URBAN FOREST STRATEGY
DRAFT GOALS & ACTIONS

INTERNAL AND EXTERNAL STAKEHOLDER WORKSHOPS
APRIL 17, 2019
Agenda

1:00  Welcome and Introductions

1:15  Presentation: Urban Forest Strategy: Draft Goals and Actions
      Spring 2018 Consultation Overview
      Hamilton UF Baseline Study
      Draft Goals and Actions to Sustain and Enhance Urban Forest

1:45  Questions

2:00  Mentimeter Activity
      Prioritize Actions!

2:10  Break

2:20  Planting the Seed - Group Activity
      Discuss & Update Prioritize Actions!
      Implementation Opportunities & Challenges

3:20  Next Steps and Closing
Urban Forest Strategy

Project timeline

Phase 1: Jan to Dec 2018
- Background Information Review

Phase 2: May to Dec 2018
- Public Engagement

Phase 3: Mar 2019
- Draft UFS Report for Review

Phase 4: Spring 2019
- Public Engagement

Final UFS Report: Dec 2019
- Council Approval
Implementation of the Urban Forestry Strategy.

The role that trees have in mitigating the impacts of climate change.

Public education and community outreach.

Increase, protect, distribute and prioritize canopy cover.

Tree maintenance, removal and replacement.

Connectivity between and accessibility to green space.

Natural areas, woodlots, parks.

Impacts of new development and land use.

Importance for human health.

Communicating the value of biodiversity and ecology.

Financial incentives and costs associated with trees (including aesthetics).
• What do you value about Hamilton’s urban forest? shade, air quality, beautification, mental health, diversity, habitat, relaxing

• What policies/guidelines would have the most impact? City-wide Private Tree By-law, Public Tree By-law, and Management Standards

• What land uses offer the best opportunity to improve urban forest? Open Space

• Key Opportunities Identified: partnerships, celebrate trees, By-laws, education, financial incentives, etc.
Vision for Hamilton’s Urban Forest:

• Multi-layered, naturalized, native trees
• Enhanced canopy cover in downtown
• Promote Niagara Escarpment
• Green neighbourhoods – public/private

Value about Hamilton’s Urban Forest:

• Nature in the City
• Shading and cooling
• Better air quality
• Escarpment & green, lush views, beauty
Hamilton Urban Forest Strategy

Draft Vision Statement

Hamilton Tree Canopy Goal

Hamilton’s Official Plan sets a forest cover target of 30% for the City.

- Hamilton’s urban forest is resilient and sustainable.
- It contributes to the health and well-being of citizens, and enhances the livability of the City.
- The City and all residents value the urban forest as an essential shared asset that should be intentionally planned and maintained for all future generations.
Goal 1: Plan & Act
Hamilton Urban Forest Strategy

Benefits of the Urban Forest

• Improves air quality by absorbing pollutants
• Cools air temperatures
• Regulates stormwater flow and improves water quality
• Mitigates climate change impacts
• Reduces energy use and carbon dioxide emissions
• Supports urban biodiversity
• Benefits mental and physical health of residents
• Increases property values
• Makes cities more beautiful & livable
2018 iTREE Eco Study* - Value of UF Benefits in Hamilton

- Air Quality Improvements
- Pollution Removal: 393 metric tons/year ($1.59 million/year) - calculated for ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide and particulate matter less than 2.5 microns

- Stormwater Management
- Avoided Runoff: 815 thousand cubic meters/year ($1.896 million/year)

- Climate Change Mitigation
- Building Energy Savings: $3,630,000/year
- Carbon Storage: 395.1 thousand metric tons ($45.4 million)
- Carbon Sequestration: 13.41 thousand metric tons ($1.54 million/year)

*www.itreetools.org

Structural value or estimated cost to replace trees within Hamilton’s urban forest: $2.13 billion
Hamilton Urban Forest Strategy

Hamilton’s Urban Forest Program Strengths

- Support for the urban forest in Policy
  - Hamilton’s Urban Official Plan “environmental systems – land, air and water – that are protected and enhanced”
  - 2016-2025 Strategic Plan - “Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces”

