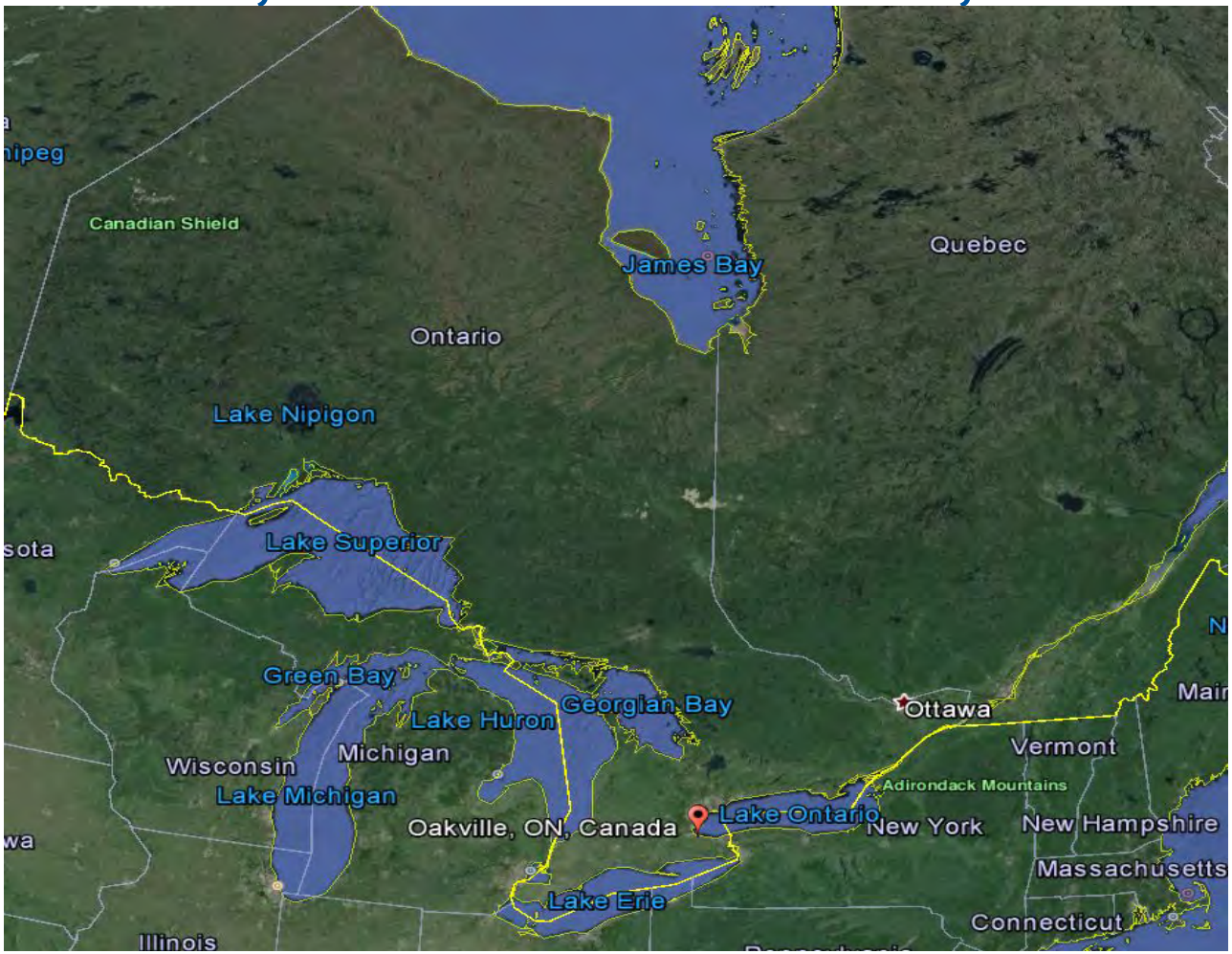
Using i-Tree as a foundation for municipal urban forest policy development and management.

John McNeil, R.P.F.
Manager of Forestry
Town of Oakville, Ontario
Canada

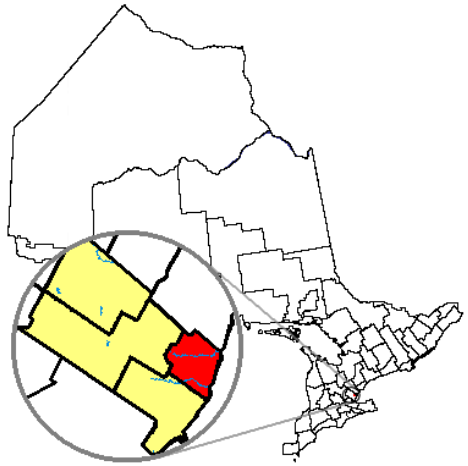
OAKVILLE

Oakville, Province of Ontario, Canada



OAKVILLE

Established in 1827
Population of 182,520
Total area 189 km**2
Part of the Greater Toronto Area (GTA)
Halton Region



OAKVILLE

SWOT Analysis: pre i-Tree

Strengths	Weaknesses
Staff expertise	No inventory of street trees and active parks trees
Good working relationship with local colleagues in gov't and industry	No inventory of woodland parks
	No information about privately owned urban forest
	Forestry Section's main focus is on reactive-based tree maintenance
	Profile in the Corporation is low- moderate
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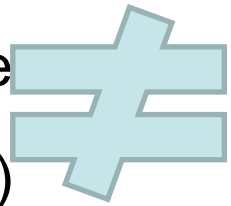
	Municipal contacts mainly in Canada and NE United States
	Corporate Forest Policy Development: only public tree by-law

Opportunities	Threats
Community highly values urban forest	Don't know our degree of exposure to canopy from invasive pests
Apply for membership in the Society of Municipal Arborists (SMA)	

President Obama's budget for Fiscal Year 2011 U.S. Forest Service budget summary:

- Corporate Goal #6 “Engage Urban America with Forest Service Programs” (page 8) was actually supported with spending increases of 6% to $32.4MM (page 41).



http://www.fs.fed.us/publications/budget-2011/fy-2011-usfs-budget-justification.pdf

The most senior government level conducting urban forestry in Canada is the Municipal….

