

Achieving tree canopy enhancement

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| Date: | May 16, 2007 |
| To: | Parks and Environment Committee |
| From: | Brenda Librecz, General Manager, Parks, Forestry and Recreation |
| Wards: | All wards |
| Reference Number: | |

SUMMARY

The purpose of this report is to identify the City initiatives and initiatives by other organizations, both public and private, that are required to achieve the tree canopy target of between 30% and 40%.

The existing urban forest has an estimated tree canopy of 17.5% and is comprised of approximately 3 million trees on public land and 4 million on private property. In order to determine more accurately what will be required to achieve the tree canopy target, a study is needed to:

- 1) quantify the structure and form of the existing urban forest;
- 2) evaluate potential planting area;
- 3) assess the vulnerability factors such as mortality, poor soil, catastrophic events such as invasive pests or severe storms; and
- 4) model the growth of trees and canopy over time.

The study is necessary to help develop a strategy for growing the urban forest and identifying tree canopy potential for public and private land that will achieve the objective of between 30 and 40 percent.

More than half of the existing urban forest is estimated to be on private land. The profile and nature of the future urban forest therefore will be significantly informed by the nature of development on private property. The recommended doubling of the tree canopy requires that future land use planning and development of private lands continue to contribute significantly to the urban forest and minimize losses. Parks, Forestry and Recreation must work together with City Planning, Transportation and other Divisions and Agencies to develop a strategy for growing the urban forest and determining the

potential for increased tree canopy that are in concert with existing and future land use planning policies and development.

RECOMMENDATIONS

The General Manager Parks, Forestry and Recreation recommends that:

1. funds required to complete a comprehensive study to assess the current structure, distribution, health and diversity of the urban forest and the land base availability and quality available for establishing canopy potential for the future urban forest, will be part of the 2008 capital budget for Parks, Forestry and Recreation; and
2. the General Manager of Parks, Forestry and Recreation work with the Chief Planner, the General Manager of Transportation Services and the Director of the Toronto Environment Office to develop a strategy for increasing the urban canopy and growing the urban forest across the City.

Financial Impact

Funding requirements to complete the comprehensive study of the Urban Forest will be considered within the overall 2008 capital budget request for Parks, Forestry and Recreation. The estimated cost is \$350,000. Once the study is submitted and reviewed, financial planning for its implementation will proceed.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting of January 23, 2007, the Parks and Environment Committee requested that the General Manager, Parks, Forestry and Recreation report on ways to achieve the tree canopy goal across the City and include City initiatives and initiatives by other organizations and private individuals. This report responds to that request.

ISSUE BACKGROUND

Municipalities across North America have recognized the importance of integrating trees as part of the urban fabric, as a means of mitigating climate change and to provide for social, environmental and economic benefits. There is a growing body of knowledge that in quantifiable terms, demonstrates the importance of investing in trees.

The Official Plan recognizes the importance of the urban forest and recommends protection and enhancement of the existing urban forest and increasing the City's tree canopy and diversity through both public and private development. A significant portion of the urban forest is located in the natural heritage system identified in the Official Plan. A study is underway to develop a framework that will better protect and enhance the natural heritage system and support the efforts described in this report.

The implementation of the Ravine Protection By-law in 2002 and the Private Tree By-law in 2004 provide important protection for the existing urban forest and helps safeguard its future. These bylaws are useful for regulating unnecessary removal of trees, for requiring acceptable pruning standards, and for educating the public and construction industry about tree protection requirements.

Urban Forestry has recommended a tree canopy cover of between 30% and 40%. A study conducted by Urban Forestry staff in 2004 determined the percent of average tree canopy over each land use area. This study used aerial photos taken in 2002, to assess 330 sample plots, each one hectare in size, distributed citywide by land use designation. The study only calculated the canopy area of each plot. It did not include a site assessment that evaluated the structure or form of the urban forest. Attachment 1 summarizes the existing estimated 17.5 % tree canopy broken down by land use area.

The strategic plan “Our Common Grounds” prepared by Parks, Forestry and Recreation and adopted by City Council in 2004, includes a number of recommendations to protect and enhance the urban forest. This report also identified action required to reduce the tree service backlog necessary to maintain the existing urban forest and to advance the objective of increasing the tree canopy. Since the 2004 report, Council has approved funding to reduce the tree service backlog, and in 2007 Council also approved a plan phased in over three years for improving maintenance of young trees and natural area plantings. The first year installment of these funds has been added to the 2007 operating budget and Urban Forestry anticipates that the second and third year installments will be approved in 2008 and 2009.

Effective pruning is critical to maintaining healthy tree structure. Early pruning to correct branch habit will significantly reduce the need for pruning later in the tree’s life and will reduce decay, extending the longevity of the tree. Better branch structure also reduces the vulnerability of trees to storm damage, something which is particularly important with increasing wind velocities and storm intensities associated with climate change.

The goal to increase canopy is reflected in the March 2007 document “Change is in the Air” prepared by the Toronto Environment Office. The document identifies 27 potential actions to mitigate and adapt to climate change including the recommendation to double the existing tree canopy to 34% by 2020.

Based on a study by University of Toronto Professor Dr. Andy Kenny, the existing urban forest has an estimated 7 million trees comprised of approximately 3 million trees on public land and 4 million on private property. Approximately 0.5 million trees on streets are included in the current inventory maintained by Urban Forestry. The remaining estimated 6.5 million trees in the city have not been inventoried.

