands to maximize the benefits of all trees in the Region and to combat threats to them. The Plan establishes a vision and goals for trees and woodlands in the Region and will be delivered through a series of objectives, strategies and short, medium and long-term actions. It builds on current strategic direction in York Region Vision 2051, York Region Official Plan 2010, the 2015-2019 Strategic Plan, and current programs such as the Greening Strategy.

A commitment to green infrastructure has multiple benefits towards advancing York Region Council's goals, and is aligned with current and future initiatives. For example, tree protection support, cooling of our urban environments in summer months, improvements in air quality and other direct and indirect public health benefits including complimenting priority initiatives of the Region's Seniors Strategy.

The Plan includes a review of the current York Region Official Plan 2010 woodland cover target of 25 per cent by 2031, and includes a total canopy cover target at the Regional level supported by target canopy cover ranges for local municipalities.

York Region's Forest Conservation (Bill 70) By-law 2013-68 protects forests in York Region. Under the By-law, landowners require a permit from York Region before they can remove any trees from treed areas greater than 0.2 hectares (0.5 acres).

City of Vaughan Official Plan and Green Directions Vaughan

The Policy Planning and Environmental Sustainability Department (PPES) is responsible for two over-arching policy documents that guide urban growth and environmental management in the City: Vaughan Official Plan 2010 (VOP

2010); and, the Community Sustainability and Environmental Master Plan (Green Directions Vaughan). The York Region Official Plan and VOP 2010 conform to the PPS 2014. Specific responsibilities of the PPES Department in relation to woodland management and tree protection are noted below:

- Developing environmental, natural heritage and green infrastructure policies as part of the VOP 2010 and supporting guidelines such as the Environmental Management Guide. This responsibility includes delineation of the Natural Heritage Network (NHN) in Schedule 2 of the VOP 2010 and maintenance of the inventory of natural features in a GIS database, including woodlands;
- Developing policies for woodland protection and woodland compensation pertaining to the maintenance of the NHN;
- Implementing NHN policies and delineation through the review of development applications under the Planning Act and infrastructure projects under an Environmental Assessment process;
- Supporting improvements in the broader urban canopy, such as through the review of environmental matters related to development applications, the development of the Sustainability Metrics, and future efforts regarding the provision of "green infrastructure" (as now defined in the Provincial Policy Statement);

Appendix B: Sample of Arborist Report

- Researching policy direction and best practices for green infrastructure and the urban canopy and connections to community health, the provision of ecosystem services, and in relation to the maintenance of biodiversity; and
- Reviewing Master Environment and Servicing Plan (MESP) submissions for Block Plans and/or Secondary Plans and reviewing Environmental Impact Study (EIS) submissions related to Draft Plan and Site Development applications.

For the sample of Arborist Report please refer to: http://www.vaughan.ca/services/business/committee_of_adjustment/General%20Documents/AGENDAS/2015%20Meeting%20Agendas/19%20-%20October%202022,%202015%20Meeting%20Agenda/Item%2036%20-%20A317-15%20-%20Addendum%201%20Arborist%20Report.pdf

PPES staff provide natural heritage planning advice in the development review process (i.e., Draft Plan of Subdivision, Site Development, Committee of Adjustments applications etc.) At the Pre-Application Consultation meeting, PPES staff will request an Environmental Impact Study/ Natural Heritage Evaluation for any proposed projects that may potentially impact natural heritage features such as woodlands. It is important to place the tree protection procedure and protocol within the context of policy protection for woodlands and maintenance of significant woodlands. Where a stand or clusters of trees meets the definition of a woodland under the VOP 2010, then woodland policies should be reviewed to determine the appropriate steps for protection and/or compensation. Where a stand of trees does not meet the criteria to be defined as woodland, then protocols for addressing individual trees are followed.