- High appreciation for recreation in natural areas – in a visitor survey, natural areas were cited as one of the top tourist draws

- Strong non-profit community group engagement, networks and support for tree planting

- Established community outreach efforts and education programs (e.g., schools program)

- Urban Forestry program capacity meets current management needs with qualified Forestry staff and tree maintenance
Hamilton’s Urban Forest Program Challenges

- Limited tools for private tree protection
- High level of invasive species in natural & other land use areas
- Planning & development processes do not contain clear requirements for maintaining or establishing trees or tree canopy
- Inconsistent support for growing the urban forest
- Limited resources (funding) for growing & maintaining the urban tree canopy
- Gaps in data & information management tools
Hamilton Urban Forest Strategy

Hamilton’s Urban Forest
Where We Stand

Tree cover potential is different for every municipality based on local context and policy goals.

- Hamilton has 21.2% tree cover (2018)
- The City’s Official Plan target is 30% - based on the minimum amount of forest cover needed to sustain basic watershed function.
• Hamilton is facing urban growth and intensification.

• Effects on tree canopy - loss of growing space (particularly for large stature/shade trees), challenging site conditions, increased heat island effect, etc.

• Urban design can address some of the issues with shrinking growing space under intensification.

• Having defined tree cover targets for development can promote good design practices and increase the long-term appeal and livability of neighbourhoods and business areas.
UTC = Urban Tree Canopy
PPA = Potential Planting Area

Land cover classification produces spatial tree cover data at the property level which can be used to:

- Identify tree canopy by neighbourhood, ward, watershed, etc.
- Develop land use targets for tree cover
- Identify low UTC areas to focus planting efforts (PPA)
- To quantify and map available planting area & loss of planting area over time
- To detect change in tree and land cover over time
- Other department program activities (e.g. Water, Public Health, Climate Change, Public Works, etc.)

Automated land cover classifications provide critical planning data for the urban forest.

Enhanced by LidAR (3D model)
Land cover data allows more detailed planning and prioritization of forest management activities.

- Land cover data can be used to do a UTC or PPA analysis
- Prioritize planting areas
- Land cover data can also be used to determine land use targets for tree cover
- Tree canopy mapping was last done in 2009, should be updated

Sample priority planting areas map by land ownership (red = high, green = low)
• Some land uses have low UTC (e.g., commercial & industrial areas), to maximize benefits from urban forest, many cities:
  
  • set land use targets for UTC to ensure more even distribution of tree canopy across the City
  
  • Integrate UTC land use targets in development and plan review based on an assessment of what is desirable/feasible in a given land use area.
Existing Policy & Planning Tools

- Official Plan, Vol. 2, Section B.3.3 Urban Design Policies
- Promote environmental sustainability, including protection of existing natural features (e.g. forest)
- Street trees in streetscape design (S 3.3.2.10)
- Landscaped islands & perimeters in parking areas (S 3.3.10)
- City-Wide Corridor Planning and Design Guidelines
- Street trees - 3 m wide tree planted perimeter landscape (Site plan guidelines)
- The Hamilton Site Plan Guidelines
- Street tree & parking lot planting areas
- Tree plantings along all property lines & screening loading areas or sensitive areas from more active uses
- Tree planting standards
Complete Livable Better streets policy and framework, which will include a Design Manual.

The policy will support best practices in streetscape design, which include requirements for street trees.

Streetscape Master Plans

Generally recommend complete streetscapes which include street trees.
**Hamilton Urban Forest Strategy**

**Implementation Gaps/Challenges**

- Site Plan Guidelines
  - Provisions for minimum 3m wide ‘landscaped’ buffer along internal property lines in industrial areas.
  - However, the guidelines indicate that tree plantings are optional

- Zoning
  - Unless tree planted landscape strips are clearly required in zoning, it is very difficult to get, or too narrow and may not support tree plantings.

