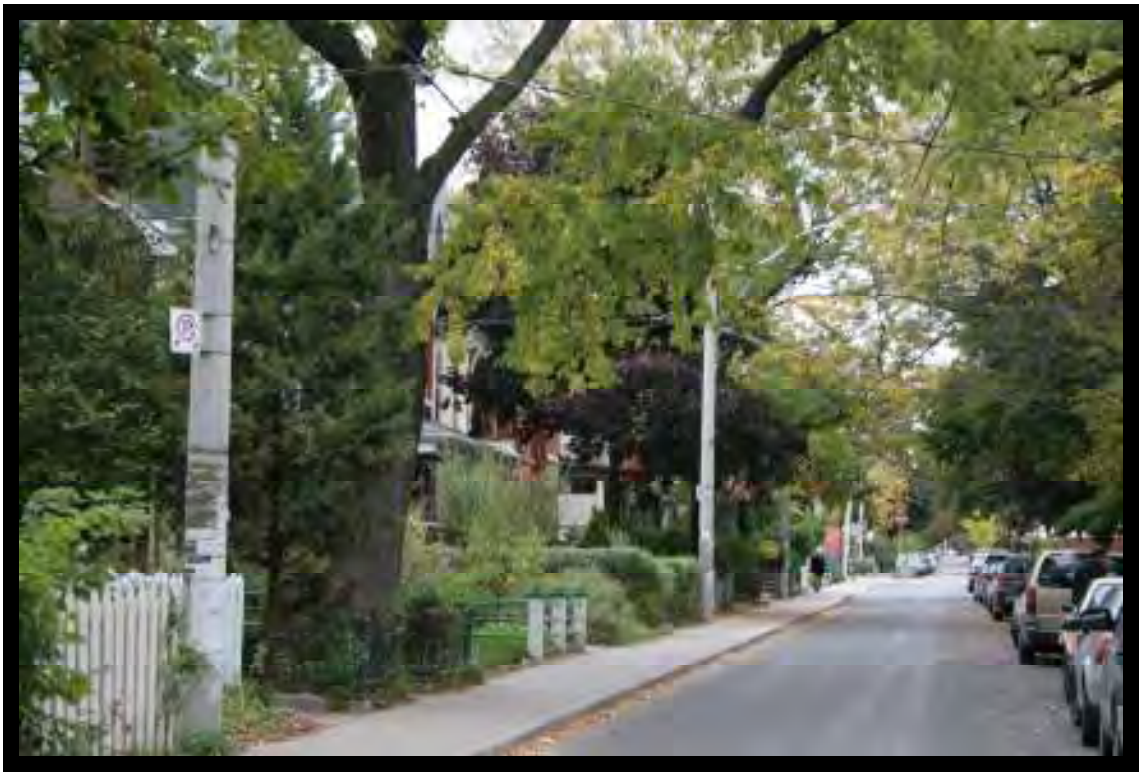
Strategic Urban Forest Management Plan for Harbord Village, Toronto



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Introduction to Harbord Village

Harbord Village is located in Toronto; east of Spadina Avenue, west of Bathurst street, south of Bloor street West, and north of College street. It is a residential area with mostly semi-detached houses, three schools and a care home for the elderly. The area does not have a park of a significant size, so their urban forest functions as their park, and the residents therefore want to preserve it. The Harbord Village Residents Association (HVRA) has a history of community activism, and have done a lot of work with and for the 1600 households in the neighbourhood, such as conflict management, graffiti removal, heritage conservation of old building, solar energy project and tree advocacy. The tree committee in Harbord Village got initiated by Jorg Felix Bentz, who was a resident in the neighbourhood and spent 37 years lobbying for the greening of the area. In 2004 he was awarded posthumously the *Hands for Nature Local Action Award* by Evergreen, and his partner donated the money to the HVRA so they could continue with the tree work that he had started.

Figure 1: Map of Harbord Village

In 2004 HVRA hired a graduate student from the University of Toronto's Faculty of Forestry to talk to the residents who did not have a tree in their front yard, and to dispel some of the myths surrounding urban trees. The graduate student encouraged the residents to take advantage of the city's tree offer, where the city will plant a tree in your front yard for free. In the first year about twelve people took advantage of this program. It

was discovered that people who were hesitant about getting a tree in their front yard were worried about tree roots, that the roots would cause problems for their foundations and pipes. The HVRA convinced the Urban Forestry Department to make a flyer called “The problem is not the roots. Lets get to the roots of the problem”, which explained that it is not the roots that cause cracks in foundations. The graduate student also took photos of all the public spaces in the neighbourhood, so that HVRA could lobby the city to have trees planted in these areas.

In 2005 the HVRA hired another graduate student to talk to the remainder of the residents without trees in their front yard. This was more successful, partly due to colour photographs of native trees, enabling the residents to see what the trees looked like. This time, around 40 people signed up to get a tree in their front yard. This project also resulted in having 20 trees planted in public spaces.

However, the HVRA was still unsuccessful in convincing the sceptical residents into getting a tree planted in their front yard. The HVRA decided to undertake a tree inventory in the summer of 2007. About 40% of the neighbourhood was inventoried, and the residents who took part in the inventory now have a completely different view of their trees.

Management Plan for Harbord Village

The management plan for Harbord Village is a twenty year strategic plan. It will encompass the vision the Harbord Village residents have for their urban forest, and include guiding principles that will help them reach these goals. In the twenty year strategic plan there will be four detailed five year management plans. Each five year plan will build upon the successes and failures of the previous management plans. For each

year there will be an annual operating plan with details describing how to implement the different tasks. The annual operating plans will be re-evaluated each year and changed accordingly.[1]

Vision of Harbord Village

In 2028 Harbord Village will have maintained or increased their crown projection area (CPA). The residents have and will be encouraged to plant trees in their front and back yards. All municipally-owned and private trees in Harbord Village will be maintained on a regular cyclic pruning plan.

Current state of Harbord Village's Urban Forest

The inventory for Harbord Village was undertaken using the Neighbour*woods* protocol, as developed by Andy Kenney and Danijela Puric-Mladenovic. Approximately 40 volunteers from the community assessed the species, size, condition and location of the trees in assigned blocks. Both private and city trees were assessed, and approximately 2,000 trees were inventoried. Tree size was measured by stem circumference at 1.3 meters above the ground, which was later converted to DBH (diameter at breast height); total height of the tree; and the length and maximum width of the crown. In addition, species and ownership were also identified, along with a number of parameters describing the condition of the trees. These parameters included the presence of cavities, rot, defoliation, lean, dead or broken branches, reduced height, weak or yellow foliage, poor

[1] Wassenaer, P., Kenney, W. A, *Strategic Urban Forest Planning in Neighbourwoods* , 2001, retrieved from: http://larva.forestry.utoronto.ca/urban/neighbourwoods/, viewed on 19.10.07

branch attachment, and conflicts with sidewalk, utilities, or other trees. Possible planting spaces were also identified.[2]

Harbord Village was divided up into 24 blocks. Both street trees, front yard trees and back yard trees were measured and assessed. Blocks numbered 3, 6, 10, 11, 17, 18 and 22 have been fully inventoried, whilst blocks numbered 7, 8, 9, 15, 16 and 23 have been started but not completed. Data for all of the schools had already been collected from a previous Neighbour*woods* inventory with the Toronto District School Board.

Figure 2: Map of the blocks used during the inventory

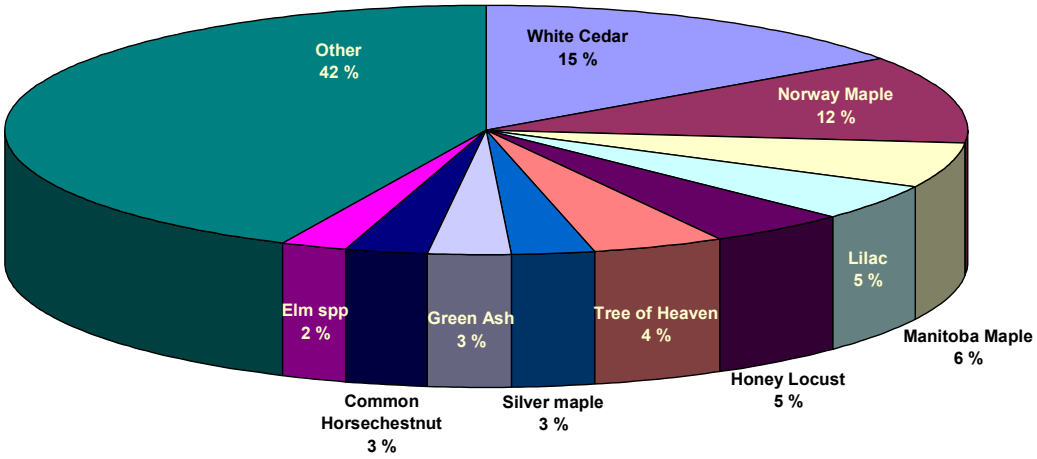

Figure 3: Relative frequency of species that were inventoried

There is a total of 129 different species in Harbord Village, and the relative frequency of the species inventoried is shown in figure 3. White cedar (*Thuja occidentalis*) and Norway maple (*Acer platanoides*) account for more than 25% of the

[2] Kenney, A, *Neighbourwoods*, Faculty of Forestry, University of Toronto, 2007

species. Six percent of the species were Manitoba maple (*Acer negundo*), whilst lilac (*Syringa spp.*) and honey locust (*Gleditsia triacanthos*) each account for 5% of the trees. Fifteen percent are accounted for by tree of heaven (*Alianthus altimissa*), silver maple (*Acer saccharinum*), green ash *(Fraxinus pennsylvanica*), common horsechestnut (*Aesculus hippocastanum*) and elm species (*Ulmus spp*.). The remaining 42% consists of other species, each present at frequencies less than 2%.

The city owns 49% of the trees that were inventoried and 43% are owned by private residents. Accessing backyards often proved to be difficult, primarily due to the owner's permission being required, so the proportion of private trees may be underestimated due to backyards not being inventoried. Eight percent of the trees are located on the school grounds of the Central Technical School, King Edward School and Harbord CI.

Harbord Village has 41% native trees, and 59% non-native trees. The high percentage of non-natives could be due to the large number of Norway maples, Manitoba maples, lilacs, tree of heaven and ornamental species in backyards. Seventy-seven percent of the trees are deciduous and 23% are evergreens.

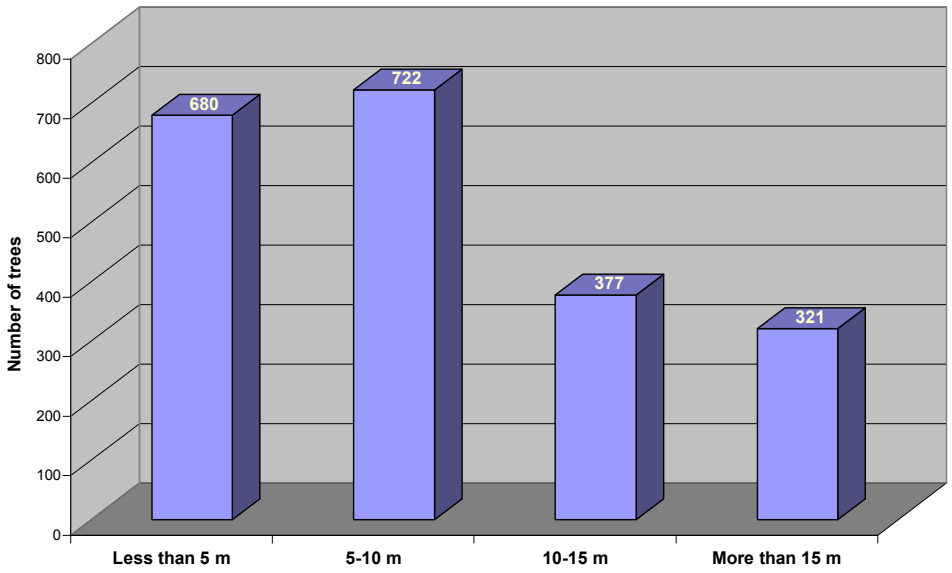

Figure 4: Distribution of height classes

Tree height was divided into discrete classes; less than 5 meters, 5-10 meters, 10-15 meters, and more than 15 meters (see figure 4). The majority of the trees are less than 10 meters tall.

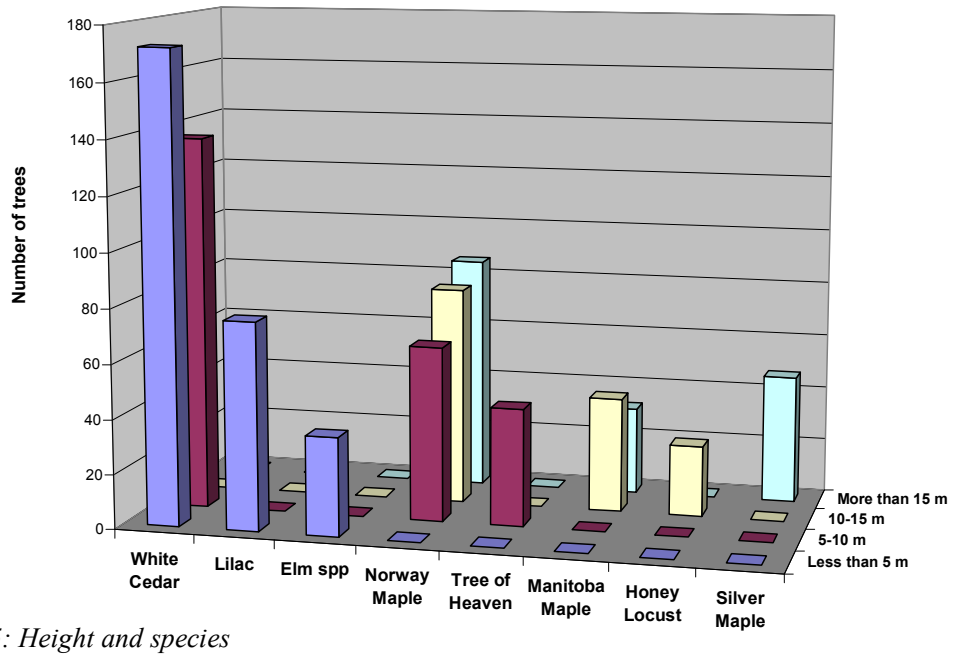

Figure 5: Height and species

Figure 5 shows the relationship between the height classes, species and the number of trees. The trees that are less than 5 meters tall consist of white cedar, lilac and

elm species. This is due to the neighbourhood's large number of cedar hedges. The majority of trees that are between 5 and 10 meters are white cedar, Norway maple and tree of heaven. Norway maples are the most common species in the height classes 10-15 meters and over 15 meters. Manitoba maple and honey locust are the second and third most common species in the height class 10-15 meters, while silver maple and Manitoba maple are the second and third most common species of trees that are taller than 15 meters. These results are to be expected, since cedar hedges and lilacs would naturally not reach the same heights as Norway maples, tree of heaven, Manitoba maples and honey locusts. Cedars can reach a height of 16 meters,[3] however, most of the white cedars in Harbord Village are in smaller hedges. Lilacs can reach a height of 6 meters,[4] while Manitoba maples have a maximum height of 20 meters,[5] Norway maples have a height of 15 meters (occasionally they might reach a height of 27 meters),[6] honey locust can reach a height of 30 meters,[7] and tree of heaven can reach a maximum height of 25 meters.[8]

[3] Evergreen Native Plant Database, retrieved from: http://www.evergreen.ca/nativeplants/search/, viewed on 16.10.07
[4] Dirr, M. A, *Manual of Woody Landscape Plants*, Stipes Publishinng Company, Ilinois, USA, 1990
[5] Evergreen Native Plant Database, retrieved from: http://www.evergreen.ca/nativeplants/search/, viewed on 16.11.07
[6] Dirr, M. A, *Manual of Woody Landscape Plants*, Stipes Publishinng Company, Ilinois, USA, 1990
[7] Laird Farrar, J, *Trees in Canada*, Fitzhenry & Whiteside Limited, Canadian Forest Service, Ontario, 1996
[8] *Ibid,*

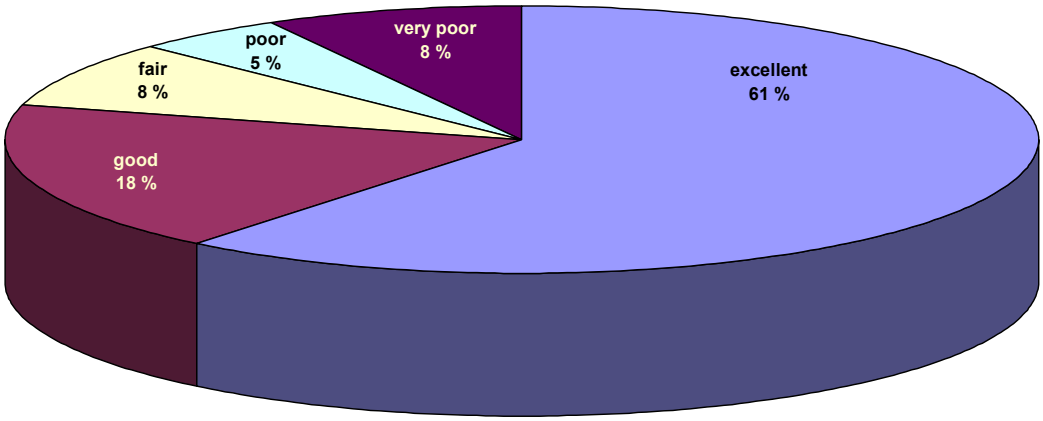

Figure 6: Condition of the trees that had been inventoried

The overall condition of the trees was determined from the inventory data and the results can be seen in figure 6. Sixty-one percent of the trees in Harbord Village are in excellent condition, and 18% of the trees are in good condition. However, 13% of the trees are in either poor or very poor condition. This is not ideal, as Harbord Village could potentially lose 13% of their trees. Harbord Village will have to plan for these trees in the future.