Appendix C: Forestry Preferred Tree Lists

List of Deciduous Trees for Parks and Development

| CODE | COMMON NAME | SCIENTIFIC NAME | FORM |
|-------|-------------------------|--|----------|
| ACc | Hedge Maple | <i>Acer campestre</i> | small |
| ACf | Freeman Maple | <i>Acer freemanii</i> | large |
| ACfF | Firefall Maple | <i>Acer x freemanii</i> 'Fire-fall' | large |
| ACfK | Karpick Maple | <i>Acer freemanii</i> 'Karpick' | columnar |
| ACgi | Amur Maple | <i>Acer ginnala</i> | small |
| ACgr | Paperbark Maple | <i>Acer griseum</i> | small |
| ACn | Manitoba Maple | <i>Acer negundo</i> | large |
| ACpa | Japanese Maple | <i>Acer palmatum</i> | small |
| ACpaB | Red Leaf Japanese Maple | <i>Acer palmatum</i> 'Blood-good' | small |
| ACp | Norway Maple | <i>Acer platanoides</i> | large |
| ACpC | Columnar Maple | <i>Acer platanoides</i> 'Columnare' | columnar |
| ACpCK | Crimson King Maple | <i>Acer platanoides</i> 'Crimson King' | large |
| ACpCS | Crimson Sentry Maple | <i>Acer platanoides</i> 'Crimson Sentry' | columnar |
| ACpD | Deborah Maple | <i>Acer platanoides</i> 'Deborah' | large |
| ACpDR | Harlequin Maple | <i>Acer platanoides</i> 'Drummondii' | medium |
| ACpG | Globe Maple | <i>Acer platanoides</i> 'Globosum' | small |
| ACpR | Royal Red Maple | <i>Acer platanoides</i> 'Royal Red' | large |

| | | | |
|------|-------------------------|---------------------------------|--------|
| ACps | Sycamore Maple | <i>Acer pseudoplatanus</i> | large |
| ACr | Native Red Maple | <i>Acer rubrum</i> | large |
| ACsi | Silver Maple | <i>Acer saccharinum</i> | large |
| ACsu | Sugar Maple | <i>Acer saccharum</i> | large |
| ACt | Tartarian Maple | <i>Acer tartaricum</i> | small |
| AEc | Ruby-Red Horse Chestnut | <i>Aesulus carnea</i> 'Briotii' | large |
| AEg | Ohio Buckeye | <i>Aesulus glabra</i> | large |
| A Eh | Horse Chestnut | <i>Aesulus hippocastanum</i> | large |
| AM | Serviceberry | <i>Amelanchier</i> spp | small |
| ARe | Devil's Walking Stick | <i>Arailia elata</i> | shrub |
| BEpa | White Birch | <i>Betula papyrifera</i> | large |
| Bepe | Cutleaf Weeping Birch | <i>Betula pendula</i> | medium |
| CAca | Musclewood - Blue Beech | <i>Carpinus caroliniana</i> | medium |
| CAco | Bitternut Hickory | <i>Carya cordiformis</i> | large |
| CAo | Shagbark Hickory | <i>Carya ovata</i> | large |
| CAP | European Hornbeam | <i>Carpinus betulus</i> | medium |
| CAs | Northern Catalpa | <i>Catalpa speciosa</i> | large |
| CEc | Red Bud | <i>Cercis canadensis</i> | small |
| CEj | Katsura | <i>Cercidiphyllum japonicum</i> | medium |
| CEo | Hackberry | <i>Celtis occidentalis</i> | large |
| COc | Turkish Hazel | <i>Corylus colurna</i> | medium |
| CR | Hawthorn spp | <i>Cretaeagus</i> spp | small |
| Ela | Russian Olive | <i>Elaeagnus angustifolia</i> | medium |
| EUac | Dwarf Burning Bush | <i>Euonymus alatus</i> compacta | shrub |

| | | | |
|-------|---------------------------|-------------------------------------|----------|
| EUu | Rubber Tree | Eucommia ulmoides | medium |
| FAG | American Beech | Fagus grandifolia | large |
| FAs | European Beech | Fagus sylvatica | large |
| FAsF | Columnar European Beech | Fagus sylvatica 'Fastigiata' | columnar |
| FAsR | Tricolor Beech | Fagus sylvatica 'Rosea-marginata' | large |
| Glb | Ginkgo / Maidenhair Tree | Ginkgo biloba | large |
| GLt | Native Honeylocust | Gleditsia triacanthos | large |
| GLtD | Street Keeper Honeylocust | Gleditsia triacanthos 'Draves' | large |
| GLtI | Thornless Honeylocust | Gleditsia triacanthos var. inermis | large |
| GLtS | Shademaster Honeylocust | Gleditsia triacanthos 'Shademaster' | large |
| GLtS | Skyline Honeylocust | Gleditsia triacanthos 'Skycole' | large |
| GLtSU | Sunburst Honeylocust | Gleditsia triacanthos 'Suncole' | large |
| GYd | Kentucky Coffee Tree | Gymnocladus dioica | large |
| JUc | Butternut | Juglans cinerea | large |
| JUn | Black Walnut | Juglans nigra | large |
| LaW | Golden Chain Tree | Laburnum x watereri 'Vossii' | large |
| LIt | Tulip Tree | Liriodendron tulipifera | large |
| LItJ | Emerald City Tulip Tree | Liriodendron tulipifera 'JFS-Oz' | large |
| MAG | Galaxy Magnolia | Magnolia x 'Galaxy' | large |
| MAP | Profusion Crabapple | Malus 'Profusion' | small |