……Dr. A. Kenney, Faculty of Forestry, University of Toronto

OAKVILLE

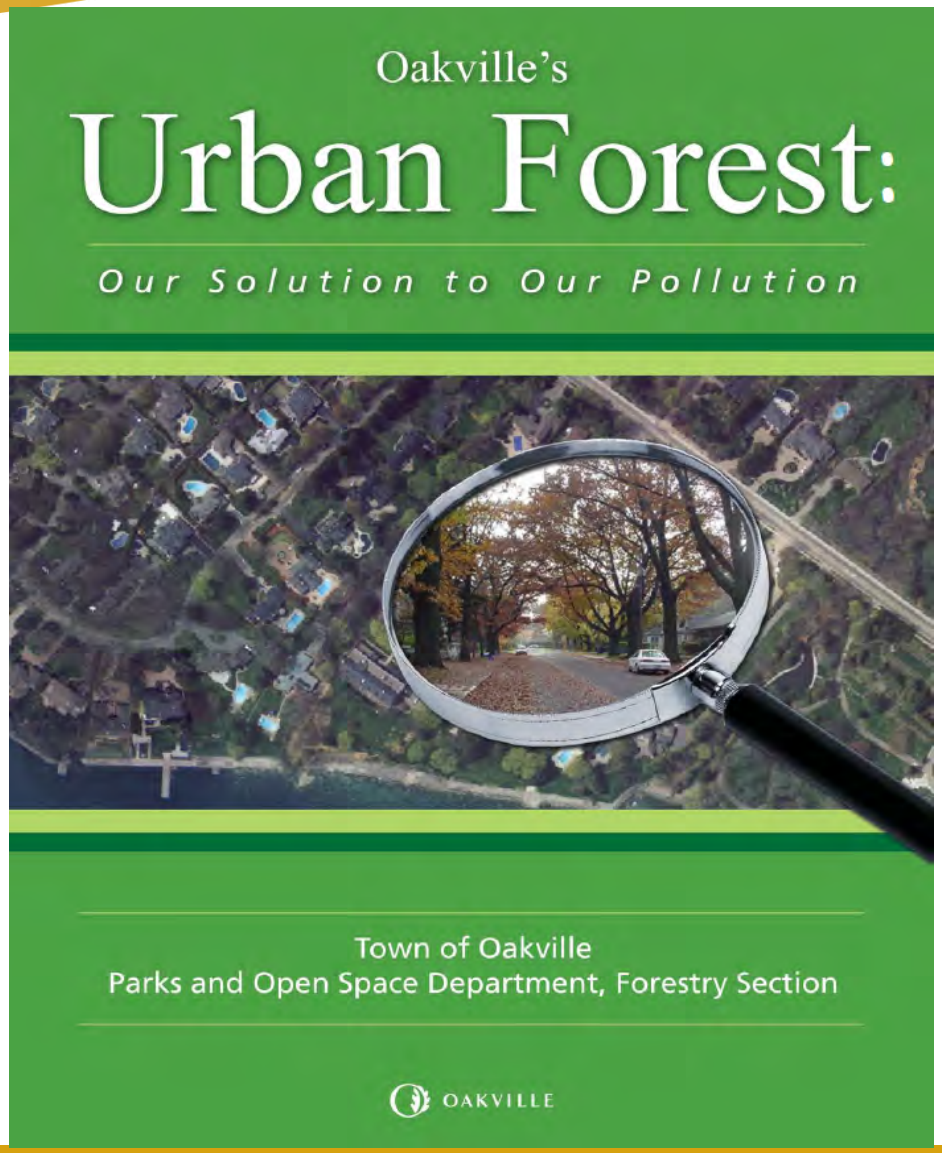
Faculty of Forestry
University of Toronto

Tree Canada Foundation
Fondation canadienne de l'arbre

MAJOR FINDINGS

FEATURE	MEASURE
Number of trees in Oakville	1.9 million
Number of trees owned by the Town	820,000 (43%)
Top 3 species by leaf area	sugar maple, Norway maple, silver maple
Average Urban Forest Canopy Cover	29.1%
Urban Forest Canopy Cover in 2046 (UFORE Grow-out Module simulation)	40%
Replacement value of the urban forest	$878 million
Carbon sequestration	6,000 tonnes/year ($141,000)
CO_2 filtered by all trees	22,000 tonnes
CO_2 filtered by Town trees	6,300 tonnes (28% of total CO2 filtered)
Criteria pollutants removed	172 tonnes ($1.12 million)
Energy savings	$840,000
Major pest damage threat	Emerald Ash Borer, $86.1 million

This Forestry staff report is intended to be read as a companion document to the Resource Bulletin expected to be published by the USDA Forest Service in 2006.



www.oakville.ca

Functions

The amount of air pollution filtered by Oakville's urban forest is equivalent to:

all (102%) of the local industrial and commercial emissions of particulate matter (PM_{10}) and 15% $PM_{2.5}$ and over two times (243%) the amount of sulpher dioxide plus other criteria pollutants…

A large-stature tree
London Plane: *Platanus x acerifolia*

$
Values

Value of ecological services provided = $2.1 million per year

Forest management implications

- Identify highest priority planting sites
- Identify highest value species for planting
- Management of invasive species such as Emerald Ash Borer
- Need for Strategic Forest Management Plan
- Affirmation of standards in place at time for street tree habitat
- Creation of new Forest Protection Business Unit

