


Urban Forest Studies Journey - put to work

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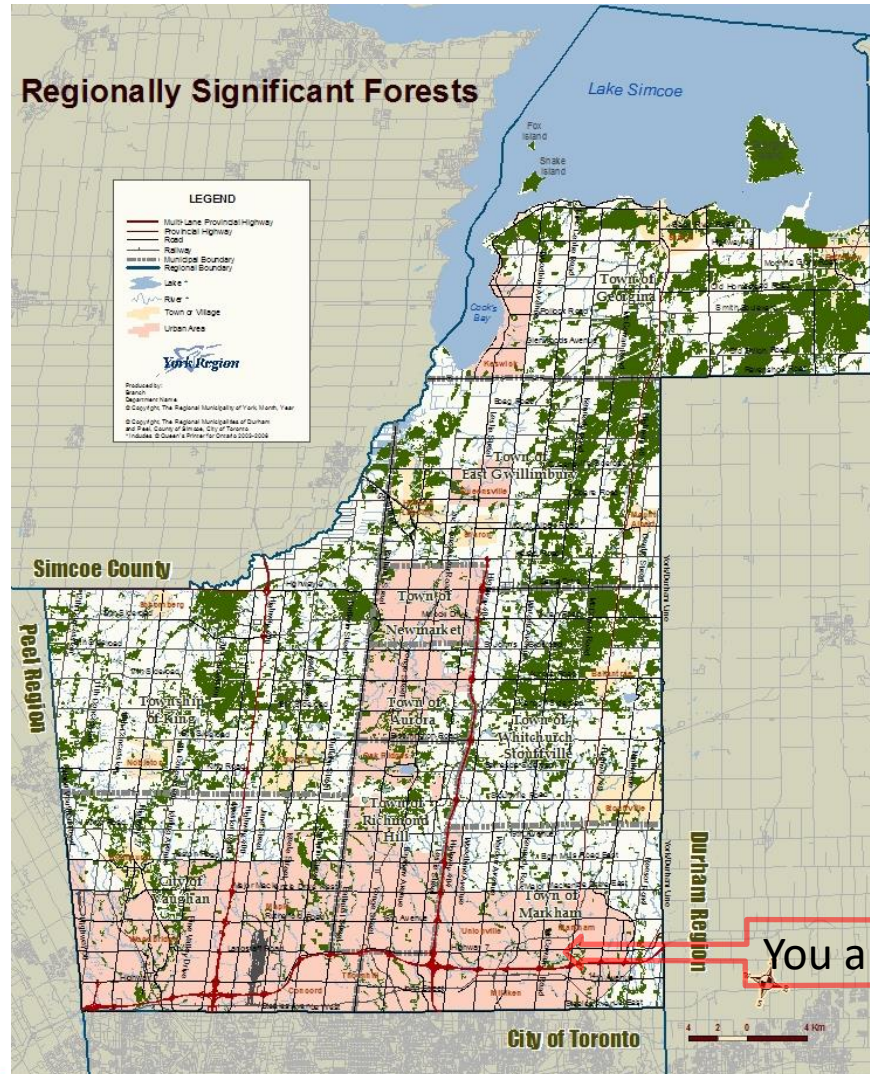
September 25, 2018



Overview

1. York Region Geography and Stats
 2. Urban Forest Studies (UFS)
 - a. Evolution
 - b. Methodology
 - c. Results
 3. Results to action
 - a. Canopy cover targets
 - b. York Region (Strategic) Forest Management Plan
 - c. Green Infrastructure Asset Management
 4. What's next
- 

York Region Geography and Stats



King

Vaughan

Aurora

Richmond Hill

Georgina

East Gwillimbury

Newmarket

Whitchurch-Stouffville

Markham

York Region Geography and Stats

John Candy
(comedian)

