I YOUR COMMITTEE RECOMMENDS:

1. That the Civic Administration BE REQUESTED to consider the attached documentation with respect to an Urban Forest Effects Model (UFORE) that is designed to analyze the structure, function and value of a municipality's urban forest and determine what the City can do as a next step in working in conjunction with the Upper Thames River Conservation Authority (UTRCA) to implement a similar model for the City of London and area; it being noted that the Trees and Forests Advisory Committee (TFAC) heard a verbal delegation from C. Harrington, Coordinator of Planning and Research and T. Tchir, Ecologist, UTRCA with respect to this matter; it being further noted that the TFAC is supportive of the UFORE model for the City of London.

II YOUR COMMITTEE REPORTS:

2. That the Trees and Forests Advisory Committee (TFAC) heard a verbal delegation and received the attached presentation from M. Minielly, Coordinator, Forestry Programs with respect to the City's Fall tree planting proposal; it being noted that the TFAC endorsed the program approach for ash tree infill, as presented by Ms. Minielly; it being further noted that the TFAC received a communication dated July 17, 2007 from the Committee Secretary with respect to this matter.

3. That the Trees and Forests Advisory Committee (TFAC) reviewed and received a communication dated July 17, 2007 from G. Sinclair with respect to proposed Tree Conservation By-law amendments. The TFAC requested that the proposed amendments be forwarded to A. Macpherson, Manager of Parks Planning and Design for consideration in developing the Tree Conservation By-law revisions.

4. That the Trees and Forests Advisory Committee (TFAC) requested that the following proposed actions to ensure the health of street trees and to encourage the maintenance of all trees in the City of London be forwarded to I. Listar, Urban Forester for consideration as part of the upcoming tree watering report as requested by Municipal Council at their meeting held on July 16, 2007:

(a) increase homeowner awareness and information delivery regarding street trees at time of planting;

(b) implement a general information and awareness campaign regarding good tree care (focusing on the need to water), including the use of a recognizable tree care symbol;

(c) implement a tree watering alert system to remind Londoners to water their trees during conditions when trees are at high risk due to low water/ high temperature conditions;

(d) implement a street tree watering regime;
(e) modify the City's street tree planting specifications to improve the survival rate and overall health of newly planted trees; and

(f) monitor newly-planted trees to evaluate the success of current and proposed planting practices.

5. That the Trees and Forests Advisory Committee (TFAC) heard a verbal update from I. Listar, Urban Forester with respect to his recent encounter with a City resident using watering buckets to water the boulevard trees and the efforts of a local garden centre offering $100 gift certificates for residents who brought in photos of themselves watering trees; it being noted that the TFAC directed the Chair to write thank you letters to these individuals in recognition of their efforts to save trees during high temperature conditions.

6. That the Trees and Forests Advisory Committee (TFAC) heard a verbal update and received the attached draft outline from I. Listar, Urban Forester with respect to a 20-year urban forestry strategic plan, incorporating the subject matter from the TFAC's Brainstorming Session held at its meeting on May 31, 2007 and existing Upper Thames River Conservation Authority (UTRCA) and City programs.

7. That the Trees and Forests Advisory Committee (TFAC) heard a verbal update from I. Listar, Urban Forester with respect to his attendance at the "Forests in Settled Landscapes" Conference being held at the St. George Campus of the University of Toronto on August 20 – 23, 2007; it being noted that individuals involved in the Urban Forest Effects Model (UFORE) will also be in attendance and Mr. Listar hopes to speak with them and provide a report back to the TFAC at its next meeting; it being further noted that the TFAC asked the Committee Secretary to put this matter on the next TFAC agenda.

8. That the Trees and Forests Advisory Committee (TFAC) heard a verbal update and viewed a sample tree bark ravaged by the Emerald Ash Borer from I. Listar, Urban Forester; it being noted that Mr. Listar will provide a further update with respect to this matter at the next TFAC meeting.