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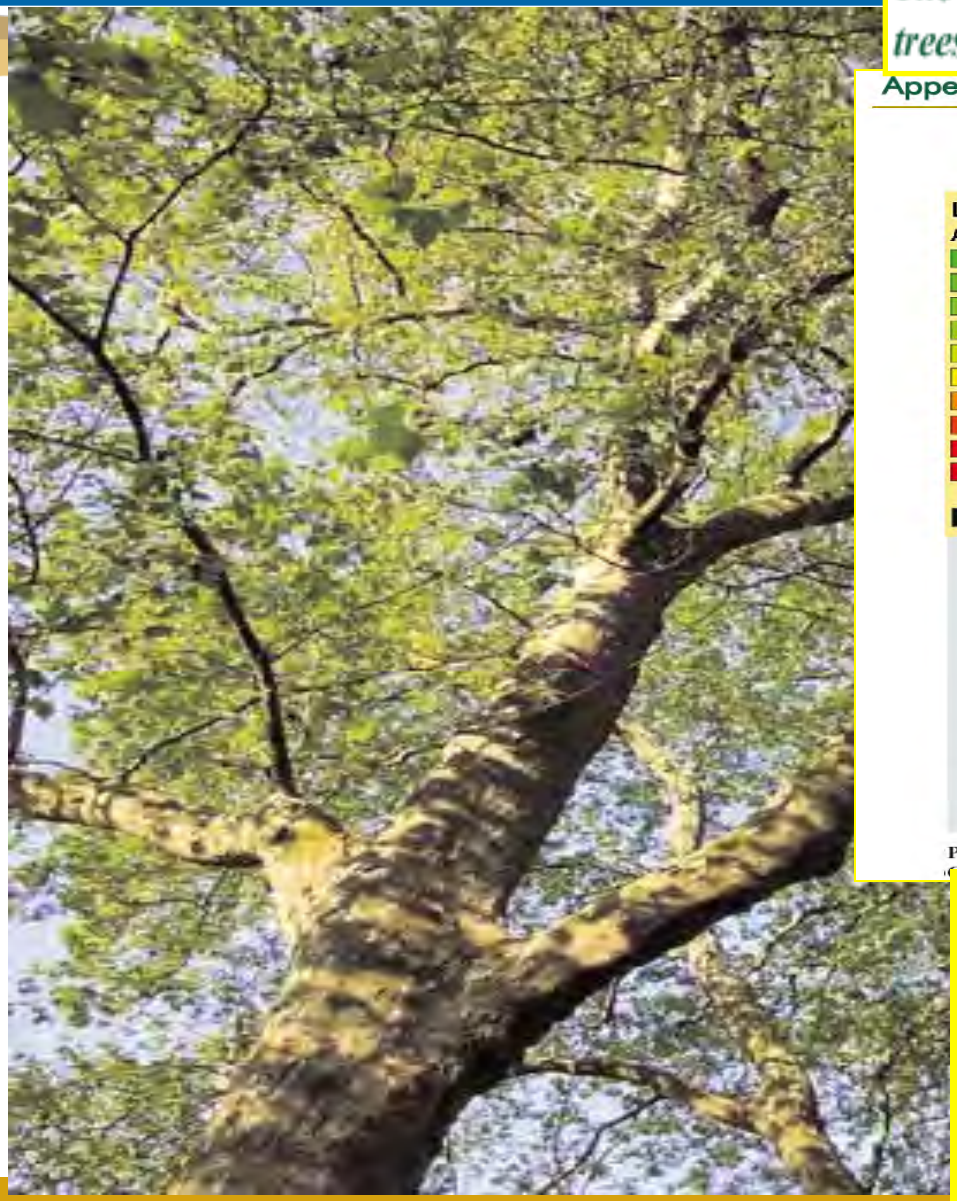
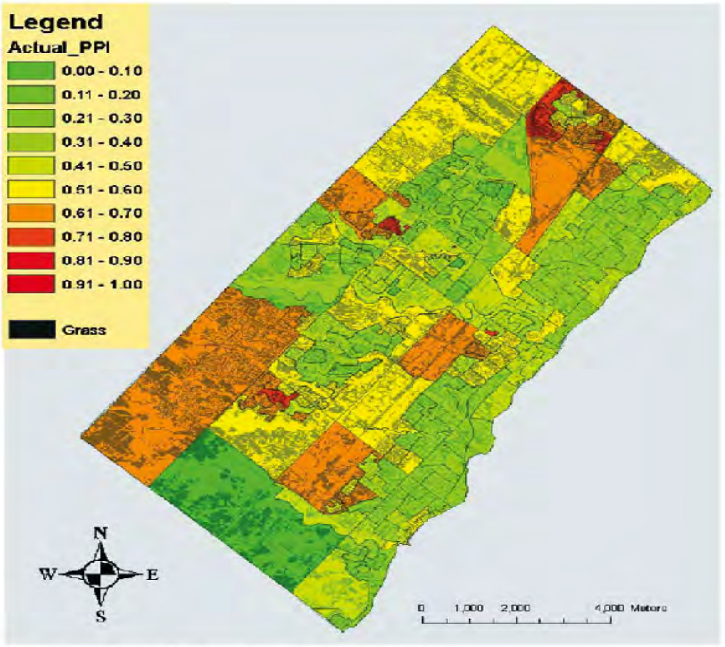


The UFORE model identifies the best locations for trees to maximize air pollution filtration.

Appendix 7: UFORE Tree Locator Module

Priority Areas to plant new trees



PPI - planting priority index (0=low; 1=high)

Appendix 8: Best Species For Air Quality Improvement

Top 25 species - **currently used by the Forestry Section** - for air quality improvement in Oakville. Index value is based on a relative index of 0 (lowest ranked tree) to 100 (highest ranked tree) for trees suitable to hardiness

Scientific Name	Common Name	Index Value
*Liriodendron tulipifera**	Tulip tree	100.0
*Tilia americana**	American basswood	97.7
Zelkova serrata	Japanese zelkova	95.0

OAKVILLE

Forest management implications

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Emerald Ash Borer(EAB) Urban Forest Impacts- Town of Oakville

EAB Structural Impacts

9.6% Canopy Loss

177,300 ash trees

EAB Structural Impacts

$108,300 less pollutants removed annually

$ 67,000 less energy savings annually

$86,100,000 loss in structural damage

GREEN RIBBON CAMPAIGN ATLAS

EVEN YEARS TREATMENT PROGRAM

JUNE 2014

OAKVILLE

Forest management implications

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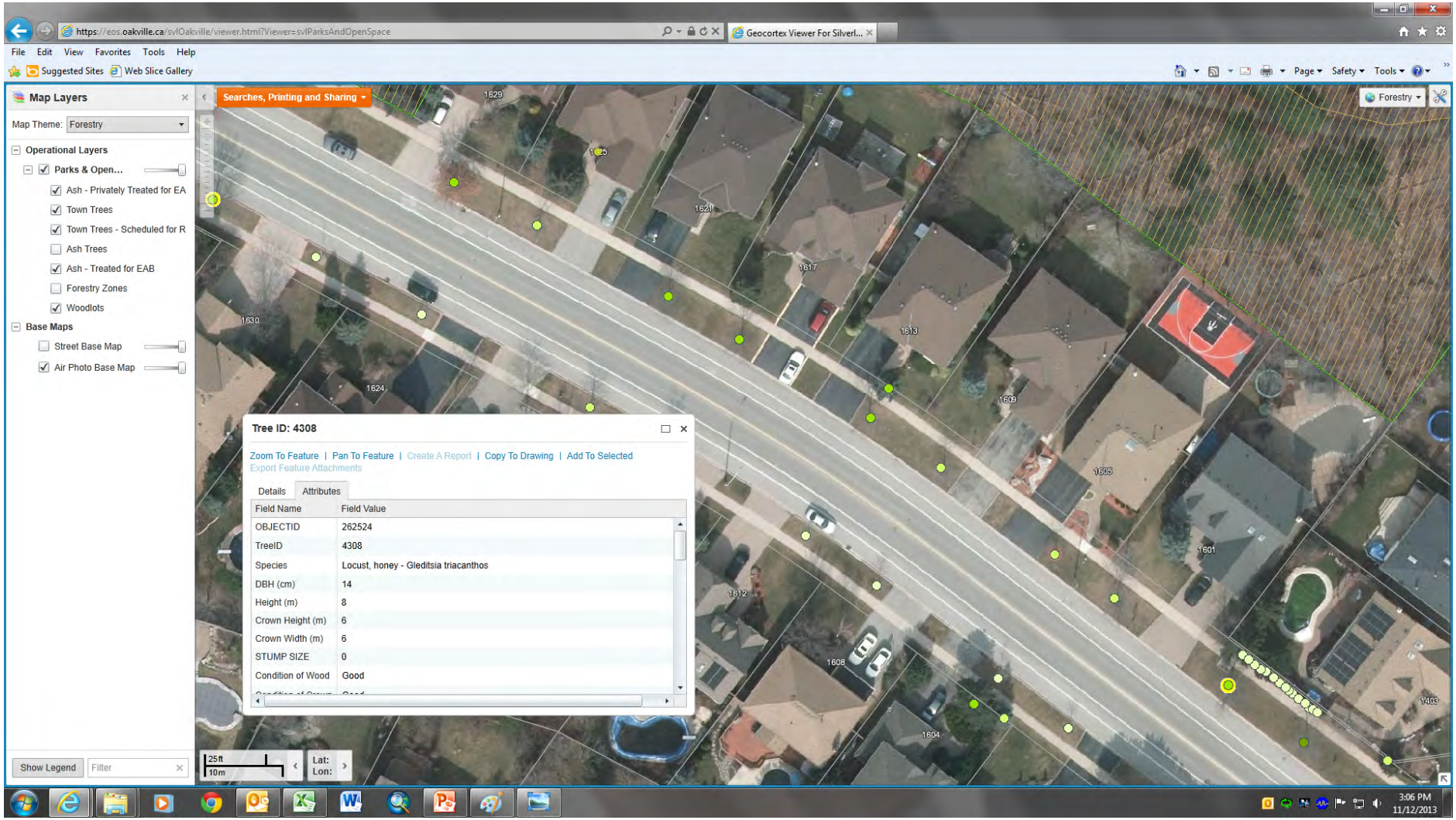
Oakville's Urban Forest