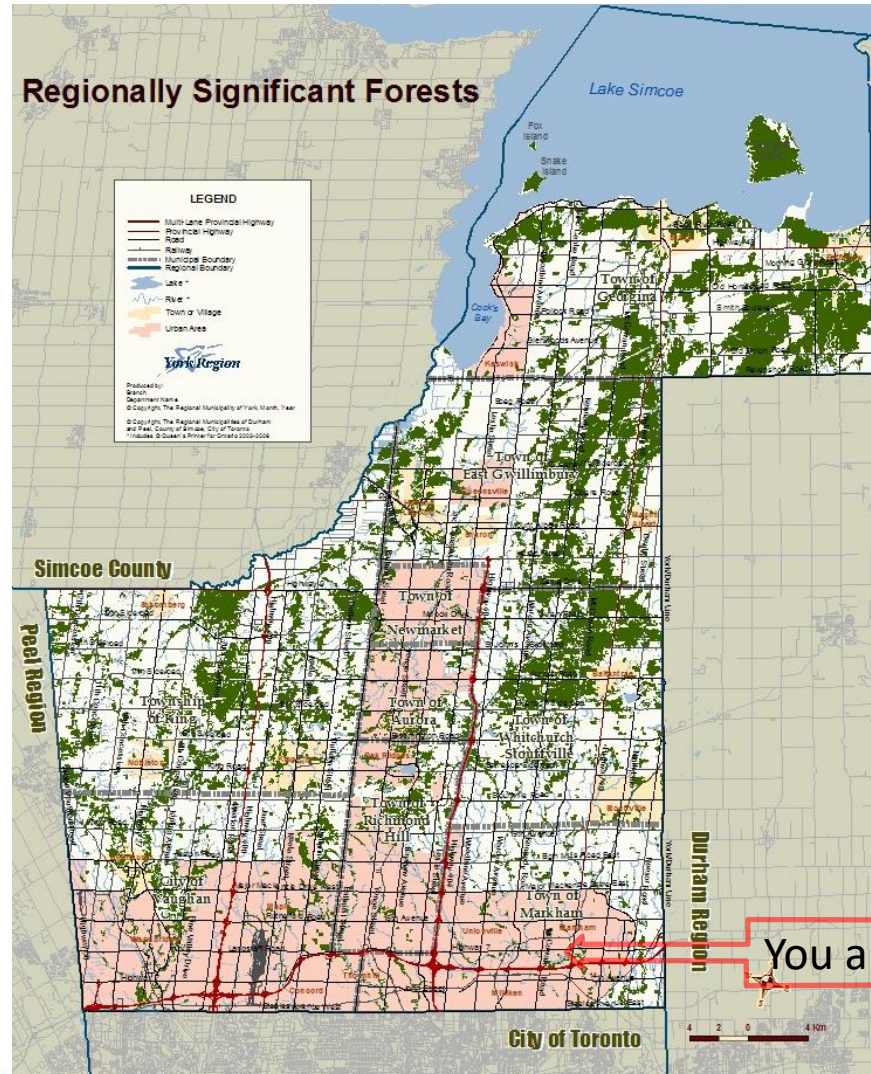
Curtis Joseph
(hockey player)

Connor McDavid
(hockey player)

Garbielle Daleman
(figure skating)

Elvis Sojko
(figure skating)

Jim Carrey
(comedian)



John Luther Long
(author:
Madame Butterfly)

James Smith
(signed the declaration
of independence)

Frederick Melsheimer
(entomologist)

York Region Geography and Stats

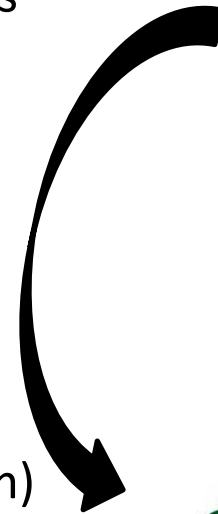


- 1996 Official Plan woodland cover target of 25% by 2031 (44,388 ha)
- 2001 Greening Strategy
- Significant woodlands study
- 2016 Woodland cover at 22.8% (40,533 ha)

- 2009-2016 Urban forest studies
- 2011 EAB Management Plan
- 2013 ice storm
- 2016 Canopy Cover 31%