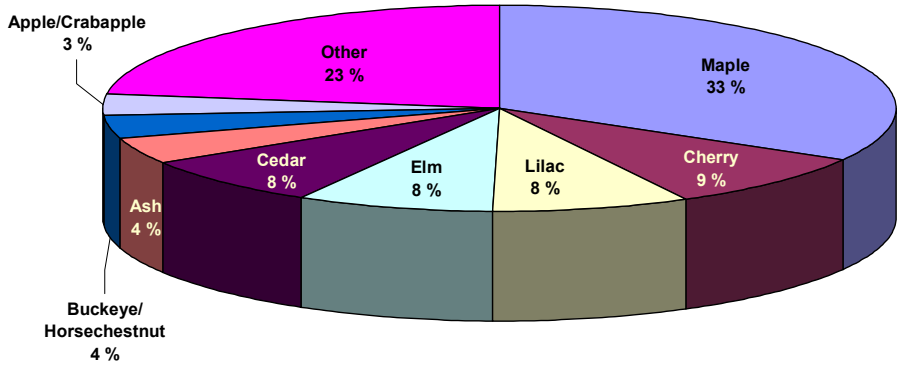

Figure 7: Genus of the poor and very poor trees

Figure 7 shows the genus of the trees that are in poor and very poor condition. The majority (33%) of the trees that are in poor or very poor condition are maple (*Acer spp.*) trees. Nine percent are cherry species (*Prunus spp.*), whereas lilac (*Vulgaris spp.*), elm species (*Ulmus spp.*) and cedar (*Thuga spp.*) each comprise 8% of the poor and very poor trees. The remaining 34% is compromised of other species in the neighbourhood. From figure 4 it can be seen that the majority of trees that are taller than 10 meters are maples. It should be expected that the maples are in worse condition than the lilacs and cedars, since they are more likely to be older, and hence have more structural faults and problems.

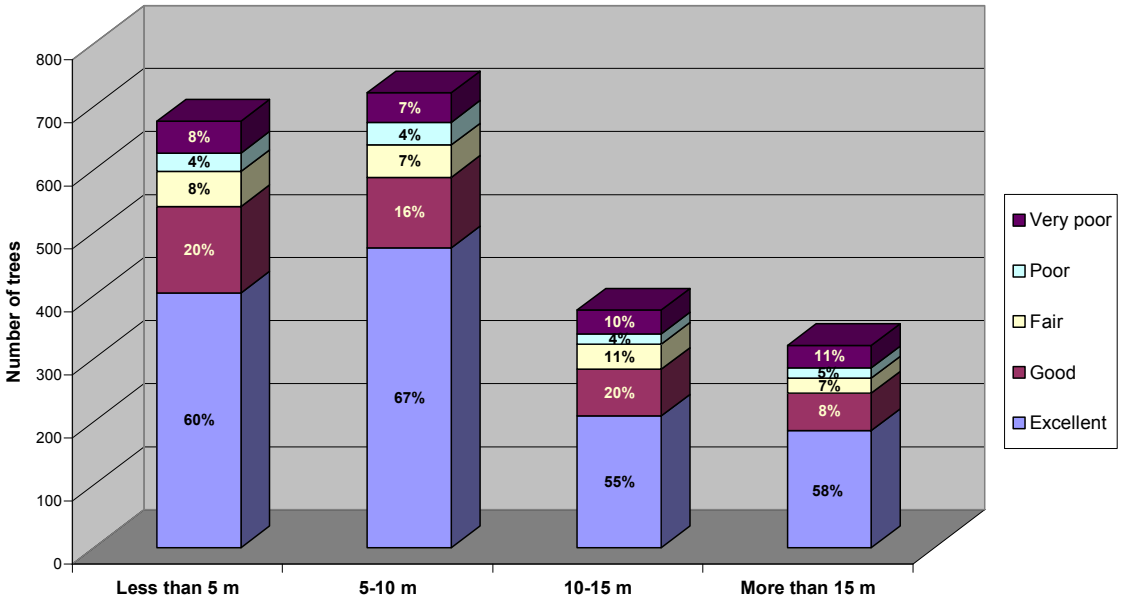

Figure 8: Condition of the trees in relation to height classes

Figure 8 shows the condition of the trees in relation to their height classes. The majority of the trees in excellent condition are in the smaller height classes, while the poor and very poor trees are mostly in the higher height classes. As previously mentioned, this should be expected, since larger trees will have more structural problems than young trees.

Crown Projection Area (CPA) was calculated for the inventoried trees. A tree's CPA is the area underneath its dripline, and an estimate of this can be calculated using:

$$CPA = \pi(CR)^2$$

where:

CPA=Crown Projection Area (m^2)
CR=Crown Radius (m) estimated as one half of the recorded crown diameter

The Crown Projection Area (CPA) was chosen instead of calculating the canopy cover for the following reasons. Canopy cover is the measurement of the ground area that is covered by the entire tree canopy, and is represented by a percentage, whilst CPA is

represented in m^2. The advantage of using the crown projection area is that information can be calculated for different sub-groups of trees (i.e. species, trees higher than 15m, trees in poor condition). In addition, CPA takes into account the fact that tree crowns will overlap.

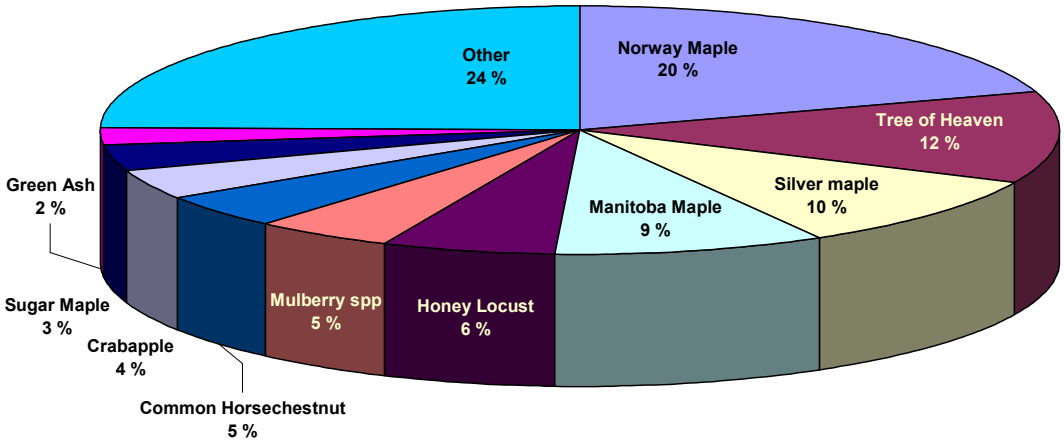

Figure 9: Species distribution by Crown Projection Area

The ranking of the ten most common species in relation to total CPA is shown in figure 9. Fifty-one percent of the total CPA is made up of just four species; Norway maple, tree of heaven, silver maple and Manitoba maple. Twenty-five percent of the CPA is made up of honey locust, mulberry spp (*Morus spp*), common horsechestnut, crabapple (*Malus spp*), sugar maple and green ash. The remaining 24% are made up of other species. There are a number of species that are present in this graph which are absent from the graph showing the relative frequency of species (figure 3), and there are species in that graph which are not present here. Mulberry, crabapple, sugar maple and green ash are not part of the ten most common species, but they do have a significant CPA. However, white cedar, lilac and elms are part of the ten most common species, but the

crowns are generally too small to be registered among the top ten species in respect to CPA. As seen in figure 7, a large percentage of the poor and very poor trees are maples. Forty-two percent the CPA is made up of maples, and hence, Harbord Village are at risk of loosing a large percentage of their CPA.

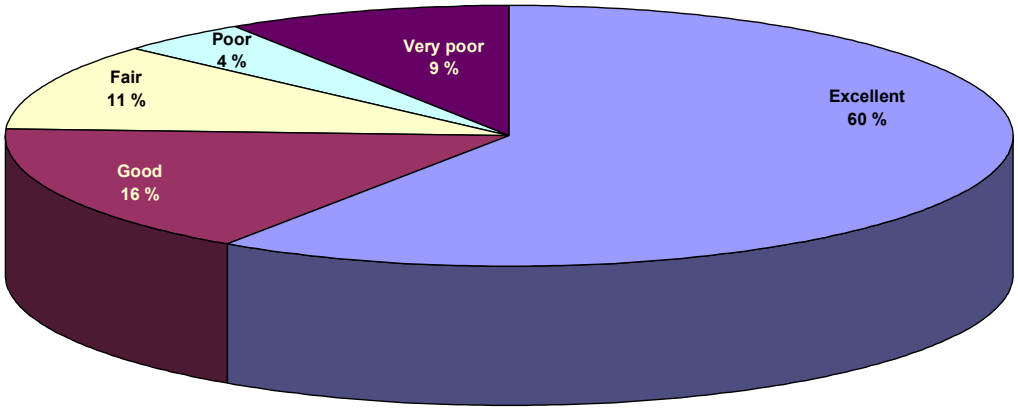

Figure 10: Condition of the trees in relation to Crown Projection Area

Figure 10 shows the relative CPA (the proportion of the total CPA for all trees represented) in relation to condition of the trees. Sixty percent of the total CPA is represented by trees in excellent condition and 16% are in good condition. However, 13% of the CPA is represented by trees in poor or very poor condition, which is not ideal. This means that Harbord Village has the potential to loose 13% of its CPA. Most of the benefits that are derived from the urban forest, such as shade, cleaner air, storm water attenuation, etc., depend on having a large crown cover. Thus, Harbord Village could lose a number of the main benefits that the urban forest provides.

The relationship between CPA and ownership of the trees was calculated. Forty-eight percent of the total CPA is represented by trees owned by the city, and 43% are

owned by private residents. These results are similar to the percentage of city-owned trees and privately-owned trees.

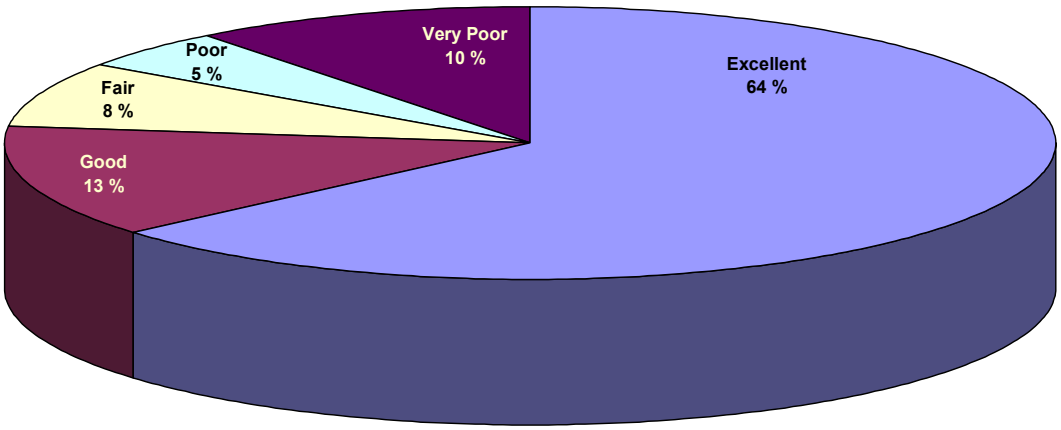

Figure 11: Condition of the private trees

The condition of the private trees can be seen in figure 11. Sixty-four percent of the private trees are in excellent condition, and 13% are on good condition. However, 15% are in either poor or very poor condition, which represent 138 trees. These private trees are in need of attention, and this will be one of the major challenges to Harbord Village, since the trees are owned by individual residents.

Fifty-nine percent of the city trees were in excellent condition, while 11% were in poor or very poor condition. Eight percent were in fair condition, the same as the private trees, whereas 21% were in good conditions. It is important for the HVRA to know the difference in condition of the municipally-owned trees and the private trees, since the legal rights for the private and the municipally-owned trees differ.

There are currently 451 private properties with absent landlords in Harbord Village. The condition of the trees among absent landlords and residents who own their

houses was analysed. With the residents that own their house, 60% of the trees were in excellent condition, 20% were in good condition, 9% were in fair condition, 4% were in poor condition and 8% were in very poor condition. With the absent landlords, 66% of the trees were in excellent condition, 12% were in good condition, 7% were in fair condition, 6% were in poor condition, and 9% were in very poor condition. A chi-square test for trends was performed, and there was no significant difference in the way that absent landlords or present landlords maintains their trees.

Current regulations and policies

Currently Harbord Village Residents Association does not have legal permission to undertake work on any of the trees in the neighbourhood. As mentioned in the previous section, the City owns 49% of the trees, the Toronto District School Board owns 8%, and 43% are owned by the private residents. For Harbord Village to pursue stewardship over their urban forest, it is important to know the legal rules about the street trees and the private trees. Recommendations as how to go about getting legal stewardships of the city trees and private trees will be discussed in the 20 year management plan.

Street trees

The City of Toronto is responsible for the planting and maintenance (including watering) of trees on street, parks and ravines. Their bylaw states that no person shall remove, cut down, destroy or injure any tree or part of a tree located on City streets except with the prior written approval of the Commissioner.[9]

[9] City of Toronto, Urban Forestry Department, *City Street Tree By-law (Article II of Chapter 813)*, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, viewed on 08.11.07

Approval by the Commissioner is also needed if a tree is to be planted on a City street, and it must take place in accordance with the City of Toronto Tree Planting Detail. The planting location, species, size and condition must be approved by the commissioner. The commissioner may request a monetary deposit to secure the planting of the trees. These funds may be held by the City until after the planting for a period of time determined by the commissioner and will be released by the city, provided that the trees are healthy and in a state of vigorous growth after the stipulated period of time.[10]

Tree Protection By-Law (commonly known as the Private Tree By-law)

According to the City of Toronto By-law, no person is allowed to injure or destroy any tree with a diameter of 30 centimetre or more, measured at 1.4 meters above the ground, unless authorized by a permit to do so. However, a permit is not required to:

- Remove a diseased, dead or hazardous trees certified as such by the Commissioner;
- Prune trees in accordance with good arboricultural practices to maintain tree health;
- Prune branches that interfere with utility lines;
- Emergency work;
- Injury or destruction of trees on roof top gardens, in interior courtyards having a soil depth of less than 1,5 meters above a built substructure, in solariums or on elevated podiums.[11]

A copy of the Toronto Municipal By-Law Chapter 813 can be found in Appendix 1.