Next Step: Link Action Items through Urban Forest Strategic Management Plan

URBAN FOREST STRATEGIC MANAGEMENT PLAN TOWN OF OAKVILLE: 2008 - 2027

Prepared by:
Urban Forest Innovations Inc. and Dr. Andy Kenney
with input and amendments by Town of Oakville Forestry staff


https://eos.oakville.ca/svlOakville/viewer.html?Viewer=svlParksAndOpenSpace
Geocortex Viewer For Silverl...
File Edit View Favorites Tools Help
Suggested Sites Web Slice Gallery
Page Safety Tools
Map Layers
Map Theme: Forestry
Operational Layers
Parks & Open...
Ash - Privately Treated for EA
Town Trees
Town Trees - Scheduled for R
Ash Trees
Ash - Treated for EAB
Forestry Zones
Woodlots
Base Maps
Street Base Map
Air Photo Base Map
Searches, Printing and Sharing
Forestry
Tree ID: 4308
Zoom To Feature | Pan To Feature | Create A Report | Copy To Drawing | Add To Selected
Export Feature Attachments
Details
Attributes
Field Name
Field Value
OBJECTID 262524
TreeID 4308
Species Locust, honey - Gleditsia triacanthos
DBH (cm) 14
Height (m) 8
Crown Height (m) 6
Crown Width (m) 6
STUMP SIZE 0
Condition of Wood Good
Show Legend
Filter
25ft
10m
Lat:
Lon:
3:06 PM
11/12/2013

OAKVILLE

Urban Forest Management Tools: Future Effects

- 100 year grow-out scenarios
- Tree mortality
- Tree planting
- Tree growth
- Land use change

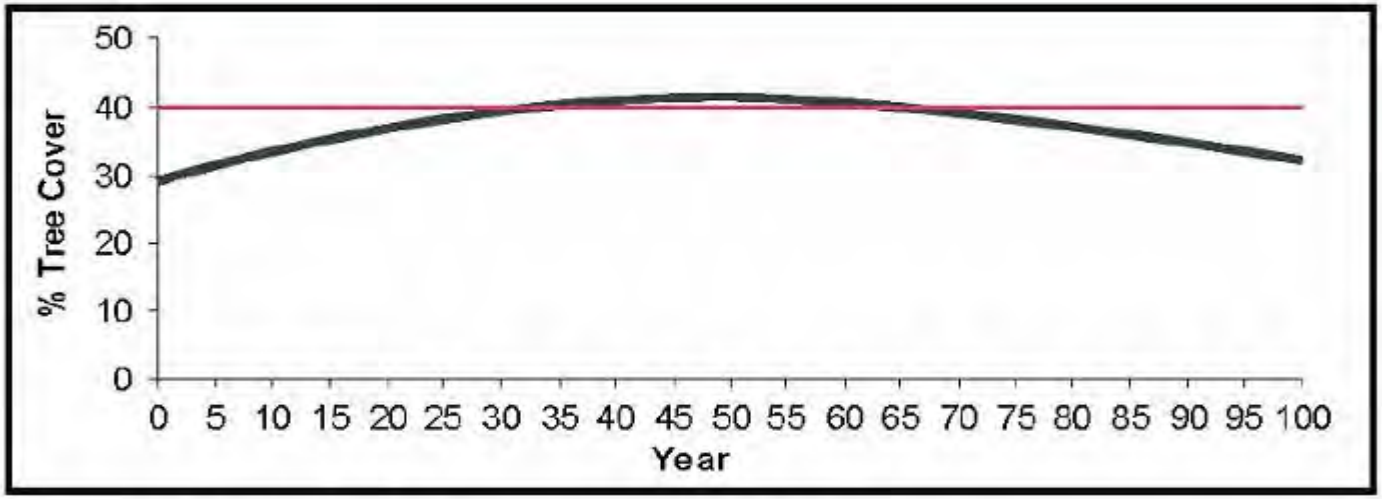
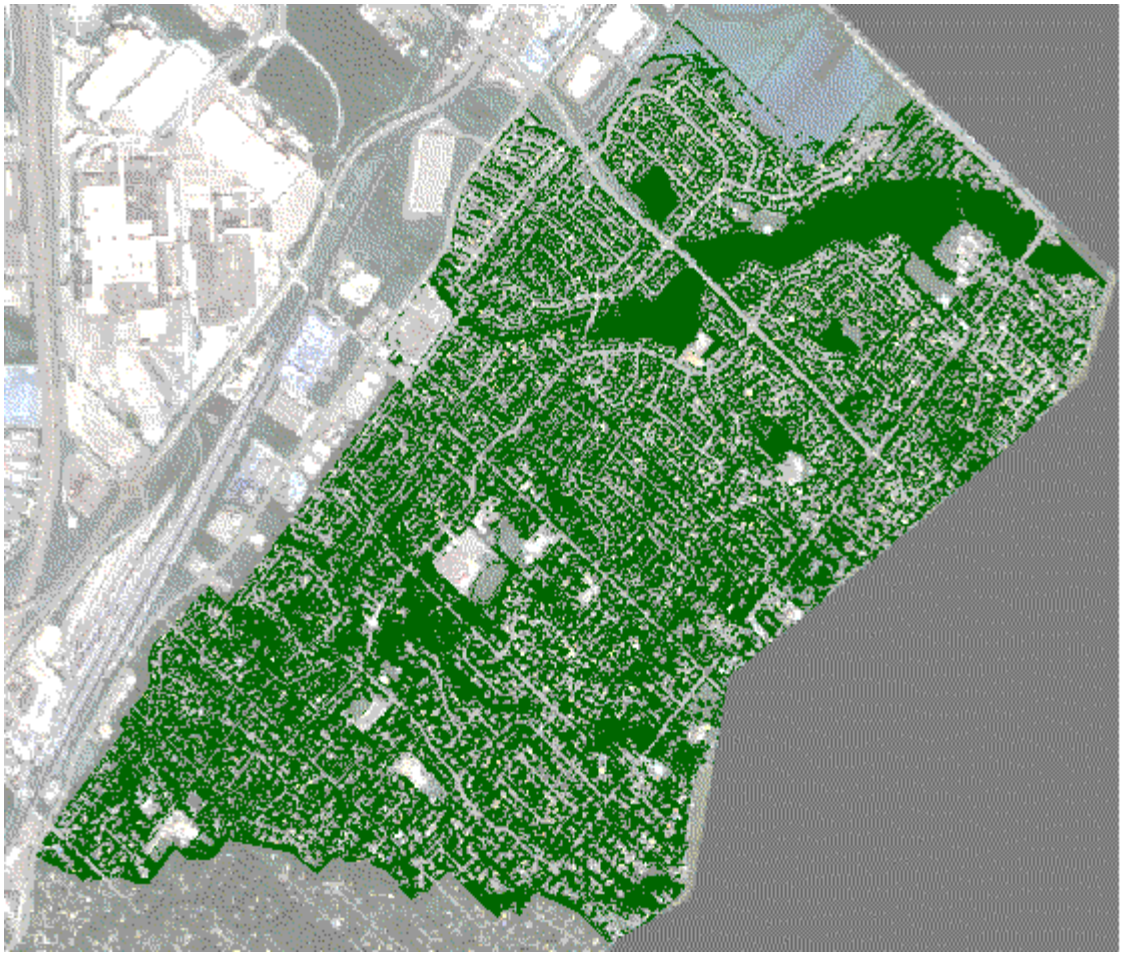