| | | | |
|-------|------------------------------------|-----------------------------------|--------|
| MApWS | Maclura pomifera 'White Shield' | White Shield Osage Orange | large |
| MAR | Royalty Crabapple | Malus 'Royalty' | small |
| MASo | Saucer Magnolia | Magnolia x 'soulangiana' | small |
| MASt | Star Magnolia | Magnolia stellata | small |
| OSv | Hop Hornbeam / Ironwood | Ostrya virginiana | medium |
| PHa | Amur Cork | Phellodendron amurense | large |
| PLa | London Plane Tree | Platanus x acerifolia | large |
| POa | White Poplar | Populus alba | large |
| POaP | Bolleana Poplar | Populus alba 'Pyramidalis' | large |
| POb | Balsam Poplar | Populus balsamifera | large |
| Poc | Carolina Poplar | Populus x canadensis 'Eugenei' | large |
| POg | Big Tooth Aspen | Populus gradidentata | large |
| POn | Lombardy Poplar | Populus nigra var. 'Italica' | large |
| POt | Trembling Aspen | Populus tremuloides | large |
| PRc | Purpleleaf Sand Cherry | Prunus x cistena | small |
| PRs | Black Cherry | Prunus serotina | small |
| PRt | Flowering Almond | Prunus triloba var. multiplex | shrub |
| PRv | Choke Cherry | Prunus virginiana | medium |
| PRvS | Schubert Cherry | Prunus virginiana 'Schubert' | medium |
| PYc | Ornamental Pear | Pyrus calleryana | small |
| QUa | White Oak | Quercus alba | large |

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|-------|-----------------------|--|--------|
| QUb | Swamp White Oak | <i>Quercus bicolor</i> | large |
| QUBM | Prairie Stature Oak | <i>Quercus x Bimundorum</i> 'Midwest' | large |
| QUm | Burr Oak | <i>Quercus macrocarpa</i> | large |
| QUp | Pin Oak | <i>Quercus palustris</i> | large |
| QUro | English Oak | <i>Quercus robur</i> | large |
| QUroa | Crimson Spire Oak | <i>Quercus robur x alba</i> 'Crimschmidt' | large |
| QUroF | Pyramidal English Oak | <i>Quercus robur</i> 'Fastigiata' | large |
| QUru | Northern Red Oak | <i>Quercus rubra</i> | large |
| ROp | Black Locust | <i>Robinia pseudoacacia</i> | large |
| SOa | European Mountain Ash | <i>Sorbus aucuparia</i> | small |
| SOj | Japanese Pagoda | <i>Sophora japonica</i> 'Regent' | medium |
| SOT | Oakleaf Mountain Ash | <i>Sorbus thuringiaca</i> 'Fastigiata' | small |
| SYr | Ivory Silk Tree Lilac | <i>Syringa reticulata</i> 'Ivory Silk' | small |
| THo | White Cedar | <i>Thuja occidentalis</i> | small |
| Tla | American Basswood | <i>Tilia americana</i> | large |
| TlaR | Redmond Linden | <i>Tilia americana</i> 'Redmond' | large |
| Tlc | Little Leaf Linden | <i>Tilia cordata</i> | large |
| TlcG | Greenspire Linden | <i>Tilia cordata</i> 'Greenspire' | large |
| ULa | American Elm | <i>Ulmus americana</i> | large |
| ULaJ | Jefferson Elm | <i>Ulmus americana</i> 'Jefferson' | large |

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|-----|-------------|-------------------|--------|
| ULP | Pioneer Elm | Ulmus x 'Pioneer' | large |
| ZEs | Zelcova | Zelcova serrata | medium |