COMMENTS

Council has requested a report on City initiatives and initiatives by other organizations and private individuals to increase tree canopy. A report to Economic Development and

Parks Committee in September, 2006 provided an assessment of current tree planting by urban forestry in 2006. There is currently no mechanism available to assess the planting that is done by private industry or private individuals in Toronto. It is important that individual groups that plant trees track the success of their plantings to ensure financial accountability. However, overall tracking of the number of trees planted would have limited usefulness in determining the impact on tree canopy given that tree growth is so variable depending on the location, species, environment and maintenance. Planting of trees is done by many other groups including other branches of Parks, Forestry and Recreation, the Toronto and Region Conservation Authority, Ontario Ministry of Transportation, Toronto Zoo, Toronto school boards, Rouge Park, Hydro One, LEAF and other groups. Trees are also planted on private development and redevelopment sites that have been reviewed under the ravine by-law and natural heritage policies and green development standards. The relative contribution of these groups to overall annual planting has not been assessed and it would be impossible for Urban Forestry to track their projects.

In order to verify the current state of and model future changes to the existing urban forest in Toronto, a baseline study is needed to identify species, size, condition and number of trees in Toronto's urban forest. It is proposed that this be accomplished through field survey of a number of sample plots, distributed over each of the land use areas as delineated by the official plan, on both public and private lands. The study would also model the existing urban forest and its future growth potential. The study would take into account factors such as the growth and mortality rate, vulnerability factors such as pest impacts, annual mortality, soil quality, or catastrophic events such as severe storms.

The study would require the hiring of technicians to analyse sample plots including on site assessments.

The results of such a study are needed to inform the strategy and help determine the programs and budget required to achieve the objective of 30 to 40% tree canopy.

Urban Forestry proposes to use the data from the proposed study to further assess the existing and future urban forest by using a tool such as UFORE. UFORE is an acronym for "Urban Forest Effects" and refers to a computer model that calculates the structure, environmental effects and values of urban forests. The City of Oakville has recently completed an evaluation of its urban forest using this tool.

UFORE is currently designed to provide accurate estimates of:

- Urban forest structure by land use type (e.g., species composition, number of trees, diameter distribution, tree health, etc.).
- Hourly amount of pollution removed by the urban forest, and associated percent air quality improvement throughout a year. Pollution removal is calculated for ozone, sulphur dioxide, nitrogen dioxide, carbon monoxide and particulate matter (<10 microns).

- Hourly urban forest volatile organic compound emissions and the relative impact of tree species on net ozone and carbon monoxide formation throughout the year.
- Total carbon stored and net carbon annually sequestered by the urban forest.
- Effects of trees on building energy use and consequent effects on carbon dioxide emissions from power plants.
- Compensatory value of the forest, as well as the value of air pollution removal and carbon sequestration.
- Potential impact of pests such as Gypsy moth, emerald ash borer, or Asian longhorned beetle.

The recommended study outlined above would require an estimated budget of \$350,000 and take one year to complete.

The potential for Toronto to grow the urban forest and meet the target of doubling the tree canopy depends on the extent of sustainable planting sites, and the growth of the existing and future plantings over time. Land in Toronto is highly valued. The desire to use public land for trees is limited by competing interests for recreational playing fields, parking, development of structures, roads, and other uses. Likewise, the development of private land is increasingly more intense. In principle this is a positive benefit and generally encouraged by existing land use planning. However, it is important to note that more than half of the existing urban forest is estimated to be on private land. The profile and nature of the future urban forest therefore will be significantly informed by the nature of development on private property. The recommended doubling of tree canopy requires that future land use planning and development of private lands provide for the protection of existing trees and additional planting of trees. Factors such as: road widths; building set-backs; building footprints in relation to natural and landscaped areas; the quantity and quality of permeable surface area and soil that meet the mutual objectives of reducing storm-water runoff and achieving successful tree growth, all impact on the extent, quality and nature of the urban forest that is located on private property. Parks, Forestry and Recreation must work together with City Planning, Transportation, Toronto Water and other divisions and agencies, to develop a strategy for increasing the urban forest that is in concert with existing and future land use planning policies and development.

Across the City there are different opportunities and challenges to make significant gains in canopy coverage and forest health. For example, in some residential areas there may be opportunities to reduce pavement areas while increasing tree canopy and reducing storm-water runoff. In areas of employment new materials and new tree planting technology can provide tree canopy over the many vast parking lots that would otherwise be an asphalt desert. Developing strategies that are effective in each land use area and identifying the mechanisms to achieve them therefore requires Parks, Forestry and Recreation to work together with staff from City Planning, Transportation Services and Toronto Water.

The year 2020 is arguably an unrealistic target to actually achieve the tree canopy due to the time it takes for a tree to mature. However it is a realistic target, subject to available resources, to develop a strategy that includes planting and maintenance programs and

identifies land use planning and development opportunities that will achieve the objective of doubling the tree canopy by 2050 and significantly enhance the City's urban forest. This target date coincides with the target for an 80% reduction in greenhouse gases as outlined in the Toronto Environment Office's report on air quality and climate change. Meanwhile, we must continue to take advantage of existing planting opportunities, minimize losses, and continue to ramp up planting as we have begun to do in the last few years. Torontonians are happily taking notice that we are finally planting more trees than we are removing each year on city lands and such work must continue while we undertake more detailed plans. Further, the public expectation is great that such new trees be tended and maintained. Planting trees is 5% of the work, maintaining them is 95%.

Toronto needs a comprehensive model that will allow us to re-evaluate the canopy growth periodically with some statistical accuracy or reliability and to support the development of the strategy to significantly enhance the urban forest.

CONTACT

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SIGNATURE

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ATTACHMENTS

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| Attachment 1 - Tree Canopy Summary : | Figure 1. Tree Canopy Summary Chart |
| | Figure 2. Tree Canopy Summary Photos |
| | Figure 3. Tree Canopy Summary Photos |