Figure 15: Oakville's urban forest canopy cover - simulation #1.



UFORE GROW OUT MODULE Simulation
2005- 2105 East Lake Community

Forest management implications

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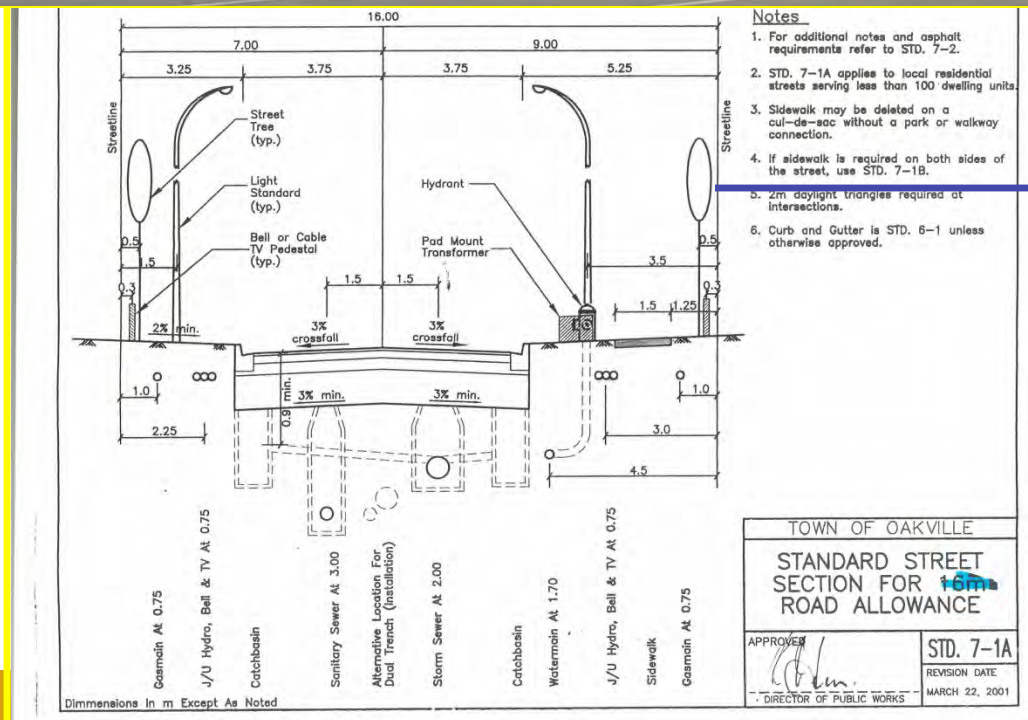


Notes

1. For additional notes and asphalt requirements refer to STD. 7-2.
2. STD. 7-1A applies to local residential streets serving less than 100 dwelling units.
3. Sidewalk may be deleted on a cul-de-sac without a park or walkway connection.
4. If sidewalk is required on both sides of the street, use STD. 7-1B.
5. 2m daylight triangles required at intersections.
6. Curb and Gutter is STD. 6-1 unless otherwise approved.

TOWN OF OAKVILLE

STANDARD STREET SECTION FOR ~~16m~~ ROAD ALLOWANCE

APPROVED

DIRECTOR OF PUBLIC WORKS

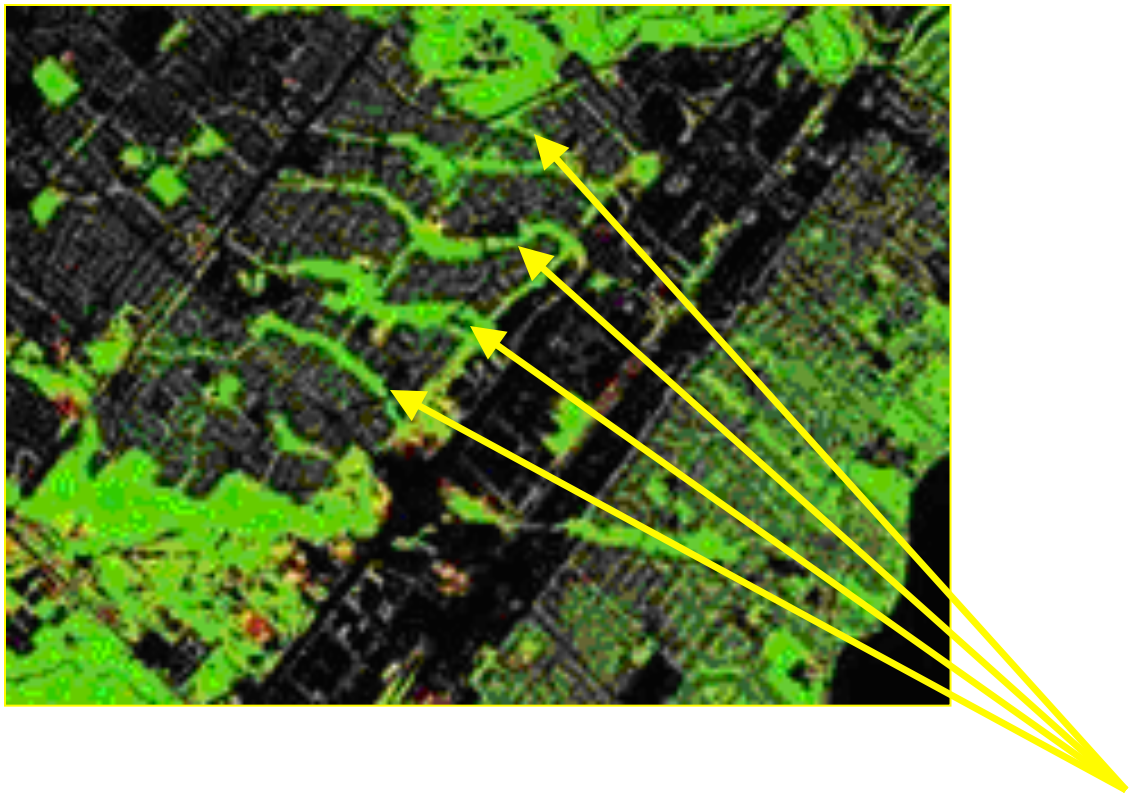
STD. 7-1A

REVISION DATE

MARCH 22, 2001

OAKVILLE

Town policy: Official Plan, Part D,
Section 4.3.2.1 Valley lands: top of bank setback on ‘minor’ and ‘major’ valley lands.