9. That the Trees and Forests Advisory Committee (TFAC) noted and filed the following:

(a) (1) the 4th Report of the Trees and Forests Advisory Committee from its meeting held on June 27, 2007;

(b) (2) a Municipal Council resolution adopted at its meeting held on July 16, 2007 with respect to clause 1 of the 4th Report of the TFAC regarding an analysis of trees lost due to drought conditions;

(c) (3) a Municipal Council resolution adopted at its meeting held on June 25, 2007 with respect to the 2007 first quarter Capital Budget status report;

(d) (5) communications dated June 27 and July 17, 2007 from K. Lacey-Rutherford and Mayor A. M. DeCicco-Best, respectively, with respect to a suggestion on enhancing the image of London;

10. That the Trees and Forests Advisory Committee (TFAC) will hold its next meeting on September 26, 2007.

The meeting adjourned at 2:45 p.m.
URBAN FOREST EFFECTS MODEL (UFORE) - PROPOSAL

"In Support of a Green Infrastructure"

TECHNICAL TERMS OF REFERENCE FOR THE CITY OF LONDON

1.0 OVERVIEW / PURPOSE

While urban areas occupy only a small proportion of the Thames River watershed’s total land area, the majority of the watershed’s population lives in urban areas. The urban forest plays a significant role in the community’s quality of life; yet the average municipality has a tree canopy less than one-third of its area, and the health of the trees forming this green umbrella is declining.

Tree cover is also directly related to environmental quality. Maintaining a robust tree cover to function as green infrastructure reduces the need and expense of building infrastructure to manage air and water resources. Unlike gray infrastructure, the value of the functional role of trees as green infrastructure in the municipalities within the Upper Thames watershed has not been quantified. Therefore, trees cannot be factored into the municipal budget process. While both gray and green infrastructure are important to a city, communities that foster green infrastructure where possible are more livable, produce fewer pollutants, and are more cost effective to operate.

The Urban Forest Effects Model (UFORE) has been designed by the United States Department of Agriculture, Forest Service. It is a scientific approach that quantifies the function and structure of the urban forest to people living and working in the urban area based on standard inputs of field, meteorological and pollution data. It was developed for urban communities of all sizes interested in the environmental benefits of community forests, to strategize their urban and community forest management efforts. Using UFORE, the size, shape and location of a city’s green infrastructure can be measured and the public utility functions they perform can be accurately calculated.

The UTRCA is interested in leading a UFORE project quantifying the tree cover for the urban municipalities in its watershed and incorporating long-term strategic planning of these areas. Undertaking an UFORE based project in the City of London will support efforts to develop and monitor an Urban Forest Strategy. The results of an UFORE project will set the context for the strategy and provide background support, such as the number, species and optimum planting locations of trees in order to achieve a sustainable urban forest canopy cover goal. It will also assist in determining where to focus the efforts of community forestry programs in the City of London.

2.0 OBJECTIVES OF THE URBAN FOREST EFFECTS MODEL (UFORE)

Results of the model will identify London’s urban forest structure and its effects in the City. This research will act as a current “state of the resource” report for the urban forest in London and a starting point for the Urban Forest Strategy. The objective of the model is to conduct a scientifically sound analysis of the structure, function and value of the municipality’s urban forest (i.e. trees, shrubs and other types of vegetation growing throughout the municipality), including its role in air quality benefits and greenhouse gas mitigation. These benefits will then be converted to an economic value.

Specifically, the UFORE model will incorporate information from random (permanent) plot field inventories within the municipality, as well as existing information (including municipal tree inventories, community forestry programs, best management practices, etc.) to determine the following parameters:
1. **Structure**: species diversity, density, health, number, leaf area, canopy cover, tree size (height and diameter), major pest threats (Asian Longhorn beetle, Emerald Ash Borer, Gypsy Moth, Dutch Elm Disease), and the total available space to plant trees.

2. **Function**: energy conservation, air pollution removal, the amount of carbon storage and sequestration, and the amount of CO2 filtered.

3. **Value**: the economic importance of the forest functions, such as replacement value of the urban forest, the amount of energy savings, the amount of money saved on pollution removal, the estimated worth of each tree as it exists in the landscape, the optimum location to plant trees (match species to location attributes), and when to begin under planting for declining trees.