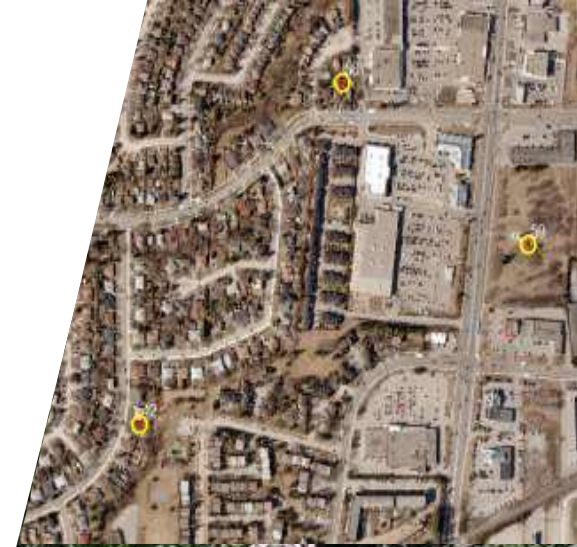
Evolution of UFS and York Region

- 2005 USDA Forest Service launches UFORE aka iTree (a modeling software designed to project the benefits of trees based on the input from field inventories)
- 2008
 - Participation in a GTA wide forum discussing a consistent methodology to urban canopy assessments
 - Initially engaged with the more urban municipalities (Vaughan, Richmond Hill, Markham)
- 2009 - 2016 complete studies for all 9 municipalities
- The suite of tools has expanded since then to include: iCanopy, iHydro, iTree Streets, iTree Vue, iTree Design (beta)



Field Surveys

- i-Tree Eco model
- Randomized grid sample
- 0.04 ha circular plots
- Field data collection
 - Tree and shrub species
 - Size and condition
 - Ground cover
- Local pollution data



Land Cover Mapping

- Urban Tree Canopy (UTC)
- Spatial analysis of existing and possible tree cover
- High-resolution colour infrared aerial imagery
- Summarized at multiple scales



Technical Results

Urban Forest	Vaughan	Richmond Hill	Markham	Aurora
<u>Structure</u>				
Canopy Cover	17%	25%	18%	28%
Leaf Area	336 km ²	171 km ²	216 km ²	99 km ²
<u>Function</u>				
Carbon Sequestration	13,040 t/yr	7,241 t/yr	9,089 t/yr	4,050 t/yr
Pollution Removal	350 t/yr	184 t/yr	301 t/yr	93 t/yr
Flow Reduction	1-3% (120,000-173,000 m ³)			

State of the Forest



MITIGATE CLIMATE CHANGE

Forests in York Region remove and store 77,000 tonnes of carbon each year - that's equivalent to taking 60,000 cars off the roads annually.



IMPROVE HEALTH

Spending time near trees improves physical, emotional and mental health.



REDUCE FLOODING

Trees and woodlands intercept and absorb rainwater which helps reduce flooding.



IMPROVE WATER QUALITY

Trees and forests filter rainwater making it cleaner.



Woodland Cover and Canopy Cover

Woodland cover - sum of all woodland areas greater than 0.2 hectares
(calculated in hectares or land base percentage)

Canopy cover - the area of ground covered by tree leaf canopy as seen from overhead (calculated in hectares or land base percentage)

CANOPY COVER = EVERY TREE



Woodland and canopy cover

- Urban Forest Studies with local municipalities - capture functions and services provided by tree canopy cover
- Canopy cover is an effective indicator for quantifying ecosystem services, economic benefits, and values of trees for communities
- Tracking canopy cover is a better measure of assessing impacts due to ice storms and invasive species (Emerald Ash Borer)
- Investigate a combination of woodland cover targets in rural landscapes complemented by canopy cover targets for urban areas