[10] City of Toronto, Urban Forestry Department, *City Street Tree By-law (Article II of Chapter 813)*, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, viewed on 08.11.07
[11] City of Toronto, Urban Forestry Department, *Private Tree By-law (Article III of Chapter 813)*, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, viewed on 08.11.07

20-Year Management Plan

This part of the plan will encompass the different management strategies and recommendations, and explain what they entail. The plan will encompass details about pruning, inventory maintenance, planting, watering, tree health care, inspection, tree liberation, heritage trees, outreach and education, lobbying the city, and funding. More detailed recommendations will come in the five-year management plan and the annual operating plans.

Pruning

Pruning is an important part of tree maintenance and can help prevent a number of problems which might occur in the future.[12] Pruning is done for a number of reasons, such as to maintain or improve health, train young trees, control plant size and form,[13] and for safety and aesthetic reasons.[14] Pruning for the health of the tree involves the removal of dead or dying branches which have been injured by insect infestation, storms or animals.[15] Pruning should also be done to remove rubbing and crossing branches,[16] which could cause a number of problems later if this is not dealt with. Pruning can also

[12] Zins, M, Brown, D, *Pruning trees and shrubs*, University of Minnesota, Extension, 2002, retrieved from: http://www.extension.umn.edu/distribution/horticulture/DG0628.html, viewed on 22.10.07
[13] Gilman, E.F, Black, R.J, *Pruning Landscape Trees and Shrubs*, University of Florida, IFAS Extension, retrieved from: http://edis.ifas.ufl.edu/MG087, viewed on 22.10.07
[14] USDA Forest Service, *How to prune trees*, retrieved from: http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm#reasons, viewed on 22.10.07
[15] Zins, M, Brown, D, *Pruning trees and shrubs*, University of Minnesota, Extension, 2002, retrieved from: http://www.extension.umn.edu/distribution/horticulture/DG0628.html, viewed on 22.10.07
[16] USDA Forest Service, *How to prune trees*, retrieved from: http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm#reasons, viewed on 22.10.07

be done to improve the structure of the tree, and this will reduce the likelihood of storm damage.[17]

Pruning should be done on planned cyclic basis rather than on a reactive basis. Currently, when the City of Toronto Urban Forestry Department receives a call from a resident about a tree, it can take anywhere between 2 and 12 weeks for that tree to be inspected by city staff. It can then take up to 18 months for any required maintenance to be completed.[18]

Inventory maintenance

Harbord Village should maintain the inventory of their urban forest to be able to adapt their management plan to whatever changes have occurred. Currently, about 2000 trees have been inventoried in Harbord Village. Plans should be made to complete the inventory. Finishing the inventory will benefit the neighbourhood in a number of ways:

- A complete picture of Harbord Village will be available;
- New plantable spaces will be identified;
- The neighbourhood will have a complete list of trees in need of inspection for the whole of Harbord Village;
- The west side of Harbord Village, and especially Bathurst Street, differs in relation to tree species and cover, so completing the inventory here will give a more accurate view of their urban forest;
- It will be easier to adapt and change the annual operating plans and the five-year management plans with a complete inventory;

[17] USDA Forest Service, *How to prune trees*, retrieved from: http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm#reasons, viewed on 22.10.07
[18] Personal Communication, Andrew Pickett, Urban Forestry, City of Toronto, viewed on 07.11.07

- ❖ The new volunteers will gain knowledge and a new view of trees in their urban environment. The more community members that realise the benefits of the urban forest, the easier it will be to implement the management plan;
- ❖ Completing the inventory will improve chances of getting a grant. It will demonstrate to the grant givers that Harbord Village are serious about maintaining their urban forest;

The inventory of Harbord Village should be repeated after 10.

Planting

It is highly recommended that Harbord Village adopts a tree planting plan. New trees are needed to replace the trees that might die or need to be cut down. It would be optimal if native species were planted (appendix 2), since there is a high percentage of non-native species in the neighbourhood (59%). On the other hand, native species have adapted to grow in "natural" conditions, with good surroundings and favourable soil,[19] conditions which are often difficult to locate in a city. The urban environment is a very tough environment for trees to grow in, and certain non-native tree species (appendix 3) fair better with urban stresses, such as pollution, drought and soil compaction. Because of this, a number of non-native tree species should also be considered.

Nonetheless, care should be taken when choosing non-native species, to make sure they are not invasive. The seed source should also be taken into account when choosing nursery stock. There will be a difference in native trees that are from a seed source close to Toronto and a seed source from e.g. Windsor. The closer the seed source is to Toronto,

[19] Tree Council, *Tree planting guide*, retrieved from: http://www.treecouncil.org.uk/info/packng2.html, viewed on 30.10.07

the better. These plants will be better adapted to the environment in Toronto,[20] and native plants will provide shelter and food source for native wildlife. Harbord Village is in the USDA Hardiness zone of 6a,[21] which will give an indication to how well certain tree species will do (see appendix 4).

In addition, HVRA should consider the diversity they already have when choosing species. In general, urban foresters and municipalities use the following guidelines to increase and keep diversity - not planting more than 10% of one species, more than 20% of any genus, or more than 30% of one family. This rule is often used a safe-guard against pest and disease,[22] however, pest management and health still needs to be an integral part of urban forest management. Harbord Village already has 15% of white cedar and 12% of Norway maples, and the maple trees as a genus represents 24% of the urban forest that was inventoried. No family is over 30% of the trees inventoried. Harbord Village needs to plan for the diversity of their urban forest, taking into careful consideration the species they are to plant.

Watering

The city of Toronto water all of their trees under contracts and they work with volunteers to water trees that volunteers have planted. There is a night and day watering program of

[20] Cappiella, K, Schueler, T, Tomlinson, J, Wright, T, *Urban Watershed Forestry Manual, Part 3: Urban Tree Planting Guide*, p. 21, Center for Watershed Protection, United States Department of Agriculture, Forest Service, Northeastern Area, State and Private Forestry, 2006
[21] Natural Resources Canada, *USDA Plant Hardiness Zones in Canada*, retrieved from: www.nrcan-rncan.gc.ca, viewed on 13.12.07
[22] Santamour, F.S. Jr, *Trees for Urban Planting: Diversity, Uniformity, and Common Sense*, US National Arboretum, Agricultural Research Service, U.S Department of Agriculture, Washington, D.C, 2002

commercial trees and trees planted in parks by the city. Trees that are planted by the city in residential front yards require watering by the homeowner.[23]

However, there was a lack of watering of both private and street trees during the summer of 2007. Due to this, the young trees in Harbord Village are suffering, especially the street trees with very little soft surface. It is therefore highly important that a watering plan is being put into action. There are already plans to start an "Adopt a tree" scheme, where local residents and local business water the young trees. The "Adopt a tree" committee will encourage residents to water certain trees, and encourage local business to either water the trees in front of their shop or allow residents access to their taps so they can do it themselves.

Tree Health Care

Harbord Village needs to be prepared for potential diseases and pests that can reach Harbord Village. However, tree health care goes beyond just prevention and cure of diseases and pests. Tree health care should involve all of the different components of a management plan, such as pruning, correct planting, enough watering, and outreach and education. Good and appropriate treatment of trees, together with fulfilling their needs, will result in a much healthier urban forest. Proper tree education for residents will result in a better understanding of trees and their needs, and hence will be better for the health of the urban forest. All of this relates back to diseases and pests, since healthier trees will often be less susceptible to pests and diseases.

[23] Personal Communication, Andrew Pickett, Urban Forestry, City of Toronto, 07.11.07

Trees in need of inspection

A number of trees were identified during the inventory as being in poor or very poor condition. This, however, does not mean that every single one of these tree needs to be inspected by an arborist. A number of these trees will be too small to pose a risk or liability to anyone, and are just in a poor condition. For example, tree number 003146 is a mulberry tree which is 2 meters tall and has a DBH of 4.5 cm. It is in very poor condition, with an asymmetrical crown, and less than ¼ of the height has been removed. In addition, ¼ to ½ of its crown is defoliated, and there is a v-shaped union with evidence of included bark. The tree also has a trunk scar with a width totalling ⅛ to ¼ of the circumference, and one or more major branch scars with a width totalling ¼ to ½ of the circumference, or a branch scar with a width totalling ⅛ to ¼ but more than 50 cm in length. This tree is in poor condition, however, it does not pose any immediate risk.

Another example is tree number 00932, a common horsechestnut which is in poor condition. It has a DBH of 54.8 cm and is 15 meters tall. The crown is slightly asymmetrical and has lost between ¼ and ½ of its leaves. The tree has at least one dead or broken branch or stub greater than 7 cm in diameter, and there is a v-shaped union between a minor branch and the main stem, but no evidence of included bark. There is a branch scar present with a width totalling ⅛ to ¼ of the circumference, and there is rot or a cavity in a branch with a width totalling ⅛ to ¼ of the diameter of the trunk or major branch. In addition, there is an obstruction which would eliminate root development in an area less than ¼ of the area within the dripline of the tree.

These two trees are just examples to show that not every tree which is in poor or very poor conditions is in immediate need of attention by an arborist. The trees that are in need of inspection can be found in appendix 5, and further description about how these

trees were selected is available in the annual operating plan. Once the rest of the neighbourhood has been inventoried, a more comprehensive list of trees in need of inspection will be available.

Tree Liberation

The City of Toronto is responsible for planting and maintaining the street trees in Toronto. Many street trees are planted along sidewalks with hard surface all the way up to the trunk of the tree. The concrete blocks around the street trees will reduce the infiltration of rainwater, even when drought conditions are not occurring. The City of Toronto is responsible for watering the city trees, however, it is unlikely that they will get around to watering all of them sufficiently. Harbord Village needs to take stewardship over the street trees in their own neighbourhood. One way to improve the health of the street trees would be to remove the hard surface around the base of the trees, put more soil and mulch down around the trees, and regularly water them. In addition to helping the street trees, it is a great exercise to get residence interested and aware of the trees and issues facing the urban forest. The more "hands-on experience" the residents have with trees, the easier it will be to get them engaged in taking stewardship over them. Also, this is a good way to show the residents that they have the ability to take responsibility over their own resources.

Tree liberation has been done in several other parts of town, such as in Kensington, where the trees have benefited enormously from having less hard surface. In addition, this is something the community can do very quickly, and without the bureaucracy of the City of Toronto. The group "Streets are for People!" have undertaken tree liberation in three places around Kensington; two on Augusta Avenue and one on

Oxford Street. Toronto Public Space Committee have a similar project with their "guerrilla gardening", where they "vandalise the city with nature" by planting seeds and seedlings in neglected corners of the city. Neither of these two groups has the permission of the city, but is working by themselves to make Toronto a greener city, and neither have been bothered or approached by the city or the police for what they have done.[24] [25]

Heritage Trees

In April 2004 the HVRA established the Harbord Village Heritage Conservation District Phase 1, which included Brunswick Avenue south of Ulster, and Willcocks Street west of Spadina. The aim of a Heritage Conservation District is to; prevent the demolition of homes that define the character of the community, encourage conservation of the community's historic character, encourage restoration rather than renovation, and aim to conserve and restore the neighbourhood so that it might regain the dignity and harmony of its appearance when it was built.[26]

The Ontario Heritage Tree Alliance are working towards designating heritage trees, and including trees as part of heritage districts. According to the Ontario Heritage Tree Alliance "*a heritage tree is an outstanding specimen because of its size, form, shape, age, colour, rarity, genetic constitution or other distinctive community landmark; a specimen associated with an historic person, place, event or period; representative of a crop grown by ancestors and their successors that is at risk of disappearing from cultivation; a specimen recognized by members of a community as deserving heritage*

[24] Personal Communication, Kelsey Carriere, Streets are for the People!
[25] Personal Communication, Andy Brown, Toronto Public Space Committee
[26] Harbord Village Residents' Association, *Harbord Village Heritage Conservation District*, retrieved from: http://harbordvillage.com/heritage-conservation, viewed on 02.12.07

recognition."[27] Originally, heritage was about properties, but it is being recognised more and more that trees are part of the landscape, especially in conservation districts. The trees in Cabbagetown have been mentioned as important for the conservation district and the community.[28] Since Harbord Village already has a Heritage Conservation District, and a committee that deals specifically with heritage, it should be easier to incorporate heritage trees into the neighbourhood.

Outreach and Education

Education and outreach will already be included in much of the work that has to be done in the neighbourhood, both directly and indirectly. Direct actions include such activities as the "Adopt a tree" program and the inventory. The "tree liberation" could also be a very good exercise to get people more aware of the trees in their neighbourhood, and Harbord Village might consider starting with this. Another potential benefit is that it might attract different people to those that volunteered for the inventory, since there is no long term commitment.

Another idea could be to have a speaker series, or aim to do a "tree-tour" in the neighbourhood. This could get residents involved who do not necessarily have the physical capacity to participate in the inventory, watering plan, tree liberation or tree planting. Indirectly, residents would have to be informed about the inventory, such as why it is being continued with, and they will have to get information on the pruning cycles and why this is necessary. Getting the pruning cycle up and running will take a lot

[27] Aird, P, University of Toronto, Ontario Heritage Tree Alliance, retrieved from: http://www.oufc.org/ohtabackground.htm, viewed on 01.12.07
[28] Saunders, B, Ontario Heritage Tree Alliance, *Heritage preservation and trees*, retrieved from: http://www.oufc.org/ohtaheritagepreservation.htm, viewed on 01.12.07

of educational work with the residents, to convey the importance of pruning on a pro-active rather than reactive basis.

Another consideration could be to contact the schools in the neighbourhood. It could be a good exercise for the students to help out with the planting of trees, especially for those residents that will not be able to plant the trees themselves.

Lobby the City

The City of Toronto's Urban Forestry Service is currently over worked, and there is backlog of 18 months in responding to calls.[29] The city is responsible for all street and park trees, and the private residents are responsible for the maintenance and health of trees on their private property. In Harbord Village, the majority of the front yards are owned by the city, and hence the trees on these properties are the responsibility of the city. Harbord Village could hire a certified arborist company to prune and maintain the private trees, however, they have no permit to undertake work on the city trees.

I would recommend that Harbord Village lobby the city to be allowed to take stewardship over both the city and the private trees. This would greatly benefit the urban forest, since pruning and maintenance would be undertaken on a more regular basis, instead of having a backlog of 18 months for maintenance on all the city trees. It would also benefit the city and reduce the work required by the Urban Forestry Service. The HVRA could also file an application for contractors to be allowed to perform arboricultural services on city-owned street trees (see appendix 6). This is discussed in more detail in the annual operating plan.

[29] Personal Communication, Andrew Pickett, Urban Forestry, City of Toronto, 07.11.07

Funding

Funding will be one of the largest barriers in implementing the strategic Urban Forest Managemet Plan. Harbord Village needs to acquire funds to implement the strategic management plan. Funds will be needed to hire an arborist, to purchase young trees, and to prepare educational material. Funding can either be obtained from grants or via fundraising. More detail can be found in the annual operating plan.

Five-Year Management Plan

Pruning Plan

Pruning needs to be done on a cyclic, planned basis. This is much more beneficial for the trees compared to when pruning is done on a reactive basis.