To establish a healthy balance of gray and green infrastructure, the municipality can then:
- use the results of UFORE to quantify the presence of green infrastructure and its function for air and water improvement
- designate green infrastructure as a public utility and allow for the planning and budgeting for this infrastructure similar to other infrastructure
- establish a tree canopy goal or target as part of every development project
- adopt public policies, regulations and incentives to increase and protect green infrastructure
- identify prime sites for their ability to provide optimum potential “tree habitat” for large-stature trees (assuming adequate soil compaction conditions) including parks, lands, road side berms, low density residential properties and low density industrial properties. The goal is to plant the best sites with the best tree species that will optimize air quality improvements.
- update UFORE every four years by measuring and analyzing changes in the urban forest over time from the permanent plots and present the results to community state of the urban forest report.

### 3.0 PROPOSED MINIMUM WORK PROGRAM

**Table 3.1: Project Components / Technical Project Team**

<table>
<thead>
<tr>
<th>Phase 1 - UFORE Project Preparation</th>
<th>Technical Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications and Consultation Plan</td>
<td>Ecologist</td>
</tr>
<tr>
<td>Project Governance and work planning</td>
<td>Coordinator, Planning and Research</td>
</tr>
<tr>
<td>Local Advisory Committee (LAC)</td>
<td>Professional Planner</td>
</tr>
<tr>
<td>Develop a UFORE and multimedia presentation</td>
<td>GIS Specialist</td>
</tr>
<tr>
<td>Initiate webpage development</td>
<td>Marketing Specialist</td>
</tr>
<tr>
<td>Background research and setup of UFORE model</td>
<td>Communication Specialist</td>
</tr>
</tbody>
</table>

**Deliverables:**
- Detailed work plan
- Report Background
- Consultation Plan
- Multimedia presentation for LAC

---

3,000

$4,000

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Technical Team</th>
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</thead>
<tbody>
<tr>
<td>Communications and Consultation Plan</td>
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<td>Ecologist</td>
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<tr>
<td>Project Governance and work planning</td>
<td>$4,000</td>
<td>Coordinator, Planning and Research</td>
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<tr>
<td>Local Advisory Committee (LAC)</td>
<td></td>
<td>Professional Planner</td>
</tr>
<tr>
<td>Develop a UFORE and multimedia presentation</td>
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<td>GIS Specialist</td>
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<tr>
<td>Initiate webpage development</td>
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<td>Marketing Specialist</td>
</tr>
<tr>
<td>Background research and setup of UFORE model</td>
<td></td>
<td>Communication Specialist</td>
</tr>
</tbody>
</table>

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UFORE London - Draft Technical Terms of Reference – August 2007  Page 2 of 6
### Phase 2 - Collect Background Information for UFORE
- Review and compile background information (City of London tree database, UTRCA community forestry plots, Reforest London forested plots, UTRCA reforestation best management practices, etc.)
- Spatial data analysis of land use layers
- Analysis to identify information gaps
- Plot selection for field inventory
- Assemble notification addresses for field plots
- Develop data management model and field data acquisition protocol
- Host two meetings with the LAC to review process and identify information gaps
- Hire and train field work assistants

**Deliverables:**
- Identification of areas requiring further study / field verification
- Land use cover maps
- Data model
- Field data acquisition protocol
- LAC meeting minutes

<table>
<thead>
<tr>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25,000</td>
<td>Ecologist Coordinator, Planning and Research</td>
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<tr>
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<td>Marketing Specialist</td>
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<tr>
<td>$27,000</td>
<td>GIS Specialist</td>
</tr>
<tr>
<td>$14,000</td>
<td>Support Staff (LAC meeting)</td>
</tr>
</tbody>
</table>

### Phase 3 - UFORE Data Acquisition and Simulation (2 Field Seasons)
- Contact landowners for field verification
- Conduct summer field inventory (3 two person crews over 6 months)
- Incorporate LAC comments from consultation process
- Link field data to land cover model
- Populate simulation model
- Analyse results
- Present results to LAC
- Launch webpage
- Produce forest cover maps