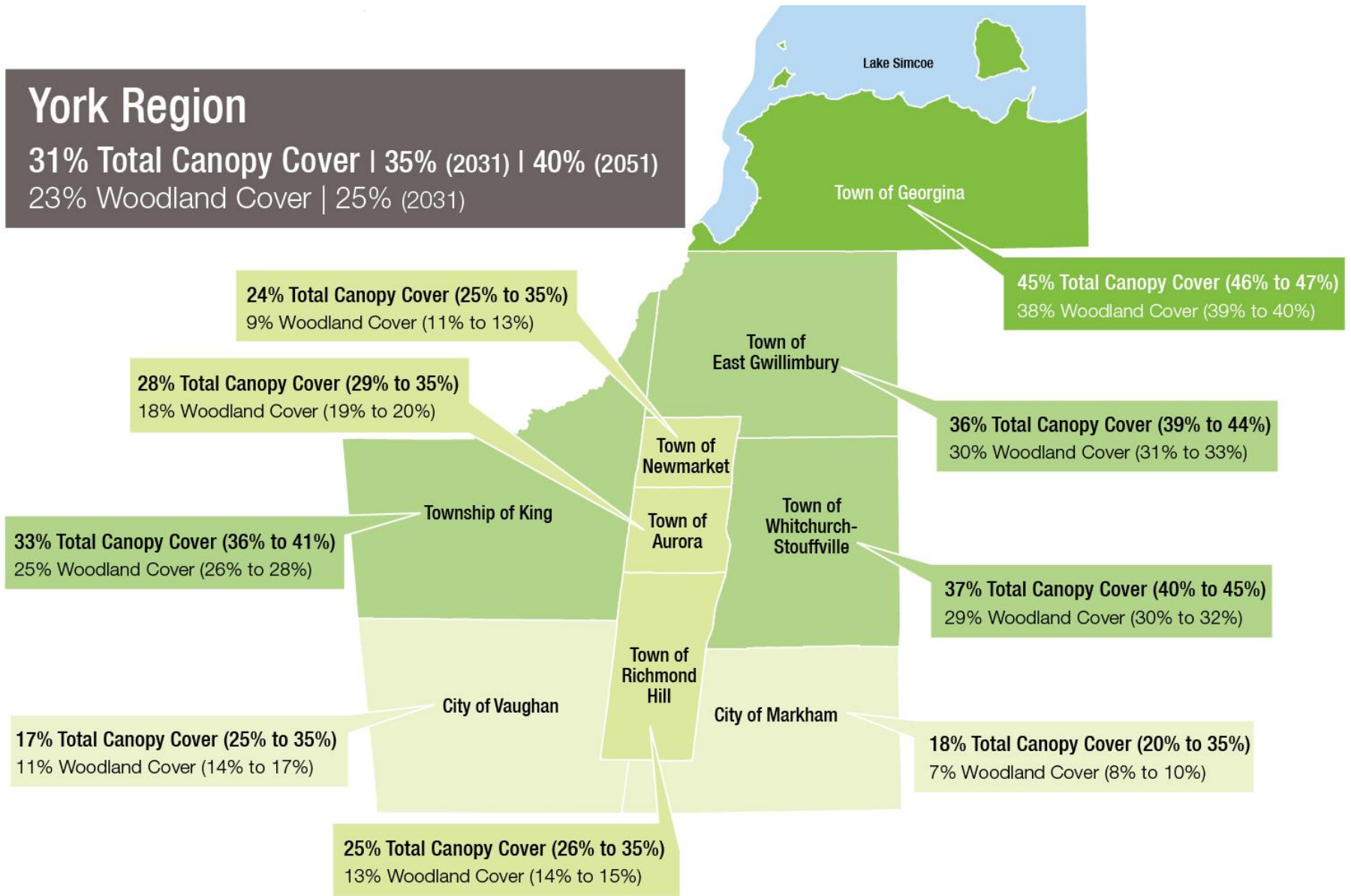
How We Measure Up to Other Municipalities

Municipality	Date of Plan	Current Canopy Cover	Target Canopy Cover
Halifax, NS	2013	41%	53%
Kingston, ON	2011	21%	42%
Mississauga, ON	2014	15%	20%
Guelph, ON	2013	20%	40%
Toronto, ON	2012	26%	40%
Oakville, ON	2012	29%	40%
Cambridge, ON	2015	27%	30%
Edmonton, AB	2012	10%	20%
New Westminster, BC	2014	18%	27%
Nanaimo, BC	2010	28%	32%
Kelowna, BC	2011	16%	20%
Victoria, BC	2013	18%	30%
York Region (proposed)	2016	31%	31% / 40%

York Region

31% Total Canopy Cover | 35% (2031) | 40% (2051)

23% Woodland Cover | 25% (2031)