- Urban Design
  - Condo roads in new developments, typically do not include boulevards (that normally hold street trees)

- Driveways on narrow lots eat into front yards, preventing future tree planting space on private land

- Many future neighbourhoods will lack trees to provide pedestrian comfort and character (contrary to OP goals)

- Official Plan
  - There are policies recommending ‘green’ design; however, departments are lacking clear requirements to implement policy.
  - There are no tree canopy targets to guide greening requirements at the individual site level.
Hamilton Urban Forest Strategy

Consolidate Private Tree By-Laws

- Approx. 60% of the City’s urban tree canopy is located on private land.
- Larger trees provide the greatest ecological and economic benefit; and tree size distribution was skewed to smaller trees (iTree Study).
- Protection of private trees is important for the long-term preservation and growth of the tree canopy.
- As of 2018, 13 of 25 nearby municipalities have a private tree by-law (or 60% of municipalities in Ontario with population > 3000).
- Tree by-laws offer the best protection for the existing urban tree canopy.
- In the shorter term, Forestry should collect more data/information on root causes of tree canopy loss to inform future program direction and make a case for improved tree protection.
Goal 2: Protect
Known Causes of Tree Removal in Hamilton

- 18,189 ash trees have been removed due to Emerald Ash Borer as of January 2019
- Replacement is 1:1 for ash - in the short term, this represents a net loss of tree canopy
- Many private trees are also being removed for development and other landowner interests
- Base tree planting budget has remained steady at $1.345 million per year for several years
- Current level of investments does not reflect the reality of present and future challenges/threats to the urban forest
- Current funding levels may support status quo, but not an increase or growth in canopy
Based on estimates from iTree plots, the greatest opportunity for planting on publicly-owned land is in the Open Space and Transportation/Utility land uses.

On private lands, potential planting area opportunity is highest in vacant, institutional and low-density residential land uses.

This information can help prioritize tree planting efforts by land use.
Though no longer planted, Norway maple still comprises 19% of the street tree population and can be found in 13 out of 14 Wards surveyed.

Maple species represent 28.2% of the street tree population. This exceed the recommended 20% of one genus in the population.

Lack of diversity in tree species composition makes the urban forest more susceptible to pest and disease impacts (e.g., Asian Long-horned Beetle).
Goal 3: Plant
87% of street trees are in ‘Good’ condition, however 6% are either ‘Poor, Dead or Dying’

An up-to-date street tree inventory would identify ‘Poor, dead or dying’ trees that should be removed and support more effective street tree asset management

It would also support the City’s tree risk management efforts
• Majority of ‘dying’ and ‘dead’ trees were in parks, natural areas, cemeteries, recreational fields and golf courses.

• There is an opportunity to increase and improve the health of the tree canopy by removing and replacing dead and dying trees in these areas.

• Requires coordination between Forestry and Parks Departments and increased funding for lead City Sections addressing the issue.

• This could be paired with silvicultural treatments (woodland management) to promote regeneration of native species in priority areas.

Percentage of “Dying” and “Dead” trees in Open Space is the highest out of all land use categories – 3.1% and 9.8%, respectively.
Fairly good overall native species diversity

Native black walnut represents about 20% of total leaf area

Ash species still represent ~5% of total leaf area, but are threatened by Emerald Ash Borer

Urban forest has a high presence of invasive species - 20-25% of the total urban forest leaf area is Category 1 and 2 invasive species

**Category 1 Invasive Species**
Excludes all other species and dominates site indefinitely.

**Category 2 Invasive Species**
Highly invasive, but tend to only dominate certain niches or do not spread rapidly from major concentrations.
Currently, there is minimal forest/vegetation management in publicly-owned natural areas and on private lands.

This creates a scenario where invasive species will continue to spread.

Invasive species present threats to biodiversity and recreational values.

15.9% of the top ten species are invasive.