**Deliverables:**
- Research Methodology
- Presentation of model results

<table>
<thead>
<tr>
<th>Cost</th>
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<tr>
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<tr>
<td>$3,000</td>
<td>Graphic Designer</td>
</tr>
<tr>
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<td>Field Crew (3 X 2 person crews)</td>
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<tr>
<td>$3,000</td>
<td>Terrestrial Biologist</td>
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<tr>
<td>$2,000</td>
<td>Vegetation Specialist</td>
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<tr>
<td>$2,000</td>
<td>Forester</td>
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<tr>
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<td>Research Assistants (students)</td>
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<tr>
<td>$2,000</td>
<td>Ecologist</td>
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</table>

Note: USDA participation in model simulation may be required.

### Phase 4 - UFORE Report
- Summary of results into final report
- GIS mapping and data management
- Project wrap-up and communication of results

**Deliverables:**
- UFORE report including city-specific results and recommendations
- Supporting data and meta-data
- Final Presentation (TFAC)

<table>
<thead>
<tr>
<th>Cost</th>
<th>Description</th>
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<tbody>
<tr>
<td>$27,000</td>
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<td>$14,000</td>
<td>Professional Planner</td>
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<td>$1,000</td>
<td>Communication Specialist</td>
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<td>$1,000</td>
<td>Graphic Designer</td>
</tr>
<tr>
<td>$1,000</td>
<td>GIS Specialist</td>
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</table>
**Table 3.2: Project Budget Summary**

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Cash Required</th>
<th>UTRCA in-Kind</th>
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</thead>
<tbody>
<tr>
<td>Project Technical Team:</td>
<td>$240,000.00</td>
<td>$99,000</td>
</tr>
<tr>
<td>Overhead / Expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Consultation (meeting facility, supplies, equipment and mailing)</td>
<td>$2,000.00</td>
<td></td>
</tr>
<tr>
<td>- Supplies, web page, field equipment, misc.</td>
<td>$3,000.00</td>
<td>$3,000</td>
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<tr>
<td>- Report printing</td>
<td>$10,000.00</td>
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<tr>
<td>Total Project Cost</td>
<td>$255,000</td>
<td>$92,000</td>
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</table>

### 4.0 PROPOSED PROJECT GOVERNANCE MODEL

- City of London representative to act as chair of the steering committee
  - Oversees the overall project and approval of project parameters, sampling methods etc.
  - All project communication approved / handled through the Project Steering Committee
  - Makes final recommendations to City Council

- Local stakeholder committee formed as part of the consultation plan
- Guide project process through recommendation of project parameters, sampling methods etc.
- Develop recommendations for the Project Steering Committee.
  - *NOTE: Only example members listed. TBD.*

- Core project technical team (outlined in work program)
- Staff from the UTRCA
- Other participants as needed
5.0 BIBLIOGRAPHY


DRAFT GOVERNANCE / ROLES

Next Steps

- Time Remaining: [Instructions]
- Next Steps:
  - Project Title: London (Green)
  - Work with London Forester (City of London)
  - GRO analysis / Peer Discussion
  - Professional contribution (Cerby)
Draft Work Plan / Budget

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Cash Required</th>
<th>UTRCA In - Kind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Technical Team</td>
<td>$240,000.00</td>
<td>$99,000</td>
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<tr>
<td>Overhead / Expenses:</td>
<td></td>
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<tr>
<td>- Consultation</td>
<td>$2,000.00</td>
<td>$5,000</td>
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<td>- Report printing</td>
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<td>Total</td>
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<td>Total Project Cost:</td>
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Draft Governance / Roles

Proposed Project Governance Model

- **City of London** representative to act as chair of the steering committee
- Oversees the project and approval of project parameters, sampling method, etc.
- Project communication
- Makes Final recommendation to City Council

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Draft Governance / Roles

Proposed Project Governance Model

- Local stakeholder committee
- Guide project process through review and recommendations of project parameters, modules, sampling methods, etc.
- Develop formal recommendations for the Project Steering Committee

**Note: only example members listed, TBD.**
DRAFT Work Plan / Budget

Proposed Terms of Reference

Major Findings

- Necessary, and revision of work plan may be required. The assumption that some data holdings exist-collection of all primary data. On induction of all model parameters and PDCM work plan and budget estimate based.