- Pruning should be done a five year cyclic basis. A five-year pruning cycle has been shown to lead to better tree condition, while minimizing costs.[30]
- Harbord Village should be divided up into five pruning blocks, North West, North East, South West, South Central and South East;

[30] Miller and Sylvester, *An economic evaluation of the pruning cycle*, Journal of Arboriculture, 7 (4), 1981, pp. 109-112

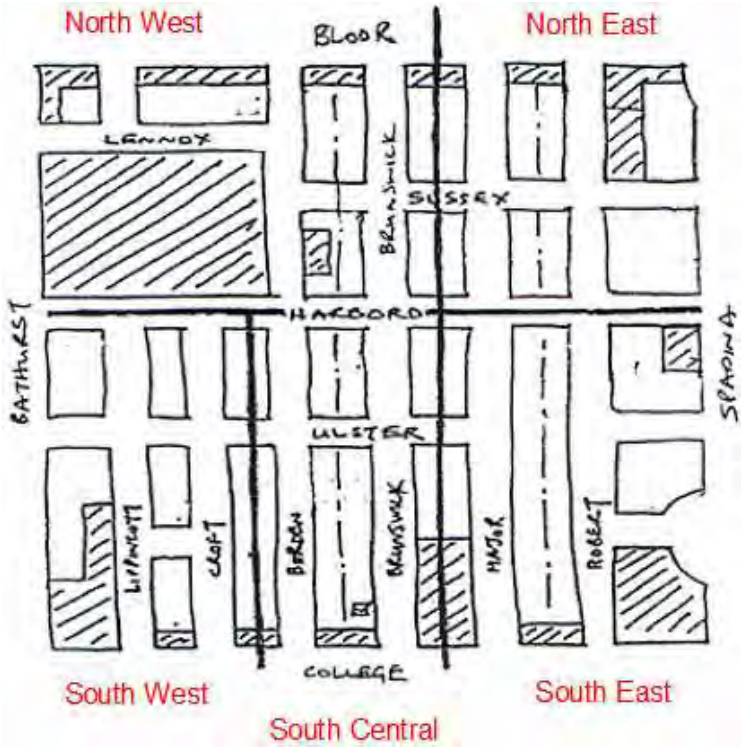

Figure 12: Harbord Village divided into management areas

- Pruning in 2008 will start in the South East block, then move on to the North East block in 2009, the North West block in 2010, the South Central block in the 2011 and the South West block in 2012. In 2013, the pruning cycle will start again in the South East block. The order of the pruning blocks is based on which blocks were finished during the inventory, and where the majority of the trees were inventoried;
- Harbord Village should start off the pruning cycle with the private trees in the neighbourhood. Currently, private residents do not have permission to maintain the city trees, however, it would be ideal if Harbord Village were allowed to prune and maintain all the trees;
- The residents in Harbord Village need to be informed about the cyclic pruning plan. Permission is required from all residents with trees in their backyards to be

allowed to prune the trees on their property. Follow-ups needs to be done with the residents, and information should be distributed in English, Chinese, Portuguese and Italian;

- The council should be lobbied so that Harbord Village can get permission to take stewardship over the city trees in their neighbourhood as well. Once this has been achieved, a pruning cycle that involves all the trees can be implemented;
- Not all of the frontyards in Harbord Village are owned by the city. Table 1 provides a list of the addresses where the front yards are private property and the city's permission is not required for pruning.

Table 1: Addresses where the front yards are private property[31]

Street	**Housenumber**
Spadina	552-566, 578, 572, 574, 620, 630, 666, 702A, 702, 704, 706, 710, 720, 736
Robert Street	8-18, 26-30, 42, 54-72, 90-94, 122-128, 140-158, 166, 168, 103-117, 121-127
Brunswick Avenue	10-88, 15-101, 183, 201, 202, 206-214, 209-213, 238, 258, 245, 279-289, 142, 144, 176-180, 186, 188, 234, 243, 270, 274, 278
Borden	7-103, 115-137, 143-147, 155-167, 215-229, 255-269, 16, 20, 22, 28, 30, 36, 36, 48, 62, 68-72, 80-84, 142, 144-164, 282-294
Major Street	145, 207, 209, 211, 251, 253, 257, 267, 269, 271, 285, 180-184, 198, 214, 278, 286, 288
Ulster Street	8-14, 18, 28-44
Lippincott Street	87, 207, 221- 229, 245, 247, 247A, 331, 333, 343-347
Bathurst Street	557-565, 569-619, 623-677

Inventory maintenance

It would be very beneficial to Harbord Village if the inventory could be updated on a regular basis. This would show if there have been any major chances in their urban forest. There are a number of ways the inventory can be updated.

[31] City of Toronto, *Property Data Map 50H-21*, Technical Services, Survey and Mapping Services, Print Day: May 2007

- An "inventory update team" should be created. This team should be informed when pruning and maintenance work is being performed, and they would update the current inventory data base with the new information. The team would either have to be present when the work is undertaken, or the arborist would have to provide a report on the treatment, so that the necessary changes can be made in the database;
- When people have new trees planted, make sure these are included in the current inventory data base. Contact details to the "inventory update team" should be made available to the residents. If the owner is not comfortable or does not know how to record the necessary information, such as species, crown width, crown height, height of tree and DBH, the "inventory update team" should be available to assess the tree;
- The "inventory update team" would also be informed if a tree has to come down, and hence delete the tree in question from the database;

It could be interesting to monitor the trees that have undertaken tree liberation so their progress can be determined.

Planting Plan

A plan should be set up that covers the number of trees to be planted, in which years they should be planted, what species should be planted, and where they should be planted.

- The HVRA have permission to plant trees of their own choice on private property in Harbord Village. A number of front yards in the neighbourhood belong to the city, and so the City of Toronto will plant trees for free. Table 1 shows which

front yards are private properties. The City of Toronto Urban Forestry Service offers a choice of 36 different trees (appendix 7);

- ❖ Get in touch with a nursery to make sure they stock the desirable species. It would be an advantage if the planting plan was made 7-8 years ahead of time, so that the nursery will have time to obtain the species that have been requested. A list of nurseries can be found in appendix 8;
- ❖ The species requested should be a mix of suitable native and non-native species. The native species should ideally be of a local seed source. Certain non-native species do well in urban environments, however, care must be taken to make sure they are not invasive;
- ❖ It will be more cost-effective if planting is done by the residents, and it will benefit the neighbourhood as well. The more hands on experience the residents have with the trees, the better;
- ❖ Explore the possibility of cooperating with other residents associations to purchase nursery stock at a reduced price.

Watering Plan

The "Adopt a tree" scheme should be evaluated to make sure it is working. It is especially important for the survival of the newly planted trees that they receive enough water. Watering of trees should be an essential part of the outreach and education plan of the HVRA. The residents of Harbord Village need to realise the importance of watering young trees, particularly residents who have just had a tree planted in their front or back yard.

Tree Health Care

There are currently a number of serious pests in Toronto. The City of Toronto is not accepting any requests for planting of ash trees due to the threat of the emerald ash borer (*Agrilus planipennis*). The pest has devastated the population of ash trees in the Essex/Windsor region, and in Detroit, Michigan.[32] The emerald ash borer was discovered in Toronto in the vicinity of Sheppard Avenue East and highway 404, in the beginning of December. Restrictions will be implemented on the movement of all firewood and ash tree materials within a five kilometre radius from where they emerald ash borer was discovered.[33]

Fifty-one percent of the most common species that make up the CPA in Harbord Village consist of Norway maple, tree of heaven, silver maple and Manitoba maple. If a disease or pest attacks the maple trees, there is potential for Harbord Village to lose a large amount of its crown projection area. Asian long-horned beetle (*Anoplophora glabripennis*)[34] and European gypsy moth (*Lymantria dispar*)[35] both have the maple as their most preferred host, however these pests infect a number of other species as well.

The Asian long-horned beetle was discovered in Toronto and the City of Vaughan in 2003. The area of infestation is under regulation and it is bordered in the north by Rutherford Road, in the east by Dufferin Street and Allan Road, in the south by Hwy. 401 and Hwy. 409, and in the west by Hwy. 27. There are now restrictions on the movement

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[32] City of Toronto, Urban Forestry Service, retrieved from: http://www.toronto.ca/trees/tree_planting.htm, viewed on 28.10.07

[33] Canadian Food Inspection Agency, *Emerald ash borer confirmed in Toronto*, retrieved from: http://www.inspection.gc.ca/english/corpaffr/newcom/2007/20071204e.shtml, viewed on 06.12.07

[34] Toronto Parks, Forestry and Recreation, Urban Forestry Service, *Forest Health Care: Asian Long-horned Beetle*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Asian_Long-horned_Beetle_fs.pdf, viewed on 08.11.07

[35] Toronto Parks, Forestry and Recreation, Urban Forestry Service, *Forest Health Care: European Gypsy Moth*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/European_Gypsy_Moth.pdf, viewed on 08.11.07

of nursery stock, trees, leaves, logs, lumber, wood, woodchips and bark chips from certain deciduous trees identified as the host of Asian long-horned beetle, and there are prohibitions of the movement on firewood of all species in and out of this area.[36]

The European gypsy moth has been present in Toronto for more than 20 years. The population of gypsy moth have been kept under control by the Urban Forestry Department and with the help of residents, using environmentally friendly methods. These methods include; scraping egg masses from the trees, installing burlap skirts and placing sticky bands on trees, using phermones to confuse male moths, and leaving wooded habitat around trees to encourage presence of moth predators. However, since 2006 the population of gypsy moth has reached levels too high to be controlled by these methods,[37] and in May 2007 it was necessary to conduct aerial and ground spray. As of writing there are no further sprays planned.[38]

Harbord Village needs to have a health care plan ready, and know what to do and who to contact if a pest is identified in the area.

Tree Inspection Plan

The trees that are in need of inspection should be inspected annually by an ISA certified arborist, regardless of whether they are in the current area of pruning. This is important to make sure that these trees are structurally sound, and will not be a liability. Trees that have to be taken down should be replaced by a new tree.

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[36] City of Toronto, Urban Forestry Service, retrieved from: http://www.toronto.ca/trees/, viewed on 09.11.07

[37] City of Toronto, Toronto Parks, Forestry and Recreation, *Gypsy Moth Control in Toronto*, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/GypsyMothBooklet_READER_1.pdf, viewed on 09.11.07

[38] City of Toronto, Urban Forestry Service, retrieved from: http://www.toronto.ca/trees/gypsy-moth.htm, viewed on 09.11.07

Tree Liberation

Tree liberation is an easy, time manageable task that can be undertaken relatively quickly. It will give the residents some "hands-on" experience with the trees in their neighbourhood, and the results can be seen within a few years.

Heritage Trees

Harbord Village should work towards designating heritage trees in their neighbourhood. This would add an extra character to the heritage district, since trees are such an important part of a neighbourhood. However, heritage trees should not only be limited to the heritage district in Harbord Village, but should also be explored in the whole community. From the inventory in the summer of 2007, 140 potential heritage trees were identified (appendix 9). Thirty of these trees were already in the Heritage Conservation District in Harbord Village (21 trees on Brunswick Avenue, south of Ulster, and 9 trees on Willcocks Street, west of Spadina).

Outreach and Education

A number of educational activities could take place in Harbord Village.

- Tree planting, tree liberation, and a community day to prune young trees can all be great educational activities;
- A speaker series could attract people. The topics could include health and disease, stresses of the urban trees, importance of pruning and how to prune small trees, or other community groups taking stewardship over their urban forest to share tips and experiences. These talks would greatly educate the

residents. This would benefit the neighbourhood in a number of ways, since residents would be more aware of the trees, and they would learn to identify potential pest threats;

- Harbord Village should aim at doing a tree-tour with LEAF (Local Enhancement and Appreciation of Forests) of the neighbourhood. This would get residents more aware of the urban forest. LEAF is conducting guided tree tours in Toronto where they highlight trees of interest to a neighbourhood and incorporate history, culture and personal stories.

Lobby the City

The HVRA needs to have a constant communication with the City of Toronto Urban Forestry Department. This is regardless of whether they have stewardship over the city-owned trees or not. I would recommend having regular meetings with the City of Toronto Urban Forestry Department, so they are aware of the work that the HVRA is doing to maintain and keep the urban forest healthy.

Funding

Funding sources must continue to be identified, so that trees will be continued to be pruned, new trees can be purchased, and educational material distributed.

Plan Review

The Five-year management plan should be reviewed, and changed according to successes and failures.

Annual Operating Plan (2008)

Pruning Plan

The first year will be crucial in getting a pruning plan started. This will demand a lot of education and outreach for people to understand the importance of pruning, and to get people on board. This will be covered further in the section about education and outreach in the annual operating plan.

- Pruning in the first year will start in the south east block;
- The pruning cycle will start with the private trees. HVRA will have to distribute educational material and encourage the residents to take part in the pruning plan;
- Pruning of large trees should be done by an ISA certified arborist company.
- Smaller trees can be pruned by the residents themselves. This will be more economically efficient and it will make the residents aware of the importance of pruning. This could be arranged by the HVRA as a "pruning day" where residents are taught how to prune young trees by a professional urban forester or arborist. A number of these young trees will be in the front yards, which are often owned by the city (see table 1 for those which are not), so the City will have to be involved. HVRA should inform the City of their plans to have a "pruning day" and request that an urban forester from the City could come and teach them how to prune young trees correctly;
- Make sure the young trees are pruned appropriately so that unnecessary pruning can be avoided when the tree is older. Pruning of young trees should be limited to correctional pruning, such as broken branches. The rest of the

pruning should be done in the second or third year after the tree has been planted. Smaller cuts will also cause less damage than large cuts. It is important to use the right instruments to prune, such as hand pruning shears. Do not use hedge shears to prune trees. For most young trees, a dominant single leader will develop. The tip of the leader should never be pruned. If the leader is outgrown by secondary branches, prune the branches back. Sometimes a young tree will develop co-dominant stems, which will lead to structural weakness later. It is better to prune back one of these stems while the tree is young. In addition, make sure that weak attachments, such as a potential for included bark, are dealt with when the tree is young.[39]

Inventory maintenance

The inventory should be completed in the first year. This will give the full picture of the urban forest in Harbord Village. The inventory should ideally be started in the south west side of the neighbourhood, since very few trees have been inventoried there. This area of Harbord Village differs from the east side of the neighbourhood and it is therefore important to cover this area.

- Efforts should be made to make people aware of the inventory so that it is possible to get into backyards. The blocks that were half completed had more front yard and street trees done than back yard trees. This is not ideal since it gives an incomplete and biased picture of the urban forest. Flyers need to be distributed in the neighbourhood to inform residents about the inventory. If the

[39] International Society of Arboriculture, *Pruning of young trees*, 1995, Updated 2003, retrieved from: http://www.lvsnag.org/pdf/PruningYoungTrees.pdf, viewed on 28.11.07

residents agree to let the volunteers assess and measure the trees in their backyards, the flyer should be placed in a window so it is visible for the volunteers. This would indicate to the volunteers that they have permission to enter the backyard, without needing to contact the resident first. This system worked in Dundas, Hamilton when they were doing a tree inventory in the summer of 2007, also using the Neighbour*woods* protocol;

- There should be a block captain for each block. The job of the block captain would be to arrange for the group to go out and do the inventory. During the last inventory there were a number of people who were waiting for people to contact them, and therefore it would be beneficial to have one person at each block to contact people;
- People who took part in the inventory last year could be used to train new volunteers in the Neighbour*woods* protocol;
- Volunteers are needed to do data entry so that the current database can be updated;
- Recruiting new volunteers will be favourable to the HVRA. The new volunteers would gain more knowledge about the urban forest and a new view of the trees. This will be advantageous to Harbord Village, since the more residents who realise the benefits of the urban forest the easier it will be to implement the management plan;
- The new volunteers need to feel comfortable in tree identification. HVRA could invest in some tree identification books that would be available from the block captains, together with the inventory equipment. A comprehensive flyer of how to

identify the most common species could also be made on the HVRA website so that volunteers could print it off.

Planting Plan

A total of 61 plantable spots, mostly in front yards, were identified during the inventory at the following streets (table 2):

Table 2: Plantable spots

Street	Number of plantable spot
Robert	20
Major	23
Lippincott	4
Lennox	2
Brunswick	9
Borden	3

The addresses of the plantable spots, together with a map, can be found in appendix 10 and 11.