The public valley lands system was increased in area by 45.2% - an additional overall contribution to the Glen Abbey Community’s urban forest canopy cover of 1.5 % …GA Secondary Plan circa 1978

Forest management implications

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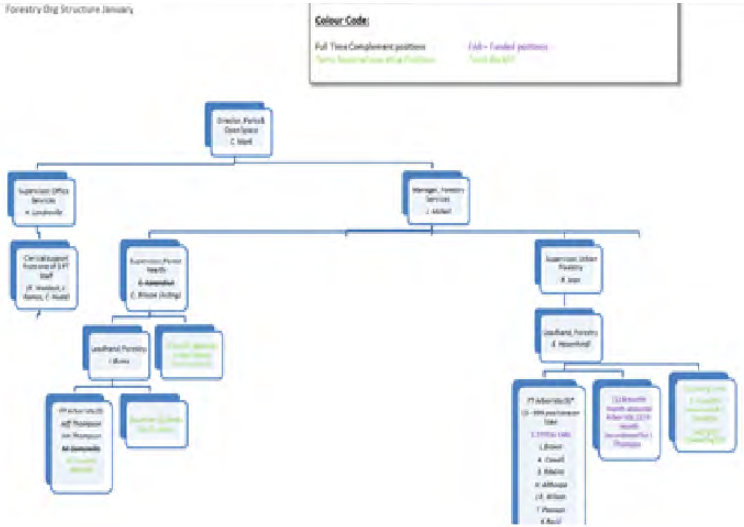
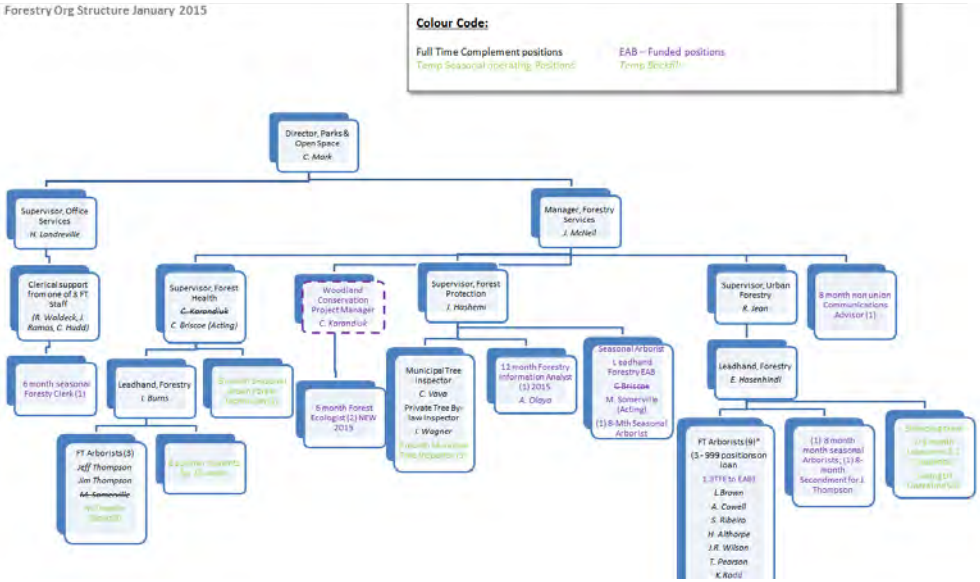
BEFORE i-Tree