<table>
<thead>
<tr>
<th>Project</th>
<th>Contributions</th>
<th>Total</th>
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<tbody>
<tr>
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Urban Forest Effects Model
City of London Proposal
Trees and Forests Advisory Committee
Wednesday August 15, 2007

Upper Thames River Conservation Authority
Tara Tchir – Forester
Chris Harrington – Coordinator, Planning and Research

Outline
- Work to Date
- UFORE Background
- Proposed Terms of Reference
  - Objectives
  - Draft Work Plan / Budget
  - Governance / Roles
- Next Steps

Work to Date
- Introduced at TFAC - June 27
- ReForest London – August 18
- City of London – August 9
- Draft Terms of Reference

UFORE Background
- Designed by the United States Department of Agriculture, Forest Service.
- Quantifies the function and structure of the urban forest based on standard inputs of field, meteorological and pollution data.
- Green infrastructure in a City can be measured and the public utility functions they perform accurately calculated.
EMERALD ASH BORER
PROACTIVE
TREE PLANTING IN AREAS
DOMINATED BY ASH SPECIES
~~~~~~~~~~~~~~~~~~~~~~~~~
PHASE I – FALL/2007
PHASE II – 2008
PHASE III – 2008 & BEYOND
PHASE I
FALL/2007

ENHANCED RESIDENTIAL

ADDRESSES - 400 IN ASH DOMINANT AREAS
- 100 ADDITIONAL INFILL

= 500 TOTAL TENDER QUANTITY

BUDGET - FALL/2007 = $165,000.00

DOWNTOWN CORE

PROJECT - AUGMENT DUNDAS ST. PROJECT - CU SOIL

BUDGET - $10,000 - $20,000

Jalna Boulevard
PHASE II
2008

ENHANCED RESIDENTIAL – SPRING

ADDRESSES - 400 IN ASH DOMINANT AREAS
- 100 ADDITIONAL INFILL

= 500 TOTAL TENDER QUANTITY

ADDITIONAL OPPORTUNITIES – FALL

= 500 TOTAL TENDER QUANTITY
Guildwood Boulevard

Guildwood Boulevard
PHASE III
2008 & BEYOND

ADDITIONAL OPPORTUNITIES

- INFILL IN NEIGHBOURHOODS BORDERING HIGH ASH CONCENTRATION AREAS
- REPLACE ASH TREE LOSSES IN NEIGHBOURHOOD PARKS
- INFILL IN AREAS OF HIGH TREE LOSS OTHER THAN ASH SPECIES - OLD EAST / OLD SOUTH / OLD NORTH
- ARTERIAL ROAD PLANTING – HIGHER COST

Huntington Park
Windermere Sports Fields
20 Year Urban Forestry Strategic Plan Components

Introduction

Planning Approach

Background- Setting the Stage

- Inventory needs assessment
- Specific factors that make London unique

Strengths, Weaknesses, Opportunities and Threats

- Benefits
- Emerald Ash Borer
- Impacts of climate change

Vision of London’s Forests

- City priorities and vision
- Municipal Benchmarking

Stratification of the City

- Street tree program
- Downtown tree management

Inventory

- Inventory needs assessment

Tree Habitat

Tree Establishment Plan

Tree Protection Plan

- Tree preservation
- Watering

Forest Health Plan

- Watering

Tree Maintenance/Pruning Plan

Hazard Abatement and Risk Management Plan

- Emergency response measures

Woodland Stewardship Program

- Private land management and by-laws
- Woodland management
- ESA management

Public Education Program

- Public education and communications
- Community involvement and Forestry programs

Private Land Stewardship Program

- Private land management and by-laws
- Tree preservation
- Community involvement and Forestry programs

Policies and By-laws

Administration

- Resources
- Organizational responsibilities
• Target – how to put all the pieces together

Budget
• Resources

• Target – how to put all the pieces together

Communication among City Departments
• Organizational responsibilities

Plan Review Process
5 year and Annual Operational Plans
• How to put all the pieces together