List of Coniferous Trees for Parks and Development

| | | | |
|-----|-----------------------|--------------------------------------|----------|
| Ab | Balsam Fir | Abies balsamea | large |
| Ac | White Fir | Abies concolor | large |
| Af | Fraser Fir | Abies fraseri | large |
| Cn | Weeping False Cypress | Chamaecyparis nootkensis 'Pendulata' | shrub |
| Jv | Eastern Red Cedar | Juniperus virginiana | shrub |
| Ld | Larch | Larix decidua | large |
| Li | Tamarack | Larix laricina | large |
| Mg | Dawn Redwood | Metasequoia glyptostroboides | large |
| Pa | Norway Spruce | Picea abies | large |
| Pg | White Spruce | Picea glauca | large |
| Pme | Douglas Fir | Pseudotsuga menziesii | large |
| Pmu | Mugo Pine | Pinus mugo | shrub |
| Pn | Austrian Pine | Pinus nigra | large |
| Po | Serbian Spruce | Picea omorika | columnar |
| PpB | Colorado Blue Spruce | Picea pungens 'Glauca' | large |
| Pst | White Pine | Pinus strobus | large |
| Psy | Scots Pine | Pinus sylvestris | large |

List of Deciduous and Coniferous Trees for Street Trees

Species Planting Rules:

No more than 10% of any Genus per project

No more than 4 trees of the same Genus in a row or in the same area

| COMMON NAME | SCIENTIFIC NAME | RESTRICTIONS |
|--------------------------|--|--|
| Hedge Maple | <i>Acer campestre</i> | none |
| Freeman Maple | <i>Acer freemanii</i> | none |
| Amur Maple | <i>Acer ginnala</i> | none |
| Norway Maple | <i>Acer platanoides</i> 'Emerald Queen' | none |
| Columnar Maple | <i>Acer platanoides</i> 'Columnare' | none |
| Royal Red Maple | <i>Acer platanoides</i> 'Royal Red' | none |
| Crimson Sentry Maple | <i>Acer platanoides</i> 'Crimson Sentry' | none |
| Karpick Maple | <i>Acer rubrum</i> "Karpick" | none |
| Silver Maple | <i>Acer saccharinum</i> | arterial roads & reverse front-ages only |
| Sugar Maple | <i>Acer saccharum</i> | residential, none arterial streets only |
| Tartarian Maple | <i>Acer tartaricum</i> | none |
| Ohio Buckeye | <i>Aesulus glabra</i> | none |
| Serviceberry | <i>Amelanchier</i> spp | none |
| European Hornbeam | <i>Carpinus betulus</i> "Fastigiata" | none |
| Katsura | <i>Cercidiphyllum japonicum</i> | residential, none arterial streets only |
| Hackberry | <i>Celtis occidentalis</i> | none |
| Turkish Hazel | <i>Corylus colurna</i> | residential, none arterial streets only |
| European Beech | <i>Fagus sylvatica</i> | none |
| Columnar European Beech | <i>Fagus sylvatica</i> 'Fastigiata' | none |
| Ginkgo / Maidenhair Tree | <i>Ginkgo biloba</i> | none |
| Skyline Honeylocust | <i>Gleditsia triocanthos</i> 'Skycole' | none |
| Sunburst Honeylocust | <i>Gleditsia triocanthos</i> 'Suncole' | none |

| | | |
|-----------------------|--|--|
| Kentucky Coffee Tree | <i>Gymnocladus dioica</i> | none |
| Tulip Tree | <i>Liriodendron tulipifera</i> | residential, none arterial streets only |
| Amur Cork | <i>Phellodendron amurense</i> | none |
| London Plane Tree | <i>Platanus x acerifolia</i> | none |
| Ornamental Pear | <i>Pyrus calleryana</i> | none |
| White Oak | <i>Quercus alba</i> | none |
| Swamp White Oak | <i>Quercus bicolor</i> | none |
| Burr Oak | <i>Quercus macrocarpa</i> | none |
| English Oak | <i>Quercus robur</i> | none |
| Crimson Spire Oak | <i>Quercus robur x alba 'Crim-schmidt'</i> | none |
| Pyramidal English Oak | <i>Quercus robur 'Fastigiata'</i> | none |
| Northern Red Oak | <i>Quercus rubra</i> | none |
| Ivory Silk Tree Lilac | <i>Syringa reticulata 'Ivory Silk'</i> | none |
| Redmond Linden | <i>Tilia americana 'Redmond'</i> | none |
| Little Leaf Linden | <i>Tilia cordata</i> | none |
| Pioneer Elm | <i>Ulmus x 'Pioneer'</i> | arterial roads & reverse front-ages only |
| American Elm | <i>Ulmus americana</i> | arterial roads & reverse front-ages only |
| Zelcova | <i>Zelcova serrata</i> | none |