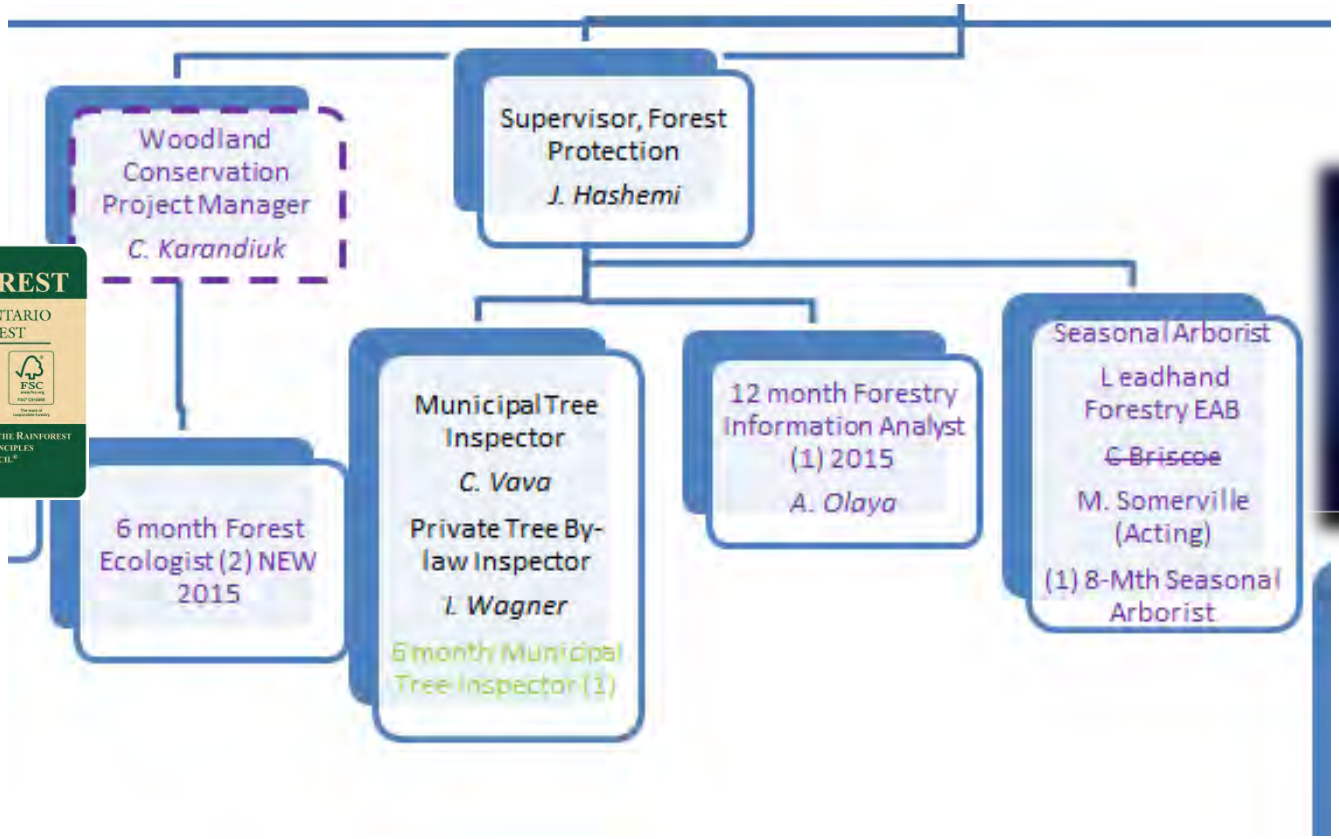
AFTER i-Tree





OAKVILLE

AFTER i-Tree



OAKVILLE

Forest Policy Implications of i-Tree

- Official Plan
- Tree Protection Policy and Procedure
- Private Tree By-law
- Zoning By-law

Forest Policy Implications of i-Tree

- Official Plan
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10. SUSTAINABILITY

The Town is committed to *sustainable development* in order to achieve environmental sustainability. This section provides objectives and policies to implement the principle of sustainability where the Town has jurisdiction.

Town of Oakville Official Plan 2009

f) to progressively increase the urban forest to achieve a canopy cover of 40% Town-wide beyond the life of this Plan.

10.11 Air Quality

10.11.1 The Town will work to improve air quality through its land use and transportation decisio

f) establishing policies and by-laws that protect and enhance the urban forest.

10.12 Urban Forests

The Town considers its municipally-owned urban forest as green infrastructure.

10.12.5 Tree removal on private property shall be subject to the Town's private tree protection by-law.

Forest Policy Implications of i-Tree

- Official Plan
- Tree Protection Policy and Procedure
- Private Tree By-law
- Zoning By-law

The Corporation of the Town of Oakville · Policy EN-TRE-001

Tree Protection

Policy Number:	EN-TRE-001
Section:	Environment
Sub-Section:	Trees
Author:	Forestry Section, Parks and Open Space and Development Services Department
Authority:	Council
Effective Date:	2009 May 04
Review by Date:	2013
Replaces:	
Last Modified:	

References and Related Documents

EN-TRE-001-001 Tree Protection Procedure
Town Tree Protection By-law 2009-025 (pdf, 32 kB)
as amended by By-law 2009-188 (pdf, 19kB)
Private Tree Protection By-law 2008-156 (pdf, 2 MB)
as amended by By-law 2009-145 (pdf, 35 kB)
Site Alteration By-law 2003-021 2003-021 (pdf, 1.4 MB)
Site Alteration By-law North Oakville Amendment 2008-124 (pdf, 33 kB)
Halton Region's Tree By-Law 121-005 (pdf, 37 kB)
Halton Region's Tree By-law Frequently Asked Questions (pdf, 720 kB)
Healthy Green Space for Public Lands Report (pdf, 5.0 Mb)
EN-GEN-001 Environmental Sustainability Policy

Policy Statement

The Corporation of the Town of Oakville shall protect trees on both public and private lands pursuant to applicable by-laws, recognizing their importance to the ecology, aesthetics, culture, and heritage of the Town.

Trees on public lands shall be removed only to safeguard public safety, as determined by the Town Forester or designate, and not solely for reasons of aesthetics or nuisance, including shade, the shedding of tree leaves, nuts, or fruits, or damage caused by tree roots.

Purpose

This policy enables the establishment of procedures to prevent damage or destruction of trees, provide for replacement of trees and optimize planting provisions and tree health for future arboricultural activities within the Town.

Tree Protection During Construction

Procedure Number:	EN-TRE-001-001
Parent Policy:	EN-TRE-001
Section:	Environment
Sub-Section:	Trees
Author:	Forestry Section, Parks and Open Space and Development Services Department
Authority:	CAO
Effective Date:	2009 May 04
Review by Date:	2013
Replaces:	
Last Modified:	

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Private Tree Protection By-law 2008-156 (pdf, 2.0 MB)
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Site Alteration By-law 2003-021 2003-021 (pdf, 1.4 MB)
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Halton Region's Tree By-Law 121-005 (pdf, 37 kB)
Halton Region's Tree By-law Frequently Asked Questions (pdf, 720 kB)
Healthy Green Space for Public Lands Report (pdf, 5.0 MB)
EN-GEN-001 Environmental Sustainability Policy
Schedule 1: Tree Protection Barrier (pdf, 148 kB)
Schedule 2: Application for Tree Protection Zone Encroachment Permit (pdf, 68 kB)
Schedule 3: Tree Protection Plan Form (pdf, 120 kB)
Schedule 4: Detail TP-1: Tree Protection During Construction (pdf, 176 kB)

Purpose Statement

The purpose of this procedure is to outline the required action to protect trees during construction. This procedure shall represent the standard specifications for tree protection whenever tree protection measures are required by the town. Higher standards of tree protection may be imposed where warranted in the opinion of the town having regard to the size, variety, location and health of the tree, and any circumstances surrounding the construction which requires additional tree protection measures.

Scope

This procedure applies to town and private trees covered under any municipal permit process or agreement relating to construction.

OAKVILLE

THE CORPORATION OF THE TOWN OF OAKVILLE

Private Tree Protection By-Law

BY-LAW NUMBER 2008-156

A by-law to regulate or prohibit the injury or destruction of trees on private property within the Town of Oakville

WHEREAS the Council of the Corporation of the Town of Oakville is authorized by paragraph 5 of subsection 11(2), section 135, 429, 431, and 444 of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, to pass by-laws to sustain and promote environmental and social benefits to the community as a whole through the

Forest Policy Implications of i-Tree

- Official Plan
- Tree Protection Policy and Procedure
- Private Tree By-law
- Zoning By-law:

Impact of Zoning By-law:
"Tree Habitat = Zoning + Engineering"

www.oakvillebeaver.com

2007

DEREK WOOLLAM / SPECIAL TO THE BEAVER

FOREST CAPITAL: On hand for Oakville's designation as the Forest Capital of Canada by the Canadian Forestry Association, are Chris Mark, left, Director of Parks and Open Space Oakville, Mayor Rob Burton, Dave Lemkay, General Manager of Canadian Forestry Association and John McNeil, Manager of Forestry and Cemetery Services Oakville.

Oakville is Forest Capital of Canada

In 2015, the town is undertaking a 2nd i-Tree Project and measuring the 10 year changes in our urban forest.

A 3rd i-Tree Project is budgeted for 2020.

i-Tree

Tools for Assessing and Managing
Community Forests

Get the Tools.