Figure 13: Map of the plantable spots

- The right tree needs to be planted in the right spot. The mature size of the tree should be considered when it is planted to make sure that the tree does not come into conflict with any infrastructure. Rooting space must also be considered. The attributes of the site needs to be identified, such as sun and soils. Pollution and

salt tolerance should also be taken into consideration.[40] Table 3 gives direction on how to assess the type of soil:

Table 3: How to identify soil texture[41]

Soil texture	**Reaction when squeezed in hand**		**Ability to form a ribbon**
	Dry Soil	**Wet Soil**	
Clay	Forms cast that can be handled easily	Forms a cohesive cast	Long, flexible ribbon
Loam	Cast can be handled relatively easily	Cast can be handled easily	Pure loam will not form ribbon, loam with silt and clay will form a fragile ribbon
Sand	Will not form cast	Cast will crumble easily	Can not form ribbon

A list of recommended trees species with their attributes can be found in appendix 2 and 3;

- Consider what species is planted. Is it already over represented in Harbord Village? A number of ornamental species, especially those of named varieties, are clonally propagated selections. A grafted cultivar possesses the same genetic material above ground, and it is therefore likely that the cultivars will have the same degree of resistance or susceptibility to biotic and abiotic influences.[42] Native trees are usually grown from seeds, and these populations can have much higher genetic diversity. This will reduce the chance that all trees will be susceptible to pest and disease problems;[43]
- Planting good nursery stock can avoid a number of problems later. Girdling roots is one problem that can be caused by bad nursery practices. Nursery stock grown in too small pots can develop girdling roots which will be hard to correct later on.

[40] Chicago Botanic Garden, *Urban Trees and Shrubs: a guide to the selection of trees and shrubs in urban areas*, retrieved from: http://www.na.fs.fed.us/spfo/pubs/uf/uts/index.htm, viewed on 04.12.07
[41] Eastern Ontario Model Forest,*Choosing the Right Tree: A Landowner's Guide to Putting Down Roots*, p. 4, retrieved from: http://www.seedlingnursery.com/choosing.htm, viewed on 12.11.07
[42] Santamour, F.S. Jr, *Trees for Urban Planting: Diversity, Uniformity, and Common Sense*, US National Arboretum, Agricultural Research Service, U.S Department of Agriculture, Washington, D.C, 2002
[43] Phytosphere Research, *Planning for the Future of Rocklin's Urban Forest*, 2006, p. 128, retrieved from: http://www.rocklin.ca.us/government/development/planning/publications_n_maps/planning_for_the_future_of_rocklins_urban_forest.asp, viewed on 26.10.07

The roots should be inspected when the seedlings are being planted. If the roots are girdling, the problem can often be corrected before it gets worse. Roots can be loosened and straightened if they are circling, and small girdling roots can be removed by hand-pruners. Root pruning can cause damage to the tree, but there is greater chance the tree will die if nothing is done. It will be necessary to root prune any container-grown tree;[44]

- For residents who do not desire a tree in their front or back yard, native shrubs can be recommended. This can be advantageous for the biodiversity of Harbord Village, and also attract local birds;
- Ensure the trees are planted in a professional manner. Trees should ideally be planted in the late summer or early fall. This will give the tree a chance to establish new roots before the winter arrives. The hole should be twice as wide and slightly shallower than the root ball. The sides of the hole should be roughened up so the roots can penetrate the soil easier.[45] The trees must also have enough growing and rooting space for their size (table 4):

Table 4: Distance of trees from house[46] [47]

Size of tree	Minimum space from wall	Minimum space from house corner
Small tree (to 8m)	1.8 – 3m	1.5 – 2.5m
Medium tree (8-15m)	3 – 4,5m	2.5 – 3.5m
Large tree (15m +)	4.5 – 6m	3.5 – 5m

[44] City of Toronto Parks, Forestry and Recreation, *Forest Health Care: Girdling Roots*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Girdling_Roots_fs.pdf, viewed on 26.10.07
[45] National Association of Conservation Districts, *Tree planting*, retrieved from: http://www.nrcs.usda.gov/Feature/backyard/pdf/treeplan.pdf, viewed on 01.11.07
[46] The Forest Where We Live, *Planting Trees Around Your Home*, retrieved from: http://www.lpb.org/programs/forest/plantguide.html, viewed on 01.11.07
[47] Arbord Day Foundation, *The Right Tree in the Right Place*, retrieved from: http://www.arborday.org/trees/rightTreeAndPlace/size.cfm, 01.11.07

In addition, trees should be planted at least 2.5 meters away from any sidewalk or walkways.[48]

- ❖ Consider whether to buy bare-root stock, container grown trees, or balled and burlapped trees (table 5).

Table 5: Type of seedling stock and their advantages and disadvantages[49] [50]

Type of Stock	**Advantages**	**Disadvantages**
Bare root	- cheaper - easy to plant and transport - roots can be examined easily - smaller size trees	- needs to be planted straight away - more subject to accidental damage by mowers - requires special handling, storage
Container grown trees	- range of sizes - longer planting window - easy to plant and establish in almost any season	- moderate to high cost - roots more likely to be girdling - may require more watering after planting
Balled and Burlapped	- longer planting window - larger plants, hence more resistant to damage	- more expensive - large trees, consequently difficult to plant without machinery - condition of roots can not be inspected

- ❖ Uncover the roots if planting balled/burlapped trees. Make sure to get the tree in the ground quickly so that the roots do not dry up;[51]
- ❖ Young trees should not have to be staked. The staking of trees will often cause problems, and containerized trees will have an adequate root mass to support and stabilize a tree if it is transplanted properly;[52]

[48] Rutledge, J, *The Tree Care Guide: A Handy Guide to Planting and Maintaining your trees*, Forest Enhancement Program, Manitoba Hydro, retrieved from: http://www.hydro.mb.ca/environment/publications/tree_care_guide.pdf, viewed on 29.10.07
[49] Cappiella, K, Schueler, T, Tomlinson, J, Wright, T, *Urban Watershed Forestry Manual, Part 3: Urban Tree Planting Guide*, p. 20, Center for Watershed Protection, United States Department of Agriculture, Forest Service, Northeastern Area, State and Private Forestry, 2006,
[50] City of Toronto Parks, Forestry and Recreation, *Forest Health Care: Girdling Roots*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Girdling_Roots_fs.pdf, viewed on 27.10.07
[51] City of Toronto Parks, Forestry and Recreation, *Forest Health Care: Girdling Roots*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Girdling_Roots_fs.pdf, viewed on 27.10.07
[52] Airhart, D. L, and Zimmerman III, G, *Mulching and staking trees*, retrieved from: http://www.tlcfortrees.info/mulching_staking.htm, viewed on 27.10.07

- ❖ It is highly recommended that the young trees are provided with mulch. Mulching is beneficial for the young tree for a number of reasons:
  - o It prevents erosion;
  - o It conserves soil moisture and keep the roots cool in the summer;
  - o Low temperatures are buffered during winter extremes;
  - o Air and water are allowed to penetrate to the roots;
  - o It will also prevent lawnmovers and trimmers of getting too close to the young tree;

  Ensure that mulch is applied correctly. Piling mulch several inches high around the base of the tree is not beneficial, and will do more harm than good. If a tree has shallow roots, they may grow into the mulch, and some trees could develop girdling roots underneath the mulch. The mulch should not touch the bark of the tree.[53] Mulch should be applied in a layer that is 5-7 cm thick, and that extends in a circle with diameter of 1.2 to1.8 meters or more.[54] HVRA should consider investing in mulch that would be available to residents at a reduced price;
- ❖ Avoid planting these species (table 6):

[53] Airhart, D. L, and Zimmerman III, G, *Mulching and staking trees*, retrieved from: http://www.tlcfortrees.info/mulching_staking.htm, 25.10.07

[54] Phytosphere Research, *Planning for the Future of Rocklin's Urban Forest*, 2006, p. 156, retrieved from: http://www.rocklin.ca.us/government/development/planning/publications_n_maps/planning_for_the_future_of_rocklins_urban_forest.asp, viewed on 26.10.07

Table 6: Trees that should not be planted

Trees that should not be planted		
Common Name	*Latin Name*	*Reason for not planting*
Norway Maple	*Acer platanoides*	Non-native, 12% of the trees in Harbord Village are already Norway Maple. Can cause root damage to hardscape and gets girdling roots easily. Invasive.
Manitoba Maple	*Acer negundo*	Non-native and invasive
Tree of Heaven	*Alianthus altimissa*	Non-native, invasive, unpleasant odour,
Ash	*Fraxinus spp*	The City of Toronto does not recommend planting Ash trees due to the threat of Emerald Ash borer.

Watering Plan

The "Adopt a tree" scheme should start as soon as possible in the spring. The residents will have to be informed about the scheme, via email, newsletter and flyers.

- Follow-up the program. If trees are not being watered, get other residents/business to do it instead;
- Have an incentive ready for the business that are participating, such as a "thank you" in the local news letter;
- Ensure that the trees are being watered correctly;

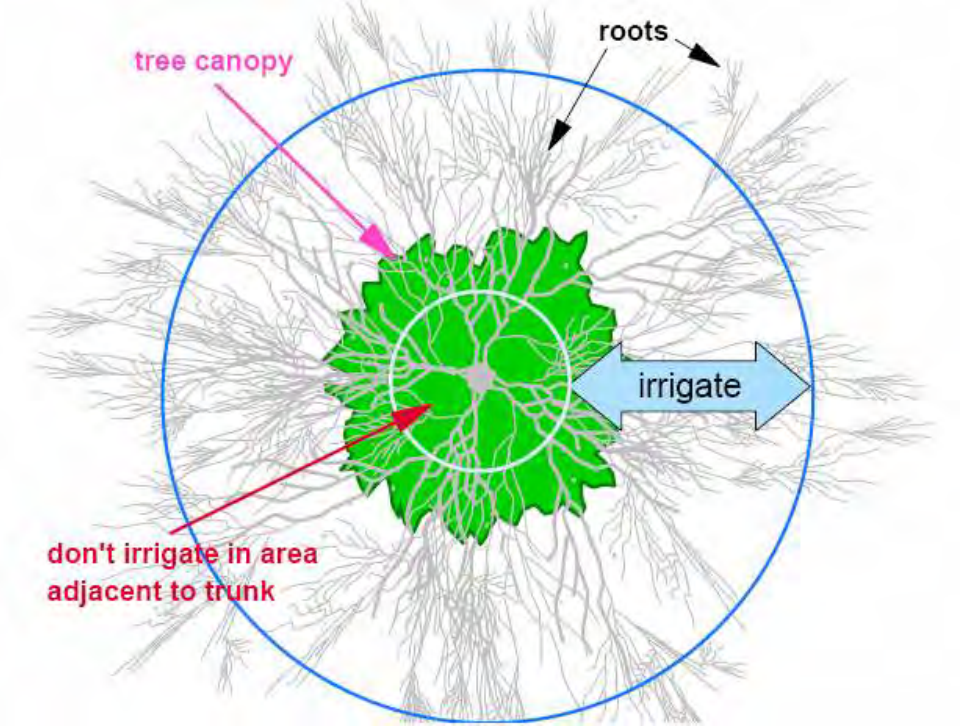

Figure 14: Diagram showing how to correct water a tree[55]

When the trees are very young and have just been planted, the root system is largely restricted to the root ball. If the root ball contains high amounts of coarse-textured potting soil, it may dry out faster than the surrounding soils. Therefore, frequent watering of the rootball may be required until the roots have expanded into the surrounding soil. This is mostly an issue for trees planted in the spring and summer. Trees that are planted in the autumn or the winter have longer time for the roots to develop before water stress becomes an issue. To encourage root expansion, water should be applied outside of the root ball, but since the roots will

[55] Phytosphere Research, *Planning for the Future of Rocklin's Urban Forest*, 2006, p. 160, retrieved from: http://www.rocklin.ca.us/government/development/planning/publications_n_maps/planning_for_the_future_of_rocklins_urban_forest.asp, viewed on 26.10.07

take time to grow there, soil moisture should be monitored in this zone so it does not become excessively wet.[56]

As a tree becomes established and the root system expands, watering over the root ball should be discouraged.[57] The amount of water needed will depend upon the type of the soil. Clay soils hold water longer than sandy soils. Trees in clay soils needs to be watered slowly over a long period of time, while trees in sandy soils require water more often.[58]

Tree Health Care Plan

One of the first lines of defence against tree pests and disease is to have a healthy population of urban trees. Information and education to the residents will have to be a key part of the health care plan.

- Workshops on the common tree pests and how to identify them could be a great asset to involve the community. The residents should learn to identify the Asian long-horned beetle, the emerald ash borer and the gypsy moth;
- Have a plan ready and in place incase the Asian long-horned beetle is discovered. If the beetle is found in the neighbourhood, the Canadian Food Inspection Agency should be phoned immediately on 1-800-442-2342 or 416-665-5055. Ask for someone who deals specifically with the Asian long-horned beetle. To prevent the spread of the insect, infected trees will be cut down by the Canadian Food Inspection Agency, and the wood destroyed before the beetles emerge from the

[56] Phytosphere Research, *Planning for the Future of Rocklin's Urban Forest*, 2006, p. 158, retrieved from: http://www.rocklin.ca.us/government/development/planning/publications_n_maps/planning_for_the_future_of_rocklins_urban_forest.asp, viewed on 26.10.07
[57] *Ibid*
[58] Toronto Parks & Recreation, Urban Forestry Services, *Forest Health Care: Water stress*, 2001, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Water_Stress_fs.pdf, viewed on 05.11.07

tree. The preferred host trees for the Asian Long-horned beetles are: all species of maples, birch, elm, horsechestnut, willow, poplar, hackberry, London plane and mountain ash. Maples are the most preferred host[59], and Harbord Village should therefore be prepared to take action if the beetle is sighted in the neighbourhood;


[60]

Figure 15: Asian long-horned beetle

- Ash species make up 5% of the species in Harbord Village, and the crown projection area consist of 4% ash. The emerald ash borer has now reached Toronto.[61] The symptoms of emerald ash borer is:
  - Thinning and/or yellowing of leaves;
  - Longs shoots growing from the trunk with large leaves;
  - Vertical cracks in the trunk;
  - Tunneling (S-shape) underneath the bark;
  - D-shaped exit holes;
  - Branch dieback;
  - Tree death;[62]

[59] City of Toronto, Toronto Parks, Forestry and Recreation, *Forest Health Care: Asian Long-horned Beetle*, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Asian_Long-horned_Beetle_fs.pdf, viewed on 28.10.07

[60] Environment Canada, *EnviroZine*, retrieved from: http://www.ec.gc.ca/EnviroZine/English/issues/66/print_version_e.cfm?page=questions, viewed on 07.11.07

[61] Canadian Food Inspection Agency, *Emerald ash borer confirmed in Toronto*, retrieved from: http://www.inspection.gc.ca/english/corpaffr/newcom/2007/20071204e.shtml, viewed on 06.12.07

The emerald ash borer can be transported from one area to another with raw wood with bark; wood packaging; nursery stock, and firewood.[63] If the Emerald Ash Borer is identified in Harbord Village, contact the Canadian Food Inspection Agency at 1-866-463-6017.

Figure 16: Emerald Ash Borer[64]

Figure 17: Emerald Ash Borer exit holes[65]

- ❖ The gypsy moth (figure 18) is a defoliating insect native to Europe. It will defoliate trees, seriously weakening or killing the tree.[66]

  Preferred hosts include: apple, basswood, birch, oak, willow, poplar, beech, elm, cherry, maple, serviceberry, tamarack, white birch and walnut. Rare host trees include: ash, catalpa, common horsechestnut, locust, London plane, silver maple, balsam fir and conifer trees.[67] [68] [69]

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[62] City of Toronto, Urban Forestry Service, *Emerald Ash Borer*, retrieved from: http://www.toronto.ca/trees/pdfs/EABPoster.pdf, viewed on 14.11.07
[63] *Ibid*
[64] David Cappaert, Michigan State University, Bugwood.org, Forestry Images, 2005, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=2106098, viewed on 20.11.07
[65] Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Forestry Images, 2006, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=5016052, viewed on 20.11.07
[66] Toronto Parks, Forestry and Recreation, *Gypsy Moth Control in Toronto: Gypsy Moth Control Methods: Guide for Homeowners*, Toronto Urban Forestry, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/GM_GuideforHomeowners.pdf, viewed on 23.11.07
[67] *Ibid*

There are a number of control methods for the gypsy moth that residents can perform themselves. From November to late April the egg masses on the trees can be removed and easily destroyed. The eggs can be scraped off with a knife, and then placed in soapy water for a few days. This will kill the eggs and they can be discarded in the garbage. Since one egg mass can contains about 300 eggs, this will significantly reduce the number of larvae that emerge in the spring. From late April to May the larvae will appear. Duct tape can be wrapped around the tree and a sticky material applied on top. This will prevent the some of the young larvae from crawling up the tree. From May to August burlap cloth can be placed around the trees (see figure 19). The burlap should be tied on the tree and folded to form a flap. The caterpillars will shelter behind this flap of burlap from the heat of the day, and can be removed in the afternoon. Again, the caterpillars can be killed by putting them in soapy water, or squashing them.[70]

[68] Barnacle, B and Burks, S, *Minimizing gypsy moth damage*, Minnesota Department of Natural Resources, 2007, retrieved from: http://www.dnr.state.mn.us/treecare/forest_health/gypsymoth/minimizedamage.html, viewed on 20.11.07

[69] Canadian Forest Service, *Gypsy moth*, 2007, retrieved from: http://scf-cfs.rncan-nrcan.gc.ca/factsheets/gypsy-moth, viewed on 20.11.07

[70] Toronto Parks, Forestry and Recreation, *Gypsy Moth Control in Toronto: Gypsy Moth Control Methods: Guide for Homeowners*, Toronto Urban Forestry, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/GM_GuideforHomeowners.pdf, viewed on 20.11.07

Figure 18: Female (top) and male(bottom) gypsy moth[71]

Figure 19: Placing burlap cloth as gypsy moth control[72]

Tree Inspection Plan

The tree inventory during the summer of 2007 identified 268 of trees that are in poor or very poor condition. Eighty trees that were in poor and very poor conditions were less than five meters tall, and the species can be seen in table 7.