Species include:
- *Norway maple*
- *Manitoba maple*
- *European buckthorn*
- *black locust*
Hamilton Urban Forest Strategy

Forest Health

Potential pest and disease risks:

<table>
<thead>
<tr>
<th>Pest</th>
<th>Number of Susceptible Trees</th>
<th>Structural Value ($)</th>
<th>Leaf Area (%)</th>
<th>Leaf Area (Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gypsy Moth</td>
<td>1 million</td>
<td>376,000,000</td>
<td>15</td>
<td>4,262</td>
</tr>
<tr>
<td>Oak Wilt</td>
<td>52,000</td>
<td>115,000,000</td>
<td>2</td>
<td>656</td>
</tr>
<tr>
<td>Asian Longhorned Beetle</td>
<td>1.2 million</td>
<td>673,000,000</td>
<td>32</td>
<td>9,320</td>
</tr>
</tbody>
</table>

Hamilton monitored gypsy moth in 2016, 2017, and 2018 (based on egg mass counts)

Otherwise, the City doesn’t have a systematic forest health monitoring program.
• Hamilton has had a regular grid pruning program in effect for several years
• Achieved a 7 year pruning cycle
• 87% of street trees are in ‘Good’ condition, 6% are dead or dying
• Hazard tree removal is done along trails in natural areas
Goal 4: Maintain
Hamilton Urban Forest Strategy

Communications and Outreach

• Hamilton has established outreach and communications programs that promote urban forest awareness and engagement

• Challenge - lack of understanding of urban forest benefits and attitudes toward trees (e.g. trees considered to be an easily replaceable resource rather than a long-term asset worthy of investment)

• The Power of Maps

• Spatial data is a powerful communication tool

• Many cities have online mapping to describe the urban forest

• Can use existing inventory data to develop online maps of the City’s forest resource

Source: Trees Hamilton

Source: Trees Hamilton
Goal 5: Communicate
Hamilton Urban Forest Strategy

Communications and Outreach

- Hamilton has an engaged non-profit community – citizen science has already contributed to information on the City’s urban forest.
- Citizen science could be used to increase public awareness and support for urban forestry and to collect data that can support specific forest management activities (e.g. invasive species tracking, tree removals, tree condition, tree planting, etc.).

Source: https://www.opentreemap.org
• Last street tree inventory completed 2006
• Parks and Cemeteries updated 2018
• The City needs a data management system to track forestry assets and management activities
• Currently, forestry tree inventories are not linked to the work order system or inspections software
City managers need good information and data about change in the urban forest to respond.

Tools can help with change detection and monitoring - e.g., United States Forest Service has developed many tools to help forest managers get the information they need.

“Adaptive management (AM) is a systematic approach for improving resource management by learning from management outcomes.”

AM can make City programs better and reduce cost.

It does this by collecting data and looking at actual (root) causes of issues.

This information can be used to apply the right solutions.
Goal 6: Monitor & Adapt
Draft Goals

- Plan & Act
- Protect
- Plant
- Maintain
- Communicate
- Monitor & Adapt

- 31 Draft Urban Forestry Actions
Questions?
Mentimeter Activity
Prioritize Actions!
Goal 1: Plan & Act
Goal 2: Protect
Goal 3: Plant
Goal 4: Maintain
Goal 5: Communicate
Goal 6: Monitor & Adapt
• Hamilton is in the transition zone between two forest ecoregions: Carolinian Zone and Great-Lakes St. Lawrence Forest, and so is home to many unique tree species.

• There is a Chinquapin Oak in Fisher's Mill Park in Dundas which is estimated to be almost 200 years old and is on the Ontario Honor Roll of Trees.

• The Niagara Escarpment runs through urban Hamilton, providing a unique forested landscape in the city!
Group Activity
Planting the Seed
Goal 1: Plan & Act
Urban Forest Strategy

Goal 1: Plan & Act

- Revise the City’s public tree by-law to reflect the Official Plan 30% forest cover target for Hamilton.

- Review key resource (staff and funding) gaps for facilitating UFS actions to achieve Hamilton urban tree canopy target.

- Complete an UTC/PPA analysis for Hamilton, using spatial data derived from a land cover classification.

- Use urban tree canopy data to develop land use targets for tree cover - integrate targets in plan review and development processes.