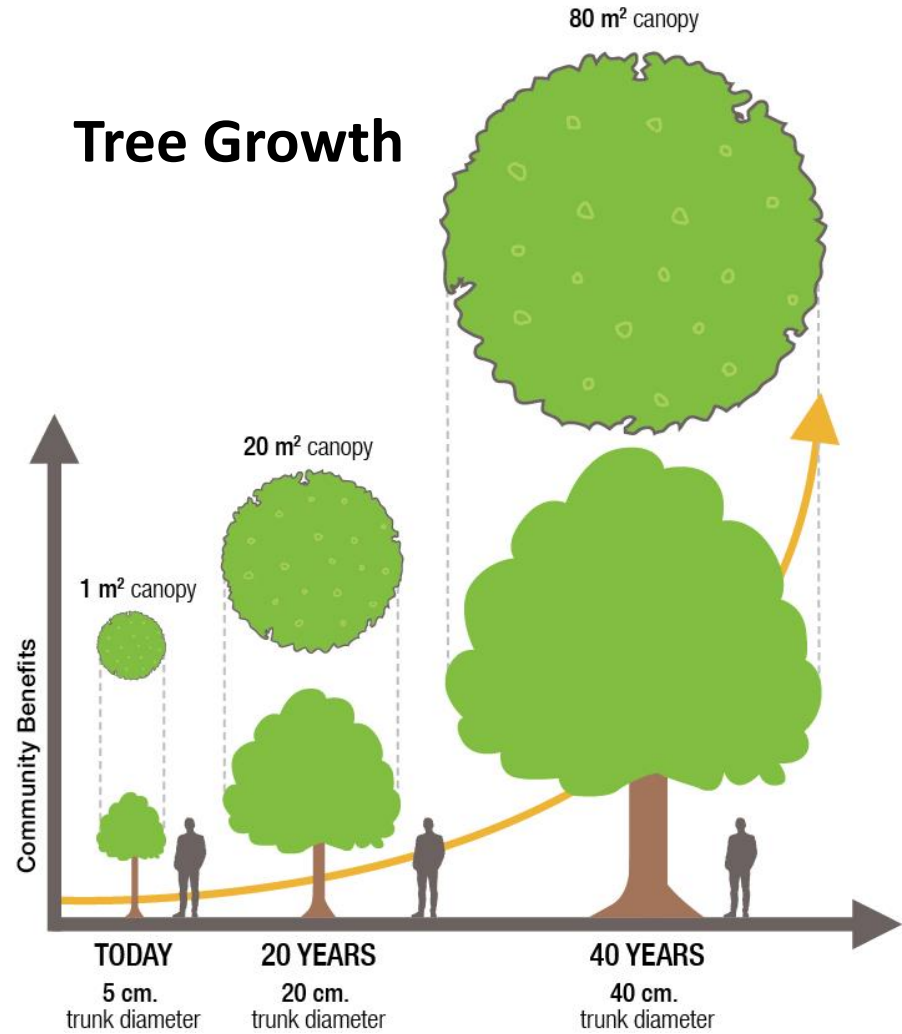


Growing your Canopy Cover

Tree Planting



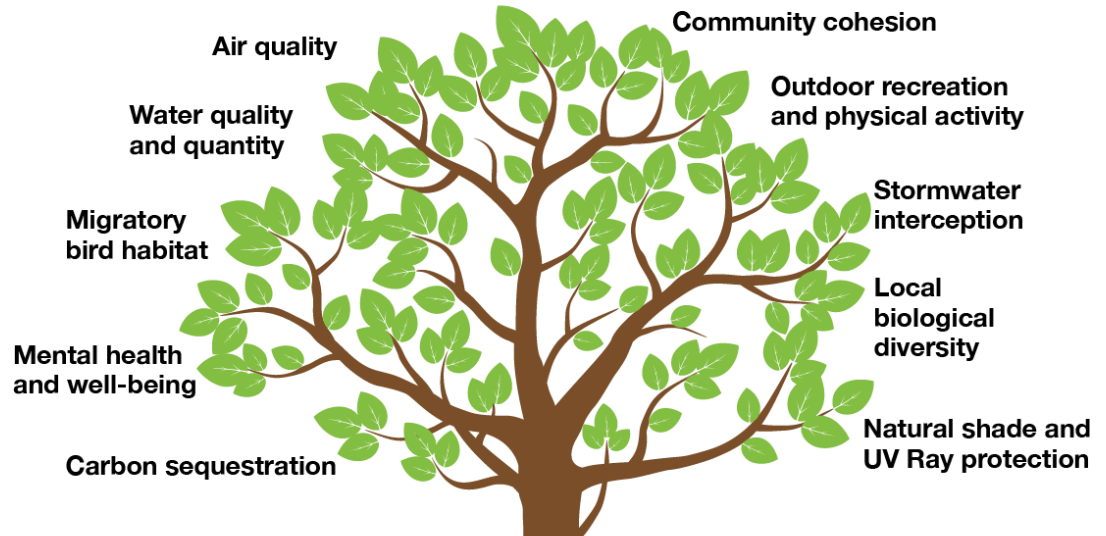
Tree Growth



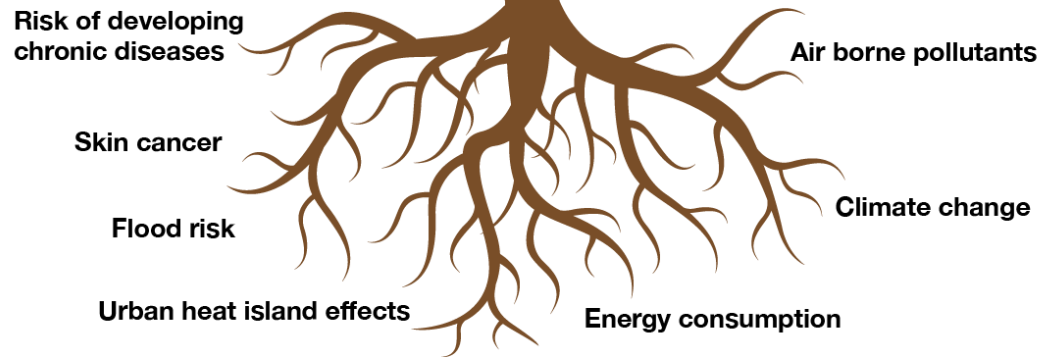
Forest Management Plan VISION

Healthy trees and diverse, sustainable forest ecosystems that support the well-being and quality of life of residents and communities.

TREES IMPROVE:



TREES REDUCE:



Forest Management Plan Goals



INCREASE

Canopy cover to 35% - 40%
and woodland cover to 25%



MANAGE

Biodiversity and minimize
impact of climate change



INCREASE

Public awareness and appreciation
of value of trees and woodlands



INCREASE

Stewardship of
trees and woodlands



SUSTAINABLY MANAGE

Trees and woodlands through
improvement and innovation



Asset Management

- Asset management planning is the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets.
- The objective is to maximize benefits, manage risk, and provide satisfactory levels of service to the public in a sustainable manner.



Why Manage Green Infrastructure as a Municipal Asset

- Recognize and communicate the benefits provided by green infrastructure
- Provides a defensible approach to identifying investment requirements – levels the playing field
- Increase access to infrastructure funding programs
- Green infrastructure can provide a lower cost solution than traditional grey infrastructure



Asset Portfolio

Urban Forest

- Biological – street trees, shrubs, perennials and growing media
- Civil – soil cells and irrigation systems, drainage

York Regional Forest

- Biological – vegetation communities (forests, wetlands, prairies)
- Civil – trails, parking lots, fences, signs, culverts, etc.



Urban Forest Asset Valuation

What is the most appropriate and defensible method to value urban forest biological assets?

- Street trees – Use CTLA trunk formula method
- Shrubs and perennials – replacement cost
- Growing media – replacement cost
- Assessed ecosystem services using I Tree Eco
- Civil assets valued using depreciated replacement cost



York Regional Forest Asset Valuation

What is the most appropriate and defensible method to value Regional Forest biological assets?

- Forests – Timber value, land value, re-establishment cost
- Wetlands and prairies – land value, re-establishment (future)
- Assessed ecosystem services using I Tree Eco
- Civil assets valued using depreciated replacement cost



Future

- Communications strategy to increase the awareness of the benefits of trees and influence property owners/managers care and planting of trees
- Priority planting tools
- Next round of studies



Thank you