Table 7: Species in poor and very poor condition that are less than 5 meters tall

Elm species	17
Lilac	15
White Cedar	7
Juniper	5
Manitoba Maple	4
White Mulberry	3
Plum	3
Yew species	2
Tulip Tree	2
Scots Elm	2
Other	20

These trees will most likely not have to be visited by an arborist since they are so small. The rest of the trees in poor and very poor conditions have been divided into high,

[71] USDA APHIS PPQ Archive, Bugwood.org, 2001, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=2652087, viewed on 14.12.07

[72] Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, 2006, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=5022083, viewed on 14.12.07

medium and low priority, based on their rankings during the inventory. The rankings that were chosen are shown in table 8. The Neighbour*woods* Condition Ranking Guide can be found in Appendix 12.

Table 8: Neighbourwoods rankings for trees in need of inspection

Problem	**Neighbourwoods Ranking**
Dead or broken branch	2, 3
Poor branch attachment	3
Lean	3
Rot cavity trunk	3
Crack	3

A tree was assigned high priority if it had two or more problems, a crack or a lean of 3. These trees should be dealt with or inspected by an ISA certified arborist as soon as possible. This does not necessarily mean that these trees are a risk, but that they should be inspected to make sure they are not a liability. A tree assigned a medium priority had a dead or broken branch, which could easily be dealt with by an arborist. Trees that have a poor branch attachment or a rot cavity in the trunk should be inspected, but this is low priority compared to the high and medium priority trees.

The fact that these trees need to be inspected does not mean that they necessarily have to come down. There might just be structural problems that can be dealt with by pruning.

The list of trees in need of inspection together with their priority can be found in appendix 5.

In addition, leaving some dead trees standing could be considered to improve the biodiversity in Harbord Village. These dead trees will be beneficial for birds, insects and fungi.[73] [74] Live trees with dead or broken tops may provide more nesting habitats for certain birds,[75] and will therefore also improve the biodiversity in the neighbourhood. However, this needs to be weighed against the possibility of having termites in the neighbourhood.[76] Nevertheless, termites will eat on any wood that is in contact with soil, so this applies to porches and other garden furniture as well.[77] The trees that are left standing should be inspected by the certified arborist every year, even if they are not in the area of the pruning cycle, to make sure they are not a liability and a risk.

Figure 20: A dead tree on Major Street pruned to reduce liability

[73] Landowner Resource Centre, Ontario Ministry of Natural Resources, *Extension Notes: Cavity trees are refugees for wildlife*, 1999
[74] Clatterbuck, W. K, Harper, C, *Urban Trees for Wildlife*, The University of Tennessee, Agricultural Extension Service, SP 530, 2005
[75] Rohila, C.M, *Landscape and local effects on snags and cavity nesting birds in an urbanizing area*, University of Washington, College of Forest Resources, 2002, pp. 40-41
[76] Proudman, J, *Termite Tips: Stumps and Dead Trees*, Newsletter of the Urban Entomology Program, No. 11, University of Toronto, 1998, retrieved from: http://www.utoronto.ca/forest/termite/tips11.htm, viewed on 23.11.07
[77] Greenshare factsheets, *Termites*, University of Rhode Island Landscape Horticulture Program, retrieved from: http://www.uri.edu/ce/factsheets/sheets/termite.html, viewed on 23.11.07

Tree Liberation

Trees that are in need of tree liberation should be identified. It is important to make sure that the sidewalk is wide enough for this to be undertaken. If the street is too narrow, it could create a hazard for pedestrians.

- Arrange for removal of the concrete slabs or other hard surfaces, and identify somewhere to dispose of them;
- Free compost can be picked up at the Ashbridges Bay Treatment Plant, 9 Leslie Street (main entrance), from April 14th to October 20th, Saturdays 7:00am to 12:00noon;[78]
- Ensure that the trees are continuously watered after the tree liberation has taken place;
- Get in touch with Streets are for People! for advice and guidance. They have undertaken tree liberation in three places in Kensington, and have good experience. They can be contacted at: info@streetsareforpeople.org.

Heritage Trees

When the inventory has been completed, other potential heritage trees can be identified. The selection of potential heritage trees has firstly been based on the species. If the species was of heritage value, then the total height and the DBH were examined for heritage value. If the tree fulfilled either of the criteria for height or DBH, then it was assigned as a potential heritage tree.[79] These trees need to be examined closer to determine if they are to be nominated as a heritage tree. Harbord Village should invest in

[78] City of Toronto, *Leaf Compost Depots*, retrieved from: http://www.toronto.ca/compost/leaf.htm, viewed on 28.11.07
[79] Andy Kenney, *NeighbourWoods*, Faculty of Forestry, University of Toronto, 2007

acquiring the Heritage Trees Protection Toolkit by the Ontario Heritage Tree Alliance. This provides extensive guidelines on how to go about nominating and evaluating trees. The Heritage Conservation District Committee in Harbord Village should be working with the tree committee to nominate heritage trees.

Outreach and Education

In the first year, education and outreach should be high on the agenda. Informing and educating the residents about future plans to take care of the urban forest will make it easier to gain access to backyard trees, to start a pruning cycle, and to start planting trees.

- A public meeting should take place to inform residents of the current plans to take stewardship over their urban forest. This will put trees on people's minds, and the flyers or newsletters distributed to the households will get more attention;
- Education and outreach is very important to take full advantage of the plantable spaces. The people who do not have a tree in their frontyard must realise the benefits trees provide if they are going to agree on planting a tree in their frontyard. It will be beneficial, as has been seen before in Harbord Village, to have colour pictures of the different trees that are available to plant.
- Different community activities should be planned, such as a speaker series, pruning days, a day of tree liberation, an invasive insect workshop and community planting events.
- LEAF should be contacted to request a tree tour. They can be contacted at: (416) 413-9244.

Lobby the City

The HVRA should start a dialogue with the City and the Urban Forestry Department. A list of trees that should be inspected by an arborist should be presented to the City. In addition, the HVRA should lobby the City to get stewardship over the private trees.

A management plan needs to be presented to the City if they are to be allowed to take stewardship over the city trees. The HVRA would also have to guarantee that a certified arborist would be used to undertake the work. Harbord Village should argue to get a tax cut in return for taking care of the city trees in their neighbourhood. In addition, a number of funding sources must be explored. Another possibility is for HVRA to send in an application for contractors to perform arboricultural services on city-owned street trees (appendix 6). "The Agreement for Contractors to Perform Arboricultural Services on City Owned Street Trees" will enable a property owner to contract standard tree maintenance work to a City approved tree service company. However, this takes place at the property owners own expense.[80] HVRA should consider this as a starting point to get stewardship over the City trees, however, they should still lobby the City to get a tax break if all the city trees in Harbord Village are included in the pruning cycle.

Funding

It would be ideal if the residents in Harbord Village could contribute to a "tree budget", however, this will demand a great deal of educational work and residents might not have the financial capacity to contribute. Therefore, a number of funding sources must be

[80] City of Toronto, Parks, Forestry and Recreation, Urban Forestry, *Information About: The Agreement for Contractors to Perform Arboricultural Services on City Owned Street Trees*, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, viewed on 23.11.07

explored. This can either be through grants, or fundraising local businesses. Following is a number of potential grant sources:

- Ontario Trillium Foundation
- Community Foundation for Greater Toronto
- J.P Bickell Foundation
- The Richard Ivey Foundation
- McGeachy Charitable Foundation
- The McLean Foundation
- The K.M Hunter Charitable Foundation
- The Noranda Foundation
- Bronfman Family Foundation, The Samuel and Saidye
- EcoAction Community Funding Program, Environment Canada
- Laidlaw Foundation
- Metcalf Foundatioan
- The Salamander Foundation
- TD Friends of the Environment Foundation
- Tides Canada Foundation

Plan Review

In the second year, a review of the first annual operating plan will be necessary. Success should be highlighted, whilst aspects that did not work well should be modified.

Budget

There are a number of costs associated with the management plan;

- The price for a certified arborist company needs to be investigated. This should include cyclic pruning, and maintenance of trees that are in need of inspection;
- Prices for bulk purchase of native and non-native nursery stocks from local nurseries that carry local seed sources. In addition, HVRA should purchase mulch in bulk, so it is available to the residents at a cheaper cost;
- Cost of printing flyers for the inventory, "Adopt a tree" scheme, and other education activities;

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References

Aird, P, University of Toronto, Ontario Heritage Tree Alliance, 2007, retrieved from: http://www.oufc.org/ohtabackground.htm, viewed on 01.12.07

Airhart, D. L, and Zimmerman III, G, *Mulching and staking trees*, 2003, retrieved from: http://www.tlcfortrees.info/mulching_staking.htm, viewed on 27.10.07

Arbord Day Foundation, *The Right Tree in the Right Place*, 2007, retrieved from: http://www.arborday.org/trees/rightTreeAndPlace/size.cfm, viewed on 01.11.07

Barnacle, B and Burks, S, *Minimizing gypsy moth damage*, Minnesota Department of Natural Resources, 2007, retrieved from: http://www.dnr.state.mn.us/treecare/forest_health/gypsymoth/minimizedamage.html, viewed on 20.11.07

Bedker, et al., *How to prune trees*, USDA Forest Service, 2007, retrieved from: http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm#reasons, viewed on 22.10.07

Canadian Food Inspection Agency, *Emerald ash borer confirmed in Toronto*, 2007, retrieved from: http://www.inspection.gc.ca/english/corpaffr/newcom/2007/20071204e.shtml, viewed on 06.12.07

Canadian Forest Service, *Gypsy moth*, 2007, retrieved from: http://scf-cfs.rncan-nrcan.gc.ca/factsheets/gypsy-moth, viewed on 20.11.07

Cappiella, K, Schueler, T, Tomlinson, J, Wright, T, *Urban Watershed Forestry Manual, Part 3: Urban Tree Planting Guide*, Center for Watershed Protection, United States Department of Agriculture, Forest Service, Northeastern Area, State and Private Forestry, 2006, pp. 20-21

Chicago Botanic Garden, *Urban Trees and Shrubs: a guide to the selection of trees and shrubs in urban areas*, 2007, retrieved from: http://www.na.fs.fed.us/spfo/pubs/uf/uts/index.htm, viewed on 04.12.07

City of Toronto, *Leaf Compost Depots*, 2007, retrieved from: http://www.toronto.ca/compost/leaf.htm, viewed on 28.11.07

City of Toronto, Urban Forestry, *Gypsy Moth Control in Toronto: Gypsy Moth Control Methods: Guide for Homeowners*, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/GM_GuideforHomeowners.pdf, viewed on 09.11.07

City of Toronto, Urban Forestry Service, 2007 retrieved from: http://www.toronto.ca/trees/tree_planting.htm, viewed on 28.10.07

City of Toronto, Urban Forestry Service, *Forest Health Care: Asian Long-horned Beetle*, 2005, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Asian_Long-horned_Beetle_fs.pdf, viewed on 08.11.07

City of Toronto, Urban Forestry Service, *Forest Health Care: European Gypsy Moth*, 2001, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/European_Gypsy_Moth.pdf, viewed on 08.11.07

City of Toronto, Urban Forestry Service, 2007, retrieved from: http://www.toronto.ca/trees/, viewed on 09.11.07

City of Toronto, Toronto Parks, Forestry and Recreation, *Gypsy Moth Control in Toronto*, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/GypsyMothBooklet_READER_1.pdf, viewed on 09.11.07

City of Toronto, Urban Forestry Service, 2007 retrieved from: http://www.toronto.ca/trees/gypsy-moth.htm, viewed on 09.11.07

City of Toronto, Urban Forestry Department, *City Street Tree By-law (Article II of Chapter 813)*, 2004, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, viewed on 08.11.07

City of Toronto, Urban Forestry Department, *Private Tree By-law (Article III of Chapter 813)*, 2004, retrieved from: http://www.toronto.ca/trees/bylaws_policies.htm, 08.11.07

City of Toronto, Urban Forestry Service, *Emerald Ash Borer*, 2007 retrieved from: http://www.toronto.ca/trees/pdfs/EABPoster.pdf, viewed on 14.11.07

City of Toronto Parks, Forestry and Recreation, *Forest Health Care: Girdling Roots*, 2001, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Girdling_Roots_fs.pdf, viewed on 26.10.07

City of Toronto, Urban Forestry Services, *Forest Health Care: Water stress*, 2001, retrieved from: http://www.toronto.ca/trees/pdfs/factsheets/Water_Stress_fs.pdf, viewed on 05.11.07

City of Toronto, *Property Data Map 50H-21*, Technical Services, Survey and Mapping Services, Print Day: May 2007

Clatterbuck, W. K, Harper, C, *Urban Trees for Wildlife*, 2007, The University of Tennessee, Agricultural Extension Service,

David Cappaert, Michigan State University, Bugwood.org, Forestry Images, 2005, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=2106098, viewed on 20.11.07

Dirr, M. A, *Manual of Woody Landscape Plants*, Stipes Publishing Company, Ilinois, USA, 1990

Eastern Ontario Model Forest, *Choosing the Right Tree: A Landowner's Guide to Putting Down Roots*, 2007, p. 4, retrieved from: http://www.seedlingnursery.com/choosing.htm, viewed on 12.11.07

Environment Canada, *EnviroZine*, 2007, retrieved from: http://www.ec.gc.ca/EnviroZine/English/issues/66/print_version_e.cfm?page=questions, viewed on 07.11.07

Evergreen Native Plant Database, 2007, retrieved from: http://www.evergreen.ca/nativeplants/search/, viewed on 16.10.07

Farrar, J.L, *Trees in Canada*, Fitzhenry & Whiteside Limited, Canadian Forest Service, Ontario, 1996

The Forest Where We Live, *Planting Trees Around Your Home*, 2007, retrieved from: http://www.lpb.org/programs/forest/plantguide.html, 01.11.07

Gilman, E.F, Black, R.J, *Pruning Landscape Trees and Shrubs*, University of Florida, IFAS Extension, 2005, retrieved from: http://edis.ifas.ufl.edu/MG087, viewed on 22.10.07

Greenshare factsheets, *Termites*, University of Rhode Island Landscape Horticulture Program, 1999, retrieved from: http://www.uri.edu/ce/factsheets/sheets/termite.html, viewed on 23.11.07

Harbord Village Residents' Association, *Harbord Village Heritage Conservation District*, 2007, retrieved from: http://harbordvillage.com/heritage-conservation, viewed on 02.12.07

International Society of Arboriculture, *Pruning of young trees*, 1995, Updated 2003, retrieved from: http://www.lvsnag.org/pdf/PruningYoungTrees.pdf, viewed on 28.11.07