- Forestry & Parks staff should actively participate in relevant policy, plan and guidelines review processes to support integration of the City’s urban forestry goals.

- Develop urban forestry ‘best practices’ to share with City departments whose activities affect the urban forest.

- Update and actively maintain street tree inventory. Include assessment of tree condition/risk.
Goal 2: Protect
Urban Forest Strategy
Goal 2: Protect

- Implement a private tree by-law for Hamilton’s urban area that includes individual trees on private property.

- Collect data and evidence to identify and explain root causes of change/loss in the urban tree canopy.

- Implement a requirement to include calculation of canopy balance (leaf area of trees removed vs. proposed planting) as part of arborist report for development applications and building/demo permits.

- Report on canopy balance in development applications as an environmental performance indicator for Hamilton.
Goal 3: Plant
Urban Forest Strategy
Goal 3: Plant

- Identify the number of trees required to be planted in Hamilton over the next 20 years to meet 30% tree canopy target and increase funding for tree planting initiatives accordingly.

- Reduce use of maple species in street tree planting in the current planning cycle. Report on canopy balance in site plans as an environmental performance indicator for the City of Hamilton.

- Implement standardized Forestry tree planting specifications in all planting projects undertaken by the City of Hamilton.

- Examine tree planting budgets and programs to identify opportunities for increasing the number of trees planted in Hamilton over the next 5 years.

- Identify plantable areas in high potential land uses to prioritize tree planting locations, outreach and partnership efforts.

- Conduct a more detailed analysis of available planting space for street trees. Prioritize planting on higher quality sites and in areas of low & over mature canopy.

- Monitor species composition over time and review planting strategies to ensure urban forest species diversity and forest resilience.
Goal 4: Maintain
Urban Forest Strategy

Goal 4: Maintain

- Update and actively maintain a street tree inventory, including assessment of tree condition and hazard risk as well as maintenance prescriptions.
- Focus on removal of ‘poor, dead or dying’ street trees to improve overall street tree condition.
- Develop an invasive species management policy for the Hamilton, including prioritization for control activities.
- Work with Parks and Conservation Authorities to prioritize investments for improving forest condition in the Open Space land use.
- Implement management activities to improve long-term forest condition in high priority natural areas.
- Examine opportunities to control invasive species under property standards regulations (e.g., Yard Maintenance By-law).
- Develop a policy that describes how the City will monitor & manage forest health threats in Hamilton.
- Develop service standards for hazard trees and other forestry service requests.
Goal 5: Communicate
Urban Forest Strategy

Goal 5: Communicate

- Complete a detailed study to identify the specific attitudes towards trees, and other opportunities and barriers to growing the urban tree canopy. Include City Council, City staff, business and development sector, residents, under-represented populations, etc.

- Use the results of the study to inform a targeted education, communications and outreach strategy.

- Build online mapping tools to communicate the character, location and condition of Hamilton urban forest, based on available spatial inventory data.

- Work with local non-profits to explore applications in citizen science and funding options that most effectively support the Urban Forest Strategy goals.
Goal 6: Monitor & Adapt
Urban Forest Strategy
Goal 6: Monitor & Adapt

- Monitor land cover change through mapping to assess spatial trends in urban tree canopy and land cover.

- Report to Council on best options for forestry asset management system based on success and utility in other jurisdictions.

- Repeat urban forest studies on a regular basis (every 10 years or in response to significant environmental change).

- Use Criteria and Indicators to assess change and report to Council on progress toward meeting CoH urban forest goals (every 5 years).

- Use available tools to assess change in tree canopy cover every 2 years (e.g., i-Tree canopy).

- Monitor change using Urban Forest Strategy Criteria and Indicators.

- Select three corporate key performance indicators to report on progress toward urban forest goals.

- Monitor street tree mortality using improved inventory and asset management tools to assess planting program effectiveness.
Next Steps & Closing
Urban Forest Strategy

Project timeline

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https://www.hamilton.ca/city-initiatives/strategies-actions/urban-forest-strategy

Thank You for Attending!