Google Custom Search | Search

Username | Password | Login

Forgot Username or Password? | Register

Home | About | Applications | Utilities | Resources | Support | News

- Applications
- i-Tree Eco
- i-Tree Streets
- i-Tree Hydro (beta)
- i-Tree Vue
- i-Tree Design
- i-Tree Canopy
- System Requirements

About Us

Abo

i-Tree er-reviewed software suite from the USDA vides urban and community forestry analy ment tools. The i-Tree tools help communities of all sizes to strengthen their urban forest management and advocacy efforts by quantifying the environmental services that trees provide and the structure of the urban forest.

Developed by USDA Forest Service and numerous cooperators, i-Tree is in the public domain and can be downloaded for free. The Forest Service, Davey Tree Expert Company, National Arbor Day Foundation, Society of Municipal Arborists, International Society of Arboriculture, and Casey Trees have entered into a cooperative partnership to further develop, disseminate and provide technical support for the suite. See the System Requirements and Installation document for registration, download and installation details.

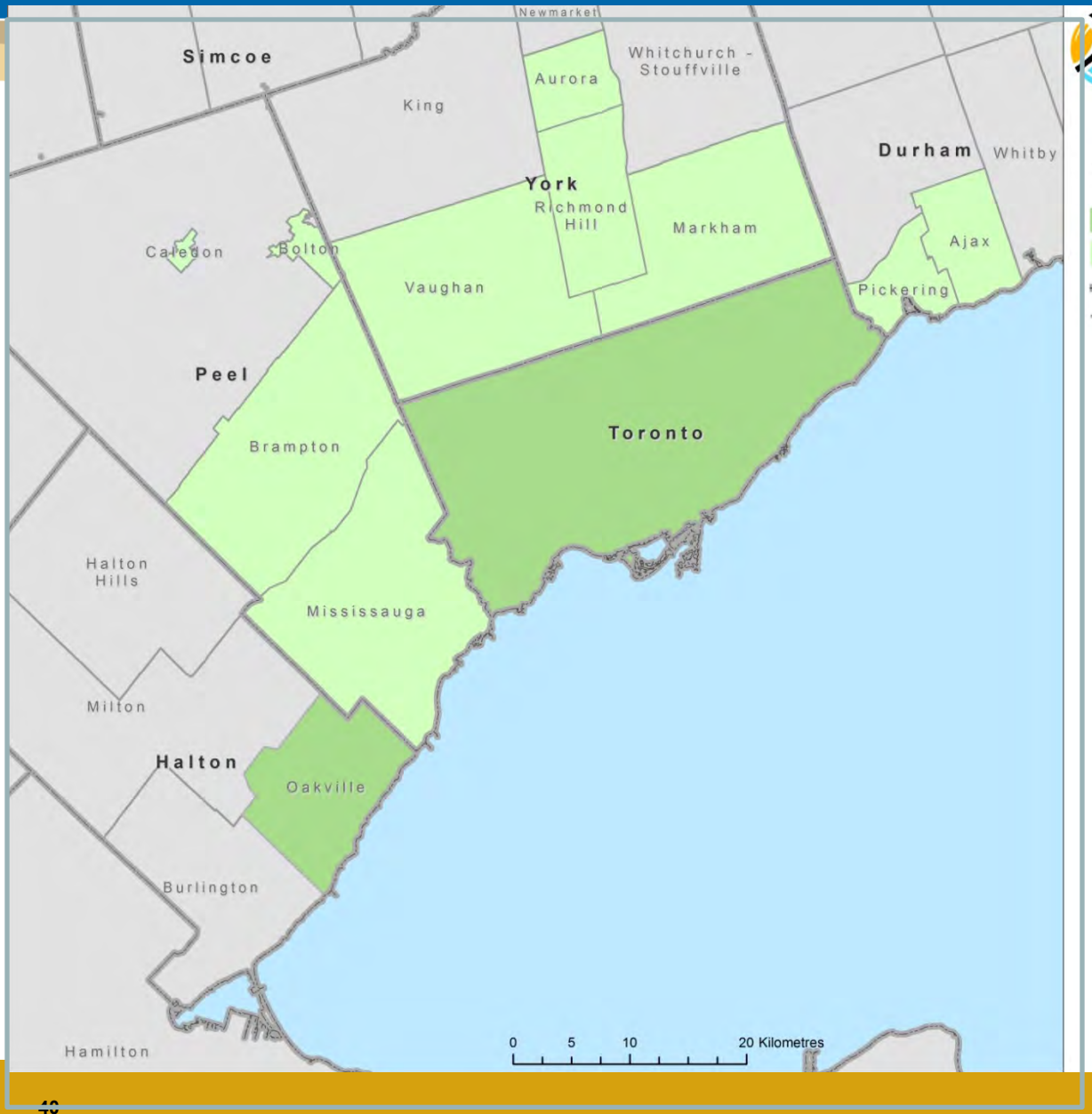
The i-Tree suite includes the following urban forest analysis tools and utility programs.

Analysis Tools

i-Tree Eco provides a broad picture of the entire urban forest. It is designed to use field data from complete inventories or randomly located plots throughout a community along with local hourly air pollution and meteorological data to quantify urban forest structure, environmental effects, and values to communities.

i-Tree Streets focuses on the benefits provided by a municipality's street trees. It makes use of a sample or complete inventory to quantify and put a dollar value on the street trees' annual environmental and aesthetic benefits. Streets also describes urban forest structure and management needs to help managers plan for the future.

i-Tree Hydro (beta) is an application designed to simulate the effects of changes in tree and impervious cover characteristics within a watershed on stream flow and water quality. The latest version of i-Tree



Toronto and Region Conservation for The Living City

GTA Urban Forest Studies

- Pioneer Urban Forest Studies
- Subsequent Urban Forest Studies
- Regional Boundaries
- Municipal Boundaries

N

Green Infrastructure ONTARIO COALITION

Using all the studies to create a regional State of the Urban Forest Report

OAKVILLE

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Opportunities	Threats
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Apply for membership in the Society of Municipal Arborists (SMA)	

SWOT Analysis: post i-Tree

Strengths	Weakneses
Staff expertise	organizational structure has not kept pace with changes in service delivery needs
Good working relationship with local colleagues in gov't and industry	
Member of Society of Municipal Arborists (SMA) + Mgr. serving on Board	
inventory of all 138,000 street trees and active parks trees	
inventory of 900 ha. woodland parks	
information about privately owned urban forest: 53% of 1.9 million trees	
Forestry Section's main focus is on proactive-based tree maintenance	
Profile in the Corporation is high	
Profile in the community is high	
Municipal contacts spread over NA continent	
degree of exposure to canopy from invasive pests: 9.6% EAB	
Corporate Policy & Procedure development: Tree protection	

Opportunities	Threats
Community highly values urban forest: 86% awareness of EAB	Asian Long-horned Beetle
2015 i-Tree project	

BEFORE i-Tree

AFTER i-Tree

END

Source: http://quoteimg.com/snoopy-happy-dance-animated/