Kenney, *NeighbourWoods*, Faculty of Forestry, University of Toronto, 2007

Landowner Resource Centre, Ontario Ministry of Natural Resources, *Extension Notes: Cavity trees are refugees for wildlife*, 1999

Miller and Sylvester, *An economic evaluation of the pruning cycle*, Journal of Arboriculture, 7 (4), 1981, pp. 109-112

National Association of Conservation Districts, *Tree planting*, 1998 retrieved from: http://www.nrcs.usda.gov/Feature/backyard/pdf/treeplan.pdf, viewed on 01.11.07

Natural Resources Canada, *USDA Plant Hardiness Zones in Canada*, retrieved from: www.nrcan-rncan.gc.ca, 2007, viewed on 13.12.07

Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Forestry Images, 2006, retrieved from: http://www.forestryimages.org/browse/detail.cfm?imgnum=5016052, viewed on 20.11.07

Personal Communication, Andy Brown, Toronto Public Space Committee, 29.11.07

Personal Communication, Kelsey Carriere, Streets are for the People!, 22.11.07

Personal Communication, Andrew Pickett, Urban Forestry, City of Toronto, 07.11.07

Phytosphere Research, *Planning for the Future of Rocklin's Urban Forest*, 2006, p. 128, retrieved from: http://www.rocklin.ca.us/government/development/planning/publications_n_maps/planning_for_the_future_of_rocklins_urban_forest.asp, viewed on 26.10.07

Rohila, C.M, *Landscape and local effects on snags and cavity nesting birds in an urbanizing area*, University of Washington, College of Forest Resources, 2002, pp. 40-41

Proudman, J, *Termite Tips: Stumps and Dead Trees*, Newsletter of the Urban Entomology Program, No. 11, University of Toronto, 1998, retrieved from: http://www.utoronto.ca/forest/termite/tips11.htm, viewed on 23.11.07

Rutledge, J, *The Tree Care Guide: A Handy Guide to Planting and Maintaining your trees*, Forest Enhancement Program, Manitoba Hydro, 2004, retrieved from: http://www.hydro.mb.ca/environment/publications/tree_care_guide.pdf, viewed on 29.10.07

Saunders, B, *Heritage preservation and trees*, Ontario Heritage Tree Alliance, 2007, retrieved from: http://www.oufc.org/ohtaheritagepreservation.htm, viewed on 01.12.07

Santamour, F.S. Jr, *Trees for Urban Planting: Diversity, Uniformity, and Common Sense*, US National Arboretum, Agricultural Research Service, U.S Department of Agriculture, Washington, D.C, 2002

Tree Council, *Tree planting guide*, 2007, retrieved from: http://www.treecouncil.org.uk/info/packng2.html, viewed on 30.10.07

Wassenaer, P., Kenney, W. A, *Strategic Urban Forest Planning in Neighbourwoods* , 2001, retrieved from: http://larva.forestry.utoronto.ca/urban/neighbourwoods/, viewed on 19.10.07

Zins, M, Brown, D, *Pruning trees and shrubs*, University of Minnesota, Extension, 2002,

retrieved from: http://www.extension.umn.edu/distribution/horticulture/DG0628.html, viewed on 22.10.07

References for appendix 2 and 3:

Arbord Day Foundation, *Trees*, 2007, retrieved from: http://www.arborday.org/trees/index.cfm, viewed on 07.12.07

Backyard Gardener, 2007, retrieved from: http://www.backyardgardener.com/, viewed on 07.12.07

Baller, Humber Arboretum, Native *Plant List: Trees, Shrubs and Vines Native to Ontario*, 2007, retrieved from: http://www.humberarboretum.on.ca/list2np.htm#TREES%20NATIVE%20TO%20ONTARIO, viewed on 07.12.07

Chicago Botanic Garden, *Urban Trees and Shrubs: a guide to the selection of trees and shrubs in urban areas*, 2007, retrieved from: http://www.na.fs.fed.us/spfo/pubs/uf/uts/index.htm, viewed on 07.12.07

City of Toronto, Urban Forestry Service, *Native Trees*, 2007, retrieved from: http://www.toronto.ca/trees/pdfs/Tree_List.pdf, viewed on 29.10.07

Dirr, M. A, *Manual of Woody Landscape Plants*, Fourth Edition, Stipes Publishing Company, 1990

Eastern Ontario Model Forest, *Choosing the Right Tree: A Landowner's Guide to Putting Down Roots*, 2007, retrieved from: http://www.seedlingnursery.com/choosing.htm, viewed on 29.10.07

Evergreen, *Native Plant Database*, 2007, retrieved from: http://www.evergreen.ca/nativeplants/search/index.php, viewed on 29.10.07

Farrar, J.L, *Trees in Canada*, Fitzhenry & Whiteside Limited, Canadian Forest Service, Ontario, 1996

Kershaw, L, *Trees of Ontario*, Lone Pine Publishing, Canada, 2001

James, T, North Carolina Department of Environment and Natural Resources, Division of Forest Resoureces, *Recommended Street Trees for North Carolina*, 2006, retrieved from: http://www.dfr.state.nc.us/urban/pdf/NC%20Urban%20Tree%20List.pdf, viewed on 29.10.07

Rushforth, K, *Trees in Britain and Europe*, Collins Wildlife Trust Guide Trees, Harper Collins Publisher, London, 1999

Sooner Plant Farm, *Shade trees*, 2007, retrieved from: http://www.soonerplantfarm.com/index.cfm?fuseaction=plants.plantDetail&plant_id=58&customerReview=1, viewed on 07.12.07
University of Illinois, *Selecting Trees for your Urban Home*, 2007, retrieved from: http://www.urbanext.uiuc.edu/treeselector/detail_plant.cfm?PlantID=235, viewed on 07.12.07

University of Rhode Island Landscape Horticulture Program, *Sustainable Trees and Shrubs*, 1999, retrieved from:, http://www.uri.edu/ce/factsheets/sheets/sustplant.html, viewed on 07.12.07

Urban Forest Ecosystem Institute, *SelecTree: A tree selection guide*, 2004, retrieved from: http://selectree.calpoly.edu/?-session=selectree:8E96B1981b90b13EFANSI2086446, viewed on 07.12.07

Wcisel, K.J, Tree Topics, *Quercus bicolor*, 2007, retrieved from: http://www.treetopics.com/quercus_bicolor/index.htm, viewed on 07.12.07

Appendix 1: Toronto Municipal By-Law Chapter 813

Chapter 813

TREES

[HISTORY: Adopted by the Council of the City of Toronto as indicated in article histories. Amendments noted where applicable.]

GENERAL REFERENCES

Tree permit fees — See Ch. 441.
Tree care in parks — See Ch. 608.
Ravine protection — See Ch. 658.

ARTICLE I
Inspection; Removal of Infested Trees
[Adopted 2000-05-11 by By-law No. 310-2000]

§ 813-1. Inspection for presence of Asian Long-Horned Beetles and other pests; removal of infested trees.

The City Forestry staff is authorized to inspect for the presence of Asian Long-Horned Beetles and other alien forest pests and to remove infested trees, on all public and private property, with the consent of the property owner.

§ 813-2. Right to enter private property.[1]

The City Forestry staff is authorized to enter upon private property to inspect for the presence of Asian Long-Horned Beetles and other alien pests and to remove infested trees.

ARTICLE II
Trees on City Streets
[Adopted 2000-06-08 by By-law No. 388-2000[2]]

§ 813-3. Definitions.

As used in this article, the following terms shall have the meanings indicated:

CARE AND MAINTENANCE — The care and maintenance of trees in accordance with good arboricultural standards and includes inspection, pruning, cabling and bracing, treatments for insect and disease problems, watering and fertilization.

CITY STREET — A common or public highway, road, street, lane or any road allowance or portion thereof under the jurisdiction of the City of Toronto.

COMMISSIONER — The Commissioner of Economic Development, Culture and Tourism or his or her delegate. **[Amended 2000-10-05 by By-law No. 869-2000]**

DESTROY/DESTRUCTION — To remove, cut down or in any other way injure a tree to such an extent that it is deemed necessary to remove or cut down the tree.

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[1] **Editor's Note: This section shall come into effect upon City Forestry staff being designated as inspectors by the President of the Canadian Food Inspection Agency in accordance with section 21 of the *Plant Protection Act*, S.C. 1990, c. 22, and section 13 of the *Canadian Food Inspection Act*, S.C. 1997, c.6.**

[2] **Editor's Note: This by-law was passed under the authority of section 312 of the *Municipal Act*, R.S.O. 1990, c. M.45. This by-law also repealed the following: Article I, Chapter 331, Trees, of the former City of Toronto Municipal Code; Article I, Chapter 243, Trees, of the former City of Etobicoke Municipal Code; By-law No. 118-97 of the former Borough of East York; Section 10 of By-law No. 211-74 of the former Metropolitan Toronto; By-law No. 31729 of the former City of North York; By-law Nos. 20975 and 21682 of the former City of Scarborough; and By-law No. 2507-92 of the former City of York. This listing of repealed by-laws was amended 2000-7-6 by By-law No. 484-2000.**

EMERGENCY WORK — Includes work associated with drain repairs, utility repairs and structural repairs to a building or any other work of an emergency nature.

INJURE/INJURY — Not protecting a tree in accordance with the City of Toronto's Specifications for Construction Near Trees and/or other standards set out by the Commissioner, entirely or in part, and/or any acts which will harm a tree's health in any manner.

PERSON — Includes a company, a corporation, a partnership or an individual person.

SPECIFICATIONS FOR CONSTRUCTION NEAR TREES — The most recent version of the City of Toronto's Specifications for Construction Near City Trees.

STANDARDS — Minimum requirements or guidelines established by the Commissioner pertaining to the protection and preservation of trees.

TREE PLANTING DETAIL — The most recent version of illustrated details with notes pertaining to the planting of trees on any City street; as found in the City of Toronto Streetscape Manual.

TREES — Any shade or ornamental tree, all or part of which is located on, above or below a City street. Ownership and maintenance of trees which have 50 percent or more of their main stem situated on a City road allowance will be the responsibility of the City.

TREE VALUE/APPRAISED VALUE — The monetary value of a tree as determined through calculations using the City of Toronto's Tree Appraisal and Evaluation form.

§ 813-4. Authority for planting, care and maintenance and removal of trees.

The planting, care and maintenance, protection, preservation and removal of all trees located on any City street shall be under the supervision of the Commissioner.

§ 813-5. Powers and duties of Commissioner.

The Commissioner is authorized to:

A. Plant, or cause to be planted, trees on City streets.

B. Care for and maintain, or cause to be cared for and maintained, any tree located on any City street.

C. Transplant, remove or cause to be transplanted or removed any tree planted or located on any City street where deemed necessary in the public interest.

D. Remove or cause to be removed without notice or compensation to any person any object or thing that adversely affects a tree or part of a tree on a City street.

E. Prune or cause to be pruned all trees located on private property, the branches of which extend over a City street, including the pruning of branches which are hazardous or create an unsafe condition.

F. Implement or cause to be implemented necessary treatments for insect and disease problems associated with trees located on a City street.

G. Remove or cause to be removed trees which are dead, hazardous or no longer viable to maintain, certified as such by the Commissioner.

H. Remove, injure or cause the removal or injury of trees as may be required to facilitate emergency work, certified as such by the Commissioner.

I. Remove or cause to be removed healthy trees located on a City street, where a written request for tree removal has been received from an adjacent property owner, that includes a landscape plan satisfactory to the Commissioner and the Ward Councillor(s). Such requests for removals may be subject to conditions which include payment of tree value, removal and replacement costs and the replanting of a replacement tree or trees by the applicant. **[Amended 2000-10-05 by By-law No. 869-2000]**

J. Refuse the removal of trees located on a City street and refer the matter to the appropriate Community Council.

K. Permit the pruning of tree roots in accordance with good arboricultural practices causing minimal damage to the tree. Such requests for injury may be subject to conditions which include the payment of tree value, removal and replacement costs, the posting of a letter of credit and the planting of a tree or trees by the applicant.

L. Stop any work causing injury or destruction to a tree located on a City street that is taking place without permission from the Commissioner and/or contrary to the City of Toronto's Specifications for Construction Near Trees and/or other standards set out and imposed by the Commissioner for the protection of a tree or trees.

§ 813-6. Protection, injury and removal of trees; prohibited activities.

A. Protection.

Every person doing any work on City streets shall carry out such work in accordance with the City's Specifications for Construction Near Trees and any other standards set out by the Commissioner.

B. Injury and removal.

No person shall injure, destroy or remove a tree without the prior written approval of the Commissioner. Approval may be subject to such conditions as the Commissioner may impose, including payment of tree value, removal and replacement costs, replanting, posting a letter of credit in a form and content acceptable to the City in an amount sufficient to cover the appraised value of the subject tree as well as removal and replacement costs, provision of a detailed tree protection plan and provision of a qualified arborist's or forester's report detailing specific arboricultural procedures to be undertaken.

C. Prohibited activities.

(1) No person shall remove, cut down, destroy or injure any tree or part of a tree located on a City street except with the prior written approval of the Commissioner.

(2) No person shall mark, cut, break, peel, deface or bury the roots of any tree or any part of a tree located on a City street.

(3) No person shall undertake or cause to undertake any activities which are contrary to the City of Toronto's Specifications for Construction Near Trees and/or any other standards or conditions imposed and set out by the Commissioner pertaining to the protection of a tree located on a City street except with the prior written approval of the Commissioner.

(4) No person shall attach in any manner any object or thing to a tree or part of a tree located on a City street except with the prior written approval of the Commissioner.

(5) Despite Subsection C(4), no person shall attach decorative lights to a tree located on a City street except with the prior written approval of the Commissioner and upon production of satisfactory evidence that all other requisite approvals have been obtained. Such requests may be subject to conditions imposed by the Commissioner.

§ 813-7. Tree planting and removal.

A. Planting of trees.

(1) Any tree planted on a City street must be approved by the Commissioner and planted in accordance with the appropriate City of Toronto Tree Planting Detail. Approval by the Commissioner will include the planting location, species, size and condition.

(2) The Commissioner may request a monetary deposit in an amount appropriate to secure the planting of trees. These funds may be held by the City until after the planting of the trees for a period of time determined by the Commissioner

and shall be released by the City, provided that the trees are healthy and in a state of vigorous growth after the stipulated time period.

B. Removal of trees.

(1) When a tree is removed, a replacement tree must be planted unless otherwise determined by the Commissioner. The planting location, species, size, condition and planting date must be approved by the Commissioner.

(2) Where the Commissioner or City Council has approved the removal of a tree, such approval may be subject to conditions which include the applicant providing payment of tree value, removal and replacement costs and a minimum of one replacement tree being planted for each tree approved for removal.

§ 813-8. Offences.

Any person who contravenes any provision of this article is guilty of an offence.[3]

ARTICLE III
Tree Protection
[Adopted 2004-09-30 by By-law No. 780-2004[4]]

§ 813-9. Definitions.

As used in this article, the following terms shall have the meanings indicated:

APPLICATION — A permit application to injure or destroy trees.

ARBORIST — An expert in the care and maintenance of trees and includes an arborist qualified by the Ontario Training and Adjustment Board Apprenticeship and Client Services Branch, a certified arborist qualified by the International Society of Arboriculture, a consulting arborist registered with the American Society of Consulting Arborists, a registered professional forester or a person with other similar qualifications as approved by the Commissioner.

ARBORIST REPORT — A technical report that identifies the species, size and condition of trees and describes tree protection measures to be implemented.

COMMISSIONER — The Commissioner of Economic Development, Culture and Tourism or his or her delegate.

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[3] **Editor's Note: This section was passed under the authority of sections 320 and 331 of the *Municipal Act*, R.S.O. 1990, c. M.45, and, under section 61 of the *Provincial Offences Act*, R.S.O. 1990, c. P.33, a person convicted of an offence under this section is liable to a fine of not more than $5,000.**

[4] **Editor's Note: This by-law was passed under the authority of sections 135, 391 and 427 of the *Municipal Act, 2001*, S.O. 2001, c. 25.**

DESTROY — To remove, cut down or injure a tree to such an extent that it is deemed necessary to remove or cut down the tree.

EMERGENCY WORK — Work required to be done immediately in order to prevent imminent damage, including soil erosion, drain repairs, utility repairs and structural repairs to a building.

ENVIRONMENTALLY SENSITIVE AREA — Includes an environmentally significant area, natural area or ravine as defined and designated in the City of Toronto official plan.

GRADE — A defined elevation of land established as a result of natural processes or by human alteration.

HAZARDOUS TREE — A destabilized or structurally compromised tree that is in imminent danger of causing damage or injury to life or property.

HERITAGE TREE — A tree designated under Part IV of the *Ontario Heritage Act*.[5]

INJURE — Any act that will harm a tree including failure to protect in accordance with the City of Toronto's Tree Protection Policy and Specifications for Construction Near Trees or other standards set out by the Commissioner.

LANDSCAPING AND REPLANTING PLAN — A plan which identifies the location, species and size of existing trees, trees to be planted and other landscape elements on a property and provides details regarding planting methodology.

OFFICER — Those persons holding the positions of City Forester, Urban Forestry Supervisor, Urban Forestry Co-ordinator, Urban Forestry Planner, Urban Forestry Planning Assistant, Urban Forestry Manager, Arborist Inspector and Arborist Foreperson.

OWNER — For purposes of making an application under this article, shall include the owner of either property where the base of a tree straddles a property line or whose property is physically impacted by the roots or crown of a tree on adjacent property.

ROOFTOP GARDEN — Does not include the rooftops of parking garages or other structures at grade.

TREE PROTECTION PLAN — A plan that identifies the location, species and size of trees on a property and provides tree protection measures, including but not limited to protective barriers and hoarding.

TREE PROTECTION POLICY AND SPECIFICATIONS FOR CONSTRUCTION NEAR TREES — The most recent version of the City of Toronto's Tree Protection

[5] **Editor's Note: See R.S.O. 1990, c. O.18.**

Policy and Specifications for Construction Near Trees as established by the Commissioner.

§ 813-10. Permit required.

No person shall, within the City's boundaries, injure or destroy any tree having a diameter of 30 centimetres or more measured at 1.4 metres above ground level unless authorized by permit to do so.

§ 813-11. Exceptions.

Despite § 813-10, a permit is not required under this article for the following activities:

A. Removal of a diseased, dead or hazardous tree certified as such by the Commissioner.

B. Pruning of a tree in accordance with good arboricultural practice to maintain tree health.

C. Pruning of tree branches that interfere with utility conductors.

D. Emergency work.

E. Injury or destruction of trees on rooftop gardens, in interior courtyards having a soil depth of less than 1.5 metres above a built substructure, in solariums or on elevated podiums.

F. Injury or destruction of trees in ravine protection areas designated under Municipal Code, Chapter 658, Ravine Protection.

§ 813-12. Applications; form and content.

A. An owner who wishes to injure or destroy a tree shall submit to the Commissioner an application on the prescribed form and shall provide the following:

(1) The name, address and telephone number of the applicant.

(2) The non-refundable application fee set out in § 441-19.

(3) The purpose for which the permit is required.

(4) A tree survey showing the location of trees on the property.

(5) An arborist report identifying the location, species, size and condition of trees on the property and describing protection measures to be implemented.

(6) A tree protection plan identifying the location, species and size of trees on the property and illustrating details of protection measures including protective

barriers and hoarding to be implemented to protect trees that are to be retained.

(7) Landscaping and replanting plans.

§ 813-13. Powers and duties of Commissioner.

The Commissioner is authorized to:

A. Issue permits for the destruction of trees in accordance with the criteria and subject to the conditions set out in this article.

B. Issue permits for the injury of trees in accordance with the criteria and subject to the conditions set out in this article.

C. Refuse to issue permits for the injury or destruction of trees and refer the matter to the appropriate community council.

D. Stop any work causing injury or destruction to trees having a diameter of 30 centimetres or more measured at 1.4 metres above ground level that is taking place without a permit or contrary to the conditions of a permit or other standards established by the Commissioner.

E. To waive the requirement for an arborist report in non-commercial applications.

F. To waive the permit application fee for owners living below the low-income cut off as determined by Statistics Canada. **[Added 2004-12-02 by By-law No. 1071-2004]**

§ 813-14. Review of applications; criteria.

The Commissioner shall consider the following criteria:

A. The application form is complete.

B. The applicant has paid all required fees.

C. The condition of the tree.

D. The location of the tree

E. The protection of environmentally sensitive areas.

F. The protection of natural landforms or contours.

G. The protection of ecological systems.

H. Erosion and flood control.

I. The protection of significant vistas.

J. Whether or not a tree is a heritage tree or should be protected as a heritage tree.

§ 813-15. Permit refusal.

The Commissioner shall not issue a permit for the injury or destruction of trees where:

A. The application form is not complete.

B. The information required by § 813-12A has not been provided to the satisfaction of the Commissioner.

C. Trees are healthy.

D. Environmentally sensitive areas, ecological systems, natural landforms or contours will not be adequately protected and preserved.

E. Erosion or flood control will be negatively impacted.

F. Significant vistas will not be adequately protected and preserved.

G. The tree is a heritage tree, or should in the opinion of the Commissioner be recommended for designation as a heritage tree.

§ 813-16. Issuance of permits.

The Commissioner is authorized to issue permits where:

A. Trees are causing or are likely to cause structural damage to load-bearing structures or roof structures.

B. Trees are in poor condition and cannot be maintained in a healthy and safe condition.

C. Trees are growing in inappropriate locations, as certified by the Commissioner, and cannot be maintained on a routine basis due to restrictive site conditions.

D. Trees are located on property where site plan, subdivision, consent or committee of adjustment approval has been obtained, provided that the trees must be injured or destroyed to facilitate construction in accordance with plans approved by the City.

E. Trees are located on property where a building permit, front yard or boulevard parking permit or permission for driveway widening has been obtained, provided that the trees must be injured or destroyed to facilitate construction in accordance with plans approved by the City.

F. Despite § 813-15C the Commissioner may issue permits to injure or destroy healthy trees where:

(1) The trees are causing or are likely to cause structural damage to load-bearing structures or roof structures.

(2) The trees are growing in inappropriate locations as certified by the Commissioner, and cannot be maintained on a routine basis due to restrictive site conditions.

(3) Injury or destruction is required in order to remediate contaminated soil.

(4) The trees are appropriately sited, and not causing or likely to cause structural damage to load-bearing structures or roof structures, provided that:

(a) Notice has been posted in accordance with § 813-17; and

(b) The Commissioner and the ward councillor are satisfied that the applicant has undertaken to implement a satisfactory landscaping and replanting plan.

§ 813-17. Notice.

Notice of an application to injure or destroy healthy trees in accordance with § 813-16F(4) shall be posted on the property:

A. In a manner and form satisfactory to the Commissioner.

B. For a period of not less than 14 days.

§ 813-18. Permits to destroy; conditions.

A permit to destroy trees shall be subject to the following terms and conditions:

A. Replacement trees shall be planted and maintained to the satisfaction of the Commissioner in accordance with landscaping and replanting plans submitted by the applicant and approved by the Commissioner.

B. Where replacement planting is not physically possible on site, the Commissioner may:

(1) Require replacement planting at another suitable location; or

(2) Accept a cash in lieu payment in an amount equal to 120 percent of the cost of replanting and maintaining the trees for a period of two years.

C. Where a property is not subject to site plan approval, the applicant shall provide a written undertaking and release to ensure that replacement planting is carried out and maintained in accordance with landscaping and replanting plans approved by the Commissioner.

D. The destruction shall only be carried out by or under the supervision of an Arborist.

§ 813-19. Permits to injure; conditions.

A permit to injure trees shall be subject to the following terms and conditions:

A. Trees shall be protected in accordance with good arboricultural practices.

B. Where a property is not subject to site plan approval, the applicant shall provide a written undertaking and release to ensure that tree protection is carried out and maintained in accordance with landscaping and replanting plans submitted by the applicant and approved by the Commissioner.

C. The injury shall be carried out by or under the supervision of an Arborist.

§ 813-20. Appeals.

A. Where the Commissioner refuses to issue a permit, an applicant may within 14 days of the date of refusal appeal to the appropriate community council by submitting a written request to the Commissioner that the permit application be heard by the appropriate community council.

B. Where an applicant has filed an appeal, the Commissioner shall prepare and forward a report on the application to the next appropriate community council meeting, setting out the grounds for refusal of the application.

C. Prior to the Commissioner reporting to community council, the City Clerk shall notify the Ward Councillor, abutting property owners and any other persons who have expressed written interest in the application of the date the application will be considered by community council.

D. Upon consideration of the application, the appropriate community council shall make a recommendation to Council.

E. Upon consideration of the application, Council may direct the Commissioner to issue a permit, subject to conditions satisfactory to Council.

§ 813-21. Order to correct violation.

If an officer is satisfied that there is a contravention of this article or a permit issued under this article, the officer may make an order setting out particulars of the contravention and requiring the person to stop the injuring or destruction of trees.

§ 813-22. Remedial action.

Wherever this article or a permit issued under this article directs or requires any matter or thing to be done by an applicant, in default of its being done by the person directed or required to do it, the matter or thing may be done under the direction of the

Commissioner, and the City may recover the costs incurred by action or by adding the costs to the tax roll and collecting them in the same manner as taxes.

§ 813-23. Offences; additional remedies.

A. Any person who contravenes any provision of this article is guilty of an offence.[6]

B. A person convicted of an offence under this article is liable:

(1) On a first conviction, to a fine of not more than $10,000 or $1,000 per tree, whichever is greater; and

(2) On any subsequent conviction, to a fine of not more than $20,000 or $2,500 per tree, whichever is greater.

C. Where a corporation is convicted of an offence under this article, the corporation is liable:

(1) On a first conviction, to a maximum fine of $50,000 or $5,000 per tree, whichever is greater; and

(2) On any subsequent conviction, to a maximum fine of $100,000 or $10,000 per tree, whichever is greater.

D. In addition to any other remedy or any penalty provided by law, the court in which the conviction has been entered, or any other court of competent jurisdiction, may make an order prohibiting the continuation or repetition of the offence by any person.

E. The court in which the conviction has been entered, and any other court of competent jurisdiction, may order the person to replant or have replanted such trees in such manner and within such time period as the court considers appropriate, including any silvicultural treatment necessary to re-establish the trees.

§ 813-24. Repeal.

The following are repealed:

A. Article III, Chapter 331, Trees, of the former City of Toronto Municipal Code.

B. By-law No. 25150 of the former City of Scarborough.

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[6] **Editor's Note: This section was passed under the authority of section 425 of the *Municipal Act, 2001*, S.O. 2001, c. 25, and, under section 61 of the *Provincial Offences Act*, R.S.O. 1990, c. P.33, a person convicted of an offence under this section is liable to a fine of not more than $5,000.**

§ 813-25. Conflict.

In the event of any conflict between this article and any other by-law of a former municipality respecting trees on private property, this article shall prevail.

§ 813-26. (Reserved)[7]

[7] Editor's Note: Former § 813-26, Fees, was repealed 2004-12-02 by By-law No. 1071-2004.

Appendix 2: Native Species List

Common Name	Latin Name	USDA Hardiness Zones	Reason for planting	Height	Moisture	Soil	Light	Things to consider
Cumulus Serviceberry	*Amelanchier laevis*	5-9	Will tolerate some shade, produces fruits in june. Salt and juglons tolerant. Attracts birds	2-10 m	dry, normal , moist	clay, sand	sun, partial shade	
Ironwood	*Carpinus carolinia*	4-8	Slow growing, tolerates shade and flooding, requires ordinary moist soil. Attracts squirrels, birds, butterflies	4-9 m	moist	clay, loam	partial shade, shade	
Hackberry	*Celtis occidentalis*	3-9	Tolerates alkaline soil, air pollution, salt and drought	15-27 m	dry, normal, moist	clay, loam, calciphile	sun, partial shade	
Kentucky Coffeetree	*Gymnocladus dioicus*	3-8	Very tolerant of air pollution. Listed as threatned in ON by SARA (Species at Risk Act)	15-25 m	dry, normal , moist	clay, sand, loam, humus enriched	sun, partial shade	
Swamp White Oak	*Quercus bicolor*	3-8	Tolerant of drought, soil compaction, salt and transplates easier than other oaks	12-20 m	moist	loam	sun, partial shade	
Bur Oak	*Quercus macrocarpa*	3-8	Tolerant of urban stresses and poor soils, will adapt to acid or alkaline soils. Resistant to air pollution and car exhaust	12-18 m	dry, normal, moist, wet	clay, loam	sun, partial shade	

Red Oak	*Quercus rubra*	3-8	Tolerant of pollution and provides shade, chlorosis may be a problem on alkaline soils. Attracts squirrels, hummigbirds, insects. Tolerant of drought, compaction, salt.	18-25 m	dry, moist	clay, sand, loam	sun	
Sugar Maple	*Acer saccharum*	3-8	Does not perform well in small growing spaces, such as planters.	35 m	dry, moist	loam, clay	partial shade, full shade	sensitive to salt and air pollution; hot, dry conditions and compacted soils
Yellow Birch	*Betula alleghaniensis*	3-7	Salt tolerant, attracts hummingbirds	15-25 m	moist	loam	partial shade, shade	
White Birch	*Betula papyrifera*	2-7	attracts birds	10-36 m	normal, moist	sand, loam, humus enriched	sun, partial shade	
American Beech	*Fagus grandifolia*	4-9	Juglones tolerant, attracts birds and insects. Low branching,	18-25 m	moist	loam, humus enriched, acidophile	partial shade, shade	
Black Walnut	*Juglans nigra*	4-9	Compaction tolerant, keeps insects away, drought resistant when established, but intolerant of root disturbance.	20-50 m	normal, moist	clay, sand, loam	sun	
Tulip Tree	*Liriodendron tulipifera*	4-9	Juglones tolerant, attracts squirrels, birds, butterfly larvae bee,	24-37 m	normal, moist	sand, loam	sun, partial shade	
America Basswood	*Tilia americana*	3-8	Salt tolerant, attracts squirrels, birds, butterflies, bees	18-22 m	dry, normal, moist	sand, loam	sun, partial shade	

Hemlock	*Tsuga canadensis*	3-8	Juglones tolerant, attracts insects	6-30 m	normal, moist	sand, loam, acidophile	partial shade, shade	
Sassafras	*Sassafras albidum*	4-9	Juglones tolerant, attracts squirrels, birds and butterflies	5-15 m	normal, moist	sand, loam	sun, partial shade	
White Spruce	*Picea glauca*	2-6	Drought tolerant, salt tolerant. Well adapted for urban conditions, tolerant heavy winds. Attracts birds	20-30 m	normal, moist	clay, sand, loam	sun, partial shade	
Largetooth Aspen	*Populus grandidentata*	3-9	Compaction tolerant, attracts butterfly larvae	15-25 m	normal, moist	sand, loam	sun	
Sycamore	*Platanoides occidentalis*		compaction tolerant, juglones tolerant	20-35 m	normal, moist	loam	sun, partial shade	
Pin Cherry	*Prunus pensylvanica*	3-8	Seeds provide food for wildlife, attracts birds and butterflies	0-9 m	normal, moist	sand, loam	sun	
Black Cherry	*Prunus serotina*	4-8	provides habitat, juglones tolerant, attracts butterflies, butterfly larvae,	20-30 m	dry, normal, moist	sand, loam	sun, partial shade	
Trembling Aspen	*Populus tremuloides*	1-8	Drought tolerant, salt tolerant, compaction tolerant	12-25 m	dry, normal, moist, wet	clay, sand, loam	sun, partial shade	
Speckled Alder	*Alnus rugosa*	3-6	Compaction tolerant,	2-4 m	moist, wet	clay, loam, humus enriched	sun	
Pitch Pine	*Pinus rigida*	4-7	Tolerates extreme sites - wet or shallow, dry soils. Drought and salt resistant.	20 m			full sun	
Honey Locust	*Gleditsia triacanthos*	5-9	Tolerant of urban condition	20 m	moist		full sun	There is already 5% of this species
Red Elderberry	*Sambucus pubens*	4-6	Tolerant of air pollution; wildlife food source	4 m	moist	wide range of soils	full sun	